DCN 1394

NRL

DEPARTMENT OF THE NAVY
OFFICE OF NAVAL RESEARCH
800 NORTH QUINCY STREET
ARLINGTON, VA 22217-5660

IN REPLY REFER TO

11000
Ser 91/133
19 May 1994

FIRST ENDORSEMENT on NRL ltr 11000 Ser 5000/026 of 21 Apr 94

From: Chief of Naval Research
To: Chief of Naval Operations (CNO (N44))

Subj: BRAC-95 DATA CALL NUMBER THIRTEEN

Ref: (a) BSAT (Labs/Tech Ctrs) ltr of 13 Apr 94

Encl: (1) BRAC Certifications

1. We have reviewed the position of the Naval Research Laboratory and the Base Structure Analysis Team's comments provided in reference (a). Based on this review, we concur with the conclusion by the Naval Research Laboratory that the Laboratory facilities are designed for conducting research and experimentation. They are not designed nor qualified for traditional Test and Evaluation efforts. Also, the infrastructure associated with traditional Test and Evaluation functions is not resident at the Laboratory. Therefore, Data Call Thirteen is not applicable to the Naval Research Laboratory.

2. Enclosure (1) provides the required BRAC certification.

MARC PELAEZ
Rear Admiral, USN

Copy to:
CO, NRL

WC

DEPARTMENT OF THE NAVY
NAVAL RESEARCH LABORATORY
WASHINGTON, D.C. 20375-5320

IN REPLY REFER TO:
11000
5000/026
21 APR 1994

From: Commanding Officer, Naval Research Laboratory
To: Base Structure Analysis Team, 4401 Ford Avenue, PO Box 16268, Alexandria, VA 22302
Via: Chief of Naval Research

Subj: BRAC-95 DATA CALL NUMBER THIRTEEN

Ref: (a) CNO ltr 11000 Ser N441/4U594482 of 8 Apr 94

1. Reference (a) requests data in the area of Joint Cross-Service Group Test and Evaluation (T&E). The Naval Research Laboratory has experimental facilities which are utilized in the support of R&D in Electronic Warfare (EW). These facilities of the Naval Research Laboratory's Tactical Electronic Warfare Division provide the Electromagnetic Research Laboratory and the scientific tools required to permit the state-of-the-art of electronic warfare technology to be advanced in response to Navy needs and the Division's role as the Navy's Lead Laboratory for EW exploratory development. This facility contains the specialized tools and lab equipment to support experiments that characterize and quantify the physical phenomena which govern the action of electronic systems, and that when understood can lead to new technologies for future EW systems development programs.

2. These facilities are Navy specific in design and focus on the S&T needs for EW in support of the unique needs of Naval surface forces. The extensive analysis, modeling, measurement and simulation tools provided by these facilities are essential to the ability of researchers to conduct their research. However, these facilities are not validated and accredited through the formal process as appropriate for use as a T&E resource upon which acquisition program decisions can be made. The Electronic Research Laboratory consists of facilities much like those found at a modern, well equipped, university laboratory or a major industrial corporate laboratory. As such, it differs greatly from the facility that would be found in a Naval Warfare Center that focuses on providing engineering support to the Navy's acquisition programs and to specific nomenclatured or production programs and their Test and Evaluation to assess their compliance with specifications, DOD standards, and TEMP requirements.

3. In summary, the Naval Research Laboratory believes that its Electromagnetic Research Laboratory which supports the NRL's R&D program in EW does not fall within the scope of the BRAC-95 Data Call Number Thirteen because it is neither a T&E facility nor is it a facility in the cross-service category. Specifically:

11000
5000/026
21 APR 1994

Subj: BRAC-95 DATA CALL NUMBER THIRTEEN

(a) The facility has been configured for an R&D role vice a production T&E role.

(b) The facility has been specifically designed to handle at-sea scenarios for Navy unique situations and hence is not appropriate as a cross-service resource.

In view of the above and unless otherwise directed, the Naval Research Laboratory will not respond to the BRAC-95 Data Call Number Thirteen.

PAUL G. GAFFNEY, II

0003

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

NAME (Please type or print

Signature

Title

Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

NAME (Please type of print

Signature

Title

Date

Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

MARC PELAEZ

NAME (Please type or print

Signature

Rear Admiral, Chief of Naval Research

Title

24 MAY 1994

Date

Office of Naval Research

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

J.B. Greene, Jr.

NAME (Please type of print

Signature

Acting

Title

27 May 1994

Date

BRAC-95 CERTIFICATION

Reference: SECNAV NOTE 11000 dtd 8 Dec 93

In accordance with policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in the BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

The signing of this certification constitutes a representation that the certifying official has reviewed the information and either (1) personally vouches for its accuracy and completeness or (2) has possession of, and is relying upon, a certification executed by a competent subordinate.

Each individual in your activity generating information for the BRAC-95 process must certify that information. Enclosure (1) is provided for individual certifications and may be duplicated as necessary. You are directed to maintain those certifications at your activity for audit purposes. For purposes of this certification sheet, the commander of the activity will begin the certification process and each reporting senior in the Chain of Command reviewing the information will also sign this certification sheet. This sheet must remain attached to this package and be forwarded up the Chain of Command. Copies must be retained by each level in the Chain of Command for audit purposes.

I certify the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

R.M. CASSIDY
NAME (Please type of print)

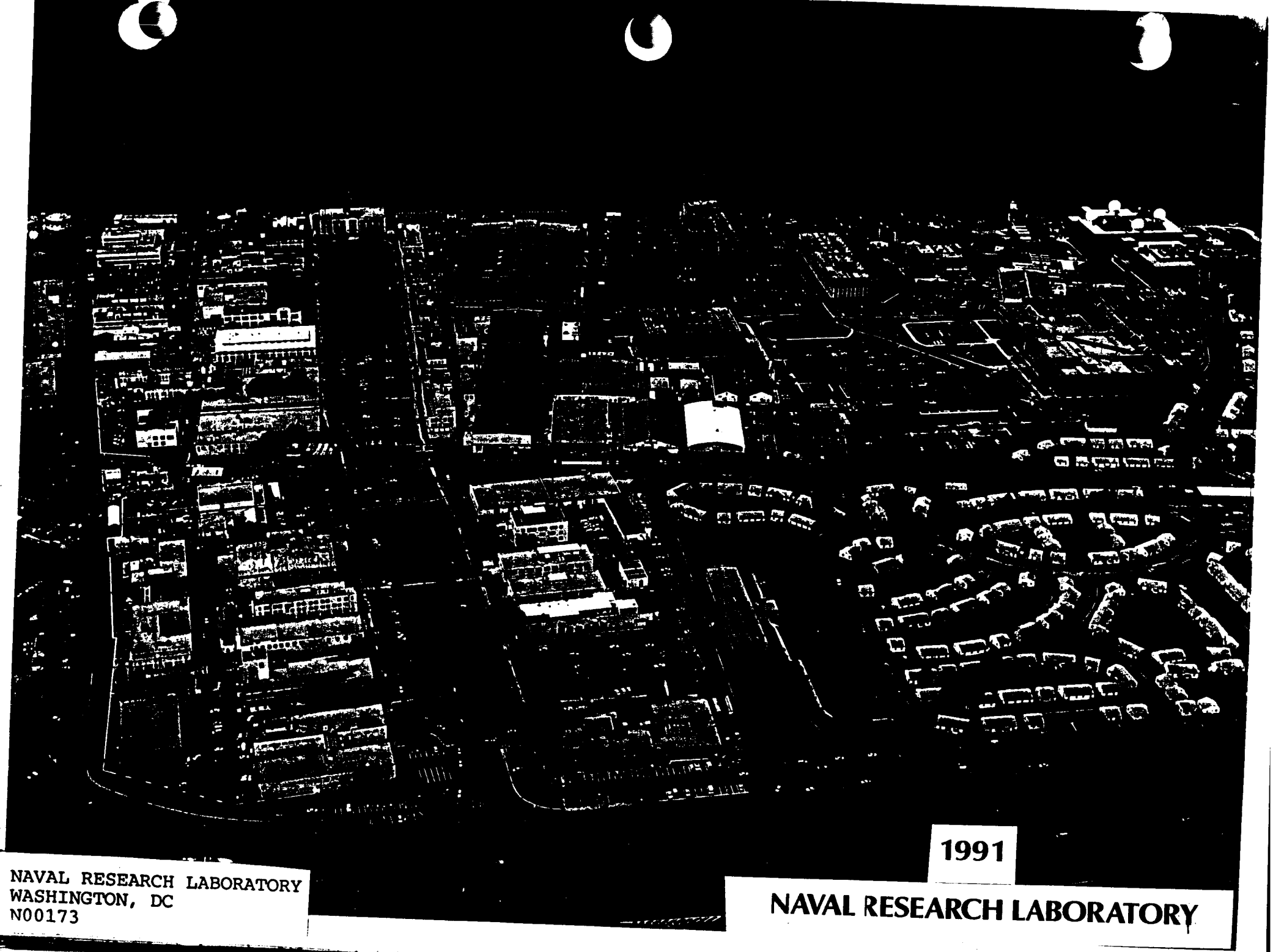
COMMANDING OFFICER
Title

NAVAL RESEARCH LABORATORY
Activity

R.M. Cassidy
Signature

5/13/94
Date

DATA CALL #13



NAVAL RESEARCH LABORATORY
WASHINGTON, DC
N00173

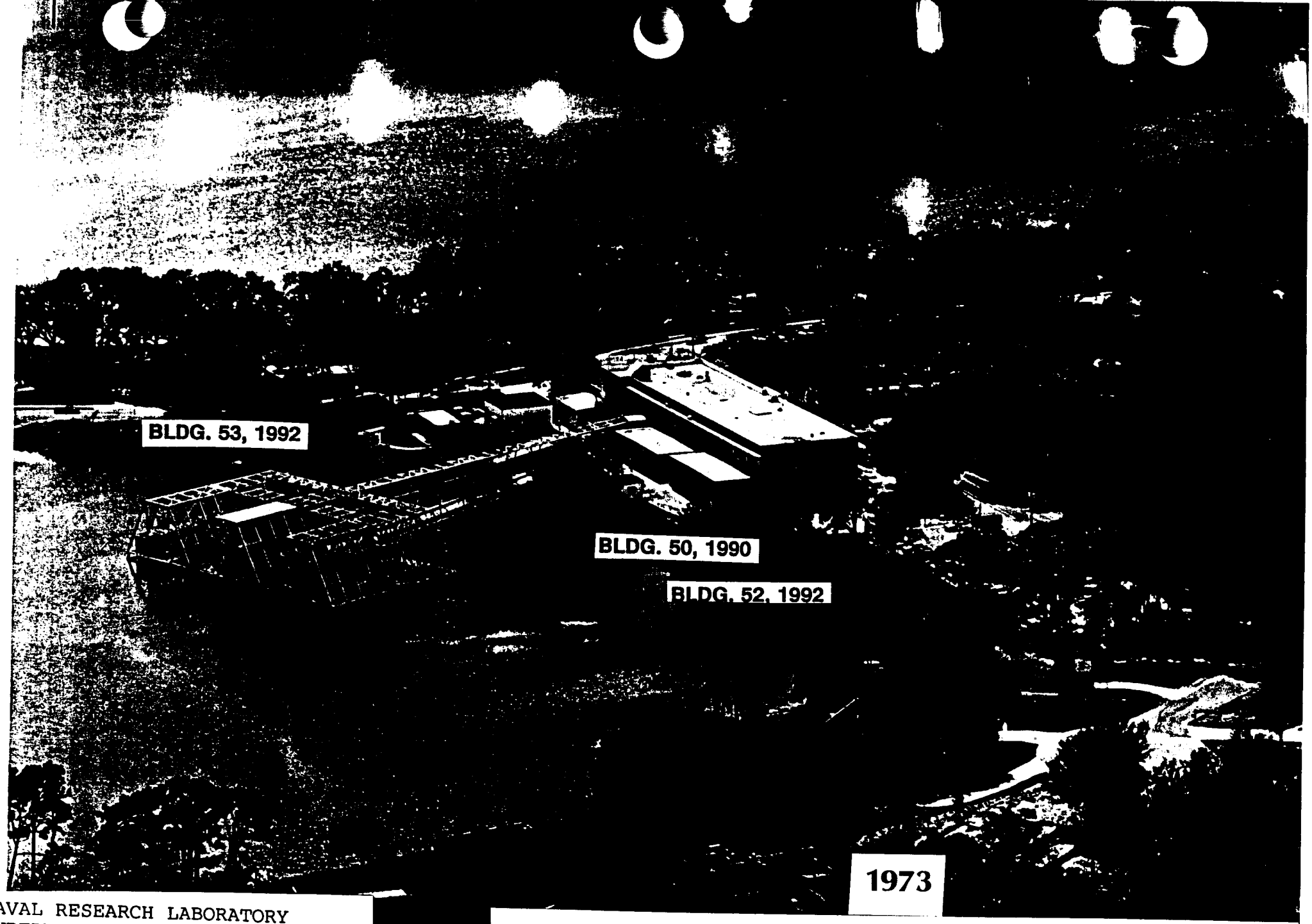
1991

NAVAL RESEARCH LABORATORY

NAVAL RESEARCH LABO! ORY
STENNIS SPACE CENTER DETACHMENT
BAY ST LOUIS, MS
N68462

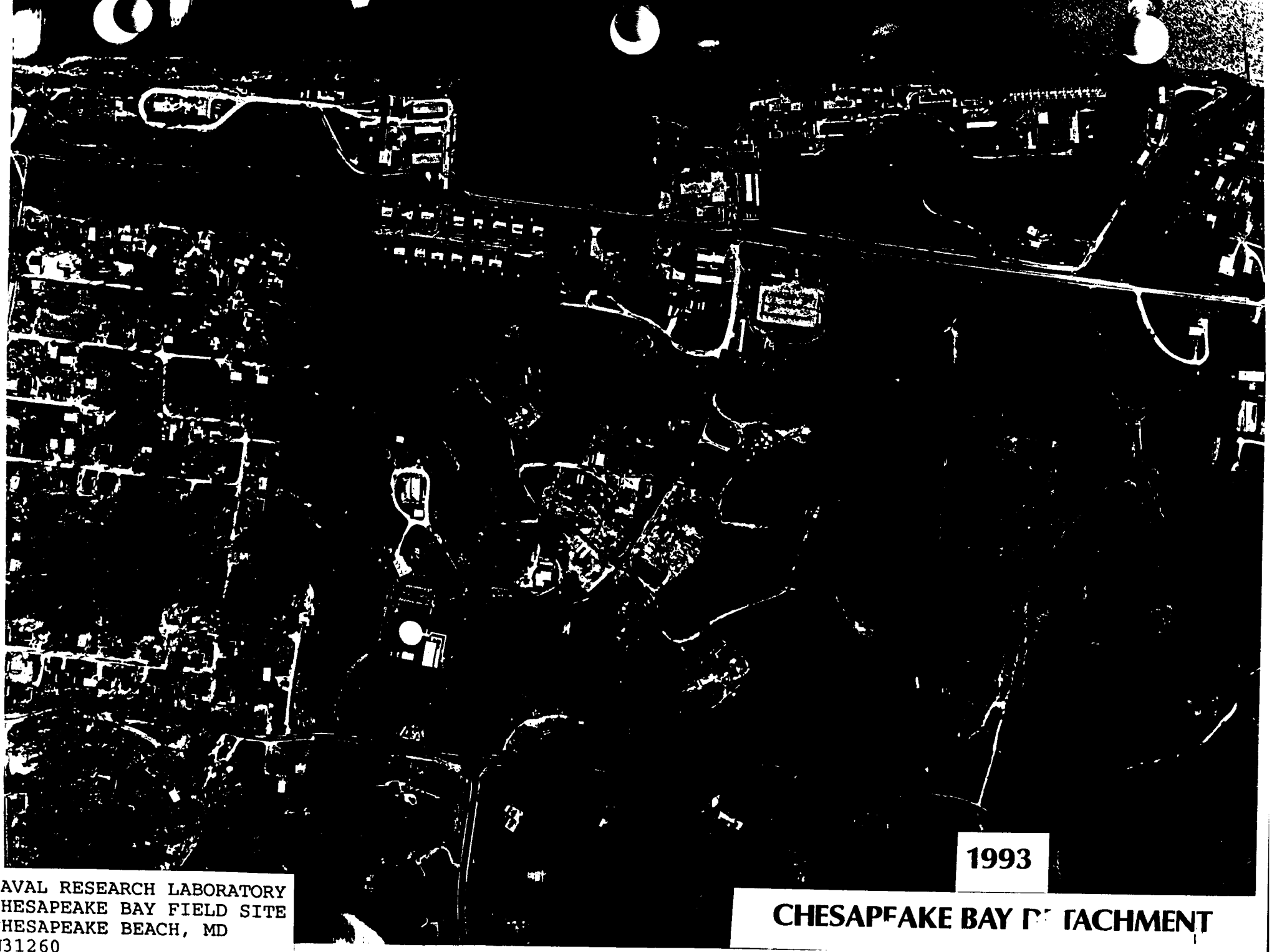
1992

STENNIS SPACE CENTER



NAVAL RESEARCH LABORATORY
UNDERWATER SOUND REFERENCE LAB
ORLANDO, FL
N62190

UNDERWATER SOUND REFERENCE DETACHMENT



NAVAL RESEARCH LABORATORY
CHESAPEAKE BAY FIELD SITE
CHESAPEAKE BEACH, MD
N31260

0009

174

T & E CAPABLE FACILITIES

#13

JUNE 1994

TACTICAL ELECTRONIC WARFARE DIVISION

CODE 5700

WC

0010

CONTENTS

1. Effectiveness Naval Electronic Warfare Systems Digital Modeling & Simulation ..... Annex A
2. Offboard Test Platform ..... Annex B
3. Radar Cross Section Measurement Lab ..... Annex C
4. Portable Radar Cross Section Measurement Radar ..... Annex D
5. Advanced Tactical Electronic Warfare Environment Simulator ..... Annex E
6. Compact Antenna Range ..... Annex F
7. RF Techniques Chamber ..... Annex G
8. Millimeter Wave Anechoic Chamber ..... Annex H
9. Isolation Measurement Chamber ..... Annex I
10. Low Power Anechoic Chamber ..... Annex J
11. Search Radar Electronic Countermeasures Simulator ..... Annex K
12. Infrared/Electro-Optical Calibration & Characterization Lab ..... Annex L
13. Infrared Missile Simulator & Development Lab ..... Annex M
14. Scale Model Analysis Facility ..... Annex N
15. Cruise Missiles Simulation ..... Annex O
16. Secure Supercomputing Facility ..... Annex P
17. Flying Electronic Warfare Laboratory ..... Annex Q
18. Central Target Simulator Facility ..... Annex R

VISUALIZATION LABORATORY

FUNCTIONS: Computer simulations are used to evaluate and improve the operational effectiveness of existing and emerging electronic warfare systems. By analyzing and visualizing the results of scenarios, the requirements in design, tactics, and training are assessed.

DESCRIPTION: Simulations performed include countertargeting, jamming, signal analysis, and mission planning. Interactive computer graphics and graphical user interface (GUI) tools are used to ease the specification of the rules of engagement. Rules are read by modules which simulate the electromagnetic environments encountered in actual conflicts. Special-purpose databases have been created for the quick retrieval of emitter characteristics, ELINT emitter scan patterns, and equipment specifications. Over three dozen analysis routines have been written to review the static and dynamic components of the simulation. Static analysis tools convey attributes such as number of platforms, missiles, and emitters used within the simulation; the location of emitters on various platforms; emitter characteristics and missile flight plans. Dynamic analysis tools convey information concerning time variant components; information concerning the number of emitters detectable, emitter location and bearing, emitter operation mode, and platform and missile location. Three dimensional (3D) computer graphics are used to display parameters in an intuitive manner, providing depth, volume, and spatial information. Antenna scan patterns are represented with 2D graphs and 3D surfaces. The polarization, scan type, and operating mode of emitters are also viewed as 3D models. Digital terrain elevation data (DTED) is used to provide accurate representation of geographical areas. Multimedia interfaces to naval platform and GIS databases also exist.

INSTRUMENTATION: The visualization laboratory is equipped with advanced computer graphics workstations, large display monitors, software tools, and video production equipment. Approximately 40 Silicon Graphics workstations are used for software development and to interactively design and visualize simulations. The staff is equipped with a wide range of workstations including; the Indigo, Indigo Extreme, Challenge, and Onyx (Reality Engine). Two 37" Mitsubishi display monitors are used for briefings and a fiber optic network is in place to display results in conference rooms and auditoriums. In addition to the software tools developed by the staff, modeling software is available to aid in the design of realistic 3D models. A commercial DataBase Management System (DBMS) is used to create generalized databases. Lastly, the video production facility is used for making video distribution material from all types of digital media. The laboratory is equipped with a scan converter, editing deck, optical disc recorder, and video cassette recording equipment.

VIRTUAL ENVIRONMENT LABORATORY

FUNCTIONS: Virtual environment technology is an all encompassing discipline which is being used to pursue the next logical progression in the fields of simulation, user interfaces, and interactive computer graphics. The novel input and output devices being used within the field offer many technical challenges in hardware design, 3D graphics, and in the definition and evaluation of appropriate interaction techniques. The primary objective of this laboratory is to research and investigate how virtual environment technology can be applied to naval electronic warfare simulations. In particular, its impact on command and control applications as well as training and evaluations is at issue.

DESCRIPTION: The Virtual Environment Laboratory currently uses an Onyx Reality Engine2 for high speed rendering of complex environments. The environments may consist of hundreds of geometric models including ships, aircraft, and terrain data sets. The simulation controlling the movement of the objects and the state of the environment is responsible for update of the graphical state of each object. Devices can be run separately to allow multiple configurations of devices for any given application or user preference. The current application focus is on command and control operations. It is believed that much of the information passing through a CIC is inherently three-dimensional and should be visualized and interacted with by the operator in its natural form. This style of visualization and interaction will improve the overall situational awareness of the operator as it will allow a greater magnitude of information to be handled by a single operator without sensory overload.

INSTRUMENTATION: The Virtual Environment Laboratory is equipped with multisensory input and output devices. Information transfer between computer simulations and their human operators is optimized when the operator's senses are fully utilized without overload. Display technology includes a Fake Space Labs, Inc. BOOM3C high resolution, full color, tracked display mounted on a counter-balanced mechanical arm. Also in use is a Cyberface2 display by LEEP Systems, Inc. which is low-resolution, full color, and head-mounted. The six degree-of-freedom tracking system is the Flock of Birds by Ascension Technologies. It is a magnetic system with an eight foot operating radius. This system is used in concert with the Cyberface2 for head tracking as well as with the Cyberglove by Virtual Technologies for hand interaction techniques. The Cyberglove is an 18 sensor device capable of high fidelity hand interactions in a virtual environment. Synthetic voice output is achieved using the DecTalk system from Digital Equipment Corporation. Lastly, the Audio Cube by Visual Synthesis, Inc. is used to produce spatially oriented sounds within the synthetic environment.

EFFECTIVENESS NAVAL ELECTRONIC WARFARE SYSTEMS DIGITAL MODELING & SIMULATION

ANNEX A

COMPUTER SIMULATION

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1 WORKLOAD

2.1.A Historical Workload

-2.1.A.1 See table.

2.1.B Forecasted Workload

-2.1.B.1 Not available at individual level.

-2.1.B.2 See Table.

2.2 UNCONSTRAINED CAPACITY

-2.2.A See Table.

-2.2.B Capacity is limited by the physical characteristics of the facility itself.

2.3 TECHNICAL RESOURCES

-2.3.A No.

-2.3.B No.

-2.3.B.1 Yes.

-2.3.B.2 Yes.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity (MV I)

-3.1.A.1 This is a stand-alone facility that has no real-time or near real-time data exchange or control with any other facility.

-3.1.A.2 No.

3.1.B Facility Condition (MV II) See Facility Condition form.

3.1.C Environmental and Encroachment Carrying Capacity (MV II)

-3.1.C.1 No.

-3.1.C.2 Not applicable.

-3.1.C.3 No.

-3.1.C.4 50 mile radius - 3 million; 100 mile radius - 6 million; 150 mile radius - 9 million; 200 mile radius - 14 million.

-3.1.C.5 Not applicable.

- **3.1.C.5.A** Not applicable.

-3.1.C.6 None.

3.1.D Specialized Test Support Facilities and Targets (MV I)

-3.1.D.1 No.

-3.1.D.2 No.

-3.1.D.2.A Not applicable.

3.1.E Expandability (MV III)

-3.1.E.1 No.

-3.1.E.1.A No.

-3.1.E.2 Not applicable.

-3.1.E.3 Yes - Secret.

-3.1.E.4 No.

3.1.F Uniqueness (MV I)

-3.1.F.1 No.

-3.1.F.1.A No.

-3.1.F.1.B No.

-3.1.F.2 No.

3.1.G Available Air, Land, and Sea Space (MV II)

None of the questions within Section 3.1.G are applicable to this facility.

3.1.H Geographic/Climatological Features (MV II)

None of the questions within Section 3.1.H are applicable to this facility.

3.2 AIR VEHICLES

None of the questions within Section 3.2 are applicable to this facility.

3.3 ELECTRONIC COMBAT

3.3.A THREAT ENVIRONMENT (MV I)

-3.3.A.1 Over 2000.

-3.3.A.2
How many simultaneous threats can be simulated? Over 10,000.
What type (e.g. AI, AAA, SAM)? All types.
What is maximum signal density? No upper limit.
Average density? Whatever desired.
What power level? Any.
What band? All bands.
Radiated or injected? Neither. All threats simulated on computers.

-3.3.A.3 Yes. Field tests.

-3.3.A.4 No; No; No.

-3.3.A.5 Threat fidelity and density are variable and user-specified.

-3.3.A.6 Yes to all. Each is digitally generated.

-3.3.A.7 Any geographic dispersion can be simulated.

-3.3.A.7.A Any threat(s) may be located at any location(s).

-3.3.A.7.B Any desired.

-3.3.A.8 Yes; Yes.

-3.3.A.9 No.

-3.3.A.10 Yes.

3.3.B Test Article Support (MV II)

None of the questions within Section 3.3B are applicable to this facility.

3.4 ARMAMENTS / WEAPONS

None of the questions within Section 3.4 are applicable to this facility.

CRUISE MISSILES SIMULATION

ANNEX O

SECTIONS 2 & 3 QUESTIONS & ANSWERS
CRUISE_Missiles Electronic Warfare Simulation Model

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1 WORKLOAD

2.1.A Historical Workload

2.1.A.1 See Table: "HISTORICAL WORKLOAD"

2.1.B Forecasted Workload

2.1.B.1 Not available at individual facility level

2.1.B.2 See Table: "HISTORICAL WORKLOAD"

2.2 UNCONSTRAINED CAPACITY

2.2.A See Table: "DETERMINATION OF UNCONSTRAINED CAPACITY"

CRUISE_Missiles simulation requires a fast supercomputer for efficient execution. *CRUISE_Missiles* currently is predominantly used within NRL TEW Division using the TEWD Secure Supercomputing Facility.

2.2.B See Table: "DETERMINATION OF UNCONSTRAINED CAPACITY"

2.3 TECHNICAL RESOURCES

2.3.A No

2.3.B No

- **2.3.B.1** Yes
- **2.3.B.2** Yes

Note: The *CRUISE_Missiles* electronic warfare simulation is primarily an R&D and S&T resource at NRL which is occasionally used to support T&E because there are no other comparable facilities.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity (MU I)

3.1.A.1 No real-time or near real-time exchange with other facilities. This is largely due to classified project considerations.

3.1.A.2 No

3.1.B Facility Condition (MU II)

3.1.C Environmental and Encroachment Carrying Capacity (MU II)

3.1.C.1 No
3.1.C.2 N/A
3.1.C.3 No
3.1.C.4 N/A -- Washington D.C. Metro Area
3.1.C.5 N/A
3.1.C.5.A None
3.1.C.6 None

3.1.D Specialized Test Support Facilities and Targets (MU I)

3.1.D.1 No
3.1.D.2 No
3.1.D.2.A N/A

Note: The *CRUISE_Missiles* electronic warfare simulation has unique capabilities for dealing with spatially extended low observable surface ship target signatures and related defense systems in such application areas as hit-point distribution and terminal-phase electronic countermeasure defense effectiveness assessment where flight to impact would prove infeasible using real targets. *CRUISE_Missiles* has the ability to perform these assessments using realistic anti-ship cruise missiles velocities and flight profiles.

3.1.E Expandability (MU III)

3.1.E.1 No

3.1.E.1.A No

3.1.E.2 No

3.1.E.3 Yes, by virtue of running on the Tactical Electronic Warfare Division Secure Supercomputing Facility computers. A security plan for GENSER Secret, Top Secret and Special Handling Procedures Required is on file with the NRL Security Office.

3.1.E.4 No

3.1.F Uniqueness (MU I)

3.1.F.1 Yes.

CRUISE_Missiles is a highly detailed, modular Radio Frequency (RF) and Infrared (IR) digital simulation emphasizing terminal phase ship defense against anti-ship cruise missile (ASCM) threats. Signal interactions and processing, and target signature fluctuations and fine structure, are represented in high detail on a pulse-by-pulse (or frame-by-frame) basis. The model handles mixtures of multiple threats against many targets which are configurable at run-time. Ship, threat and countermeasure modules are carefully derived from authenticated sources. A highly interactive graphical executive facilitates experimentation, and a production or batch mode can be used for long-haul Monte-Carlo runs.

CRUISE_Missiles is unique is its high-resolution target and signal processing representations and its inventory of ship signatures, electronic countermeasures and anti-ship cruise missile threats.

3.1.F.1.A Yes. See Comment above.

3.1.F.1.B yes. See Comment above.

3.1.F.2 No.

3.1.G Available Air, Land, and Sea Space (MU II) N/A

3.1.H Geographic/Climatological Features (MU II) N/A

Note: The *CRUISE_Missiles* simulation encorporates ship motion, sea multipath, clutter and other environmentally sensitive responses in a parametric fashion according to sea state, wind and other factors. It is therefore possible to simulate a multitude of varying geographic and climatic conditions.

3.2 AIR VEHICLES N/A

3.3 ELECTRONIC COMBAT *CRUISE_Missiles* is a highly detailed, modular Radar (RF) and Infrared (IR) digital simulation concentrating on terminal-phase ship defense against anti-ship cruise missile (ASCM) threats. Signal interactions and processing, and target signature fluctuations and fine structure, are represented in high detail on a pulse-by-pulse (or frame-by-frame) basis. The model handles mixtures of multiple threats against many targets which are configurable at run-time. Ship, threat and countermeasure modules are carefully derived from authenticated sources. A highly interactive graphical executive facilitates experimentation, and a production or batch mode can be used for long-haul Monte-Carlo runs.

3.3.A Threat Environment (MU I) See comment above

3.3.A.1 5 threats. In FY-95, 2 more threat models will be added.

3.3.A.2 Unlimited simultaneous threats. (Only run time is compromised).

3.3.A.3 Validation was initiated in FY-94 by IDA and Pt. Magu in the application context of evaluations of the benefit of ship radar cross section modification from the electronic warfare perspective.

3.3.A.4 Both open loop and closed loop testing can be handled.

3.3.A.5 Threats are represented in high detail (analytic envelopes emulated on pulse-by=pulse basis) derived from authenticated sources.

3.3.A.6 Focus is on sea threats.

3.3.A.7 Focus is on terminal-phase ship self defense.

3.3.A.7.A See comment above.

3.3.A.7.B See comment above.

3.3.A.8 Yes. See above.

3.3.A.9 No.

3.3.A.10 No. However, run-time is ultimately constrained by the capacity of the host CPU.

3.3.B Test Article Support (MU II)

3.3.B.1 No.

3.3.B.2 Unlimited. The model has special capabilities for handling coordinated countermeasure tactics in many-on-many defense scenarios.

3.3.B.3 Radar and Infrared.

3.3.B.4 Radar and Infrared.

3.3.B.5 Yes. Both radar and Infrared background clutter is

represented.

3.4 ARMAMENTS / WEAPONS N/A

SECURE SUPERCOMPUTING FACILITY

ANNEX P

SECURE SUPERCOMPUTING FACILITY

FUNCTION: The TEWD Secure Supercomputing Facility (SSF) serves classified laboratory, Navy, and DoD needs for high-speed, large-memory computation. Throughput is comparable to a Cray XMP with large solid state disk, and can complete a year of VAX 11/780 runs within a matter of days, or even hours. The SSF primarily addresses requirements for GENSER Secret, Top Secret, and material requiring special controls using workspaces located within the secure Building 210 complex.

DESCRIPTION: The SSF centerpiece is a Convex C-3820 with two GaAs CPUs each achieving 250 MFLOPS, and with 1 GB of physical memory and 4 GB virtual memory. Local disk storage >10 GB uses removable Winchester disk cassettes RAIDed with 4-way striping and redundancy. The SSF also includes a fully-automated, infinitely-extensible network file server with a storage capacity > 200 GB.

SSF security measures comply with DIAM 50-3, OPNAV 5510.J. Access to the SSF is restricted to workspaces within the controlled perimeter of the TEWD Building complex. All storage is removable, including system and paging disks. Normally, the SSF can run tasks through GENSER Secret and may be accessed from TEWD workspaces via TEWNET, the TEWD network. For special projects (Top Secret or material requiring special controls), normal mode and TEWNET access ceases, and the SSF C-3820 and vault enclosure become dedicated to the particular project. Each project acquires its own exclusive complement of removable disk cassettes and system and application software. Safes are provided within the vault for temporary storage of classified material.

INSTRUMENTATION: SSF visitors are accommodated in spaces featuring popular high-performance workstations, X/terminals and PCs, and a complement of B&W and color printers. Users experience the capabilities of the supercomputer through the same familiar environments that most workstations provide.

Productivity tools include X/windows and Motif graphical user interfaces, a full set of UNIX network connectivity tools (telnet, ftp, NFS), a VAX/VMS compatibility suite (including DECnet, DCL, sys$library, VAX FORTRAN extensions, VMS backup and binary data conversion), popular editors (vi, emacs, edt), UNIX shells (csh, sh, tcsh, ksh), UNIX programmer tools (make, perl, awk, grep, sccs, rcs), languages and compilers (FORTRAN, ANSI C, and Ada) with vector/parallel optimization, interactive profilers and debuggers, high performance Math libraries (IMSL, Math Advantage, VECLIB, LINPACK, EISPACK), data visualization (AVS, Explorer, NCSA, Spyglass, SGI's DGL, GKS, X/Windows, PLOT-10, MATLAB, and Mathematica).

SECTIONS 2 & 3 QUESTIONS & ANSWERS
Tactical Electronic Warfare Division
Secure Supercomputing Facility

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1 WORKLOAD

2.1.A Historical Workload

2.1.A.1 See Table: "HISTORICAL WORKLOAD"

2.1.B Forecasted Workload

2.1.B.1 Not available at individual facility level

2.1.B.2 See Table: "HISTORICAL WORKLOAD"

2.2 UNCONSTRAINED CAPACITY

2.2.A See Table: "DETERMINATION OF UNCONSTRAINED CAPACITY"

2.2.B See Table: "DETERMINATION OF UNCONSTRAINED CAPACITY"

2.3 TECHNICAL RESOURCES

2.3.A No

2.3.B No

- **2.3.B.1** Yes
- **2.3.B.2** Yes

Note: The Secure Supercomputing Facility is primarily an R&D and S&T facility at NRL which is occasionally used to support T&E because there are no other comparable facilities.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity (MU I)

3.1.A.1 No real-time or near real-time exchange with other facilities. This is largely due to classified project considerations.

3.1.A.2 No

3.1.B Facility Condition (MU II)

3.1.C Environmental and Encroachment Carrying Capacity (MU II)

3.1.C.1 No
3.1.C.2 N/A
3.1.C.3 No
3.1.C.4 N/A -- Washington D.C. Metro Area
3.1.C.5 N/A
3.1.C.5.A None
3.1.C.6 None

3.1.D Specialized Test Support Facilities and Targets (MU I)

3.1.D.1 No
3.1.D.2 No
3.1.D.2.A N/A

3.1.E Expandability (MU III)

3.1.E.1 No
3.1.E.1.A No. However, the Secure Supercomputing Facility, being fundamentally a computer, is intrinsically flexible with respect to workload.
3.1.E.2 No
3.1.E.3 Yes. Security plan for GENSER Secret, Top Secret and

Special Handling Procedures Required is on file with the NRL Security Office.

3.1.E.4 Beginning in FY-95, and continuing in FY-96, an upgrade to the Secure Supercomputing Facility will achieve a 10X-20X increase in throughput.

3.1.F Uniqueness (MU I)

3.1.F.1 No. However, for NRL classified applications to use other DoD facilities, sharing concepts would need to be put in place at these facilities. While other classified computational centers do indeed exist within DoD, and could be accessed by suitably secure networks, multilevel secure operating systems have not been designed or qualified on the latest and most advanced scalable supercomputer architectures, and therefore shared multilevel environments have not kept pace with the evolution of these architectures. The only workable solution to date has been dedicated systems running in system-high dedicated mode, the technique used for the NRL Tactical Electronic Warfare Division Secure Supercomputing Facility within the physical confines of a Tactical Electronic Warfare Division vault. The cost of designing, implementing and security-qualifying an operating system (estimated by Cray and Convex at >$10M) greatly exceeds the total investment of the NRL Tactical Electronic Warfare Division Secure Supercomputing Facility ($2-3M).

3.1.F.1.A No. See Comment above.

3.1.F.1.B No. See Comment above. Security requirements necessarily rule out the use of commercial services.

3.1.F.2 No.

3.1.G Available Air, Land, and Sea Space (MU II) N/A

3.1.H Geographic/Climatological Features (MU II) N/A

3.2 AIR VEHICLES N/A

3.3 ELECTRONIC COMBAT

Note: Secure Supercomputing Facility supports electronic combat T&E asset functions through the use of a detailed digital simulation model, *CRUISE_Missiles*, described as a separate NRL T&E facility. See the write-up on the *CRUISE_Missiles* simulation.

3.3.A Threat Environment (MU I) N/A

3.3.B Test Article Support (MU II) N/A

3.4 ARMAMENTS / WEAPONS N/A. However, the Secure Supercomputing Facility runs a detailed digital Electronic Warfare Simulation, *CRUISE_Missiles*, that can evaluate certain aspects of anti-ship cruise missile performance. See write-up on *CRUISE_Missiles*.

3.4.A Directed Energy (MU II) N/A

OFFBOARD TEST PLATFORM

ANNEX B

OFFBOARD TEST PLATFORM

Function: This laboratory was established to measure the aerodynamic forces and moments, and study the airflow characteristics over offboard countermeasures deployment vehicles. It also supports the development and testing of propulsion systems for deployment vehicles. This facility is especially suited to the study of subsonic low Reynolds number aerodynamics due to its low turbulence intensity.

Description: This facility is particularly focused on the development of air vehicles designed to operate at low speed, low altitude, and low Reynolds number.

The wind tunnel is a continuous flow design that operates over the range of 20 to 200 knots, and has two interchangeable test sections. The aerodynamic test section has a 4 ft by 4 ft cross-section, and full 3 axis, 6 component strain gauge balance. Models are attached to the balance "sting", which can be manually or automatically controlled to sweep through ranges of angle of attack and sideslip while force and moment data are collected.

The propulsion test section is used for the development of electric, internal combustion, and miniature turbojet engines. It features an open jet test section, and simply provides a simulation of in-flight air flow conditions.

Instrumentation: The aerodynamic test section has a full 3 axis, 6 component strain gauge balance, a 48 port scanivalve pressure measurement system, and an automated data collection system.

OFFBOARD TEST PLATFORM

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1.A Historical Workload

-2.1.A.1 See table.

2.1.B Forecasted Workload

-2.1.B.1 Not available at individual level.

-2.1.B.2 See table.

2.2 UNCONSTRAINED CAPACITY

-2.2.A See table.

-2.2.B This capacity limited by the physical characteristics of the facility itself.

2.3 TECHNICAL RESOURCES

-2.3.A No.

-2.3.B No.

-2.3.B.1 No.

-2.3.B.2 No.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity

-3.1.A.1 This is a stand-alone facility that has no real-time or near real-time data exchange or control with any other facility

-3.1.A.2 No, there would be no impact on other facilities if this facility were closed.

3.1.B Facility Condition See Form

3.1.C Environmental and Encroachment Carrying Capacity

- 3.1.C.1 There are no limiting (current or future) environmental and/or encroachment characteristics associated with the installation/facility?

- 3.1.C.2 Not applicable

- 3.1.C.3 No, this facility does not currently operate under temporary permits of an environmental nature, or voluntary agreements (including treaties) of any sort that deal with the environment

- 3.1.C.4 The total population within a 50 mile radius is approximately 3 million. Within a 100 mile radius the total population is approximately 6 million. Within a 150 mile radius the total population is approximately 9 million. Within a 200 mile radius the total population is approximately 14 million.

- 3.1.C.5 Not Applicable.

- 3.1.C.5.A Not Applicable.

- 3.1.C.6 No test missions that have been canceled due to encroachment in each of the last two years?

3.1.D Specialized Test Support Facilities and Targets

-3.1.D.1 No. This facility does not have or require specialized support facilities to support conducting test operations

-3.1.D.2 No specialized targets are required to support this facility.

-3.1.D.2.A Not applicable

3.1.E Expandability

-3.1.E.1 No. There are no special aspects of this facility that enhance its ability to expand output within each T&E functional area.

-3.1.E.1.A No. This facility cannot accept new T&E workload different from what is currently being performed.

-3.1.E.2 Not Applicable.

-3.1.E.3 Yes, this facility is equipped to support secure operations at the classification level of Secret.

-3.1.E.4 No capital improvements are underway or programmed in the 95 FYDP, that would change the capacity/capability of this facility.

3.1.F Uniqueness

-3.1.F.1 No, this facility is one of several low speed wind tunnels within the DoD.

-3.1.F.1.A No.

-3.1.F.1.B No.

-3.1.F.2 No, this facility is not currently providing support to DoD users outside of the Navy.

3.1.G Available Air, Land, and Sea Space

None of the questions within Section 3.1.G are applicable to this facility.

3.1.H Geographic/Climatological Features

None of the questions within Section 3.1.H are applicable to this facility.

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment

Although this facility supports the development and testing of electronic combat subsystems, none of the questions of Section 3.3.A. are applicable for this facility

3.3.B Test Article Support

-3.3.B.1 Test operations in this wind tunnel facility are limited to testing aerodynamic models having wingspans of 3 feet or less at airspeeds between 20 knots and 200 knots. In addition to there being no forseeable need, it would be physically and economically impractical to take measures to extend these limits.

-3.3.B.2 Not applicable

-3.3.B.3 Not applicable

-3.3.B.4 Not applicable

-3.3.B.5 Not applicable

PORTABLE RADAR CROSS SECTION MEASUREMENT RADAR

ANNEX D

TRANSPORTABLE
RADAR CROSS SECTION MEASUREMENT RADAR

FUNCTION: The purpose of this laboratory is to provide a mobile facility to measure over-water radar cross section (RCS) of ships and electronic warfare passive and active systems over 8 to 18 GHz. Additionally, the system can measure the Effective Radiated Power (ERP) and sensitivity of active electronic warfare systems over the same frequency range.

DESCRIPTION: The facility consists of an I band tracking radar for target tracking, an optical designator to aid in target acquisition, and a broadband 1 KW TWT based data radar for ERP, sensitivity and RCS measurements. ERP of the data radar is 86-90 dbm. Both radars are housed inside a 8 foot by 12 foot instrumentation hut with all antennas mounted on a common pedestal. Both the radar hut and antenna pedestal are mounted on a 40 foot trailer that can be moved to any test range where measurements are to be made. A 60 KW diesel generator can also be provided to power the system if required.

INSTRUMENTATION: The data radar is calibrated using a combination of internal and external calibration procedures. ERP, sensitivity and RCS data is collected on a pulse-by-pulse basis using fast A to D converters and data collection and storage systems. The target of interest from each radar pulse is digitized and stored for post-test data processing. Data processing is very flexible with the form of the processed data tailored to user requirements. RCS measurements can be made at selectable transmit polarizations with received polarization switchable on a pulse by pulse basis if required.

PORTABLE RCS MEASUREMENT RADAR

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1 WORKLOAD

2.1.A Historical Workload

-2.1.A.1 See table.

2.1.B Forecasted Workload

-2.1.B.1 Not available at individual level.

-2.1.B.2 See table.

2.2 UNCONSTRAINED CAPACITY

-2.2.A See table.

-2.2.B This capacity limited by the physical characteristics of the facility itself.

2.3 TECHNICAL RESOURCES

-2.3.A No.

-2.3.B No.

-2.3.B.1 No.

-2.3.B.2 No.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity

-3.1.A.1 None of the workload in FY93 was involved in the real-time or near real time exchange of data or control with another facility

-3.1.A.2 No.

3.1.B Facility Condition See Form.

3.1.C Environmental and Encroachment Carrying Capacity

- 3.1.C.1 No

- 3.1.C.2 Not Applicable

- 3.1.C.3 No.

- 3.1.C.4 Facility is mobile and it depends on where the testing is conducted.

- 3.1.C.5 Facility is mobile and it depends on where the testing is conducted.

- 3.1.C.5.A Facility is mobile and it depends on where the testing is conducted.

- 3.1.C.6 None due to encroachment.

3.1.D Specialized Test Support Facilities and Targets

-3.1.D.1 None.

-3.1.D.2 No.

-3.1.D.2.A Not applicable.

3.1.E Expandability

-3.1.E.1 No

-3.1.E.1.A No

-3.1.E.2 No.

-3.1.E.3 Yes, up to Secret.

-3.1.E.4 Yes, see attached form.

3.1.F Uniqueness

-3.1.F.1 Yes. This is the only known mobile DoD facility specifically optimized for the precision radar cross section and ERP measurements of EW systems.

-3.1.F.1.A Yes, See above.

-3.1.F.1.B Yes, See above.

-3.1.F.2 No.

3.1.G Available Air, Land, and Sea Space

Facility is mobile and it depends on where the testing is conducted.

3.1.H Geographic/Climatological Features

Facility is mobile and it depends on where the testing is conducted.

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment

-3.3.A.1 The facility is capable of simulating up to 30 simultaneous radar signals.

-3.3.A.2 30 simultaneous radar transmissions can transmitted at up to 2% duty factor in each of the 2-4, or 8-17 GHz bands with a typical ERP of 60 dbW

-3.3.A.3 Not applicable

-3.3.A.4 Open loop testing.

-3.3.A.5 Not applicable.

-3.3.A.6 Not applicable.

-3.3.A.7 Single point of transmission and receive.

-3.3.A.7.A Not applicable.

-3.3.A.7.B Not applicable.

-3.3.A.8 Not applicable.

-3.3.A.9 No.

-3.3.A.10 Yes

3.3.B Test Article Support

-3.3.B.1 No.

-3.3.B.2 One at a time as seen by up to 30 radars simultaneously.

-3.3.B.3 8-17 GHz.

-3.3.B.4 Same as above

-3.3.B.5 No.

RNG

COMPACT ANTENNA RANGE

ANNEX F

COMPACT ANTENNA RANGE FACILITY

FUNCTIONS: The primary purpose of the facility is to measure phase and amplitude pattern characteristics of antenna systems over a primary range of 2.0 to 90 GHz in a controlled environment. The facility also provides the capability for radar cross section measurement from 2.0 to 40 GHz and small device characterizations from 0.45 to 50 GHz.

DESCRIPTION: This facility is an anechoic chamber that is designed to operate in conjunction with a Scientific Atlanta Compact Range Model 5751 with MMW reflector. The compact antenna range facility consists of a shielded anechoic chamber (18' high x 22' wide x 40' long) and geometry that enables far field radiation patterns to be taken in a small space. Illumination of the MMW reflector at one end of the chamber provides a cylindrical quiet zone (4' diameter x 6' long) in which all radiation patterns are measured. The quiet zone is specified to provide > 45 dB of background noise isolation from 2.0 to 8.0 GHz and > 50 dB from 8.0 to 94.0 GHz. The amplitude taper is specified to be ≥ 0.5 dB over the quiet zone with a corresponding specification of ≥ 10° phase taper. Positioning of test antennas or subsystems are made by attaching them to an azimuth over elevation mount. Further degrees of freedom are allowed with the mounting point being on a roll axis and the entire positioner on a slide axis. A second roll axis is provided for source illumination and enables the source polarization to be quickly rotated. Note that from 2.0 to 26.5 GHz four simultaneous channel measurements can be made to characterize an antenna or the radar cross section of a target.

INSTRUMENTATION: The compact antenna range uses a complete complement of microwave laboratory instrumentation : network analyzers, microwave receivers, spectrum analyzers, microwave frequency counters, power meters , function generators, and microwave synthesizers. Data recording instrumentation include an analog strip chart recorder, an X-Y plotter, and a digital recorder. Radar cross section measurements are made using an HP 8530 microwave receiver and small device characterizations are done with an HP 8510C network analyzer.

Compact Antenna Range

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1.A Historical Work Load
2.1.A.1 See attached table

2.1.B Forecasted Workload
2.1.B.1 Not available at individual facility level
2.1.B.2 See attached table

2.2 Unconstrained Capacity
2.2.A See attached table
2.2.B See attached table

2.3 Technical Resources
2.3.A No
2.3.B No
2.3.B.1 Yes
2.3.B.2 Yes

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A Interconnectivity (MU-I): Not applicable.
3.1.B Facility Condition: See attached table
3.1.C Environmental and Encroachment Carrying Capacity (MU-II):
Not applicable. This is an indoor facility.
3.1.D Specialized Test Support Facilities and Targets (MU-I):
3.1.D.1 No
3.1.D.2 No
3.1.D.2A No
3.1.E Expandability (MU-III):
3.1.E.1 No
3.1.E.1A No
3.1.E.2 No
3.1.E.3 Yes. Secret Level.

3.1.E.4 No

3.1.F Uniqueness (MU-I):

3.1.F.1 No

3.1.F.1A No

3.1.F.1B No

3.1.F.2 No

FOR OFFICIAL USE ONLY

3.1.G Available Air, Land, and Sea Space (MU-II): Not applicable

3.1.H Geographic/Climatological features (MU-II): Not applicable

3.2 AIR VEHICLES: Not applicable

3.3 ELECTRONIC COMBAT: This facility is used for R & D metrology evaluation of EW Brassboard Systems and ECM techniques against surrogates.

3.3.A Threat Environmental (MU-I): Not applicable. This facility has no threat simulation capability.

3.3.B Test Article Support (MU-II): Not applicable.

3.4 ARMAMENT / WEAPONS: Not applicable.

FOR OFFICIAL USE ONLY

RF TECHNIQUES CHAMBER

ANNEX G

RF TECHNIQUES CHAMBER FACILITY

FUNCTIONS: The techniques anechoic chamber is used for making RF systems measurements involving the use of transmitters and receiving antenna hardware. The facility is designed to conduct ECM research on RF homing missiles, airborne intercept radars, anti-radiation missiles, small tracking radars and in general, to aid in the development of airborne EW systems over the frequency range of 2.0 to 40.0 GHz.

DESCRIPTIONS: The RF techniques chamber facility consists of an anechoic chamber (16' high x 17' wide x 40 ' long) and two adjoining control rooms on each end of the chamber. One end of the chamber has a moving wall with a pass-through into the chamber for direct jamming of the desired target (missile, radar, etc.). At the other end of the chamber is a fixed wall with an adjoining quiet zone that is 4' x 4' x 4'. This wall has an opening through which a missile can be placed on an azimuth over elevation mount and slid into the chamber. The quiet zone is designed for > 45 dB of background noise isolation from 2.0 to 18.0 GHz and > 50 dB from 18.0 to 40.0 GHz.

INSTRUMENTATION: The RF techniques chamber uses a complete range of microwave instrumentation including : network analyzers, microwave receivers, spectrum analyzers, microwave frequency counters, power meters, function generators, and microwave synthesizers. Analog instrumentation recorders include X-Y plotters, eight-channel strip chart-recorders, and single channel recorders. Test data can also be recorded digitally.

RF Techniques Chamber

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1.A Historical Work Load
2.1.A.1 See attached table

2.1.B Forecasted Workload
2.1.B.1 Not available at individual facility level
2.1.B.2 See attached table

2.2 Unconstrained Capacity
2.2.A See attached table
2.2.B See attached table

2.3 Technical Resources
2.3.A No
2.3.B No
2.3.B.1 Yes
2.3.B.2 Yes

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A Interconnectivity (MV-I): Not applicable.
3.1.B Facility Condition: See attached table
3.1.C Environmental and Encroachment Carrying Capacity (MV-II):
Not applicable. This is an indoor facility.
3.1.D Specialized Test Support Facilities and Targets (MV-I):
3.1.D.1 No
3.1.D.2 No
3.1.D.2A No
3.1.E Expandability (MV-III):
3.1.E.1 No
3.1.E.1A No
3.1.E.2 No
3.1.E.3 Yes. Secret Level.
3.1.E.4 No
3.1.F Uniqueness (MV-I):
3.1.F.1 No
3.1.F.1A No
3.1.F.1B No
3.1.F.2 No

3.1.G Available Air, Land, and Sea Space (MV-II): Not applicable
3.1.H Geographic/Climatological features (MV-II): Not applicable

3.2 AIR VEHICLES: Not applicable

3.3 ELECTRONIC COMBAT: This facility is used for R & D metrology evaluation of EW Brassboard Systems and ECM techniques against surrogates.

3.3.A Threat Environmental (MV-I): Not applicable. This facility has no threat simulation capability.

3.3.B Test Article Support (MV-II): Not applicable.

3.4 ARMAMENT / WEAPONS: Not applicable.

FOR OFFICIAL USE ONLY

MILLIMETER WAVE ANECHOIC CHAMBER

ANNEX H

MILLIMETER WAVE ANECHOIC CHAMBER FACILITY

FUNCTIONS: The Millimeter Wave (MMW) Anechoic Chamber facility is designed to measure antenna radiation patterns as well as, to perform other low power millimeter wave metrology measurements in the 8.0 to 100.00 GHz range. The facility also provides a means to measure the RF characteristics of radomes intended for use in EW homing missiles and target tracking radar systems.

DESCRIPTION: The MMW Anechoic Chamber facility consists of a shielded anechoic chamber (16' high x 16.5' wide x 28.5' long) with Emerson and Cummings anechoic absorber lining. The quiet zone is a 3 ft. diameter sphere which is located at one end of the chamber. The quiet zone reflectivity characteristics (i.e., dB below incident power level) are: (a) >40 dB between 8.0 to 18.0 GHz and (b) >50 dB between 18.0 to 100.0 GHz. At each end of the chamber spaced 20 ft. apart are two antenna mounts.

INSTRUMENTATION: The MMW Anechoic Chamber Facility was designed to operate with a Scientific Atlanta Model 5751 Compact Range instrumentation. One Scientific Atlanta antenna mount has a 125 lb. weight capability, is designed in a roll/azimuth/elevation configuration and is centered in the quiet zone area. The other end of the chamber has another Scientific Atlanta antenna mount with roll only capability. Control of the mount position can be done remotely via Scientific Atlanta hardware or other digital means. Scientific Atlanta RF synthesizers are available up to
40.0 GHz. A full set of mixers and pyramidal standard gain horn antennas are available up to 100 GHz. The facility will also operate with the Hewlett Packard 8510C automatic network analyzer which has a capability up to 50 GHz.

Millimeter Wave Anechoic Chamber

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1.A Historical Work Load
2.1.A.1 See attached table

2.1.B Forecasted Workload
2.1.B.1 Not available at individual facility level
2.1.B.2 See attached table

2.2 Unconstrained Capacity
2.2.A See attached table
2.2.B See attached table

2.3 Technical Resources
2.3.A No
2.3.B No
2.3.B.1 Yes
2.3.B.2 Yes

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A Interconnectivity (MV-I): Not applicable.
3.1.B Facility Condition: See attached table
3.1.C Environmental and Encroachment Carrying Capacity (MV-II):
Not applicable. This is an indoor facility.
3.1.D Specialized Test Support Facilities and Targets (MV-I):
3.1.D.1 No
3.1.D.2 No
3.1.D.2A No
3.1.E Expandability (MV-III):
3.1.E.1 No
3.1.E.1A No
3.1.E.2 No
3.1.E.3 Yes. Secret Level.
3.1.E.4 No
3.1.F Uniqueness (MV-I):
3.1.F.1 No
3.1.F.1A No
3.1.F.1B No
3.1.F.2 No

3.1.G Available Air, Land, and Sea Space (MV-II): Not applicable
3.1.H Geographic/Climatological features (MV-II): Not applicable

3.2 AIR VEHICLES: Not applicable

3.3 ELECTRONIC COMBAT: This facility is used for R & D metrology evaluation of EW Brassboard Systems and ECM techniques against surrogates.

3.3.A Threat Environmental (MV-I): Not applicable. This facility has no threat simulation capability.
3.3.B Test Article Support (MV-II): Not applicable.

3.4 ARMAMENT / WEAPONS: Not applicable.

ISOLATION MEASUREMENT CHAMBER

ANNEX I

ISOLATION MEASUREMENT CHAMBER FACILITY

FUNCTIONS: The Isolation Measurement Chamber Facility provides a capability for measuring antenna to antenna radiation coupling characteristics from 2.0 to 40.0 GHz. Configuration and size of the facility and special handling equipment allow for accommodation of portions of airframes having antennas mounted in the same position as those of operational aircraft. The facility is also capable for making accurate measurements of the radar cross section (RCS) of small objects.

DESCRIPTION: The facility consists of a shielded anechoic chamber (24' wide by 30' long by 50' high). The quiet zone area is located at the base and has an extent of 12' by 18' by 10'. Quiet zone reflectivity measurements (i.e., dB below incident power) are: (a) >75 dB at 2.0 GHz, (b) >85 dB at 4.0 GHz, (c) >95 dB from 6.0 GHz to 8.0 GHz and (d) >100 dB at 18.0 GHz. The chamber walls facing the control room are designed to be removed in order to allow an operator to install a large objects.

INSTRUMENTATION: This facility has no dedicated equipment, however, a Hewlett Packard 8510C Automatic Network Analyzer has been used to make measurements up to 40.0 GHz. A number of RCS calibration spheres and antennas are available up to 40.0 GHz.

Isolation Measurement Chamber

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1.A Historical Work Load
2.1.A.1 See attached table

2.1.B Forecasted Workload
2.1.B.1 Not available at individual facility level
2.1.B.2 See attached table

2.2 Unconstrained Capacity
2.2.A See attached table
2.2.B See attached table

2.3 Technical Resources
2.3.A No
2.3.B No
2.3.B.1 Yes
2.3.B.2 Yes

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A Interconnectivity (MV-I): Not applicable.
3.1.B Facility Condition: See attached table
3.1.C Environmental and Encroachment Carrying Capacity (MV-II):
Not applicable. This is an indoor facility.
3.1.D Specialized Test Support Facilities and Targets (MV-I):
3.1.D.1 No
3.1.D.2 No
3.1.D.2A No
3.1.E Expandability (MV-III):
3.1.E.1 No
3.1.E.1A No
3.1.E.2 No
3.1.E.3 Yes. Secret Level.
3.1.E.4 No
3.1.F Uniqueness (MV-I):
3.1.F.1 No
3.1.F.1A No
3.1.F.1B No
3.1.F.2 No

3.1.G Available Air, Land, and Sea Space (MV-II): Not applicable
3.1.H Geographic/Climatological features (MV-II): Not applicable

3.2 AIR VEHICLES: Not applicable

3.3 ELECTRONIC COMBAT: This facility is used for R & D metrology evaluation of EW Brassboard Systems and ECM techniques against surrogates.

3.3.A Threat Environmental (MV-I): Not applicable. This facility has no threat simulation capability.
3.3.B Test Article Support (MV-II): Not applicable.

3.4 ARMAMENT / WEAPONS: Not applicable.

CECL

INFRARED/ELECTRO-OPTICAL CALIBRATION & CHARACTERIZATION LAB

ANNEX L

INFRARED/ELECTRO-OPTICAL CALIBRATION AND CHARACTERIZATION LABORATORY

FUNCTIONS: This facility enables the optical characterization of infrared materials and precise calibration of infrared (IR) radiometric and spectroscopic instrumentation.

DESCRIPTION: The Infrared/Electro-optical Calibration and Characterization Laboratory is an essential element of NRL's IR signature measurement and signature control programs. NAVSEA supported ship signature measurement and ship decoy development programs rely on this laboratory for accurate calibration of instruments such as Interferometer spectrometers, circular variable filter radiometers, and IR imaging radiometers. For infrared signature control programs, the facility provides the capability of characterizing the surface emissive and reflective properties of IR paints and materials. Measurements are made on transmittance, specular reflectance, diffuse reflectance, and bi-directional reflectance.

INSTRUMENTATION: The laboratory uses a number of state-of-the-art instruments and devices. Calibrations of instruments are carried out using any one of a number of accurate IR calibration sources and a 24 inch diameter, 200 inch focal length off-axis collimator. Infrared paints and materials are characterized by several instruments: a Perkin-Elmer spectrophotometer (transmittance and specular reflectance), and two Bomem FTIR integrating spheres for both visual and IR bands giving values for total and diffuse reflectance. These calibrations can be carried out at several ambient temperatures using a Tenny environmentally controlled chamber.

INFRARED/ELECTRO-OPTICAL CALIBRATION AND CHARACTERIZATION LABORATORY

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1 WORKLOAD

2.1.A Historical Workload

-2.1.A.1 See table.

2.1.B Forecasted Workload

-2.1.B.1 Not available at individual facility level.

-2.1.B.2 See table.

2.2 UNCONSTRAINED CAPACITY

-2.2.A See table.

-2.2.B See table.

2.3 TECHNICAL RESOURCES

-2.3.A No.

-2.3.B No.

-2.3.B.1 Yes.

-2.3.B.2 Yes.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity (MU I)

-3.1.A.1 None - not interconnected to any other facility.

-3.1.A.2 No since not interconnected.

3.1.B Facility Condition (MU II) See table.

3.1.C Environmental and Encroachment Carrying Capacity (MU II)

- 3.1.C.1 No.

- 3.1.C.2 N/A

- 3.1.C.3 No.

- 3.1.C.4 N/A - Washington, D.C. metropolitan area

- 3.1.C.5 N/A

    - 3.1.C.5.A None.

- 3.1.C.6 None.

3.1.D Specialized Test Support Facilities and Targets (MU I) -

-3.1.D.1 No.

-3.1.D.2 No.

-3.1.D.2.A N/A - no specialized targets.

3.1.E Expandability (MU III)

-3.1.E.1 No.

-3.1.E.1.A No.

-3.1.E.2 No.

-3.1.E.3 Yes - Secret is routine level of secuity; Top Secret and Special Access
Required can be accommodated with special arrangements.

-3.1.E.4 No.

3.1.F Uniqueness (MU I)

-3.1.F.1 Yes. Facility contains a unique combination of infrared measurement and calibration hardware configured expressly for ship signature and ship infrared decoy measurements. In addition, a number of special aircraft (A/C) mounts which allow integration of reconfigurable hardware arrangements are part of the facility.

-3.1.F.1.A Yes - Mission described in 3.1.F.1 is unique to this facility.

-3.1.F.1.B Yes - See above (3.1.F.1.A)

-3.1.F.2 No.

3.1.G Available Air, Land, and Sea Space (MU II) N/A

3.2 AIR VEHICLES N/A

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment (MU I)

-3.3.A.1 N/A - not a threat simulation.

-3.3.A.2 N/A - not a threat simulation.

-3.3.A.3 N/A - not a threat simulation.

-3.3.A.4 N/A - not a threat simulation.

-3.3.A.5 N/A - not a threat simulation.

-3.3.A.6 N/A - not a threat simulation.

-3.3.A.7 N/A - not a threat simulation.

-3.3.A.7.A N/A - not a threat simulation.
-3.3.A.7.B N/A - not a threat simulation.

-3.3.A.8 The facility can be operated from land sites or from aircraft, both fixed wing and helicopters. To provide added flexilbilty in testing and efficiency of operation, the measurement facility has been integrated into a large van which allows rapid and fully supported redeployment to remote sites.

-3.3.A.9 No.

-3.3.A.10 YES.

3.3.B Test Article Support (MU II)

-3.3.B.1 Yes - system has been designed to measure one target at a time.

-3.3.B.2 Measurement system is heavily used to characterize infrared decoys. The measurement process normally isolates one target at a time to obtain spectral and

intensity data on that device. However, if a multiple launch of the decoy is how it is intended to be used, the facility will properly characterize that constellation.

-3.3.B.3 The facility employs an extensive array of infrared measurement devices including spectral radiometric equipment covering the infrared spectrum from 2.0 μm to14 μm and imaging banded radiometers spanning the same infrared range.

-3.3.B.4 See 3.3.B.3

-3.3.B.5 No.

3.4 ARMAMENTS / WEAPONS N/A

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1.A Historical Work Load
2.1.A.1 See attached table

2.1.B Forecasted Workload
2.1.B.1 Not available at individual facility level
2.1.B.2 See attached table

2.2 Unconstrained Capacity
2.2.A See attached table
2.2.B See attached table

2.3 Technical Resources
2.3.A No
2.3.B No
2.3.B.1 Yes
2.3.B.2 Yes

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A Interconnectivity (MV-I): Not applicable.
3.1.B Facility Condition: See attached table
3.1.C Environmental and Encroachment Carrying Capacity (MV-II):
Not applicable. This is an indoor facility.
3.1.D Specialized Test Support Facilities and Targets (MV-I):
3.1.D.1 No
3.1.D.2 No
3.1.D.2A No
3.1.E Expandability (MV-III):
3.1.E.1 No
3.1.E.1A No
3.1.E.2 No
3.1.E.3 Yes. Secret Level.
3.1.E.4 No
3.1.F Uniqueness (MV-I):
3.1.F.1 No
3.1.F.1A No
3.1.F.1B No
3.1.F.2 No

3.1.G Available Air, Land, and Sea Space (MV-II): Not applicable
3.1.H Geographic/Climatological features (MV-II): Not applicable

3.2 AIR VEHICLES: Not applicable

3.3 ELECTRONIC COMBAT: This facility is used for R & D metrology evaluation of EW Brassboard Systems and ECM techniques against surrogates.

3.3.A Threat Environmental (MV-I): Not applicable. This facility has no threat simulation capability.
3.3.B Test Article Support (MV-II): Not applicable.

3.4 ARMAMENT / WEAPONS: Not applicable.

WIS

INFRARED MISSILE SIMULATOR & DEVELOPMENT LAB

ANNEX M

0073

INFRARED(IR) MISSILE SIMULATOR AND DEVELOPMENT LABORATORY

FUNCTIONS: Determines the effectiveness of ship based IR decoys and IR laser CM systems against the IR guided ASM. Develops performance bounds of IR ASMs to detect and engage both conventional and signature reduced U.S. surface platforms, and to evaluate the performance of various IRCM techniques from R&D to DT/OT.

DESCRIPTIONS: The IR Missile Simulator and Development Laboratory consists of ground based and P-3 mountable IR ASM simulators and fully equipped laboratory facilities for sensor evaluation, processor design and development, flight hardware assembly, algorithm design, and data analysis. The aircraft mounted systems exploit fiber optic communications between the pylon installed pod and the instrumentation/display interface inside the aircraft proper. This new capability permits low noise operations of all video channels and a high bandwidth digital path. Two primary simulator systems contain an integrated data system that makes for easy data analysis of extensive field trials and allows ready visualization of both the actual tests and post test data reduction. One simulator is a reprogrammable system built to evaluate a variety of threats. Both detector configurations and algorithms can be changed to approximate actual or hypothesized threats. The second flyable simulator supports research associated with imaging IR threats. The large diameter gimbal in this system can accommodate a number of the new highly capable imaging IR cameras now available. Using commercial image processing boards and an array of micro-processors, a complete missile seeker system having exceptional flexibility to incorporate new algorithms and IRCCM approaches is obtained.

INSTRUMENTATION: An extensive array of equipment supports the development, test, and operation of the IR simulators. The character of the modern seeker systems requires a comprehensive set of tools for optical and electronic analysis, data collection and display, software development, and for overall system performance analysis. A variety of optical hardware is in place to align and characterize the seeker front ends. Digital and analog data transfer between the seeker front end and the processing electronics is monitored by high speed oscilloscopes, digital logic analyzers, and fiber optic monitoring probes. Test and analysis of much of the electronics (pointing system, image processing, system control) is accomplished through custom interfaces coupled to portable, computer based data acquisition subsystems. Standard video formats are RGB and S-VHS but conversion systems are used to interface to several foreign video standards encountered during multi-national operations. Software development facilities are a major feature of the simula- tors. Development environments based in work stations allow for the development of both high level and assembly level code for real time operations. The real time performance requirements dictate that the target code functions in a multitasking, multi- processing mode. A high performance emulation environment makes development of this complex code possible.

INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1 WORKLOAD

2.1.A Historical Workload

-2.1.A.1 See table.

2.1.B Forecasted Workload

-2.1.B.1 Not available at individual facility level.

-2.1.B.2 See table.

2.2 UNCONSTRAINED CAPACITY

-2.2.A See table.

-2.2.B See table.

2.3 TECHNICAL RESOURCES

-2.3.A No.

-2.3.B No.

-2.3.B.1 Yes.

-2.3.B.2 Yes.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity (MU I)

-3.1.A.1 None.

-3.1.A.2 N/A

3.1.B Facility Condition (MU II) See table.

3.1.C Environmental and Encroachment Carrying Capacity (MU II)

- 3.1.C.1 No.

- 3.1.C.2 N/A

- 3.1.C.3 No.

- 3.1.C.4 N/A - Washington, D.C. metropolitan area.

- 3.1.C.5 N/A

  - 3.1.C.5.A None.

- 3.1.C.6 None.

3.1.D Specialized Test Support Facilities and Targets (MU I) -

-3.1.D.1 No.

-3.1.D.2 No.

-3.1.D.2.A N/A

3.1.E Expandability (MU III)

-3.1.E.1 No.

-3.1.E.1.A No.

-3.1.E.2 No.

-3.1.E.3 Yes - Secret is routine level of secuity; Top Secret and Special Access
Required can be accommodated with special arrangements.

-3.1.E.4 Yes - see Facility Condition. Threat and instrumentation upgrades
are fundamental to this facility and are incorporated into program planning and
documentation.

3.1.F Uniqueness (MU I)

-3.1.F.1 Yes. Facility deals with development and use of foreign infrared anti-ship missile simulators which are used to support countermeasures S&T
and T&E.

-3.1.F.1.A Yes - Mission described in 3.1.F.1 is unique to this facility.

-3.1.F.1.B Yes - See above (3.1.F.1.A)

-3.1.F.2 No.

3.1.G Available Air, Land, and Sea Space (MU II) N/A

3.2 AIR VEHICLES N/A

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment (MU I)

-3.3.A.1 Systems are aircraft (A/C) mounted simulator pods, land based systems, and some which are dual use. Total number of individual threat types
is seven plus variants. Two of the simulators are reprogrammable so that a number of individual threats can be emulated within these architechures.

-3.3.A.2 On land, all of the individual systems can be operated simultaneously.
On A/C, the two reprogrammable systems can be flown and operated simultaneously. Type - Infrared anti-ship missile (ASM). Simulators operate in all of the threat infrared bands spanning the 3-5 μm and 8-12 μm atmospheric windows.

-3.3.A.3 No, but ASM threat simulators are in the process of being validated.
This activity is done under the authority of PMA 272 and OP 912 by the U.S. Navy Unique ASM Threat Simulator Validation Working Group.

-3.3.A.4 Do you conduct open loop testing? - Yes
Reactive? - Yes Closed loop? - No

-3.3.A.5 In some cases actual threat hardware is used, in others hardware emulations are employed.

-3.3.A.6 Are you capable of simulating land threats? - No
Sea threats? - Yes, see 3.3.A.1 and 3.3.A.2. Combined land/sea threats? No.

-3.3.A.7 Simulators are generally collocated at one land site in a tight grouping to take advantage of limited countermeasures resources. When A/C mounted the two flyable systems could both be on the same A/C or on two separate A/C.

-3.3.A.7.A See 3.3.A.7
-3.3.A.7.B See 3.3 A.7

-3.3.A.8 See 3.3.A.7

-3.3.A.9 No.

-3.3.A.10 YES.

3.3.B Test Article Support (MU II)

-3.3.B.1 No.

-3.3.B.2 Can use any desired number of countermeasures simultaneously, e.g.
jamming and decoys or multiple decoys. However, testing is generally done with one countermeasure at a time to evaluate its performance.

-3.3.B.3 See 3.3.A.2

-3.3.B.4 See 3.3.A.2

-3.3.B.5 No.

3.4 ARMAMENTS / WEAPONS N/A

SCALE MODEL ANALYSIS FACILITY

ANNEX N

SCALE MODEL ANALYSIS FACILITY

FUNCTION: Uses reduced scale models and a submillimeter (SMM) detection system o measure and analyze the radar cross sections (RCS) of ships and ship systems.

DESCRIPTION: The Scale Model Analysis facility (SMAF) has been established at NRL as a low-cost method of measuring and analyzing the RCS of objects through an accurate scaling of the object, the radar system, and the environment. The scaling factor of the mod- el is determined by the source frequencies that can be generated and the desired base frequency. For ship models of manageable size, mid-x band studies require SMAF to operate in the SMM region. Lower scaling ratios permit more detailed study of indi- indi structures such as radars or weapon systems. However, SMAF can accommodate rather large targets so that even at 70:1 scaling ratio full ship models can be handled. SMAF is an indoor compact range which consists of a SMM radar analog and an anechoic cham- ber. During measurement, the model is illuminated by a narrow SMM beam emitted from the radar analog while translating in a raster pattern in the anechoic chamber. This process continues until the entire model has been swept across by the beam. Backscattered energy is collected by a receiving system during the scan and is recorded in a computer as a function of elevation and cross-range. Collected data is then processed to produce high resolution radar images from which locations in cross-range and elevation, magni- tudes, and angular persistencies of the major scattering centers on the target can be accurately assessed.

INSTRUMENTATION: The radar analog is a homodyne system with a continuous wave SMM laser transmitter and a liquid helium cooled, hot electron bolometer receiver. The laser transmitter is based on a far infrared laser which is optically pumped by a 50 watt CO_2 laser. Target translation and orientation are accomplished with a high precision, six degree-of-freedom positioning stage. Data acquisition, processing, and presentation are handled by two net-worked computers. One computer is dedicated to control of the target positioner and to record digitized signals from the receiver system. The second computer accesses and processes the data collected by the first while data acquisition continues. A recently developed high quality SMM absorption material is currently used as a SMM absorption material in the anechoic chamber of SMAF so that background signals can be further reduced. A simulated sea surface has been installed to include measurement of the multipath effect to generate the complicated interactions between the target and the sea. A stereo lithography system adds to the capability of model construction. Such a system enables models to be constructed directly from CAD drawings in a short period. With this capability, SMAF offers a quick way for performing 'what if' evaluations in the RCS studies of new ship designs.

SCALE MODEL ANALYSIS FACILITY

2.1 WORKLOAD

2.1.A Historical Workload

-2.1.A.1 See Historical Workload Form provided in Appendix A of this package.

2.1.B Forecasted Workload

-2.1.B.1 Not available at individual facility level.

-2.1.B.2 See Historical Workload Form provided in Appendix A of this package.

2.2 UNCONSTRAINED CAPACITY

-2.2.A See Determination of Unconstrained Capacity Form.

-2.2.B See Determination of Unconstrained Capacity Form.

2.3 TECHNICAL RESOURCES

-2.3.A No

-2.3.B No

-2.3.B.1 Yes

-2.3.B.2 Yes SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity (MU I)

-3.1.A.1 None. The Scale Model Analysis Facility is not interconnected to other facilities.

-3.1.A.2 N/A - Not interconnected.

3.1.B Facility Condition (MU II) See the Facility Condition Form.

3.1.C Environmental and Encroachment Carrying Capacity (MU II)

3.1.C.1 No

- 3.1.C.2 N/A

- 3.1.C.3 No

- 3.1.C.4 N/A - Washington, D.C. metropolitan area.

- 3.1.C.5 N/A

  - 3.1.C.5.A None

- 3.1.C.6 None

3.1.D Specialized Test Support Facilities and Targets (MU I)

-3.1.D.1 No

-3.1.D.2 Yes. Precision ship/ship system models fabricated uniquely for submillimeter modeling.

-3.1.D.2.A Yes. NRL personnel and contractors check fabricated models against drawings.

3.1.E Expandability (MU III)

-3.1.E.1 No

-3.1.E.1.A Yes. Can modify to measure air, land, and space vehicles.

-3.1.E.2 N/A - Indoor facility.

-3.1.E.3 Yes. The facility is currently operated at the Secret level but could easily be upgraded to Top Secret and Special Access Required.

-3.1.E.4 Yes - A substantial CPP investment is planned for FY 96.

3.1.F Uniqueness (MU I)

-3.1.F.1 Yes - Designed specifically to do signature analysis of ship size targets in sea clutter backgrounds. The facility employs a submillimeter laser operating at 693 gHz and a special optical system and receiver to act as a radar analogue.
Through use of 75:1 scale models of ships mounted on a large 6 degree of freedom positioner, the radar analogue can produce a radar scattering image of the ship.

-3.1.F.1.A Yes. This facility is designed uniquely for ship studies.
-3.1.F.1.B Yes. Same as above.

-3.1.F.2 No.

3.1.G Available Air, Land, and Sea Space (MU II)

3.2 AIR VEHICLES N/A

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment (MU I) N/A - System is not a

threat similator.

3.3.B Test Article Support (MU II)

3.3.B.1 Yes. Model size can be no larger than 9 feet and no heavier than 200 pounds.

-3.3.B.2 N/A - not a threat simulator.

-3.3.B.3 300GHz - 2000 GHz

-3.3.B.4 Same as 3.3.B.2

-3.3.B.5 Yes. System can generate radar cross section maps of both ship target and, to a limited extent, the sea background.

3.4 ARMAMENTS / WEAPONS N/A

ADVANCED TACTICAL ELECTRONIC WARFARE ENVIRONMENT SIMULATOR

ANNEX E

ADVANCED TACTICAL ELECTRONIC WARFARE ENVIRONMENT SIMULATOR

FUNCTIONS: Real-time hardware-in-the-loop test and evaluation of electronic warfare (EW) sensor systems and concepts in the 0.5 to 18.0 GHz microwave range.

DESCRIPTION: The Advanced Tactical Electronic Warfare Environment Simulator (ATEWES) is a general purpose system designed to provide complex and realistic RF signal environments for laboratory testing and evaluation of modern EW/ESM systems. The most significant aspect of the ATEWES is its ability to generate a near real-world dynamic RF environment consisting of up to a thousand simultaneous signals with a combined pulse density of one million pulses per second. Frequency coverage of 0.5 to 18.0 GHz and hemispheric spatial coverage with azimuth and elevation accuracies of approximately 1.0-mrad is provided. This overall capability is driven by an operator defined scenario which can be rapidly programmed for operational use. This level of performance permits laboratory evaluation of modern EW/ESM systems under controlled conditions and can minimize or avoid costly at-sea and/or flight testing, while allowing new system development and concepts to transition to the fleet in reduced time and cost. Recent ATEWES enhancements include complex features for evaluating real-time battle force engagements in three-dimensional space. The ATEWES can be configured to interface with the system-under-test through a variety of means and include direct-coupling, free-space radiated or interface with (and combined utilization of) the Central Target Simulation (CTS) anechoic chamber.

INSTRUMENTATION: The ATEWES uses a complete complement of laboratory microwave instrumentation: network analyzers, spectrum analyzer, microwave frequency counters, power meters, microwave synthesizers, digital-controlled-oscillators, function generators, and solid-state amplifiers. Internal data recording includes a record of simulation data and signal-level pulse-history of all pulses delivered to the system under test. Computer displays include interactive graphics operator terminal and three-dimensional color graphics situation display.

ADVANCED TACTICAL ELECTRONIC WARFARE ENVIRONMENT SIMULATOR (ATEWES)

2.1 WORKLOAD

2.1.A. HISTORICAL WORKLOAD

-2.1.A.1. See Historical Workload Form provided in Appendix A of this package.

2.1.B. Forecasted Workload

-2.1.B.1 Not available at individual facility level.

-2.1.B.2 See Historical Workload Form provided in Appendix A of this package.

2.2 UNCONSTRAINED CAPACITY

-2.2.A See Determination of Unconstrained Capacity Form.

-2.2.B See Determination of Unconstrained Capacity Form.

2.3 TECHNICAL RESOURCES

-2.3.A No

2.3.B No

-2.3.B.1 Yes.

-2.3.B.2 Yes.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. The ATEWES is linked with the Central Target Simulator (CTS). It does not represent a single node failure.

3.1.A.1 None

3.1.A.2 Yes. Realistic RF environment simulation would not be possible.

3.1.B **Facility Condition** (MV II) See the Facility Condition Form provided in Appendix A of this package.

3.1.C **Environmental and Encroachment Carrying Capacity (MV II)**

3.1.C.1 No

3.1.C.2 N/A

3.1.C.3 No

3.1.C.4 N/A - Washington, DC. metropolitan area.

3.1.C.5 N/A

3.1.C.5.A None

3.1.C.6 None

3.1.D **Specialized Test Support Facilities and Targets** (MV I)

3.1.D.1 No

3.1.D.2 No

3.1.D.2.A No

3.1.E **Expandability** (MV III)

3.1.E.1 No

3.1.E.1.A No

3.1.E.2 No

3.1.E.3 Yes. The facility is currently operated at the Secret level but could easily be upgraded to Top Secret and Special Access Required.

3.1.E.4 Yes. Expansion into the millimeter wave band is planned for FY96.

3.1.F UNIQUENESS (MV I)

3.1.F.1 No

3.1.F.1.A No

3.1.F.1.B No

3.1.F.2 No

3.1.G Available Air, Land, and Sea Space (MV II)

3.1.G.1 N/A

3.1.G.2 N/A

3.1.G.3 N/A

3.1.G.4 N/A

3.1.G.5 N/A

3.1.G.6 N/A

3.1.G.7 N/A

3.1.G.8 N/A

3.1.H Geographic/Climatological Features (MV II)

3.1.H.1 through 3.1.H.10 N/A

3.2 AIR VEHICLES

N/A

3.3 ELECTRONIC COMBAT

3.3.A. Threat Environment (MV I) - Measure of Merit

3.3.A.1 One thousand threat emitters can be simulated.

3.3.A.2 Two hundred fifty six threat platforms can be simulated simultaneously. Most radars can be simulated up to a maximum signal density of four million pulses per second. The average density is one million pulses per second. The power level is a maximum of ten milliwatts from 0.5 GHz to 18 GHz. These signals can be radiated or injected.

3.3.A.3 Yes. The validation was conducted by the intelligence agencies (CIA, NSA, ONI).

3.3.A.4 Yes. No. Yes.

3.3.A.5 The simulator provides accurate reproduction of existing and projected radar threats. It incorporates all varieties of scan modulations and radar modes. The density is one thousand emitters located on 256 fixed or mobile platforms.

3.3.A.6 Yes. Yes. Yes. See 3.3.A.5 above.

3.3.A.7 Anywhere in the world.

3.3.A.7.A Any radar emitters.

3.3.A.7.B Any line of sight distance from receiving platform.

3.3.A.8 Yes.

3.3.A.9 No.

3.3.A.10 Yes.

3.3.B Test Article Support (MV II)

3.3.B.1 No.

3.3.B.2 This is an ESM System.

3.3.B.3 0.5 GHz - 18 GHz.

3.3.B.4 The entire RF spectrum.

3.3.B.5 No.

3.4 ARMAMENTS/WEAPONS N/A

CHAMBER

LOW POWER ANECHOIC CHAMBER

ANNEX J

Additional Information for Technical Information Page:

Instrumentation/Assets

1. Antishipping Missile Seekers
2. Scientific Atlanta Pedestal/Controller
3. Anechoic Chamber
4. Moving Target Mechanism
5. AD/100 Multiprocessor
    - Simulation Computer
    - I/O System
    - VAX Station
6. Target Generation Hardware
7. Frequency Sources
8. High Power RF Amplifiers
9. SLQ-32 Techniques Generator
10. SLQ-17 Techniques Generator
11. Astro Med Recording System
12. Silicon Graphics Work Station
13. Oscilloscopes
14. Spectrum Analyzer
15. RF Microwave Components
16. Sun Work Station

0094

LOW POWER ANECHOIC CHAMBER FOR ECM TECHNIQUES DEVELOPMENT

FUNCTION: This facility is a hardware-in-the-loop low power RF simulation laboratory used the development and evaluation of the effectiveness of electronic countermeasures techniques agai antiship cruise missiles. All terminal electronic countermeasures programmed in the active AN/SLQ 32(V) area threat libraries are developed, tested and evaluated in this facility in open and closed loo test configurations. Measures of effectiveness of the electronic countermeasure waveforms against missiles are obtained through closed loop testing.

DESCRIPTION: The hardware-in-the-loop facility is instrumented to test antiship missiles operating in I and J band of the frequency spectrum, with the capability for up to two targets, such as ship and chaff, in the scenarios. The two targets alternatively can also be implemented to simulate t ships each having an on-board active EW system. Missile radar seekers are mounted on a two-axis pedestal allowing closed loop evaluation in the azimuth and elevation planes. The engagement an associated kinematics are developed using computer-controlled interactions between the pedestal, fixed and a moving horn. The fixed horn is implemented using synthetic line of sight. Signals radiat in the direction of the missile radar seeker simulate targets as seen by the missile seeker to include pulse by pulse seeker antenna patterns, ship cross sectional area, range attenuation, and scintillati effects. ECM returns are radiated to also include the effects of seeker antenna pattern, range attenuation and realistic jamming to signal ratios. The missile autopilot / aerodynamics modeling is done in real time using an Applied Dynamics AD/100 dynamic simulation system, with the capability collecting and displaying more than 50 channels of data.

INSTRUMENTATION: ECM equipment includes the ADCAP SLQ-32 techniques generatc and SLQ-17 waveform generator. The facility instrumentation assets include Astro- Med strip chart recorder, X/Y plotter, RF spectrum analyzer, oscilloscopes, RF power meter and microwave sources generating target signatures including TWT and solid state microwave wide band amplifiers.

Low Power Anechoic Chamber for ECM Technique Development T&E

SECTION 1: GUIDANCE, STANDARDS, AND ASSUMPTIONS

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1 WORKLOAD

2.1.A Historical Workload

-2.1.A.1 See Table

2.1.B Forecasted Workload

-2.1.B.1 Not available at facility level.

-2.1.B.2 See Table

2.2 UNCONSTRAINED CAPACITY

-2.2.A See Table

-2.2.B See Table

2.3 TECHNICAL RESOURCES

-2.3.A No

-2.3.B No

-2.3.B.1 No

-2.3.B.2 Yes

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity (MV I)

-3.1.A.1 None

-3.1.A.2 NA

3.1.B Facility Condition (MV II) See Table

3.1.C Environmental and Encroachment Carrying Capacity (MV II)

- **3.1.C.1** No

- **3.1.C.2** NA

- **3.1.C.3** No

- **3.1.C.4** NA (Washington DC metropolitan area)

- **3.1.C.5** NA - indoor facility

    - **3.1.C.5.A** None

- **3.1.C.6** None

3.1.D Specialized Test Support Facilities and Targets (MV I)

-3.1.D.1 No

-3.1.D.2 No

-3.1.D.2.A NA

3.1.E Expandability (MV III)

-3.1.E.1 No

-3.1.E.1.A No

-3.1.E.2 NA - indoor facility

-3.1.E.3 Yes - Confidential, Secret, Top Secret and Special Access Required

-3.1.E.4 Yes - see Table

3.1.F Uniqueness (MV I)

-3.1.F.1 No

-3.1.F.1.A No

-3.1.F.1.B No

-3.1.F.2 No

3.1.G Available Air, Land, and Sea Space (MV II) NA - indoor facility

3.1.H Geographic/Climatological Features (MV II) NA - indoor facility

3.2 AIR VEHICLES NA

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment (MV I)

-3.3.A.1 Twelve (12) antiship missiles (ASM)

-3.3.A.2 One threat at a time. Antiship missile (ASM). Maximum density - continuous; average density 5000 pulse per second. Effective radiated power is 20 dBw. I/J Bands. Signals are radiated.

-3.3.A.3 No, but validation is in process with final approval via OPNAV Code N 912.

-3.3.A.4 Yes - open loop and closed loop.

-3.3.A.5 Real threat hardware is used (fidelity is therefore absolute). Single threat operation at any one time.

-3.3.A.6 Yes - antiship missiles (target is at sea, attacking missile launch can be from land, air or sea)

-3.3.A.7 Single ship engagements

-3.3.A.7.A As required
-3.3.A.7.B As specified for the antiship missile (acquisition range, which varies by missile, is simulated to missile specifications)

-3.3.A.8 Yes

-3.3.A.9 No

-3.3.A.10 Yes

3.3.B Test Article Support (MV II)

-3.3.B.1 Yes - weight and moment of missile seeker head mounted on chamber pedestal which may exceed pedestal capacity - not a current

limitation for threat missiles in use

-3.3.B.2 one (1)

-3.3.B.3 RF I/J Bands (i.e. Radar X and Ku Bands)

-3.3.B.4 I/J Bands

-3.3.B.5 Yes - can generate a radar return of a ship and (ass applicable) an accompanying airborne platform carrying a jammer

3.4 ARMAMENTS / WEAPONS NA

CENTRAL TARGET SIMULATOR FACILITY

ANNEX R

0107

CENTRAL TARGET SIMULATION FACILITY

FUNCTIONS: The Central Target Simulator (CTS) is a high performance, hardware-in-the-loop simulator used for real-time test and evaluation of Electronic Warfare systems and techniques for countering the missile threat to the Navy.

DESCRIPTION: The facility which operates in the 2 to 18 GHz frequency region consists of a shielded anechoic chamber containing a large matrix array of microwave antennas designed to transmit the RF environment an attacking missile might encounter in a real world scenario. Simulated radar echo's from ships, aircraft, decoys, and electronic countermeasures (ECM) signals are part of the RF environment presented to the attacking missile. Missile RF guidance hardware is mounted on a high-performance, three-axis electrohydraulic flight simulator (TAFS). The TAFS simulates the flight dynamics of a missile. The simulation loop between the missile hardware mounted on the TAFS and the RF environment transmitted from the antenna array is closed thru a DEC VAX 8650 computer. The computer is programmed with an aerodynamics and autopilot model which interacts with the guidance hardware in response to the RF stimuli. Detailed performance of a missile in flight is recorded from launch through impact. The shielded anechoic chamber creates the free-space propagation environment for the radiated RF fields. The size (114' x 127' x 38') and geometry of the chamber enable accurate simulation of tactical missile engagements over a wide field of view. Currently, the angular coverage is provided by 225 antenna elements, giving 18.75° azimuth by 8.75° elevation in the center and a 1.25° azimuth strip over the remaining 78.75°. Independent RF feeds distribute time-coincident signals either co-located or at differing positions on the antenna array. This capability permits a wide selection of tactical engagement scenarios featuring various mixes of radar echoes and deceptive or denial ECM signals. The programmable radio frequency generator modulator (RFGM) is used to simulate ship and aircraft echo's, chaff, and/or deceptive ECM signals. The coherent environment generator (CEG) allows CW-doppler simulation capabilities as well as ECM signals associated with antiaircraft missile engagements.

INSTRUMENTATION: The CTS facility uses a complete complement of laboratory microwave instrumentation and data recording devices to capture information relative to the test being conducted. Analog data recording instrumentation includes eight-channel strip chart records, Silicon Graphic workstations, and a DEC VAX computer. A master control console provides six CCTV monitors which can monitor the activities in the TAFS room, in the chamber, in the operations control room, or in other facility locations. The console also provides audio intercoms and special control panels for the flight table and RF environment generation equipment.

Central Target Simulator (CTS), Naval Research Laboratory, Code 5760

SECTION 2: Capacity & Technical Resources

2.1 WORKLOAD

2.1.A Historical Workload
2.1.A.1 See table

2.1.B Forcasted Workload
2.1.B.1 Not available at individual facility level.
2.1.B.2 See table

2.3 TECHNICAL RESOURCES

2.3.A No

2.3.B No

2.3.B.1 Yes

2.3.B.2 Yes

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A.1 30%. EP-3B flying EW laboratory interconnected thru ASM simulators; near real-time; external to CTS site.

3.1.A.2 Yes. We support activities on the EP-3B flying EW laboratory.

3.1.C.1 NA

3.1.C.2 NA

3.1.C.3 NA

3.1.C.4 NA

3.1.C.5 NA
3.1.C.5.A NA

3.1.C.6 NA

3.1.D.1 No

3.1.D.2 No
3.1.D.2.A No

3.1.E.1 No

3.1.E.1.A No

3.1.E.2 No

3.1.E.3 Yes; SAR

3.1.E.4 Yes; see table

3.1.F.1 Yes.
3.1.F.1.A Yes
3.1.F.1.B Yes. CTS performs Naval task force level Anti-Shipping Missile, hardware in the loop, closed loop simulations including multiple ship, aircraft, decoy, and ECM platforms.

3.1.F.2 No

3.1.G NA

3.1.H NA

3.3 ELECTRONIC COMBAT

3.3.A.1 Thirty six (36) are simulated/tested.

3.3.A.2 One (1) threat utilizing hardware-in-the-loop (HIL) testing.

Type of threats include Anti-Ship Missiles (ASM) and CW Doppler anti-air missiles.

Maximum signal density in normal mode includes four targets at the same range cell and total of 64 targets spaced in range.

The average density of targets is typically 4 to 6 per scenario.

Max. power of two fine positioned targets is +32 dBm Effective Radiated Power (ERP).
Max. power of two fixed position targets is +40 dBm Effective Radiated Power (ERP).

Freq. Band of operation is 8 - 18 GHz.

RF signals in the facility are radiated in a 75 foot radius, 38 foot high anechoic chamber.

3.3.A.3 The threat software models and simulators are not validated. A structured Navy validation program for ASM's is presently being initiated with NRL as one of the primary participants.

3.3.A.4 CTS conducts open loop, closed loop and reactive tests.

3.3.A.5 Actual (if available) or simulated threat hardware is utilized. Simulated threat hardware fidelity is dependent upon extent of threat exploitation or INTEL data. Only one threat ASM is simulated at a time.

3.3.A.6 We can simulate sea and air threats but no land or land/sea threats. Single ASM HIL simulation at a time.

3.3.A.7

(a) Target angles to threat in degrees possible from CTS generated scenarios.

AZ	EL	
18.75	8.75	main array
77.5	1.25	wings (used for wide horizon coverage)

(The above angular scenario coverage is for fully geometrically decoupled simulations, synthetic line of sight simulations allow +- 50 degrees plus above limits in both Az and EL)

(b) Typically we can simulate targets with a range of 1/8 - 670 Nmiles from the threat.

3.3.A.8 The threats are dynamically movable on a three axis flight simulator representing missile body motion. Targets are dynamically movable from one PRI to the next on an electronically switched RF array of antennas with position accuracy of 1 milliradian, ERP accuracy of .5 dB and range accuracy of 10 nanoseconds. Independent targets can be generated every 2 microseconds (1000 ft. range spacing) on a single feed with 2 independent simultaneous RF feeds available. Two additional fixed position RF feeds are also simultaneously available.

Both the threats and targets simulations are relocatable to different test scenarios.

3.3.A.9 The facility is not interlinked with off-site threats.

3.3.A.10 We can handle only one user at a time.

3.3.B.1 For normal operation the weight limit for the threat radar system is 400 lb. To increase the weight limit restriction requires a new Three Axis Flight Simulator (TAFS). The maximum radar diameter at the gimbal intersection of the TAFS is 22 inches (however, larger diameter radars can be mounted in front of the gimbals with slightly degraded target positioning accuracy).

3.3.B.2 The number of simultaneous independent RF countermeasures that can be evaluated is 3 (time multiplexed countermeasures allow a greater number depending on ECM timing).

3.3.B.3 We can test and evaluate threats in the RF microwave band from 8 to 18 Ghz.

3.3.B.4 Target models of ships, aircraft, chaff, offboard decoys, and onboard ECM systems are available. Environmental effects such as wind, multipath, etc. are modeled.

3.3.B.5 Our "scene" generation capabilities include RF modeling and placement of complex naval tactical scenarios including all major components of same.

SEARCH RADAR ELECTRONIC COUNTERMEASURES SIMULATOR

ANNEX K

0100

Additional Information for Technical Information Page:

SRES Instrumentation Assets

AN/SLQ-32 Techniques Generator
AN/ALQ-99 Techniques Generator
Video Scan Converter
RF Spectrum Analyzers
RF Synthesizer Signal Generator

SEARCH RADAR ECM SIMULATOR

FUNCTION: This facility tests the effectiveness of electronic countermeasures (ECM) equipment and techniques for jamming airborne search and targeting radars.

DESCRIPTION: The Search Radar ECM Simulator (SRES) is an electronic laboratory designed to test ECM equipment by simulating the engagement between an airborne threat search radar and a group of surface ships and aircraft that use ECM as part of their defense. The method of simulation is real-time generation of the RF signals that would be present in the threat radar receiver from the radar echoes and ECM. These signals are processed by the radar receivers and displayed on radar displays for man-in-the-loop determination of ECM effectiveness. An effective ECM would prevent the radar operator from determining the preferred target's location.

The simulator is housed in an RF-shielded room with both 60 and 400 Hz electrical power. The simulation is implemented by using parallel single board computers that digitally control microwave attenuators and switches to produce the simulated radar signals. Another single board computer controls the simulation and interface with a CRT terminal for data entry. The simulator uses human radar operators to achieve actual man-in-the-loop target determination.

INSTRUMENTATION: Resident ECM equipment includes ALQ-99 and SLQ-32 techniques generators, noise sources, and false target generators. Radar equipment includes two PPIs, A and B scopes, and various radar receivers. Additional data recording devices are a line printer for simulator data hard copy, photographic and VHS video recording of radar displays, microwave spectrum analyzer with camera, and direct recording of wide-band radar video with time code and antenna position data.

3.1.C Environmental and Encroachment Carrying Capacity (MV II)

- **3.1.C.1** No

- **3.1.C.2** NA

- **3.1.C.3** No

- **3.1.C.4** NA (Washington DC metropolitan area)

- **3.1.C.5** NA - indoor facility

    - **3.1.C.5.A** None

- **3.1.C.6** None

3.1.D Specialized Test Support Facilities and Targets (MV I)

-3.1.D.1 No

-3.1.D.2 No

-3.1.D.2.A NA

3.1.E Expandability (MV III)

-3.1.E.1 No

-3.1.E.1.A No

-3.1.E.2 NA - indoor facility

-3.1.E.3 Yes - Confidential, Secret and Special Access Required

-3.1.E.4 Yes - see Table

3.1.F Uniqueness (MV I)

-3.1.F.1 Yes - the combination of specific equipment (including ALQ-99 and SLQ-32 techniques generators), software and capabilities associated with and developed for the SRES laboratory are unique to this facility .

-3.1.F.1.A Yes, see 3.1.F.1

-3.1.F.1.B Yes, see 3.1.F.1

-3.1.F.2 Yes - approximately 5%

3.1.G Available Air, Land, and Sea Space (MV II) NA - indoor facility

3.1.H Geographic/Climatological Features (MV II) NA - indoor facility

3.2 AIR VEHICLES NA

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment (MV I)

-3.3.A.1 Programmable for in excess of 10 threat radars

-3.3.A.2 One threat at a time. Search and targeting radars for antiship missile launch platforms. Maximum density - continuous; average density varies and is scenario specific. Effective radiated power is NA. I/J Bands. Signals are injected.

-3.3.A.3 No

-3.3.A.4 Yes - closed loop (man in the loop).

-3.3.A.5 Threat radars are based on best available intelligence community data.. Single threat radar operation at any one time; up to four simultaneous emitters.

-3.3.A.6 Yes - search and target radars (target is at sea; threat radar can be on land, air or sea)

-3.3.A.7 Up to sixteen targets (ships) over a two hundred mile radius

-3.3.A.7.A Sixteen target ships, with up to four ECM sources and a single threat radar engaging them.
-3.3.A.7.B Two hundred mile radius from threat radar site

-3.3.A.8 Yes

-3.3.A.9 No

-3.3.A.10 Yes

3.3.B Test Article Support (MV II)

-3.3.B.1 Yes - weight and moment of missile seeker head mounted on chamber pedestal which may exceed pedestal capacity - not a current limitation for threat missiles in use

-3.3.B.2 one (1)

-3.3.B.3 RF I/J Bands (i.e. Radar X and Ku Bands)

-3.3.B.4 I/J Bands

-3.3.B.5 No

3.4 ARMAMENTS / WEAPONS NA

RADAR CROSS SECTION MEASUREMENT LAB

ANNEX C

0112

RADAR CROSS SECTION MEASUREMENT LABORATORY (CHESAPEAKE BAY DETACHMENT)

FUNCTION: This laboratory has been designed to collect precision over-water radar cross section (RCS) and effective radiated power (ERP) measurements on both developmental as well as production surface and airborne EW systems.

DESCRIPTION: The laboratory is composed of both fixed frequency and swept frequency radars operating from
2 GHz up to 18 GHz. Both a 35 GHz and 95 GHz radar are being added to the complex. The laboratory overlooks the Chesapeake Bay and the NRL over-water test range atop a 100 foot high cliff. The laboratory is supported by small boats operating out of CBD's boat dock and by aircraft operating from the Patuxent River Naval Air Station located about 40 miles to the South. Limited helicopter operations can be conducted directly from the facility.

INSTRUMENTATION: All radars are calibrated prior to , during and after all tests to ensure an accuracy of 1 dB or better. All radars are interlinked through a common tracking radar to assure that all systems are simultaneously collecting data on the same target of interest. Data is collected on a pulse-by-pulse basis for each radar and digitized for post-test processing. Measurements can be conducted at either horizontal or vertical polarizations. Extensive pulse-to-pulse variations in the swept 2 to 18 GHz frequency radar system is possible. Multiple levels of data processing can be performed. Typical data outputs from the radar measurement systems include RCS or ERP as a function of time or as a function of frequency. Other outputs are available and include extended time history records, spectral analysis and other statistical data. Data requirements can be tailored to the users needs.

RCS MEASUREMENT LAB

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.1 WORKLOAD

2.1.A Historical Workload

-2.1.A.1 See table.

2.1.B Forecasted Workload

-2.1.B.1 Not available at individual level.

-2.1.B.2 See table.

2.2 UNCONSTRAINED CAPACITY

-2.2.A See table.

-2.2.B This capacity limited by the physical characteristics of the facility itself.

2.3 TECHNICAL RESOURCES

-2.3.A No.

-2.3.B No.

-2.3.B.1 Yes - PEO(TAD) and PEO(TACAIR) for the testing of decoy systems developed and produced for their organizations.

-2.3.B.2 Yes - For acceptance testing and surveillance testing of surface and air decoy systems purchased for the Navy.

SECTION 3: MEASURES OF MERIT

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity

-3.1.A.1 None of the workload in FY93 was involved in the real-time or near real time exchange of data or control with another facility

-3.1.A.2 No.

3.1.B Facility Condition See Form.

3.1.C Environmental and Encroachment Carrying Capacity

- 3.1.C.1 Yes. The area surrounding the location where this facility is located is seeing a significant increase in residential housing and commercial buildings.

- 3.1.C.2 This encroachment from the outside has had no impact on the operations and the work load could at least be tripled.

- 3.1.C.3 No.

- 3.1.C.4 Within a 50 mile radius - approximately 3 million people. Within a 100 mile radius - approximately 6 million people. Within a 150 mile radius - approximately 9 million people. Within a 200 mile radius - approximately 14 million people.

- 3.1.C.5 Commercial and pleasure craft routinely operate in the area over which the facility males measurements but to date this has not had any significant impact on the operations..

- 3.1.C.5.A No test missions have been canceled.

- 3.1.C.6 None due to encroachment.

3.1.D Specialized Test Support Facilities and Targets

-3.1.D.1 Yes. In order to prepare the decoy rounds for testing their is a need for an explosives handling and storage areas.

-3.1.D.2 No.

-3.1.D.2.A Not applicable.

3.1.E Expandability

-3.1.E.1 No

-3.1.E.1.A No

-3.1.E.2 No.

-3.1.E.3 Yes, up to Secret.

-3.1.E.4 Yes, see attached form.

3.1.F Uniqueness

-3.1.F.1 Yes. This is the only known fixed site DoD facility specifically optimized for the precision radar cross section and ERP measurements of EW systems.

-3.1.F.1.A Yes, See above.

-3.1.F.1.B Yes, See above.

-3.1.F.2 Yes. Approximately 5% for the Air Force in both FY-92 and 93.

3.1.G Available Air, Land, and Sea Space

-3.1.G.1 90 square miles.

-3.1.G.2 The space used is unrestricted space on the Chesapeake bay owned by the State of Maryland.

-3.1.G.3 Not applicable.

-3.1.G.4 Not applicable.

-3.1.G.5 Not applicable.

-3.1.G.6 Not applicable.

-3.1.G.7 Not applicable.

-3.1.G.8 Unrestricted airspace over the Chesapeake Bay adjoining the facility. Dispensing of airborne chaff decoys. Yes, we do anticipate being able to use the same public airspace for similar tests in the future.

3.1.H Geographic/Climatological Features

-3.1.H.1 100 ft high cliff overlooking the Chesapeake Bay.

-3.1.H.2 Yes the proximity to the water and the altitude above it.

-3.1.H.3 No.

-3.1.H.4 30 days per year the average temperature is below 32 degrees F; 335 days between 32 and 95 degrees; 0 days above 95 degrees.

-3.1.H.5 30 days per year the average relative humidity is below 30%; 275 days between 30 and 80%; 60 days above 80%.

-3.1.H.6 20 test missions per year.

-3.1.H.7 10 test days per year.

-3.1.H.8 15 days per year the visibility is less than 1 mile; 45 days between 1 and 3 miles; 305 greater than 3 miles?

-3.1.H.9 275 days

-3.1.H.10 10 % due to weather.

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment

-3.3.A.1 The facility is capable of simulating up to 50 simultaneous radar signals.

-3.3.A.2 50 simultaneous radar transmissions can transmitted at up to 2% duty factor in each of the 2-4, 4-8, 8-17 GHz bands with a typical ERP of 60 dbW

-3.3.A.3 Not applicable

-3.3.A.4 Open loop testing.

-3.3.A.5 Not applicable.

-3.3.A.6 Not applicable.

-3.3.A.7 Single point of transmission and receive.

-3.3.A.7.A Not applicable.

-3.3.A.7.B Not applicable.

-3.3.A.8 Not applicable.

-3.3.A.9 No.

-3.3.A.10 Yes

3.3.B Test Article Support

-3.3.B.1 No.

-3.3.B.2 One at a time as seen by up to 50 radars simultaneously.

-3.3.B.3 2-17 GHz and 35 GHz.

-3.3.B.4 Same as above

-3.3.B.5 No.

FLYING ELECTRONIC WARFARE LABORATORY

ANNEX Q

0120

FLYING ELECTRONIC WARFARE LABORATORY

FUNCTIONS: Two specially configured EP-3B aircraft provide host platforms for anti ship missile seeker simulators used for EW effectiveness assessment in an at-sea environment. This capability provides the Navy's RDT&E and operational communities with unique assets and realistic methods for evaluating Surface Navy EW systems.

DESCRIPTION: The ability to provide ASM threat representation is satisfied through the adaptation of a host of missile seeker simulators and replica threat systems. Operational testing against ship's EW assets is enhanced thru the unique ability to provide real-time feedback relative to the effectiveness of ECM responses to the threat seeker's stimuli. The aircraft are operated and maintained by NRL's Flight Support Detachment located at the Patuxent River NAS. Each aircraft provide 10 completely wired wing stations that can carry the seeker simulators in electronic pods weighing up to 2500 pounds. A total of 15 different simulators representing various ASM threat types are available as part of the ENEWS Program. During a typical mission up to 6 simulators are operated simultaneously and used to exercise the on/offboard EW assets available to the ships. Aircraft interiors are configured for rapid installation and removal of equipment associated with the simulators. Onboard equipment and data acquisition instrumentation provides for real-time analysis of test data during flight, thus providing immediate feedback of results. The aircraft are configured for R&D activities and can be readily re-configured to accommodate special T&E requirements. Internally mounted equipment racks contain seeker control panels, displays, data acquisition and communications subsystems which are organic to each seeker simulator. The aircraft support RDT&E and operational activities on a worldwide basis having provided EW testing support to NATO programs as well as those of individual countries.

INSTRUMENTATION: Two heavy weight EP-3B aircraft are configured for captive-carry of up to 10 seeker simulators. Each simulator can be operated simultaneously and independently. They represent a large cross section of threat missile systems available worldwide and carry ENEWS Program unclassified designations like Alpha, Bravo, etc. The Golf 1 and Golf 2 simulators are AN/ALQ-170 systems which operate in different frequency bands. The remaining simulators are derived from other programs or hardware systems modified to represent various threat seekers. All of the simulators are unique, one of a kind systems with associated instrumentation tailored to the system. Included are data recording equipment, 8 channel strip chart recorders, VCRs, TV and scope cameras and oscilloscope displays. The aircraft navigation systems include an AN/APS-80 radar as well as GPS for ground truth determination.

FLYING EW LABORATORY

SECTION 2: CAPACITY & TECHNICAL RESOURCES

2.2 UNCONSTRAINED CAPACITY

-2.2.B No

2.3 TECHNICAL RESOURCES

-2.3.A No

-2.3.B No

-2.3.B.1 Yes

-2.3.B.2 Yes

3.1 OVER-ARCHING MEASURES OF MERIT

3.1.A. Interconnectivity (MV I)

-3.1.A.1 Thirty percent of total test workload in FY93 involved near real time exchange of data with the Central Target Simulator facility, this is not done simultaneously. This is an internal facility.

-3.1.A.2 No

3.1.B Facility Condition (MV II) - See Table

3.1.C Environmental and Encroachment Carrying Capacity (MV II)

- 3.1.C.1 No

- 3.1.C.2 No limits

- 3.1.C.3 No

- 3.1.C.4 Total population within a 50 mile radius - 3 million; 100 mile radius - 6 million; 150 mile radius - 9 million; 200 mile radius - 14 million

-3.1.C.5 None, we use military airspace

-3.1.C.5.A Zero

-3.1.C.6 Zero

3.1.D Specialized Test Support Facilities and Targets (MV I)

-3.1.D.1 Yes. Corrosion control, painting, washing facilities; avionics intermediate shops; airport; maintenance and ground support facilities. P-3 aircraft are stationed at NAS Patuxent River, MD

-3.1.D.2 No

-3.1.D.2.A Not applicable

3.1.E Expandability (MV III)

-3.1.E.1 No

-3.1.E.1.A No

-3.1.E.2 No

-3.1.E.3 Yes, Secret

-3.1.E.4 Yes, See Table

3.1.F Uniqueness (MV I)

-3.1.F.1 Yes, The NRL Flying EW Laboratory provides a realistic at-sea scenario capability for assessing EW effectiveness of Naval ECM systems worldwide .

-3.1.F.1.A Yes

-3.1.F.1.B Yes

-3.1.F.2 Yes, NATO Countries - 5%

3.1.G Available Air, Land, and Sea Space (MV II)

-3.1.G.1 Not applicable

-3.1.G.2 Not applicable

-3.1.G.3 Not applicable

-3.1.G.4 Not applicable

-3.1.G.5 Not applicable

-3.1.G.6 Not applicable

-3.1.G.7 Not applicable

-3.1.G.8 Not applicable

3.1.H Geographic/Climatological Features (MV II)

-3.1.H.1 Not applicable

-3.1.H.2 Not applicable

-3.1.H.3 Not applicable

-3.1.H.4 Not applicable

-3.1.H.5 Not applicable

-3.1.H.6 Not applicable

-3.1.H.7 Not applicable

-3.1.H.8 Not applicable

-3.1.H.9 Not applicable

-3.1.H.10 Not applicable

3.3 ELECTRONIC COMBAT

3.3.A Threat Environment

-3.3.A.1 36 threats simulated

-3.3.A.2 Eighteen(18) simultaneous threats can be simulated. Sixteen(16) ASM threats and two search radars. The maximum signal density is 31876 pulses/second. The average density is 14167 pulses/second. The power levels range from 5 to 100 Kilowatts in both the I and J bands, radiated signals.

-3.3.A.3 The threat simulators are undergoing validation. This is being done under the authority of NAVAIR PMA272 and OP912 by the U. S. Navy Unique ASM Threat Simulator Validation Working Group.

-3.3.A.4 The simulator testing is conducted open loop and is reactive. No closed loop testing is done using the Flying EW Lab.

-3.3.A.5 Threat fidelity varies with the simulator being used. For EM radiation all simulators are of the highest fidelity. The fidelity of other threat features depends on the type of simulators being used with replicas and actual threat systems having the highest fidelity.

-3.3.A.6 Our simulators are capable of simulating land, sea, and combined land/sea threats. Several of our simulated threats are deployed in a coastal defense role or are capable of being submarine launched.

-3.3.A.7 With two aircraft the flight profiles can simulate a multi-axis launch of ASM threats. Different simulators can be turned on at different times to simulate different range to target.

-3.3.A.7.A Not applicable
-3.3.A.7.B Simulate representative distances of 2 to 100 kilometers.

-3.3.A.8 The threats are moveable within a scenario and relocatable to new scenarios.

-3.3.A.9 The facility is not interlinked with off-site threats.

-3.3.A.10 There is no limit on simultaneous users. Multiple ship systems can be evaluated with ASM simulators.

-3.3.B Test Article Support

-3.3.B.1 The only limits pertain to the safety restrictions related to P-3 aircraft operations with a full simulator load.

-3.3.B.2 The number of simultaneous countermeasures that can be evaluated is limited to the test scenarios for surface NAVY EW.

-3.3.B.3 The range of spectra that can be tested and evaluated is 2 - 4 GHz, 8 - 9.5 GHz, 14.5 - 15.0 GHz, 16 - 17 GHz.

-3.3.B.4 The available spectra are 2 - 4 GHz and 8 -18 GHz.

-3.3.B.5 There is no requirement for a scene generation capability since this is an OAR.

SIMULATION

GENERAL INFORMATION

Facility/Capability Title: COMPUTER SIMULATION

Origin Date: 6/19/94

Service: Navy Organization/Activity: NRL Location: DC

T&E Functional Area: Electronic Combat UIC = 00173

T&E Test Facility Category Digital Models & Computer Simulations (DMS)

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	14	30	56			
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC	14	30	56			
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

0126

TECHNICAL INFORMATION

Facility/Capability Title: COMPUTER SIMULATION

Facility Description; Including mission statement: This is a modeling and simulation facility whose mission is to evaluate and improve the operational effectiveness of emerging electronic warfare systems through computer simulation. This is performed through development of large-scale digital models for simulation of electronic warfare systems to quantify contributions.
Interconnectivity/Multi-Use of T&E Facility: We are linked to "hardware-in-the-loop" test and evaluation in the Counter Targeting Simulation facility and to P-3 aircraft carrying actual hardware or simulators. Data collected from these tests are fed back to our facility and used to improve the accuracy of our digital simulations and for validation purposes.
Type of Test Supported: Naval Surface to Surface Anti-Ship Missile; define requirements for future electronic warfare systems; evaluation and refinement of shipborne tactics against antiship cruise missiles; electromagnetic interference and compatibility modeling.
Summary of Technical Capabilities: Ability to generate, analyze, and visualize complex, large-scale, electromagnetic environments (electronic warfare scenarios) which include environmental effects (atmosphere) and terrain; antiship cruise missile models; various electronic warfare system models. This facility utilizes over three dozen computer graphics workstations of varying capabilities.
Keywords: Modeling and Simulation (M&S)

0129

ADDITIONAL INFORMATION

Facility/Capability Title: COMPUTER SIMULATION

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	2	2	2	2	2	2	2
Contractor	2	2	2	2	2	2	2
Total	4	4	4	4	4	4	4

Total Square Footage: 2500
Total Area Square Footage: 2500
Tonnage of Equipment: 2 TONS
Annual Maintenance Cost: 100K

Office Space Square Footage: 1000 SQ. FT.
Volume of Equipment: 1000 CU. FT.
Estimated Moving Cost: 20K

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
73K	**1160K**	**222K**	**299K**	**282K**	**243K**	**200K**

0126

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: COMPUTER SIMULATION

AGE: 20 REPLACEMENT VALUE: $10M

MAINTENANCE AND REPAIR BACKLOG: $100K

DATE OF LAST UPGRADE: FY94

NATURE OF LAST UPGRADE: MAJOR COMPUTER UPGRADE TO INCREASE SIMULATION CAPABILITY. COMPUTER SCHEDULED FOR DELIVERY IN LATE FY94.

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: Computer Simulation Task 1.2 Upgrades

   TOTAL PROGRAMMED AMOUNT: 4950K over 8 years (FY94-FY01). Average 619K/FY.
   SUMMARY DESCRIPTION: Periodic upgrades to scenarios, software, and equipment.

2. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT: N/A
   SUMMARY DESCRIPTION:

0129

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: COMPUTER SIMULATION

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	3700	3700	3700	3700	3700	3700	3700	3700
	TEST HOURS	7400	7400	7400	7400	7400	7400	7400	7400
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0130

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: COMPUTER SIMULATION

ANNUAL HOURS OF DOWNTIME	1	336
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	0.92
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	23.08

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
SIMULATION RUNS	4	.5	2	1200.16
				ANNUAL UNCONSTRAINED CAPACITY 9 438,058.4
"TYPICAL"	100	.5	50	
			TOTAL: 52	

0131

GENERAL INFORMATION

Facility/Capability Title: *CRUISE Missiles* Electronic Warfare Simulation Model

Origin Date: 06/27/94

Service: NAVY Organization/Activity: Naval Research Lab (NRL) Location: Washington, DC

T&E Functional Area: Electronic Combat Systems UIC = 00173

T&E Test Facility Category Digital Models and Computer Simulations (DMS)

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	20%	80%				
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC	20%	80%				
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

C132

TECHNICAL INFORMATION

Facility/Capability Title: *CRUISE Missiles* Electronic Warfare Simulation Model

Facility Description; Including mission statement:
CRUISE_Missiles is a highly detailed, modular RF/IR digital simulation emphasizing terminal phase ship defense against ASCM threats. Signal interactions and processing, and threat signature fluctuations and fine structure, are represented in high detail on a pulse-by-pulse (or frame-by-frame) basis. The model handles mixtures of multiple threats against many targets which are configurable at run time. Ship, threat, and countermeasure models are carefully derived from authenticated sources. A highly interactive graphical executive facilitates experimentation, and a production or batch mode can be used for long-haul Monte-Carlo runs.

Interconnectivity/Mulit-Use of T&E Facility:
Simulation runs on TEWD SSF which is accessed throughout entire TEW Division via secure LAN. Multiple simultaneous simulation runs are supported by UNIX O/S environment running on multiple CPU's.

Type of Test Supported:
Simulation of anti-ship cruise missile (ASCM) engagements and effects of electronic countermeasures with emphasis on pulse-by-pulse signal interactions between spatially extended target signatures and CM waveforms.

Summary of Technical Capabilities:
Detailed pulse-by-pulse modeling of anti-ship cruise missiles (RF & IR).
Highly detailed spatially extended digital ship signature models: FFG-XX, CG-XX, DD-XX, DDG-XX, CV/CVN, ...
Detailed sea surface & atmospheric models (IR)
Both on-board and off-board ECM models: chaff, FLYRT, SLQ-32, ...
Combined tactics (DDI). Many threats on many targets.

Keywords:
Electronic Warfare, Simulation, Radar, Infrared, Signature

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: *CRUISE Missiles* Electronic Warfare Simulation Model

AGE: 8 years (1986) REPLACEMENT VALUE: $10M (Software Development Effort)

MAINTENANCE AND REPAIR BACKLOG: $1M per annum, no backlog

DATE OF LAST UPGRADE: October 1992 -- February 1993

NATURE OF LAST UPGRADE: RF and IR threat, target, and environmental models whose R&D is funded under ONR 6.2 applied research programs. Continuous annual improvements tracking advances in threat ASCM intelligence information and Navy consideration of new surface ship designs and associated EW/Softkill defense concepts.

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: Threat, target, and environment model enhancements

   TOTAL PROGRAMMED AMOUNT: $2M
   SUMMARY DESCRIPTION: Add several new ship signature models, add additional simulated countermeasures, and modify modeled countermeasure tactics

2. UPGRADE TITLE: _____

   TOTAL PROGRAMMED AMOUNT: _____
   SUMMARY DESCRIPTION: _____

ADDITIONAL INFORMATION

Facility/Capability Title: *CRUISE Missiles* Electronic Warfare Simulation Model

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	6	6	6	6	6	6	6
Contractor							
Total	6	6	6	6	6	6	6

Total Square Footage: _____

Total Area Square Footage: _____

Tonnage of Equipment: < 1

Annual Maintenance Cost: $1M

Office Space Square Footage: 1000

Volume of Equipment: 12 cu. ft.

Estimated Moving Cost: $10K

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$100K	**$50K**	**$150K**	**$100K**	**$50K**	**$100K**	**$150K**

Note: *CRUISE_Missiles* is a Navy-developed software model. Capital equipment investment shown represents ancillary development software tools, libraries, and workstations needed to continue and maintain its development.

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: *CRUISE Missiles* Electronic Warfare Simulation Model

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR								
	TEST HOURS	2000	2000	2000	2000	2000	2000	2000	2000
	MISSIONS	8577	8577	8577	8577	8577	8577	8577	8577
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: *CRUISE Missiles* Electronic Warfare Simulation Model

ANNUAL HOURS OF DOWNTIME	1	175
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	0.5
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	23.5

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
EW Engagement Studies	1	0.33	0.33	23.5
"TYPICAL"	2	0.33	0.67	
				ANNUAL UNCONSTRAINED CAPACITY 9 8577
			TOTAL: 1	

Note: *CRUISE_Missiles* simulation is a model requiring a fast supercomputer for efficient execution. *CRUISE_Missiles* is primarily used within NRL TEW Division using the TEWD Secure Supercomputing Facility (SSF).

C130

TECHNICAL INFORMATION

Facility/Capability Title: Secure Supercomputing Facility (SSF)

Facility Description; Including mission statement:

The TEWD Secure Supercomputing Facility (SSF) serves classified Laboratory, Navy, and DoD needs for high-speed, large memory computation. Emphasis and greatest benefit has been derived in running classified detailed electronic warfare defense simulations. The SSF features a Convex C-3820, with performance comparable to a Cray X/MP with large solid-state disk, and can complete a year of VAX 11/780 runs within a matter of days, or even hours. The SSF primarily adddresses requirements for GENSER Secret, Top Secret, and material requiring special controls using workspaces within the secure Building 210 complex.

Interconnectivity/Multi-Use of T&E Facility:

The SSF is accessed exclusively within the confines of NRL TEWD. Modern workstation-equipped facilities are provided to support outside visitors. During normal-mode operations, the SSF is accessed by a dedicated Division-wide secure network. Users can run tasks through GENSER Secret (system high) in this mode. For special projects (Top Secret or material requiring special controls), normal mode and TEWNET access ceases, and the SSF and vault enclosure become dedicated to the particular project. All SSF disks utilize removable 5-1/4" winchester cassettes, including the console boot disk. Each project acquires its own exclusive complement of disk cassettes and receives its own dedicated copy of system and application software.

Type of Test Supported:

The SSF serves classified Laboratory, Navy and DoD needs for high-speed, large memory computation. Navy application domains include: detailed RF and IR EW simulations, digital modeling of radar target signatures, large-body hydrodynamic equations associated with both sub-surface and surface vehicles, acoustic wave propagation and signal analysis, and inverse scattering and 3-D imaging. Most recent emphasis has been focussed on determination of survivability enhancement of modern surface ships to advanced anti-ship cruise missiles using sophsticated simulations (NRL *RTS* and *CRUISE missiles* models).

Summary of Technical Capabilities:

Convex C-3820 supercomputer with: dual Gallium-Arsenide vector/scalar processors, 500 Million Floating Point Operations per sec. (MFLOPS), 1 Gigabyte (GB) of physical memory, 4 GB virtual memory, 12 GB of local removable disk storage, > 1 Terabyte storage on attached archive system. BSD Unix O/S, Fortran & C Compilers, math libraries, graphics.

Keywords:

Computer, Supercomputer, Simulation

01.39

GENERAL INFORMATION

Facility/Capability Title: Secure Supercompuing Facility (SSF)

Origin Date: 06/27/94

Service: NAVY Organization/Activity: Naval Research Lab (NRL) Location: Washington, DC

T&E Functional Area: Electronic Combat Systems UIC = 00173

T&E Test Facility Category Digital Models and Computer Simulations (DMS)

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	20%	80%				
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC	20%	80%				
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

0138

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: Secure Supercomputer Facility

AGE: 5 years (1989) REPLACEMENT VALUE: $3M

MAINTENANCE AND REPAIR BACKLOG: $125K per annum, no backlog

DATE OF LAST UPGRADE: October 1992

NATURE OF LAST UPGRADE: Upgraded primary compute resource from Convex C-220 to a Convex C-3820. Improved throughput by approx.5X to 500 MFLOPS peak; increased memory 4X to 1 GByte. Upgrade was available 1 November 1992.

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: Performance Upgrade

   TOTAL PROGRAMMED AMOUNT: $800K
   SUMMARY DESCRIPTION: 10X-20X increase in throughput via parallel RISC CPU's

2. UPGRADE TITLE: Network Upgrade

   TOTAL PROGRAMMED AMOUNT: $100K
   SUMMARY DESCRIPTION: Asynchronous Transfer Mode (ATM) hub upgrade to network

ADDITIONAL INFORMATION

Facility/Capability Title: Secure Supercomputing Facility (SSF)

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	1	1	1	1	1	1	1
Contractor							
Total	1	1	1	1	1	1	1

Total Square Footage: approx. 1600
Total Area Square Footage: approx. 1600
Tonnage of Equipment: approx. 3 Tons
Annual Maintenance Cost: approx. $125K per annum

Office Space Square Footage: N/A
Volume of Equipment: approx. 16,000 cu. ft.
Estimated Moving Cost: approx. $10K

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$350K	$150K	$200K	$600K	$150K	$150K	$150K

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: Secure Supercomputing Facility (SSF)

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR				2000	2000	2000	2000	2000
	TEST HOURS				8577	8577	8577	8577	8577
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

C142

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: Secure Supercomputing Facility (SSF)

ANNUAL HOURS OF DOWNTIME	1	175
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	0.5
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	23.5

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
EW Engagement Studies	1	0.33	0.33	23.5
"TYPICAL"	2	0.33	0.67	
				ANNUAL UNCONSTRAINED CAPACITY 9 8577
			TOTAL: 1	

0143

FACILITIES

GENERAL INFORMATION

Facility/Capability Title: OFFBOARD TEST PLATFORM

Origin Date: JUNE 28, 1994

Service: NAVY Organization/Activity: NRL Location: DC

T&E Functional Area: MEASUREMENT FACILITY UIC = 00173

T&E Test Facility Category ELECTRONIC COMBAT

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:		100				
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC		100				
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

C144

TECHNICAL INFORMATION

Facility/Capability Title: OFFBOARD TEST PLATFORM

Facility Description; Including mission statement: This facility is a low Turbulence, closed return Wind Tunnel having a 4' x 4' x8' Test section for aerodynamic measurement and a 6' x 6' x 8' test section for propulsion measurements. These measurements are required for the development of small scale air vehicles designed to operate at low speeds, low altitudes, or low reynolds numbers. These air vehicles are "Cutting Edge" Technology Demonstrators optimized for the Deployment of Offboard Countermeasures EW Payloads.
Interconnectivity/Mulit-Use of T&E Facility: N/A Stand Alone Facility
Type of Test Supported: This facility has been utilized for Multiple Tests in support of Major Decoy Vehicles Development efforts, EW-Related experiments, Fight Data Sensor Calibrations, and propulsion System Developments
Summary of Technical Capabilities: This facility is used to conduct precise performance, stability, control, and propulsive efficiency measurements of advanced technology, Ew Air Vehicle (Decoy) designs to provide the empirical data needed to Develop & Test feasibility demonstrator EW systems.
Keywords: Low Turbulence wind tunnel, Low Reynolds Number Testing, Decoy Air Vehicles, Decoy Air Vehicles, EW Platforms

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: OFFBOARD TEST PLATFORM

AGE: 5 YEARS REPLACEMENT VALUE: $4M

MAINTENANCE AND REPAIR BACKLOG: NONE

DATE OF LAST UPGRADE: FACILITY IS ESSENTIALLY NEW

NATURE OF LAST UPGRADE: NONE

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: NONE

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

2. UPGRADE TITLE:

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

0146

ADDITIONAL INFORMATION

Facility/Capability Title: OFFBOARD TEST PLATFORM

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	1	1.5	2	2	2	2	2
Contractor	1	1.5	0	0	0	0	0
Total	2	3	2	2	2	2	2

Total Square Footage: 3000 SQ FT

Total Area Square Footage: 500 SQ FT

Office Space Square Footage: N/A

Tonnage of Equipment: 6

Volume of Equipment: 10,000 CU FT

Annual Maintenance Cost: $10K

Estimated Moving Cost: $2M

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
0	0	$50K	$50K	$100K	$50K	$50K

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: OFFBOARD TEST PLATFORM

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR				320	800	1000	1000	1000
	TEST HOURS				160	400	500	500	500
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: OFFBOARD TEST PLATFORM

ANNUAL HOURS OF DOWNTIME 1 2190
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365) 2 6
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2) 3 18

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
MODEL TESTING	1	2	2	36
				ANNUAL UNCONSTRAINED CAPACITY 9 13140
"TYPICAL"	0	2	0	
			TOTAL: 2	

0149

GENERAL INFORMATION

Facility/Capability Title: PORTABLE RCS MEASUREMENT RADAR

Origin Date: 28 June 1994

Service: Navy Organization/Activity: NRL Location: _____

T&E Functional Area: ELECTRONIC COMBAT UIC = 00173

T&E Test Facility Category MEASUREMENT FACILITY

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	30	60	10			
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC	30	60	10			
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

TECHNICAL INFORMATION

Facility/Capability Title: PORTABLE RCS MEASUREMENT RADAR

Facility Description; Including mission statement: 8. The TSFR R&D data collection system consists of precision commercial laboratory quality instrumentation and data acquisition equipment integrated together as a highly calibrated radar source and managed by a micro.computer based control system. The TSFR contains specialized RF microwave receivers, A/D converters and controller boards. The radar is a commercial I band tracking radar used to direct the precision instrumentation. The TSRF is a one of kind RCS signature characterization instrument , specifically configured to characterize ship and decoy signatures of interest to the Navy. The TSFR is the only known transportable radar that can characterize and quantify the sensitivity, ERP and apparent RCS of active ECM devices. Additionally, the TSFR is the only known data radar that can go to sea onboard ships to characterize the signature of ECM devices while they are operating in a realistic at-sea environment.
Interconnectivity/Multi-Use of T&E Facility: NONE
Type of Test Supported: RADAR CROSS SECTION (RCS) SIGNATURES EFFECTIVE RADIATED POWER (EPR)
Summary of Technical Capabilities: The TSFR was designed and is used as transportable R&D tool to accurately characterize and quantify the over water radar cross section (RCS) signature of ships and electronic warfare passive and active systems over the 2 to 18 Ghz RF band. Additionally, the system can characterize and quantify the Effective Radiated Power (ERP) and sensitivity of active electronic warfare systems over the same frequency range. This system complements current fixed site resources.
Keywords: RADAR, TRANSPORTABLE, RCS, ERP, TRAJECTORY

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: PORTABLE RCS MEASUREMENT RADAR

AGE: 5 YEARS REPLACEMENT VALUE: $1.1M
MAINTENANCE AND REPAIR BACKLOG: NO BACKLOG

DATE OF LAST UPGRADE: JAN 1994
NATURE OF LAST UPGRADE: SINGLE CHANNEL SWITCHABLE PORT RECEIVER

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: DUAL RECIEVERS

   TOTAL PROGRAMMED AMOUNT: $45K
   SUMMARY DESCRIPTION: DUAL CHANNEL RECEIVERS FOR SIMULTANEOUS MEASUREMENTS AT DIFFERENT POLARIZATIONS

2. UPGRADE TITLE: CONTROL COMPUTER

   TOTAL PROGRAMMED AMOUNT: $10K
   SUMMARY DESCRIPTION: UPGRADE FROM 286 TO 486 PROCESSOR

0152

ADDITIONAL INFORMATION

Facility/Capability Title: PORTABLE RCS MEASUREMENT RADAR

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	.5	.5	.5	.5	.5	.5	.5
Contractor	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Total	2.0	2.0	2.0	2.0	2.0	2.0	2.0

Total Square Footage: 96 SQ FT

Total Area Square Footage: 280 SQ FT ON TRUCK

Office Space Square Footage: N/A

Tonnage of Equipment: 3

Volume of Equipment: 1000 CU FT

Annual Maintenance Cost: $20K

Estimated Moving Cost: $5K

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$50K	$50K	$50K	$50K	$50K	$50K	$50K

0153

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: PORTABLE RCS MEASUREMENT RADAR

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR					3120	3120	3120	3120
	TEST HOURS					100	100	100	100
	MISSIONS					10	10	10	10
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0154

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: PORTABLE RCS MEASUREMENT RADAR

ANNUAL HOURS OF DOWNTIME	1	4748
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	13
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	11

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8 22
RCS MEASUREMENT	1	2	2	
				ANNUAL UNCONSTRAINED CAPACITY 9 8030
"TYPICAL"	0	3.0	0	
			TOTAL: 2	

0155

GENERAL INFORMATION

Facility/Capability Title: Compact Antenna Range Facility

Origin Date: 06/27/94

Service: Navy Organization/Activity: Naval Research Laboratory Location: Washington, D.C.

T&E Functional Area: Electronic Combat UIC = 00173

T&E Test Facility Category: Measurement Facilities (MF)

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:		100%				
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC		100%				
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

TECHNICAL INFORMATION

Facility/Capability Title: Compact Antenna Range Facility

Facility Description; Including mission statement: The primary purpose of the Compact Antenna Range Facility is to provide a unique state-of-the-art anechoic chamber to measure the phase and amplitude pattern characteristics of antenna systems over a frequency range of 2.0-100.0 GHz in a controlled environment in support of NRL research in EW. The facility also provides the capability for radar cross section measurements from 2.0-40.0 GHz, and small device metrology from 0.45 to 50 GHz. This facility is not automated. It is strictly for S&T purposes, and was unique to Industry and DoD when it was first constructed.
Interconnectivity/Mulit-Use of T&E Facility: NONE
Type of Test Supported: Microwave Antenna Characterization and small-object RCS measurements
Summary of Technical Capabilities: Special RFI/EMI hardening, temperature and humidity control and RF absorber with >50 dB incident reflectivity reduction for a 6 ft diameter by 4 ft quiet zone.
Keywords: Antennas, Small Object RCS

G5P

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: Compact Antenna Range Facility

AGE: 14 Years REPLACEMENT VALUE: $ 2600 K

MAINTENANCE AND REPAIR BACKLOG: Repair of Microwave Absorber at $ 330 K

DATE OF LAST UPGRADE: 1993

NATURE OF LAST UPGRADE: Procurement of an HP8510C Automatic Network Analyzer

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

2. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

ADDITIONAL INFORMATION

Facility/Capability Title: Compact Antenna Range Facility

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	1	1	0.9	1.1	1.2	0.8	0.7
Contractor							
Total							

Total Square Footage: 880
Total Area Square Footage: 3960
Tonnage of Equipment: 6.5
Annual Maintenance Cost: 25 k

Office Space Square Footage: 120
Volume of Equipment: 500 cu ft
Estimated Moving Cost: part of building

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$ 300 K	0 k	0 k	150 k	100 k	50 k	100 k

0159

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: Compact Antenna Range Facility

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	1416	1380	1450	1300	1375	1425	1500	1296
	TEST HOURS	472	460	500	410	432	455	470	380
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0160

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: Compact Antenna Range Facility

ANNUAL HOURS OF DOWNTIME	1	328
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	0.90
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	23.10

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
Ant. Meas.	1	3	3	138.60
				ANNUAL UNCONSTRAINED CAPACITY 9 50589
"TYPICAL"	1	3	3	
			TOTAL: 6	

0161

FAC

GENERAL INFORMATION

Facility/Capability Title: RF Techniques Chamber Facility

Origin Date: 06/27/94

Service: Navy Organization/Activity: Naval Research Laboratory Location: Washington, D.C.

T&E Functional Area: Electronic Combat UIC = 00173

T&E Test Facility Category: Measurement Facilities (MF)

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:		100%				
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC		100%				
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

0162

TECHNICAL INFORMATION

Facility/Capability Title: RF Techniques Chamber Facility

Facility Description; Including mission statement: The primary function of the RF Techniques Chamber Facility is to provide a low cost anechoic chamber capability to conduct ECM research on RF homing missiles, airborne intercept radars, anti-radiation missiles, small tracking radars and in general to aid in the development of airborne EW systems over the frequency range of 2.0 - 4.0. This facility is not automated and it was built strictly for S&T purposes.
Interconnectivity/Mulit-Use of T&E Facility: NONE
Type of Test Supported: Electronic countermeasure techniques research against RF homing missile seekers.
Summary of Technical Capabilities: State-of-the-art facility for in-depth investigations of ECM effects on homing seekers. Tests are low-cost and the facility is EMI/RFI hardened, and a quiet zone area with >50dB below incident reflectivity reduction. Seeker positioner supports RF sensors such as homing seekers, AI radars, and other sensors in the 2 - 18 GHz range.
Keywords: ECM effects, RF seekers, AI radars, RF jamming

0163

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: RF Techniques Chamber Facility

AGE: 14 Years REPLACEMENT VALUE: $ 1500 K

MAINTENANCE AND REPAIR BACKLOG: N/A

DATE OF LAST UPGRADE: 1985

NATURE OF LAST UPGRADE: Scientific Atlanta Missile positioner and controller

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

2. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

0164

ADDITIONAL INFORMATION

Facility/Capability Title: RF Techniques Chamber Facility

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	.8	1	1.2	1.5	1	1.3	1.5
Contractor							
Total							

Total Square Footage: 680
Total Area Square Footage: 2720
Tonnage of Equipment: 3.5
Annual Maintenance Cost: 50 k

Office Space Square Footage: 120
Volume of Equipment: 480 cu ft
Estimated Moving Cost: part of building

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
0 k	0 k	0 k	100 k	50 k	150 k	100 k

0165

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: RF Techniques Chamber Facility

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	1568	1800	1125	1300	1500	1400	1700	1800
	TEST HOURS	522	600	750	650	750	700	850	900
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0166

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: RF Techniques Chamber Facility

ANNUAL HOURS OF DOWNTIME	1	350.4
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	0.96
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	23.04

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
ECM Tech. Devel.	1	2	2	92.16
				ANNUAL UNCONSTRAINED CAPACITY 9 33638.4
"TYPICAL"	1	2	2	
			TOTAL: 4	

0160

GENERAL INFORMATION

Facility/Capability Title: Millimeter Wave Anechoic Chamber

Origin Date: 06/27/94

Service: Navy Organization/Activity: Naval Research Laboratory Location: Washington, D.C.

T&E Functional Area: Electronic Combat UIC = 00173

T&E Test Facility Category: Measurement Facilities (MF)

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:		100%				
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC		100%				
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

3910 0168

TECHNICAL INFORMATION

Facility/Capability Title: Millimeter Wave Anechoic Chamber

Facility Description; Including mission statement: The primary function of the state-of-the-art Millimeter Wave (MMW) Anechoic Chamber Facility is to measure and characterize antenna gain, bandwidth, axial roll, beam squint, phase center, VSWR and cross-polarization levels at low power continuously over the frequency range from 8.0 - 100.0 GHz. The facility also provides a means to measure the radio frequency transmission and insertion loss of radomes intended for use in shipboard, aircraft, satellite and missile seekers. In addition, the facility can also provide a static means to emulate MMW EW techniques against radar missile seekers. This facility is not automated. It is strictly for S&T purposes, and was unique to Industry and DoD when it was first constructed.
Interconnectivity/Mulit-Use of T&E Facility: NONE
Type of Test Supported: Millimneter wave antenna characterization and millimeter wave ECM effects to homing seekers.
Summary of Technical Capabilities: Special RFI/EMI hardening, RF absorber with >50 dB incident reflectivity reduction for a 3 foot diameter quiet zone. Temperature and humidity control.
Keywords: Millimeter Wave, MMW antenna measuerments

0169

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: Millimeter Wave Anechoic Chamber

AGE: 14 Years REPLACEMENT VALUE: $ 2000 K

MAINTENANCE AND REPAIR BACKLOG: N/A

DATE OF LAST UPGRADE: Original equipment.

NATURE OF LAST UPGRADE: _____

_____

_____

_____

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

2. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

0170

ADDITIONAL INFORMATION

Facility/Capability Title: Millimeter Wave Anechoic Chamber

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	0.85	0.75	0.85	0.90	0.70	0.75	0.80
Contractor							
Total							

Total Square Footage: 470.25
Total Area Square Footage: 2150
Tonnage of Equipment: 5
Annual Maintenance Cost: 25 k

Office Space Square Footage: 120
Volume of Equipment: 500 cu ft
Estimated Moving Cost: part of building

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
0 k	50 k	0 k	300 k	50 k	200 k	150 k

019

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: Millimeter Wave Anechoic Chamber

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	1000	990	1150	1080	1100	1200	900	800
	TEST HOURS	330	320	360	310	280	315	270	250
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0172

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: Millimeter Wave Anechoic Chamber

ANNUAL HOURS OF DOWNTIME	1	318
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	0.87
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	23.13

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
Ant. Meas.	1	3	3	138.77
				ANNUAL UNCONSTRAINED CAPACITY 9 50652
"TYPICAL"	1	3	3	
			TOTAL: 6	

GENERAL INFORMATION

Facility/Capability Title: Isolation Measurement Chamber

Origin Date: 06/27/94

Service: Navy Organization/Activity: Naval Research Laboratory Location: Washington, D.C.

T&E Functional Area: Electronic Combat UIC = 00173

T&E Test Facility Category: Measurement Facilities (MF)

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:		100%				
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC		100%				
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

0174

TECHNICAL INFORMATION

Facility/Capability Title: Isolation Measurement Chamber

Facility Description; Including mission statement: The Isolation Measurement Chamber Facility provides a capability for measuring antenna to antenna radiation coupling characteristics from 2.0 - 40.0 GHz in support of EW research. Configuration and size of the facility and special handling equipment allow for unique accomodation of portions of airframes having antennas mounted in the same position as those of operational aircraft. The facility is also capable for making accurate measurements of the radar cross section (RCS) of small objects. This facility is not automated. It is strictly for S&T purposes, and the facility was unique to Industry and DoD when it was first constructed.
Interconnectivity/Mulit-Use of T&E Facility: NONE
Type of Test Supported: Antenna Isolation Measurements and small-object RCS measurements.
Summary of Technical Capabilities: The state-of-the-art RF absorber, humidity and temperature control, and RFI/EMI shielding provides a quiet zone of 12x18x10 cu ft with a >100 dB below incident reflectivity reduction. Special handling features support 12x15 ft panels from aircraft wings, fuselage, ship parts, etc. Supports special sensors.
Keywords: Antenna Isolation, small-object RCS

0175

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: Isolation Measurement Chamber

AGE: 14 Years REPLACEMENT VALUE: $3000 K

MAINTENANCE AND REPAIR BACKLOG: N/A

DATE OF LAST UPGRADE: Original equipment.

NATURE OF LAST UPGRADE: _____

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

2. UPGRADE TITLE: N/A

   TOTAL PROGRAMMED AMOUNT: _____
   SUMMARY DESCRIPTION: _____

0176

ADDITIONAL INFORMATION

Facility/Capability Title: Isolation Measurement Chamber

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	.45	.5	.6	.75	1.0	1.2	1.3
Contractor							
Total							

Total Square Footage: 720
Total Area Square Footage: 18,000
Tonnage of Equipment: 2.5
Annual Maintenance Cost: 30 k

Office Space Square Footage: 120
Volume of Equipment: 2000 cu ft
Estimated Moving Cost: separate fixed building

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
100 k	0 k	0 k	350 k	100 k	250 k	75 k

0199

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: Isolation Measurement Chamber

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	874	1000	928	1100	1008	1270	850	1050
	TEST HOURS	437	500	464	550	504	635	425	520
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0198

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: Isolation Measurement Chamber

ANNUAL HOURS OF DOWNTIME	1	340
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	0.93
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	23.07

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
Antenna Isol.	1	4	4	184.56
				ANNUAL UNCONSTRAINED CAPACITY 9 67364.4
"TYPICAL"	1	4	4	
			TOTAL: 8	

6/10

CAL

GENERAL INFORMATION

Facility/Capability Title: ELECTRO-OPTICAL CALIBRATION AND CHARACTERIZATION LABORATORY

Origin Date: 29 JUNE 94

Service: NAVY Organization/Activity: NRL Location: WASH DC

T&E Functional Area: ELECTRONIC COMBAT UIC = 00173

T&E Test Facility Category MEASUREMENT FACILITIES

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	25	50	25			
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC	25	50	25			
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

TECHNICAL INFORMATION

Facility/Capability Title: **INFRARED/ELECTRO-OPTICAL CALIBRATION AND CHARACTERIZATION LABORATORY**

Facility Description; Including mission statement: calibration laboratory designed to provide sophisicated electro-optical instruments for evaluating infrared signatures of US combatants, infrared countermeasures, and infrared materials that are designed to reduce emissive signatures.
Interconnectivity/Mulit-Use of T&E Facility: NSWC-Dahlgren,VA., NSWC, Carderock, NSWC, Crane; no real time interconnectivity
Type of Test Supported: Developmental, technical, and operational evaluations
Summary of Technical Capabilities: calibrated spectral and spatial data is available from FTIR instruments and radiometric thermal imagers incorporated in an mobile instrumentation van and laboratory environment.
Keywords: electro-optical, infrared, radiometers, FTIR, thermal imagers

1810

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: INFRARED/ELECTRO-OPTICAL CALIBRATION AND CHARACTERIZATION LABORATORY

AGE: 12 years REPLACEMENT VALUE: **$2.5 M.**

MAINTENANCE AND REPAIR BACKLOG: **NONE**

DATE OF LAST UPGRADE: **DEC. 93**

NATURE OF LAST UPGRADE: ADDITION OF ENHANCED SPECTRO-RADIOMETER, MOBILE INSTRUMENTATION VAN AND ELECTRO-OPTICAL TRACKING MOUNT
MAJOR UPGRADES PROGRAMMED-NONE PLANNED AT THIS TIME

1. UPGRADE TITLE: **N.A.**

   TOTAL PROGRAMMED AMOUNT: N.A.
   SUMMARY DESCRIPTION: N.A.

2. UPGRADE TITLE: N.A.

   TOTAL PROGRAMMED AMOUNT: N.A.
   SUMMARY DESCRIPTION: N.A.

0182

ADDITIONAL INFORMATION

Facility/Capability Title: **ELECTRO-OPTICAL CALIBRATION AND CHARACTERIZATION LABORATORY**

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	4	4	4	4	4	4	4
Contractor	3	4	4	3	3	3	3
Total	7	8	8	7	7	7	7

Total Square Footage: **144**
Total Area Square Footage:**2100** Office Space Square Footage:**1000**
Tonnage of Equipment:**10** Volume of Equipment:**500**
Annual Maintenance CostNA Estimated Moving Cost:**50K**

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
200K	**250K**					

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: **INFRARED/ELECTRO-OPTICAL CALIBRATION AND CHARACTERIZATION LABORATORY**

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	8384	8384	8384	10435	10435	12522	12522	14609
	TEST HOURS	100	150	200	210	240	300	270	200
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0184

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: INFRARED/ELECTRO-OPTICAL CALIBRATION AND CHARACTERIZATION LABORATORY

ANNUAL HOURS OF DOWNTIME	1	869
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	2.4
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	21.6

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8 86.4
IR Decoy and Ship Signature Measurements	1	4	4	ANNUAL UNCONSTRAINED CAPACITY 9 31536
"TYPICAL"	0	0	0	
			TOTAL: 4	

5810

0185

GENERAL INFORMATION

Facility/Capability Title: **INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY**

Origin Date: **06/29/94**

Service: Navy Organization/Activity: Naval Research Laboratory Location: **Washington DC**

T&E Functional Area: **Electronic Combat** UIC = **00173**
T&E Test Facility Category **MF**

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	7	16	74			3

BREAKOUT BY T&E FUNCTIONAL AREA (%)

Air Vehicles						
Armanent/Weapons						
EC	7	16	74			3
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

9810

TECHNICAL INFORMATION

Facility/Capability Title: **INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY**

Facility Description; Including mission statement: This **facility represents the only IR ASM simulator laboratory in DON devoted to the development of development of IR decoys and IR laser CM systems against the IR guided ASM. The facility determines the effectiveness of ship based IR decoys and IR laser CM systems against the IR guided ASM. The facility develops performance bounds of IR ASMs to detect and engage both conventional and signature reduced U.S. surface platforms, and to characterize the performance of various IRCM techniques. The IR Missile Simulator and Development Laboratory consists of ground based and P-3 mountable IR ASM simulators and fully equipped laboratory facilities for sensor evaluation, processor design and development, flight hardware assembly, algorithm design, and data analysis, a ground based test site, and two specially configured P-3 aircraft. The aircraft mounted systems exploit special aircraft configured fiber optic communications between the pylon installed pod and the instrumentation/display interface inside the aircraft proper. Two primary simulator systems contain an integrated data system for analysis of extensive field trials and allows ready visualization of both the actual tests and post test data reduction. One simulator is a reprogrammable system built to evaluate a variety of threats. Both detector configurations and algorithms can be changed to approximate actual or hypothesized threats. The second flyable simulator supports research associated with imaging IR threats. The large diameter gimbal in this system can accommodate a number of the new highly capable imaging IR cameras now available. Using image processing boards and an array of micro-processors, a complete missile seeker system having exceptional flexibility to incorporate new algorithms and IRCM approaches is obtained.**

Interconnectivity/Mulit-Use of T&E Facility:

Data exchange with NSWC-Dahlgren of reduced and analyzed data. No real time data connection.

Type of Test Supported:

IR ship detection measurements, Missile miss distance for ship targets, IR Decoy effectiveness, anti ship missile threat vulnerability, IR target acquisition and tracking

Summary of Technical Capabilities:

see attached sheet

Keywords: Infrared (IR), Anti Ship Missile (ASM) Simulator, IR Focal Plane Array (IR FPA) Sensors, IR Spectral Signature Measurements, Multi Spectral Seekers

TECHNICAL INFORMATION ATTACHMENT

Facility/Capability Title: **INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY**

SUMMARY OF TECHNICAL CAPABILITIES:

Instrumentation/Assets include seeker simulators, measurement instrumentation, electronic and optical test equipment which are briefly summarized below.

Flyable Seeker Simulators: two instrumented IR systems (Victor and Foxtrot) which can be installed on the specially configured P3 aircraft (described in a separate submission) or installed in fixed field sites or in the lab. These simulators are programmable and can be configured to represent a variety of anti ship missile threat seekers.

Ground Based Seeker Simulators: six instrumented IR systems (Summit, Banner, Question, STIR, SIR, and Mav) which can be operated in the lab or installed in fixed field sites such as at the Chesapeake Bay. These systems have limited programmability and are either actual hardware or replicas of specific anti ship missile threat systems.

Infrared Cameras: eight systems which produce an RS 170 video (standard TV) of the infrared scene. Some of these instruments are calibrated allowing an approximate measurement of the energy present in the specific spectral bands detected by the cameras. Frequently these cameras are used for reference sources for the seeker simulators.

Pointing Systems: four steerable platforms for lab or aircraft which can aim the IR cameras or detector arrays.

Video Instrumentation: flight certified and lab video recorders, mixers, displays, amplifiers, and stabilization electronics in several formats (VHS, SVHS, PAL, SEACAM). Data capture and subsequent analysis of the test data is conducted with these.

IR Sources: Calibrated sources, apertures, and collimators for providing test patterns to the IR seekers and instrumentation.

Test Instrumentation: standard laboratory scopes, meters, signal generators, and connector fabrication equipment for analysis of analog and digital systems.

0168

TECHNICAL INFORMATION ATTACHMENT

Facility/Capability Title: **INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY**

SUMMARY OF TECHNICAL CAPABILITIES:

Processor Development Systems: software coding, linking, debug and analysis station for the development of the software control and algorithms for 68000 based processor systems.

Chesapeake Bay Division (CBD) Field Site: instrumented spaces and building overlooking the bay with an unobstructed path across a water background for 10 miles. Other features are a radio communication network (allowing test participants to monitor the trial procedure); a controlled access facility; boat services for launching decoys and placing sources at specified locations at the bay; a 100 foot high tower located in a controlled access area directly across the bay; a separate machine shop area for fabrication of parts and brackets; a test control area to coordinate the tests; and several weather monitoring stations.

P3 Aircraft for Simulator Flights: two specially configured EP-3B aircraft can carry multiple simulator pods for at sea flight tests against ships. In addition to the standard avionics for the aircraft special project wiring is installed to carry data and control signals between the aircraft interior and ten separate pod stations on the aircraft wing. Fiber optic lines are available in this wiring to carry high rate and low noise data between the operator racks and the pod simulators. The aircraft interior is configured to accept custom simulator racks and instrumentation consoles. A project data bus inside the P3 permits the distribution of real time simulator, time code, and position data between the simulators and data collection stations.

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY

AGE: 16 YEARS REPLACEMENT VALUE: $36M

MAINTENANCE AND REPAIR BACKLOG: N.A.

DATE OF LAST UPGRADE: MAY 93

NATURE OF LAST UPGRADE: Addition of two simulations to facility. Standard bus based programmable simulator to model advanced Anti Ship Missile threats and a portable version of the IR Maverick.

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: DUAL BAND DETECTOR

TOTAL PROGRAMMED AMOUNT: $600K
SUMMARY DESCRIPTION: High resolution & sensitivity detector with multiple spectral bands for flight simulations of Anti Ship Seekers.

2. UPGRADE TITLE: FLYABLE FOXTROT IMAGING SEEKER SIMULATOR

TOTAL PROGRAMMED AMOUNT: $900K
SUMMARY DESCRIPTION: Hardware and software modifications to a laboratory system to add a specific anti ship missile threat mode and to integrate simulator to P3 aircraft. Provide a capability for evaluation of staring array sensor based anti ship seekers.

0196

ADDITIONAL INFORMATION

Facility/Capability Title: **INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY**

PERSONNEL (does not include military staff for flight operation and maintenance of P3s)

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	9	9	9	9	9	10	10
Contractor	2	3	3	3	3	3	3
Total	11	12	12	12	12	13	13

Total Square Footage: 6800 ft^2

Total Area Square Footage: 5500 ft^2

Tonnage of Equipment: 14 tons

Annual Maintenance Cost: $400K

Office Space Square Footage: 1300 ft^2

Volume of Equipment: 14100 ft^3

Estimated Moving Cost: $900K

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$380K	$490K	$530K	$400K	$450K	$500K	$550K

0191

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: **INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY**

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	16696	16696	18783	18783	20870	20870	22957	25044
	TEST HOURS	555	520	570	600	520	590	610	630
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0192

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: **INFRARED MISSILE SIMULATOR & DEVELOPMENT LABORATORY**

ANNUAL HOURS OF DOWNTIME	1 2464
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2 7
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3 17

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8 238
At Sea Flight T&E or Shore Site D&E or T&E	1	14	14	
				ANNUAL UNCONSTRAINED CAPACITY 9 86870
"TYPICAL"	0	0		
			TOTAL: 14	

619 3

GENERAL INFORMATION

Facility/Capability Title: SCALE MODEL ANALYSIS FACILITY (SMAF)

Origin Date: 06/29/94

Service: Navy Organization/Activity: NRL Location: Washington D.C.

T&E Functional Area: Other UIC = 00173

T&E Test Facility Category MF

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	40	10	45	0	1	4
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC						
Other	40	10	45	0	1	4

Total in Breakout Must Equal "Percentage Use" On First Line

0194

TECHNICAL INFORMATION

Facility/Capability Title: SCALE MODEL ANALYSIS FACILITY

Facility Description; Including mission statement: The Scale Model Analysis Facility is a compact radar analogue range, that provides the unique cost effective capability to measure and analyze the radar cross section of existing and/or planned naval platforms through the use of submillimeter modeling technique.
Interconnectivity/Mulit-Use of T&E Facility: The Scale Model Analysis Facility is not linked to any other T&E facility
Type of Test Supported: Radar cross section reduction studies, low radar cross section ship design and development, digital modeling, field radar cross section measurements
Summary of Technical Capabilities: - measure target radar cross section coherently and incoherently - Identify major scattering contributors to assist radar cross section reduction efforts and low radar cross section ship design - study the effect of sea clutter on platform radar signature - fabricate precision models using the state of the art rapid prototyping technology with which platform geometry, a main determining factor of radar cross section, can be visualized and studied in a short time frame - have the ability to study very low cross section platform (the exact numbers are classified)
Keywords: radar cross section, models, submillimeter wave

0195

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: SCALE MODEL ANALYSIS FACILITY (SMAF)

AGE: 9 yrs REPLACEMENT VALUE: $3.42 M

MAINTENANCE AND REPAIR BACKLOG: $ 0

DATE OF LAST UPGRADE: April 94

NATURE OF LAST UPGRADE: Installation of an environmental control unit

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: Installation of a new heterodyne system

   TOTAL PROGRAMMED AMOUNT: $ 0.5 M
   SUMMARY DESCRIPTION: The new heterodyne system will enhance system bandwidth and sensitivity resulting in higher productivity

2. UPGRADE TITLE:

   TOTAL PROGRAMMED AMOUNT:
   SUMMARY DESCRIPTION:

0196

ADDITIONAL INFORMATION

Facility/Capability Title: SCALE MODEL ANALYSIS FACILITY (SMAF)

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	2	2	2	2	2	2	2
Contractor	1	1	1	1	1	1	1
Total	3	3	3	3	3	3	3

Total Square Footage: 4000
Total Area Square Footage: 4200
Tonnage of Equipment: 14.3 tons
Annual Maintenance Cost: $ 5K

Office Space Square Footage: 200
Volume of Equipment: 6500 cu ft
Estimated Moving Cost: $ 140k

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$20k			$500k			

0199

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: SCALE MODEL ANALYSIS FACILITY (SMAF)

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR				3174	4174	6261	5500	5500
	TEST HOURS				1000	1000	1500	1630	1630
	MISSIONS								
OTHER (Facility Set-up)	DIRECT LABOR	4174	4174	4174	1000	250			
	TEST HOURS								
	MISSIONS								

0198

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: SCALE MODEL ANALYSIS FACILITY (SMAF)

ANNUAL HOURS OF DOWNTIME	1	680
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	2
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	22

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8 66
Radar Cross Section Analysis	1	3	3	
				ANNUAL UNCONSTRAINED CAPACITY 9 24090
"TYPICAL"	0	0		
			TOTAL: 3	

c199

LOOP

GENERAL INFORMATION

Facility/Capability Title: Advanced Tactical Electronic Warfare Environment Simulator (ATEWES)

Origin Date: 6/27/94

Service: Navy

Organization/Activity: Naval Research Laboratory (NRL)
Location: Washington, D.C.

T&E Functional Area: Electronic Combat UIC = 00173

T&E Test Facility Category HITL

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	10	90	0	0	0	0

BREAKOUT BY T&E FUNCTIONAL AREA (%)

Air Vehicles		
Armanent/Weapons		
EC	10	90
Other		

Total in Breakout Must Equal "Percentage Use" On First Line

0220

TECHNICAL INFORMATION

Facility/Capability Title: Advanced Tactical Electronic Warfare Environment Simulator (ATEWES)

Facility Description; Including mission statement: This facility provides RF simulation of radar environments. It has the capability of simulating up to 1000 emitters on 250 fixed or movable platforms. It's primary mission is to provide a realistic RF environment for the testing of receivers and processing systems in development.
Interconnectivity/Multi-Use of Facility: It is interconnected to the antenna array of the NRL; CENTRAL TARGET SIMULATOR for spatial testing.
Type of Test Supported: Radar and ELINT receiver tests, receiver/processor tests and any tests that require a low power RF radar environment.
Summary of Technical Capabilities: This system was developed to provide a controlled, realistic, Radio Frequency (RF) signal environment to permit quantitative evaluation of modern ESM systems prior to deployment before costly technical evaluation/operation. The system provides the capability to generate in real time, a high density, multi-threat environment which is complex and dynamic. The simulator is capable of performing complex baseline testing and provides automatic correlation and analysis of all collected data that produces a summarized performance report. (U) A realistic signal environment is essential in the testing of automatic systems designed to operate in dense electromagnetic environments, and to assure the predictable completion of the development and evaluation stages of military programs. ATEWES is a multi-level test and evaluation system which allows controlled, performance evaluation of modern electronic warfare (EW) systems during and after the development period. It provides a real-time, high density, dynamic, RF signal environment, having sufficient realism to permit baseline performance level testing to ESM systems. Once baseline performance data are determined, actual performance limits can be established. The baseline performance data can further form a basis for evaluating subsequent ESM system upgrades.

(U) The simulation is defined by a scenario file, which contains time ordered events describing the environment. The scenario events reference two basic model elements: platforms and emitters. A platform may be used to represent air, sea or land based radar sites. An emitter represents a set of radar characteristics and platform association. The ATEWES system is capable of generating a complex, dense environment (4,000,000 pulses per second peak) containing a maximum of 250 platforms and 1023 simultaneous emitters. The system under test is subjected to a interactive, dynamic environment, where each platform is uniquely positioned and driven in 3 dimensional space by the scenario events. Each emitter is independently defined parameterically and updated pulse-to-pulse to reflect any change that result from platform motion and antenna scan.

(U) The ATEWES also provides for data extraction of environment status on an emitter by emitter basis, and correlation with EW system (system under test) reports, allowing automated analysis and evaluation of system performance in the simulated engagement.

Keywords: RF Simulation, RF Environment, Radar Simulator, Electronic Support Measures (ESM),

C202

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: Advanced Tactical Electronic Warfare Environment Simulator (ATEWES)

AGE: 10YRS REPLACEMENT VALUE: $1.6M

MAINTENANCE AND REPAIR BACKLOG: 0

DATE OF LAST UPGRADE: 6/92

NATURE OF LAST UPGRADE: Software enhancements to increase simulation capabilities.

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: Millimeter Wave
   TOTAL PROGRAMMED AMOUNT: 100K
   SUMMARY DESCRIPTION: Add frequency extension

2. UPGRADE TITLE: _____

   TOTAL PROGRAMMED AMOUNT: _____
   SUMMARY DESCRIPTION: _____

023

ADDITIONAL INFORMATION

Facility/Capability Title: Advanced Tactical Electronic Warfare Environment Simulator (ATEWES)

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	1	1	1	1	1	1	1
Contractor							
Total							

Total Square Footage: 27
Total Area Square Footage: 144
Tonnage of Equipment: 0.25
Annual Maintenance Cost: 25K

Office Space Square Footage: 0
Volume of Equipment: 162cu ft
Estimated Moving Cost: 10K

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
0	0	0	100K	0	0	0

0204

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: Advanced Tactical Electronic Warfare Environment Simulator (ATEWES)

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	240	300	210	200	280	200	200	240
	TEST HOURS	120	150	100	80	130	100	100	120
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0205

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: Advanced Tactical Electronic Warfare Environment Simulator (ATEWES)

ANNUAL HOURS OF DOWNTIME	1 36
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2 0.1
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3 23.9

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
SENSOR SYSTEM	1	3	3	71.7
				ANNUAL UNCONSTRAINED CAPACITY 9 25812
"TYPICAL"	0			
			TOTAL: 3	

0206

ANECHOIC

GENERAL INFORMATION

Facility/Capability Title: Low Power Anechoic Chamber for ECM Techniques Development

Service: NAVY

Origin Date: 06/27/94

Organization/Activity: NRL Location: Wash. DC

T&E Functional Area: Electronic Combat

UIC = 00173

T&E Test Facility Category ISTF/HITL

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:		60	40			
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armament/Weapons						
EC		60	40			
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

0267

TECHNICAL INFORMATION

Facility/Capability Title: Low Power Anechoic Chamber for ECM Technique Development

Facility Description; Including mission statement: Joint Littorial Warfare ships self defense Anechoic chamber capable within the 2-16 GHZ range used to investigate and evaluate ECM effectiveness for the surface Navy. The chamber comprises of a two degree of freedom pedestal with motion in the azimuth and elevation planes. The pedestal is used to mount ASM seekers and the motion of the pedestal simulates the missile body motion. Two horns are situated at the far end of the chamber which represent two separate movable targets. The autopilot/aero & kinematics are modeled on the Applied Dynamics 100 high speed multi processor. ECM techniques are generated using an SLQ-32 techniques generator and for airborne application an ALQ-99 exciter.
Interconnectivity/Mulit-Use of T&E Facility: None
Type of Test Supported: Surface Navy ECM technique evaluation/validation against ASM using the criteria of missile miss distance.
Summary of Technical Capabilities: Used to evaluate and validate all AN/SLQ-32 ECM techniques against ASM prior to being submitted into the surface operational Navy threat area libraries. This evaluation is done using operational missile seekers obtained from foreign material exploitation programs. Tactics and ECM techniques used by the EA-6B are evaluated using the ALQ-99 exciter.
Keywords: Electronic CounterMeasures (ECM), Antishipping Missiles, AN-SLQ-32, validation anechoic chamber, ALQ-99

0208

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: Low Power Anechoic Chamber for ECM Technique Development

AGE: 20 Years REPLACEMENT VALUE: 4000K

MAINTENANCE AND REPAIR BACKLOG: 40K

DATE OF LAST UPGRADE: 1989

NATURE OF LAST UPGRADE: Applied Dynamics 100 Multiprocessor System replaced Applied Dynamics 4 which was an analog computer. Allows autopilot to be developed in higher language with greater input/output flexibility and data analysis

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: Two axis motion simulator

   TOTAL PROGRAMMED AMOUNT: 150K
   SUMMARY DESCRIPTION: Pedestal to mount seeker heads required to simulate motion of high performing ASM.

2. UPGRADE TITLE: New Anechoic Material/Frequency Agility Capability

   TOTAL PROGRAMMED AMOUNT: 425K
   SUMMARY DESCRIPTION: Replace absorber material in chamber which has deteriorated. Provide capability to test frequency agility seekers in closed loop.

0209

ADDITIONAL INFORMATION

Facility/Capability Title: Low Power Anechoic Chamber for ECM Techniques Development

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	6	7	6	7	7	7	7
Contractor							
Total							

Total Square Footage: 4362
Total Area Square Footage: 2200
Tonnage of Equipment: 15 ton
Annual Maintenance Cost: 100K

Office Space Square Footage: 744
Volume of Equipment: 69792
Estimated Moving Cost: 900K

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
70K		150K	250K			

0210

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: Low Power Anechoic Chamber for ECM Techniques Development

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	1440	1440	1440	2000	2500	2500	2500	2500
	TEST HOURS	720	720	720	816	960	960	960	960
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: Low Power Anechoic Chamber for ECM Technique Development

ANNUAL HOURS OF DOWNTIME	1	360
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	1
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	23

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
ECM Testing	1	2.5	2.5	345
				ANNUAL UNCONSTRAINED CAPACITY 9 125,925
"TYPICAL"	5	2.5	12.5	
			TOTAL: 15.0	

0212

GENERAL INFORMATION

Facility/Capability Title: Search Radar Electronic Countermeasures Simulator (SRES)

Origin Date: 6/29/94

Service: NAVY Organization/Activity: NRL Location: Wash. DC

T&E Functional Area: Electronic Combat UIC = 00173

T&E Test Facility Category HITL and ISTF

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:		60	40			
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armament/Weapons						
EC		60	40			
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

0213

TECHNICAL INFORMATION

Facility/Capability Title: Search Radar Electronic Countermeasures Simulator (SRES)

Facility Description; Including mission statement: The Search Radar ECM Simulator uses jammer and radar hardware in the loop along with computer controlled microwave signal processing capability to simulate the attack of an airborne targeting threat against a group of Navy surface ships (including aircraft carriers). The measure of effectiveness is the threat's capability to detect and target the ships.
Interconnectivity/Mulit-Use of T&E Facility: None
Type of Test Supported: Surface and air Navy ECM technique evaluation against search and targeting threat radars.
Summary of Technical Capabilities: Use of actual jammer equipments and radar receivers with anti-jam capabilities to evaluate effectiveness of the jamming techniques and usage.
Keywords: Search and Targeting Radar Jamming Countertargeting, AN/SLQ-32, EA-6B, AN/ALQ-99

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: Search Radar Electronic Countermeasures Simulator (SRES)

AGE: 12 Years REPLACEMENT VALUE: 3000K

MAINTENANCE AND REPAIR BACKLOG: None

DATE OF LAST UPGRADE: 1991
NATURE OF LAST UPGRADE: Frequency Agile Radar Simulation

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: New Threat Receiver

   TOTAL PROGRAMMED AMOUNT: 100K
   SUMMARY DESCRIPTION: Implementation Targeting Threat Radar Receiver
2. UPGRADE TITLE: Large Scale Special Integration Processor

   TOTAL PROGRAMMED AMOUNT: 200K
   SUMMARY DESCRIPTION: Replace CPU with LSI programmable gate arrays.

0215

ADDITIONAL INFORMATION

Facility/Capability Title: Search Radar Electronic Countermeasures Simulator (SRES)

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	5	5	5	5	5	5	5
Contractor	2	2	2	2	2	2	2
Total							

Total Square Footage: 750
Test Area Square Footage: 375
Tonnage of Equipment: 3 Tons
Annual Maintenance Cost: 100K

Office Space Square Footage: 450 Sq. Ft
Volume of Equipment: 300 Cu Ft
Estimated Moving Cost: $3 million

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
		100K	200K			

0216

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: Search Radar Electronic Countermeasures Simulator (SRES)

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	3120	3120	3120	4160	6000	4800	6000	6000
	TEST HOURS	1040	1040	1040	1040	1500	1200	1200	1200
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: Search Radar Electronic Countermeasures Simulator (SRES)

ANNUAL HOURS OF DOWNTIME	1	384
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	1.05
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	22.95

TEST TYPES 4	TESTS AT ONE TIME One 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
Radar Jamming	1	5	5	573.8
				ANNUAL UNCONSTRAINED CAPACITY 9 209,437
"TYPICAL"	4	5	20	
			TOTAL: 25	

0218

GENERAL INFORMATION

Facility/Capability Title: CENTRAL TARGET SIMULATOR (CTS)

Origin Date: 06/29/94

Service: NAVY Organization/Activity: NRL Location: WASHINGTON, DC

T&E Functional Area: ELECTRONIC COMBAT UIC = 00173

T&E Test Facility Category HARDWARE-IN-THE-LOOP (HWIL)

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	10	41	49			
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armament/Weapons		11				
EC	10	29	49			
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

0219

TECHNICAL INFORMATION

Facility/Capability Title: CENTRAL TARGET SIMULATOR (CTS)

Facility Description; Including mission statement: THE CTS FACILITY CONSISTS OF AN ANECHOIC CHAMBER, A FLIGHT SIMULATOR, AND RF GENERATION EQUIPMENT DESIGNED TO SIMULATE RADAR ECHO'S FROM AN AT SEA ENVIRONMENT AS PART OF THE RF ENVIRONMENT PRESENTED TO AN ATTACKING MISSILE. CTS PRIMARILY PERFORMS RDT&E OF ELECTRONIC WARFARE SYSTEMS AGAINST ANTI-SHIPPING MISSILES USING ACTUAL MISSILE HARDWARE.
Interconnectivity/Multi-Use of T&E Facility: CTS IS INTERCONNECTED VIA ASM SIMULATORS WITH THE EP-3B FLYING EW LABORATORY.
Type of Test Supported: CLOSED-LOOP, OPEN-LOOP, HARDWARE-IN-THE-LOOP, MISSILE SEEKER AND SIMULATOR CHARACTERIZATION, MISSILE SEEKER AND SIMULATOR VALIDATION, ECM SYSTEM TESTING AND DEVELOPMENT
Summary of Technical Capabilities: MULTI-TARGET FINE POSITION, CO-LOCATED, PHASE COHERENT PULSE OR CW RF TARGET GENERATION
Keywords: ANECHOIC CHAMBER, THREE-AXIS FLIGHT SIMULATOR (TAFS), ELECTRONIC COUNTERMEASURES (ECM) GENERATION, COMPUTER CONTROLLED RADIO FREQUENCY (RF) ANTENNA ARRAY

0220

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: CENTRAL TARGET SIMULATOR (CTS)
AGE: 15 YEARS REPLACEMENT VALUE: $ 30 M

MAINTENANCE AND REPAIR BACKLOG: $ 600 K

DATE OF LAST UPGRADE: 1991

NATURE OF LAST UPGRADE: CALIBRATION AND TRACKING SYSTEM

CALIBRATION SYSTEM FOR PRECISE AMPLITUDE AND PHASE MEASUREMENTS OF A 255 ELEMENT ANTENNA ARRAY AND AN EIGHT CHANNEL RF SOURCE CONTROLLABLE IN AMPLITUDE AND PHASE OVER 8 - 18 GHZ

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: FREQUENCY AGILE RF GENERATION SYSTEM

   TOTAL PROGRAMMED AMOUNT: $ 500K
   SUMMARY DESCRIPTION: BROADBAND RF GENERATION SYSTEM FOR FREQUENCY AGILE ASM'S

2. UPGRADE TITLE: FIBER OPTIC SIMULATION DATA LINK

   TOTAL PROGRAMMED AMOUNT: $ 200K
   SUMMARY DESCRIPTION: REAL-TIME DISTRIBUTED COMPUTING REFLECTIVE MEMORY

0221

ADDITIONAL INFORMATION

Facility/Capability Title: CENTRAL TARGET SIMULATOR (CTS)

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer	0	0	0	0	0	0	0
Enlisted	0	0	0	0	0	0	0
Civilian	6	6	7	7	7	7	7
Contractor	1	1	1	1	1	1	1
Total	7	7	8	8	8	8	8

Total Square Footage: 23,375 SQUARE FEET
Total Area Square Footage: 25,200 SQUARE FEET
Tonnage of Equipment: 60 TONS
Annual Maintenance Cost: $ 225K

Office Space Square Footage: 1,875 SQUARE FEET
Volume of Equipment: 650,000 CUBIC FEET
Estimated Moving Cost: FACILITY INTEGRAL TO BUILDING

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
0	0	0	0	0	0	0

0222

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: CENTRAL TARGET SIMULATOR (CTS)

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	3720	4560	4320	4560	4700	4500	3800	4560
	TEST HOURS	1200	1450	1400	1500	1480	1440	1240	1120
	MISSIONS	0	0	0	0	0	0	0	0
ARMAMENT/WEAPONS	DIRECT LABOR								772
	TEST HOURS								480
	MISSIONS								0
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: CENTRAL TARGET SIMULATOR (CTS)

ANNUAL HOURS OF DOWNTIME	1	504 HOURS
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	1.38 HOURS
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	22.62 HOURS

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
EC	1	3	3	67.9
				ANNUAL UNCONSTRAINED CAPACITY 9
				24,783
"TYPICAL"				
			TOTAL: 3	

0224

GENERAL INFORMATION

Facility/Capability Title: RCS MEASUREMENT LAB

Origin Date: 29 June 1994

Service: NAVY Organization/Activity: NRL Location: CHESAPEAKE BEACH, MD

T&E Functional Area: ELCTRONIC COMBAT UIC = 00173

T&E Test Facility Category OPEN AIR RANGE

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	30	30	10	30		
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC	30	30	10	30		
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

0225

TECHNICAL INFORMATION

Facility/Capability Title: RCS MEASUREMENT LAB

Facility Description; Including mission statement: This facility is a land based radar installation designed and optimized to accurately characterize and quantify the over water radar cross section (RCS) of electronic warfare passive and active systems used to defend ships and aircraft. The facility is situated on a 100 ft high cliff over-looking the Chesapeake Bay above which the test data is collected. This test location is accessible by surface and airborne deployers and suffers from minimal electromagnetic interference from external sources. A complementary site located across from the facility permits direct transmission measurements typically unavailable at most other sites.
Interconnectivity/Mulit-Use of T&E Facility: There is no inteconnectivity required for this facility.
Type of Test Supported: This is a unique, one-of-a-kind, facility. This facility is the only Navy facility optimized and routinely used to conduct the necessary measurements critical to the design, development, and test verification of both decoy and onboard ECM systems.
Summary of Technical Capabilities: The system is capable of collecting precision RCS and effective radiated power (ERP) data in the 2 to 18 GHz and 35 GHz bands. The system includes conventional single frequency collection capabilities as well as broadband step frequency coverage which is the equivalent of operating up to 50 radars nearly simultaneously. Both coherent and non-coherent systems are available. A 95 GHz radar is being installed
Keywords: EW Measurements, RCS Measurement, ERP Measurements, Step Frequency Radar, Coherent Radar

0226

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: RCS MEASUREMENT LAB

AGE: 20 YEARS REPLACEMENT VALUE: $15M

MAINTENANCE AND REPAIR BACKLOG: $225K

DATE OF LAST UPGRADE: 1993

NATURE OF LAST UPGRADE: INSTALLATION OF 35 GHZ CAPABILITY

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: CLOUD MAPPING SYSTEM

   TOTAL PROGRAMMED AMOUNT: $150K
   SUMMARY DESCRIPTION: 3-D MAPPING CAPABILITY OF CHAFF CLOUDS

2. UPGRADE TITLE: 95 GHZ RADAR

   TOTAL PROGRAMMED AMOUNT: $200K
   SUMMARY DESCRIPTION: INSTALLATION OF 95 GHZ CAPABILITY

0220

ADDITIONAL INFORMATION

Facility/Capability Title: RCS MEASUREMENT LAB

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer							
Enlisted							
Civilian	4	4	4	4	4	4	4
Contractor	9	7	6	6	6	6	6
Total	13	11	10	10	10	10	10

Total Square Footage: 8165 SQ FT
Total Area Square Footage: 1750 SQ FT Office Space Square Footage: 6415
Tonnage of Equipment: 20 Volume of Equipment: 9500 CUFT
Annual Maintenance Cost: $700K Estimated Moving Cost: $2M

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$325K	$150K	$110K	$100K	$100K	$100K	$100K

228

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: RCS MEASUREMENT LAB

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	6000	3310	4470	3190	2560	3578	3180	2690
	TEST HOURS	945	480	645	465	360	503	480	390
	MISSIONS	76	51	75	59	48	77	59	55
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

0229

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: RCS MEASUREMENT LAB

ANNUAL HOURS OF DOWNTIME	1	5728
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	16
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	8

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8 25
RCS/ERP	1	5	5	
				ANNUAL UNCONSTRAINED CAPACITY 9 9125
"TYPICAL"	0	7	0	
			TOTAL: 5	

0230

GENERAL INFORMATION

Facility/Capability Title: FLYING ELECTRONIC WARFARE LABORATORY P-3 BuNo 153442 BuNo 154589

Origin Date: 06/27/94

Service: NAVY Organization/Activity: NAVAL RESEARCH LABORATORY/ NRL Location: PATUXENT RIVER, MD

T&E Functional Area: ELECTRONIC COMBAT UIC = 00173

T&E Test Facility Category: OPEN AIR RANGE

	T&E	S&T	D&E	IE	T&D	OTHER =100%
PERCENTAGE USE:	10	60	30			
BREAKOUT BY T&E FUNCTIONAL AREA (%)						
Air Vehicles						
Armanent/Weapons						
EC	10	60	30			
Other						

Total in Breakout Must Equal "Percentage Use" On First Line

023

TECHNICAL INFORMATION

Facility/Capability Title: FLYING ELECTRONIC WARFARE LABORATORY P-3 BuNo 153442 and BuNo 154589

Facility Description; Including mission statement: THE LABORATORY CONSISTS OF 2 SPECIALLY MODIFIED P-3 AIRCRAFT AND 18 ANTI-SHIP MISSILE SEEKER SIMULATORS. THE FLYING ELECTRONIC WARFARE LABORATORY SERVES AS A HOST PLATFORM FOR ANTI-SHIP MISSILE-SEEKER SIMULATORS USED FOR EW EFFECTIVENESS ASSESSMENTS IN AN AT-SEA ENVIRONMENT. THIS CAPABILITY PROVIDES THE NAVY'S S&T, AND T&E COMMUNITY WITH UNIQUE ASSETS AND REALISTIC METHODS FOR EVALUATING SURFACE NAVY EW SYSTEM AND TECHNIQUES
Interconnectivity/Multi-Use of T&E Facility: THE FLYING EW LABORATORY WITH ITS ASM SEEKER SIMULATORS IS CLOSELY COUPLED TO THE CENTRAL TARGET SIMULATOR FACILITY AND THE EFFECTIVENESS NAVAL EW SYSTEMS PROGRAM DMS ACTIVITY FOR CHARACTERIZATION, VERIFICATION, VALIDATION, AND ACCREDITATION
Type of Test Supported: SHIPS DEFENSE ECM EFFECTIVENESS EVALUATION, ELECTRONIC SURVEILLANCE
Summary of Technical Capabilities: NRL HAS TWO P-3 AIRCRAFT SPECIALLY MODIFIED FOR CAPTIVE CARRY OF ANTI-SHIP MISSILE THREAT SIMULATOR PODS. THE CAPABILITIES INCLUDE EIGHTEEN DIFFERENT SPECIAL PURPOSE PODS CAPABLE OF SIMULATING THIRTY-SIX DIFFERENT ASM THREATS. THESE SIMULATORS, ALONG WITH ASSOCIATED DATA COLLECTION EQUIPMENT, ARE FLOWN ON THE ELECTRONIC WARFARE FLYING LABORATORY P-3's. THE DATA COLLECTION EQUIPMENT CONSISTS OF STRIPCHART RECORDERS, DIGITAL DATA RECORDING SYSTEMS, OSCILLOSCOPES, AND VIDEO RECORDING EQUIPMENT. ADDITIONAL ASSETS INCLUDE SPECTRUM ANALYZERS, RADIO FREQUENCY GENERATORS, AND A COMPUTER CONTROLLED TARGET GENERATION SYSTEM
Keywords: EW - ELECTRONIC WARFARE, ECM - ELECTRONIC COUNTERMEASURES, ASM - ANTI-SHIP MISSILE, SHIPS DEFENSE

0232

FACILITY CONDITION

FACILITY/CAPABILITY TITLE: FLYING ELECTRONIC WARFARE LABORATORY P-3 BuNo 153442 and BuNo 154589

AGE: APPROXIMATELY 30 YEARS REPLACEMENT VALUE: $27 M

MAINTENANCE AND REPAIR BACKLOG: $1.6M

DATE OF LAST UPGRADE: JUNE 93

NATURE OF LAST UPGRADE: SIMULATOR CAPTIVE CARRY CAPABILITY ADDED TO BuNo 154589 AIRCRAFT

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: AVIONICS UPGRADE

   TOTAL PROGRAMMED AMOUNT: $100 K
   SUMMARY DESCRIPTION: AVIONICS ENHANCEMENT TO BRING AVIONICS OF BOTH P-3 AIRCRAFT UP TO DATE

ADDITIONAL INFORMATION

Facility/Capability Title: FLYING ELECTRONIC WARFARE LABORATORY P-3 BuNo 153442 BuNo 154589

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer	4	4	4	4	4	4	4
Enlisted	8	8	8	8	8	8	8
Civilian	7	7	7	7	7	7	7
Contractor	8	8	8	8	8	8	8
Total	27	27	27	27	27	27	27

Total Square Footage: 5500
Total Area Square Footage: 2000
Tonnage of Equipment: 6.5
Annual Maintenance Cost: $2.3 M

Office Space Square Footage: 3500
Volume of Equipment: 1500 Ft^3
Estimated Moving Cost: $1 M

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$1.7 M	**$2.0**	**$2.3**	**$2.57**	**$2.8**	**$2.95**	**$2.97**

0234

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: FLYING ELECTRONIC WARFARE LABORATORY P-3 BuNo 153442 and BuNo 154589

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR	9960	10920	8870	8960	9180	12240	14750	10220
	TEST HOURS	396	452	367	376	238	504	475	302
	MISSIONS	15	16	13	13	17	18	25	18
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								

C235

DETERMINATION OF UNCONSTRAINED CAPACITY

FACILITY/CAPABILITY TITLE: FLYING ELECTRONIC WARFARE LABORATORY P-3 BuNo 153442 and BuNo 154589

ANNUAL HOURS OF DOWNTIME	1	4380
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	12
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	12

TEST TYPES 4	TESTS AT ONE TIME 5	WORKLOAD PER TEST PER FACILITY HOUR 6	WORKLOAD PER FACILITY HOUR 7	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL _) 8
EC	1	23	23	276
				ANNUAL UNCONSTRAINED CAPACITY 9 100740
"TYPICAL"	0			
			TOTAL: 23	

C236

NRL Data Call 15 (T&E Facilities)

BRAC-95 CERTIFICATION

Reference: SECNAV NOTE 11000 dtd 8 Dec 93

In accordance with policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in the BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

The signing of this certification constitutes a representation that the certifying official has reviewed the information and either (1) personally vouches for its accuracy and completeness or (2) has possession of, and is relying upon, a certification executed by a competent subordinate.

Each individual in your activity generating information for the BRAC-95 process must certify that information. Enclosure (1) is provided for individual certifications and may be duplicated as necessary. You are directed to maintain those certifications at your activity for audit purposes. For purposes of this certification sheet, the commander of the activity will begin the certification process and each reporting senior in the Chain of Command reviewing the information will also sign this certification sheet. This sheet must remain attached to this package and be forwarded up the Chain of Command. Copies must be retained by each level in the Chain of Command for audit purposes.

I certify the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

L.M. CASSIDY
NAME (Please type of print)

L.M. Cassidy
Signature

CO
Title

7-6-94
Date

NRL
Activity

0239

DATA CALL 13 NRL (T&E Facilities)

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

NAME (Please type or print

Signature

Title

Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

NAME (Please type of print

Signature

Title

Date

Activity

In certify that the information herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

Marc Pelaez

NAME (Please type or print

Signature

Rear Admiral
Chief of Naval Research

Title

15 JULY 94

Date

Office of Naval Research

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

W. A. EARNER

NAME (Please type of print

Signature

Title

7/30/94

Date

0238

Document Separator

PMRF

177

Department of Defense

1995 Base Realignment and Closure T&E Joint Cross-Service Group Data Guidance

March 31, 1994

WC

1

T&E JOINT CROSS-SERVICE GROUP DATA GUIDANCE

SECTION 1: GUIDANCE, STANDARDS, AND ASSUMPTIONS
1.1 GUIDANCE
1.1.A Guidance for Identification of Test and Evaluation (T&E) Facilities/Capabilities
1.1.B Guidance for Military Department Data Collection
1.1.C Guidance for Military Department Data Analysis
1.2 ASSUMPTIONS
1.3 FUNCTIONAL AREAS
1.3.A Air Vehicles
1.3.B Electronic Combat (EC) Systems
1.3.C Armaments/Weapons

SECTION 2: CAPACITY & TECHNICAL RESOURCES
2.1 WORKLOAD
2.1.A Historical Workload
2.1.B Forecasted Workload
2.2 UNCONSTRAINED CAPACITY
2.3 TECHNICAL RESOURCES

SECTION 3: MEASURES OF MERIT
3.1 OVER-ARCHING MEASURES OF MERIT
3.1.A Interconnectivity
3.1.B Facility Condition
3.1.C Environmental and Encroachment Carrying Capacity
3.1.D Specialized Test Support Facilities and Targets
3.1.E Expandability
3.1.F Uniqueness
3.1.G Available Air, Land, and Sea Space
3.1.H Geographic/Climatological Features
3.2 AIR VEHICLES
3.2.A Supersonic Airspace
3.2.B Airfield and Facility Characteristics
3.2.C Test Operations
3.3 ELECTRONIC COMBAT
3.3.A Threat Environment
3.3.B Test Article Support
3.4 ARMAMENTS/WEAPONS
3.4.A Directed Energy
3.4.B Rocket/Missile/Bomb Systems

BRAC 95 DATA CALL NUMBER 13
T&E JOINT CROSS-SERVICE GROUP

PACIFIC MISSILE RANGE FACILITY

The scope of this data call covers T&E facilities. Additionally, this inquiry is specifically interested in three functional T&E areas; air vehicles, electronic combat, and armaments/weapons for any component, subsystem, system or platform. Also, this data call groups T&E facilities under one of the following categories: modeling and simulation, measurement, integration laboratory, hardware-in-the-loop, installed systems, or open air.

PMRF is a training range that also supports T&E operations. PMRF does not respond to or work from AIR TASKS, SEA TASKS or WEP TASKS. PMRF does not work from TEMPS or ORs and is not involved directly in T&E of any system. Customers of the PMRF range are not resident on the facility and do not involve the facility in testing requirements planning unless there is a specific measurement required for the test that they will provide resources to accomplish. Rather, PMRF customers use existing range capability to conduct testing operations when the range is available. Often, T&E customers will share operational testing activity on board fleet units while the unit is on range conducting training operations. There are no facilities at PMRF to instrument an aircraft, tune/adjust an electronic component under test, or setup/detonate/measure a weapon. These are activities associated with testers, not a range.

Given the possible mismatch (or misunderstanding) of this data call to the function of PMRF, the response hereby provided in terms of capacity, workload, unconstrained capacity and technical resources, and the measures of merit response are all with respect to the mission of PMRF. In other words, the response attempts to measure the operational training work and the T&E work done on the range. The T&E work done on the range is accomplished in a fully operational setting. Tests here involve an operational platform (usually a ship, submarine, aircraft or ballistic/guided missile), a weapon system (sensors, missiles, torpedoes, bombs or research payloads), and an operational target. Often, tactics are an important part of the test and the range's mission is to provide accurate data on the positions of all participants and to receive and record data from the test object for evaluation by the tester. The range does not instrument test objects, write test plans, determine test geometry or analyze/evaluate test data.

Additionally, for range statistical data collection purposes, what a given user is doing on the PMRF range is not as important to the range as is that fact that he is using the range. PMRF statistics record the user sponsor, describe whether the vehicle is a ship, aircraft, submarine, rocket, etc., records whether the mission is a live fire operation, and records which range resources support the operation. Operation completion records are accounts of the success, or lack of it, of the range in supporting its customer without regard to the success of the customers mission. For example, if a ship fires a missile at a target and misses, the range operational records show a successfully completed (range) mission. There is no record kept as to the success or failure of the missile because that is a matter for the tester to determine. Similarly, there is no record kept as to the testers mission (whether he is testing the ship, ship sensors or the missile). This explains why data is not generally available at PMRF as to the group a test belongs in (airframe, electronic combat system, or armament/weapon system) for the purposes of this data call. It is suggested that data call number five is more appropriate for PMRF than this one.

4

T&E JOINT CROSS-SERVICE GROUP

SECTION 1: GUIDANCE, STANDARDS, AND ASSUMPTIONS

The Military Departments will use the following information for data collection on each facility that has performed T&E and is still capable of performing T&E within the three functional areas of air vehicles, electronic combat, and armaments/weapons for any component (hardware or software), subsystem, system, or platform. Guidance is provided on conducting a cross-service analysis.

1.1 GUIDANCE

1.1.A Guidance for Identification of Test and Evaluation (T&E) Facilities / Capabilities

1.1.A.1 Scope

All DoD installations will be examined to identify facilities that have and are still capable of performing T&E within the three functional areas of air vehicles, electronic combat, and armaments/weapons.

All facilities (tenant and host on the installation) owned by DoD are within scope of this examination.

The Military Departments and Defense Agencies are responsible for submitting the data.

The scope of this examination will include T&E facilities that are funded from any funding source and appropriation (RDT&E, procurement, O&M, training, etc.).

1.1.A.2 T&E Facilities / Capabilities

The definition of a T&E facility/capability to be used for purposes of data collection will be a set of DoD-owned or controlled property (air/land/sea space) or any collection of equipment, platforms, ADPE or instrumentation that can conduct a T&E operation and provide a deliverable T&E product.

5

The T&E facility can support T&E of components through systems platforms or missions in the following functional areas: air, land, sea, space, C4I, armaments/weapons, electronic combat, nuclear effects, chem/bio, propulsion, environmental effects, guidance, and materials.

The T&E facilities will be grouped under one of the following test facility categories: modeling and simulation, measurement, integration laboratory, hardware-in-the-loop, installed systems, or open air (See Appendix A for definitions). It will typically consist of all of the following components:
data collection sensors and instrumentation, data reception and storage, data processing, and data display and reporting.

The scope will include T&E operations from all funding sources (RDT&E, procurement, O&M, training, etc.).

1.1.B Guidance for Military Department Data Collection

The Military Departments will use the T&E facility/capability definitions included within this data call package. In your descriptions of facility technical capabilities include programmed investments/upgrades in Military Department or Defense Agency 1995 Future Years Defense Plan (FY95 FYDP) in support of the President's Budget (PB95). When calculating capacity data, use the guidelines/definitions included in this package.

Data will be collected on all facilities/capabilities that are within the scope defined in section 1.1.A. Data will be collected using Appendix A, Data Forms and Instructions

1.1.C Guidance for Military Department Data Analysis

The Military Departments will use the 95 FYDP as the baseline to calculate costs and savings. Address closure/realignment opportunities at the functional T&E and facility levels. Retain essential technical capabilities for core competencies and technologies. Consider consolidation of subfunctions such as centralized maintenance of common platforms, instrumentation, data processing. Consider retention of difficult-to-replace essential geographic assets (e.g. airspace, ground/terrain, climates, seaports) without regard to "ownership". Recognize adaptability to future technologies. Do not consider environmental cleanup costs/difficulties for closure or downsizing a facility/capability.

1.2 ASSUMPTIONS

Cross-service analyses will use the following assumptions:

1.2.A T&E workload is not a direct function of force structure, but is related to the RDT&E budget and acquisition funding.

1.2.B The FYDP is considered certified data. Information from non-DoD activities will not be used as a basis for analyses.

1.2.C At least one test facility/capability will be required to address any technology in use or nearing maturation. Geographic assets (airspace, ground space, sea space, terrain, climate, physical security) must be adequate. Closure or realignments of laboratories, maintenance depots, and training activities could necessitate consolidation with T&E facilities/capabilities.

1.2.D Evaluation of developing technologies and systems will follow a process that involves a progression of test facilities/capabilities ranging from modeling and simulation, measurements, through hardware-in-the-loop, system integration laboratories, installed-systems, to open air/range testing.

1.2.E Potential for internetting facilities/capabilities can be considered in workload projections if investments to provide internetting capability are programmed.

1.2.F With regard to outsourcing, it will be assumed that work currently performed in-house will remain in-house and that work currently outsourced will remain outsourced.

1.2.G With regard to foreign military sales (FMS), it will be assumed that the FMS workload will continue at FY93 levels into the future (straight-lined).

1.3 FUNCTIONAL AREAS

Three functional areas of T&E facilities/capabilities were selected for specific emphasis during cross-service analyses following analysis of the T&E Reliance study areas. These three areas -- air vehicles, electronic combat, and armament/weapons -- show the greatest potential for cross-service consolidation opportunities; others are predominately or nearly Military Department unique.

Over-arching measures of merit have been developed that are applicable to many T&E facilities/capabilities across the three functional areas. These measures generally relate to the overall demographics of the facility/capability at an installation and are important to evaluating a facility/capability for: overall condition; potential to support current or future contingency, mobilization and future missions; additional workload; and overall Mission Essentiality. Additional data specific to the three functional areas will also be collected. For the purpose of this data collection, the three functional areas are defined as follows:

1.3.A Air Vehicles

This functional area includes facilities involved in the testing of all air vehicles/subsystems/components whether fixed wing or rotary wing and test of major sub-systems (e.g., avionics, engines, and sensors). This includes flight testing and the testing involving pre- and post-flight preparation and processing of the air vehicle. Unmanned air vehicles and cruise missiles are included.

1.3.B Electronic Combat (EC) Systems

This functional area includes facilities involved in the testing of stand-alone electronic combat systems and electronic combat subsystems that are normally integrated into other weapon systems. It includes the testing of systems or subsystems that have as their primary mission threat warning, testing of systems that provide countermeasures in the RF (radio frequency) spectrum against radars and other RF sensors, systems that provide countermeasures that are used against sensors in the electro-optical or infrared spectrum as well as testing of electronic and C3 countermeasures.

1.3.C Armaments / Weapons

This functional area includes facilities involved in the testing of the weapons portion of a weapon system. In those cases where the weapon system is composed almost exclusively of the weapon, it may include system-level and platform integration testing. In other cases, it addresses just the weapon subsystem (e.g., guidance and control, propulsion, warheads, and airframe), while the testing of the weapon system's vehicle is in another functional area.

SECTION 2: CAPACITY & TECHNICAL RESOURCES

Use the forms and accompanying instructions in appendix A to provide answers for this section.

Input provided on forms attached.

CNAP CHANGED 9405

2.1 WORKLOAD

Annual workload will be reported in units as follows: for open air ranges involving flight testing, report test hours and missions. For all other T&E facilities direct labor hours and test hours must be reported; if available, missions must be reported. If an estimation of test hours based on direct labor hours is necessary, refer to the instructions for Determination of Unconstrained Capacity on page 32.

2.1.A Historical Workload

-2.1.A.1 What amount of workload have you performed each year from FY86-93? Use the Historical Workload Form provided in Appendix A of this package.

2.1.B Forecasted Workload

-2.1.B.1 Identify all appropriations (by program element) that generated a requirement for testing or test support, or are expected to generate a requirement for testing/test support in your Military Department (by functional areas of air vehicles, electronic combat (EC), armament/ weapons, and other test) for FY92, FY93, and each year in the FY95 FYDP. The Military Departments will provide total funding amounts appropriated for all PEs identified in each functional area shown above.

N/A; SEE PAGE 2

-2.1.B.2 What amount of test work was performed at your facility (in workyears by functional areas of air vehicles, electronic combat, armament/weapons, other tests, and other) in FY92 & FY93?

N/A; SEE PAGE 2

9

2.2 UNCONSTRAINED CAPACITY

-2.2.A Unconstrained capacity is the maximum capacity of this facility, assuming manpower and consumable supplies (excluding utilities) are unlimited, but allowing for expected downtime (maintenance, weather, darkness (daylight), holidays, etc.). Provide your response by filling out the Determination of Unconstrained Capacity Form in accordance with the instructions in
Appendix A.

CNAP CHANGED 9405

-2.2.B Is this capacity limited by the physical characteristics of the facility itself, safety or health considerations, commercial utility availability, etc? *N/A*

Change N4644-CPF MAY 94

2.3 TECHNICAL RESOURCES

-2.3.A Does the facility have a specified war-time or contingency role established in approved war plans? Yes/no.
NO

-2.3.B Does the facility provide a T&E product or service, without which irreparable harm would be imposed on the test mission of the host installation?
NO

-2.3.B.1 On the test mission of any other activity?
NO

-2.3.B.2 On any other mission deemed critical to the operational effectiveness of the armed forces of the United States?
NO

10

SECTION 3: MEASURES OF MERIT

This section relates the measures of merit and the required data to the four criteria that have been established for Military Value. The four military value (MV) criteria are:

CRITERION 1: The current and future mission requirements and the impact on operational readiness of the Department of Defense's total force.

CRITERION 2: The availability and condition of land, facilities and associated airspace at both the existing and potential receiving locations.

CRITERION 3: The ability to accommodate contingency, mobilization, and future total force requirements at both the existing and potential receiving locations.

CRITERION 4: The cost and manpower implications.

3.1 OVER-ARCHING MEASURES OF MERIT

The over-arching measures of merit are listed with accompanying questions (or data requirements) intended to elicit standard information upon which the cross-service analyses can be based, and on which the Joint Cross-Service Groups can base their reviews of the Military Department analyses. Additional specific measures of merit are shown under individual functional areas. The numbers in parentheses () before each measure of merit indicate the BRAC selection criteria for military value.

3.1.A. Interconnectivity (MV I) - Measure of Merit: *Extent of linkage of this facility with other facilities and assessment of single-node failure potential.*

11

-3.1.A.1 What percentage of total test workload in FY93 involved the real-time or near real time exchange of data or control with another facility? List the facilities you interconnect to for test and identify how many are simultaneous activities. Identify these as to whether they are internal and external to the site.

Approximately 10% of PMRF's test workload in FY-93 involved the real-time exchange of data with external facilities other than units under test on the range. The exchange includes telemetry data to NWAC Corona California during AEGIS PCT&T operations, and real-time tracking data exchange between PMRF and Kwajalein Missile Range during U.S. Army SDC STARS launches. Data is frequently exchanged via fleet SATCOM (OTCIX/TADIX and NTDS) between PMRF, fleet units on range and fleet command centers during training operations.

-3.1.A.2 If your facility were to be closed, would there be an impact on other facilities to which you are connected? Yes/no. If yes, explain.

No. The assumption is that work currently done here would continue to be done somewhere, and the data would continue to be provided by another facility.

3.1.B Facility Condition (MV II) - Measure of merit: *Current and planned status of the T&E facilities for supporting assigned test missions.*
Fill out the Facility Condition Form in Appendix A in accordance with the instructions.
Form attached.

3.1.C Environmental and Encroachment Carrying Capacity (MV II) - Measure of Merit: *Extent of current and future potential environmental and encroachment impacts on air, land, and sea space for testing.*

12

- 3.1.C.1 Do you have limiting (current or future) environmental and/or encroachment characteristics associated with the installation/facility?
Yes/no. If yes, explain.

No. A major factor in the success of PMRF is location. The land area surrounding PMRF to the East is agriculture marsh land that by its nature can never be developed in an economically feasible way. To the West, there is nothing but thousands of miles of ocean. PMRF has scheduling authority for warning and restricted airspace that covers over 40,000 square miles and extends from the surface to unlimited altitude. There are no sea lanes running through PMRF's sea range. With no major population centers within 125 miles of PMRF, the electromagnetic spectrum is reasonably clear. There are no encroachment concerns, from PMRF or to PMRF, either now or anticipated in the future. The work of PMRF is benign to the local community and provides jobs. There is strong community support for PMRF and its contribution to
the local economy which is considerable.

- 3.1.C.2 How much could workload be increased before this limit would be reached? Express your answer as a percentage of your current workload.

Environmental and/or encroachment issues that might be driven by workload do not exist at PMRF, therefore an increase of 100% (a two shift operation) or 200% (a 24 hour per day operation) would not change the situation. However, environmental issues might be attached to the kind of work done on the range, i.e., new class of fuels or ordnance, or a new type of electromagnetic radiation.

- 3.1.C.3 Do you currently operate under temporary permits of an environmental nature, or voluntary agreements (including treaties) of any sort that deal with the environment? If so, when do they expire? Please describe.

Yes.
1. PMRF will be submitting a State of Hawaii "Permit Application for Solid Waste Management Facility." Application will be submitted mid-June 94. Permit is expected to be issued within 30 days of receipt. The State is expected to issue the permit for a 5-year period.

Change
N45-CPF
MAY 94

2. The Navy is currently negotiating "Recycling Program" permit with the State of Hawaii. Permit is expected to be issued by late summer 94 for a 5-year period.

17

- 3.1.C.4 What is the total population within a 50 mile radius? 100 mile radius? 150 mile radius? 200 mile radius?

There is a population of approximately 55,300 on Kauai (50 mile radius), the same at 100 miles, 918,417 at 150 miles which includes Kauai and Oahu, and 1,026,414 at 200 miles including the population of all the islands except the island of Hawaii.

- 3.1.C.5 Identify the commercial air/land/sea traffic routes, public use of air/land/sea space, and frequency of use for each that affects or could affect mission accomplishment in your air, land, or sea space.

There are no restrictions to the vast air space extending from the surface to unlimited altitudes to the west and north of PMRF. Coordination with the FAA in keeping at least one air corridor open for east/west air traffic has never been a problem in the history of PMRF. However, we are required to keep chaff clear of the open air corridor. Other than that, there is more than enough air space around PMRF to accommodate our missions and the FAA's. There are no commercial sea traffic routes through PMRFs warning areas and there is no issue concerning public access to the PMRF base or restricted sea space. Additionally, none are anticipated in the future.

- 3.1.C.5.A How many test missions per year are canceled due to commercial or public use?

None.

CNAP CHANGED 9405

- 3.1.C.6 What is the number of test missions that have been canceled due to encroachment in each of the last two years?

None.

17

3.1.D Specialized Test Support Facilities and Targets (MV I) - Measure of Merit: *Extent to which specialized test support facilities and targets are available.*

-3.1.D.1 Do you have specialized facilities are required to support you in conducting your test operations at your facility (e.g. Aerial delivery load build-up facilities; parachute drying towers/packing facilities; paratroop support facilities; specialized fuel storage and delivery systems; mission planning facilities; corrosion control, painting, washing facilities; and specialized maintenance facilities such as avionics intermediate shops)? Yes/no. If yes, please describe.

Yes. PMRF has a torpedo post-run flushing facility and detoxifies the Otto Fuel waste by destroying the cyanide generated by the MK 48/MK 46 torpedoes to reduce health and safety impact of the waste. The facility also has ordnance buildup (missile assembly) buildings and launching facilities. All of the range instrumentation might be considered specialized therefore they are included herein. PMRFs instrumentation includes tracking radars, telemetry, underwater tracking, cooperative tracking systems, surveillance systems, control centers, communications systems, video systems, satellite and land line voice/data links, safety centers, target systems (air, surface and underwater), and recovery boats and aircraft. See data call number five and PMRF Range Users Handbook **is available upon request.**

Change
N45-CPF
MAY 94

-3.1.D.2 Are specialized targets required to support this facility? Yes/no. If yes, explain.

No.

-3.1.D.2.A Have the specialized targets been validated? Yes/no. If yes, by whom?

N/A; **No specialized targets.**

3.1.E Expandability (MV III) - Measure of Merit: *Extent to which an installation/facility is able to expand to accommodate additional workload or new missions.*

-3.1.E.1 Other than the expandability inherent in unconstrained capacity, discussed earlier, are there any special aspects of this facility that enhance its ability to expand output within each T&E functional area? Yes/no. If yes, explain.

Change N4644-CPF MAY 94

Yes. A major factor in the success of PMRF is location. The land area surrounding PMRF to the East is agriculture marsh land that by its nature can never be developed in an economically feasible way. To the West, there is nothing but thousands of miles of ocean. PMRF has scheduling authority for warning and restricted airspace that covers over 40,000 square miles and extends from the surface to unlimited altitude. There are no sea lanes running through PMRFs sea range. With no major population centers within 125 miles of PMRF, the electromagnetic spectrum is reasonably clear. There are no encroachment concerns, from PMRF or to PMRF, either now or anticipated in the future. The work of PMRF is benign to the local community and provides jobs. There is strong community support for PMRF and its contribution to the local economy which is considerable. Clear weather, lack of encroachment, a sea test range where large missile hazard areas can be readily cleared, deep water, shallow water and Navy controlled airspace are all important to ensure that tests and operations can be completed with minimal impact by factors outside of test parameters. This results in excellent support within scheduled periods and reduced cost of false starts and retests. Additionally, data gathering instrumentation and launch facilities are located in the mountains adjacent to the range at elevations that extend the area of instrumentation coverage and closely simulate the altitudes of tactical aircraft. This provides sites that are particularly suitable for testing airborne systems without having to fly aircraft. This capability extends test time availability, facilitates adjustments to equipment during testing and significantly reduces testing costs. The mid-pacific location of PMRF is ideal for a variety of exoatmospheric/space studies involving satellites and rocketborne experiments, and the location is right for midcourse data gathering on ICBMs launched from the West coast of the CONUS. The location and layout of PMRFs instrumentation and launching facilities are ideal for testing and training missions in a littoral warfare situation and this mid-pacific site is perfect for theater missile defense development, testing and training. Additional area to the east (W-189) is available to PMRF range operations through scheduling. Many of PMRFs customers require air and sea space beyond W-188 to the south, west and north for missile overflight and debris impact or payload impact and recovery. These missions are accommodated through scheduling and by issuing NOTAMs for the areas required. For all practical purposes, the air and sea space available to the west and north is limitless for the occasional mission that requires it. Examples of these missions are satellite recovery, exoatmospheric sounding rockets, missile defense tests, long range missile intercept development tests and missions requiring high and low altitude supersonic flight. Expandability for additional T&E functional test areas is a key aspect of the PMRF range.

16

-3.1.E.1.A Can you accept new T&E workload different from what you are currently performing? Yes/no. If yes, identify by T&E functional area and test type.

Yes. In addition to Theater Missile Defense, PMRF can accommodate aircraft testing, new weapons development tests, target systems tests, and new range technology testing. Submarine, ship, air and space testing programs of many disciplines can be conducted at PMRF. Additionally, PMRF is the only range in the world where multi-threat, multi-participant underwater, surface, air and space operations/tests can be conducted simultaneously from the same geographical location under the control of a single OCE/OTC.

-3.1.E.2 Are airspace, land, and water areas--adjacent to areas under DoD control--available and/or suited for physical expansion to support new missions or increased footprints? Yes/no. If yes, please explain.

Yes. See 3.1.E.1 and 3.1.E.1.A above.

-3.1.E.3 Is the facility equipped to support secure operations? Yes/no. If yes, to what level of classification (Confidential, Secret, Top Secret, Special Access Required)?

Yes, currently to the Secret level. A new customer coming on line next year has a requirement to upgrade the facility to Special Access Required.

-3.1.E.4 Are there any capital improvements underway or programmed in the 95 FYDP, that would change your capacity/capability? Yes/no. If yes, explain.

Yes. Communications upgrades, full motion video transmission/reception, over-the-horizon-tracking and control capability for targets, GPS based tracking system, telemetry system improvements, surveillance radar replacement, NTDS replacement/upgrade, underwater tracking system replacement (BARSTUR), shallow water tracking system, fiber optic tie in to the super computer facility on Maui, Battle Management Interoperability Center modernization, Display and control system modernization, remote control of electronic warfare systems improvement and chaff dispensers for range aircraft.

12

3.1.F Uniqueness (MV I) - Measure of Merit: *Extent to which the facility is one-of-a kind.*

-3.1.F.1 Is this a one-of-a-kind facility within the DoD? Yes/no. If yes, describe.

Yes. Since its beginning in the 1960's, PMRF has been a T&E range that also conducts training operations. Beginning it FY-93, through a transfer of claimancy to the fleet, PMRF became a training range that also does T&E operations. PMRF is a live fire ocean range that supports training and testing missions assigned to submarines, ships, aircraft and spacecraft of the U.S. and friendly foreign governments. Weapon systems of many types, from torpedoes to ICBMs are operated in, around and over the PMRF range. The range provides ground truth data for exercise reconstruction and/or weapon system/tactics performance verification and analysis. PMRF is the only range in the world where multi-threat, multi-participant underwater, surface, air and space operations/tests can be conducted simultaneously from the same geographical location under the control of a single OCE/OTC. See paragraph 3.1.E.1 above.

-3.1.F.1.A Within the US Government? Yes/no. If yes, describe.

Yes. No other facility has the simultaneously capability of underwater, surface, air and space data gathering from the same geographical location.

-3.1.F.1.B Within the US? Yes/no. If yes, describe.

Yes, same as above.

-3.1.F.2 Are you currently providing support to DoD users outside your Military Department? Yes/no. If yes, indicate percentage of total workload in FY92 and FY93 by Military Department.

Yes. 7% DOD, 2% Army and 1% Air Force for fiscal years 92 and 93.

3.1.G Available Air, Land, and Sea Space (MV II) - Measure of Merit: *Extent to which controlled test ranges satisfy weapon system test requirements.*

-3.1.G.1 How many square miles of air, land, and sea space are available to support test operations?

40,000 square miles.

-3.1.G.2 Who owns and or controls the land under the restricted airspace you use?

Commanding Officer, Pacific Missile Range Facility (U.S. Navy).

-3.1.G.3 How much of this is Restricted Airspace, and what altitude limits are associated with the restricted areas?

45 Square miles of Restricted airspace extends from the surface to unlimited altitude. 40,000 square miles of warning area extends from the surface to unlimited altitude.

-3.1.G.4 Do you have special use airspace other than supersonic airspace? Yes/no. If yes, for what types of test (e.g. terrain following radar)? Dimensions? Will it support simultaneous users? Yes/no.

No.

-3.1.G.5 Is the airspace over land or water? List the number of square miles over each.

Change N4644-CPF MAY 94

The warning area is over water, the restricted airspace is over water. 42,000 SQUARE MILES.

-3.1.G.6 Identify known or projected airspace problems that may prevent accomplishing your mission.

None.

-3.1.G.7 What is the maximum straight line segment in your airspace in nautical miles?

275 Nautical Miles.

-3.1.G.8 What public airspace have you used for overflight of weapons systems in the past? What was the nature of those tests? Do you anticipate being able to use that same public airspace for similar tests in the future? Yes/no.

Change N4644-CPF MAY 94

None, *N/A, N/A*

19

types of climatic/geographic conditions represent world-wide operational conditions.

-3.1.H.1 Describe the topography and ground cover/vegetation within your test airspace (include map-of-the-earth capability). Identify all of the following that apply: mountains, forest/jungle, cultivated lowland, swamp/riverine, desert, and sea. State the area of each in square miles.

PMRF is a sea test range of 40,000 square miles over ocean.

-3.1.H.2 Are there features of the local geology or soil conditions that enhance or inhibit any types of test? No.

-3.1.H.3 Did you have to go to other geographical locations to satisfy test requirements? Yes/no and explain. If yes, provide as a percent of overall workload per year for the past 8 years.

No. PMRF is not a tester.

-3.1.H.4 What is the number of days per year the average temperature is below 32 degrees F? Between 32 and 95 degrees? Above 95 degrees?

The temperature at PMRF is always higher than 32 degrees and lower than 95 degrees.

-3.1.H.5 What is the number of days per year the average relative humidity is below 30%? Between 30 and 80%? Above 80%?

The average relative humidity at PMRF is always between 30% and 80%.

-3.1.H.6 What is the number of test missions per year (1985 - 1993) canceled due to weather?

On the average, only 5-7 missions per year are canceled because of weather. Always because of high seas. Of the canceled missions, all of them reschedule and complete the mission during the following day or two. The exception to this average occurred in FY-92 when hurricane Iniki caused the cancellation of all operations at PMRF for a month.

-3.1.H.7 What is the number of test days per year (1985 - 1993) canceled due to weather?

Same as 3.1.H.6 above. Most missions at PMRF are scheduled in half days or whole days or more. The nature of ships, submarines and patrol aircraft is to remain on range for long periods of time. Therefore, a canceled mission usually means a canceled range day. Additionally, when two or more missions are simultaneously scheduled on range, a weather scrub can cancel the equivalent of 2 or more range days in terms of customer hours of support.

-3.1.H.8 What is the number of days per year the visibility is less than 1 mile? Between 81 and 3 miles? Greater than 3 miles?

The visibility at PMRF is always greater than 3 miles except during a heavy rain squall, which is rare.

-3.1.H.9 What is the average number of flying days available per year for flight test? Provide historical average from the past eight years.

360 allowing for a few days of exceptionally heavy rain or wind.

-3.1.H.10 What percentage of the time are your test operations restricted due to weather?

About 1% or less.

3.2 AIR VEHICLES

This functional area includes facilities involved in the testing of all air vehicles/subsystems/components whether fixed wing or rotary wing and test of major subsystems (e.g., avionics, engines, and sensors). This includes flight testing and the testing involving pre- and post-flight preparation and processing of the air vehicle. Unmanned air vehicles and cruise missiles are included.

3.2.A Supersonic Airspace (MV II) - Measure of Merit: *Extent of range size to support weapon system requirements.*

-3.2.A.1 Do supersonic corridors or areas exist? Yes/no.

Yes.

-3.2.A.2 Where are they located relative to your airfield?

30 Miles to sea when operating below 30,000 ft. Flight must be oriented away from the island when operating above 30,000 feet within 30 miles of Kauai.

-3.2.A.3 At what altitude (upper and lower altitude)?

See 3.2.A.2.

-3.2.A.4 Over land or water? What size and shape (length and width)?

The PMRF warning area is all over water. The size is roughly 275 miles by 180 miles. The boundaries are not straight lines but contain arcs, however, the area calculates to about 40,000 sq. mi.

-3.2.A.5 Are there restrictions you must observe to use this space? Yes/no. If yes, explain.

Yes. Use of the space must be scheduled by PMRF and communications must be maintained with range control.

-3.2.A.6 What is the maximum number of simultaneous users?

This depends on what is going on and what the hazards are. With 40,000 square miles to work with, the range can handle many participants. Two or more operations are routinely conducted simultaneously.

-3.2.B Airfield and Facility Characteristics (MV II) - Measure of Merit: *Extent of air vehicle infrastructure to support T&E operations.*

-3.2.B.1 Provide a brief description of your airfield and support facilities, to include the following: number and azimuth of runways, elevation, runway length (excluding overrun), overrun length, terminal and/or landing aids, arresting cable (yes/no, type), ramp area (in square feet), construction material (runway and ramps), load capability, and hangar space.

The PMRF runway is on an azimuth of 16/34 (magnetic headings of 158 deg and 338 deg), elevation is 14 feet, 6000 feet in length, 150 feet wide with a 100 foot overrun. There is an optical landing system (MK-8 MOD 0 Fresnel lens). The runway has two E28 arresting systems. The runway is asphalt and there is aircraft parking with tie-down capability on 13,000 square yards of apron. There are four helicopter landing pads, one of which is designated as the primary hot fuel area for helicopters. The Air Operations Center, Building 300, is east of the runway at its north end. The airfield control tower and crash/fire facilities are included in building 300. The height of the tower with antennas is 77 feet MSL.

-3.2.B.2 How close and how many emergency runways or airfields are in your area of operation?

Lihue airport is located 26 miles to the east and has 2 runways, 03/21 and 17/35.

-3.2.B.3 Where is your airfield situated relative to working areas (airspace) for supporting test operations?

The PMRF airfield is adjacent to the range.

CNAP CHANGED 9405

-3.2.B.4 What makes your airfield unique or at least suited for supporting test operations?

The PMRF airfield is part of the range infrastructure. It primarily supports range aircraft. Customer aircraft usually operate from airfields on Oahu, landing here for brief/debrief purposes.

-3.2.B.5 Is there a size, weight, maintenance or mission limitation that would affect test operations? If so, describe the limitation(s).

No.

-3.2.B.6 Including hangers and ramp space, how many fighter size aircraft could you support? Large multi-engine aircraft? Rotary wing? UAV? Cruise missiles?

PMRF has hanger space for stations C-12 and UH-3 helicopters. No additional hanger space available for other aircraft. PMRF has no AIMD or associated support services. As to ramp space there are spots for 12 fighter aircraft on the field. There is a 6000 by 150 foot north taxi strip leading to a red label area that could be used to park another 30 or so fighters. A squadron of P3s could be parked on the field, the runway will handle a C-5 with just enough room to turn around. Two C-141s could use the field and several helicopter squadrons regularly use the PMRF air field. UAVs and Cruise missiles can be accomodated in the numbers they come in.

-3.2.C Test Operations (MV II) - Measure of Merit: *Extent of T&E operations that the airspace can accommodate.*

-3.2.C.1 What types of air vehicle testing (fixed wing, rotary wing, unmanned vehicles, and cruise missiles) can be supported? (e.g. performance, handling qualities, fatigue life, static, wheels and brakes, physical integration with external stores or avionics)

Depending on the test requirements, all mentioned vehicles can be tested on the PMRF range. Harpoon Cruise missiles are regularly fired on the range (the range is Tomahawk certified) but these are operational exercises rather than airframe or vehicle tests.

-3.2.C.2 Do ground support facilities exist for pre-flight checkout or rehearsal of test missions? No.

-3.2.C.3 What kinds, numbers of aircraft and mix can be supported (manned and unmanned)?

The Range can support up to three Harpoon cruise missiles with a simultaneous time on target, four unmanned drone targets, two flights of fighters with safety observers, a SAU or two with LAMPS helos, two or three submarines, two patrol aircraft, one or two AWACs, a strike flight, SEPTAR and hulk surface targets, SAMs, AAMs and an aircraft carrier or other high value unit operating in a multi-threat, freeplay exercise. Or any combination thereof.

-3.2.C.4 Does UAV and or rotary wing operations pose any limitation on other types of missions? If yes, explain. No.

-3.2.C.5 What sorts of missions (e.g. air-to-air, air-to-ground and refueling) can be flown within local airspace?

PMRF is a full service range.

-3.2.C.6 What is the maximum number of simultaneous missions you can support that require telemetry?

Five, not counting ITCS targets that have their own telemetry system.

-3.2.C.7 What is the largest number of simultaneous test missions you have supported in your airspace?

A carrier battle group evaluation with over 100 participants. PMRF has supported up to four of these per year in the past and is sized to support an opposing carrier battle force (two carrier battle groups).

-3.2.C.8 Identify the number, types, and owners of aircraft at your installation.

PMRF owns two range C-12 fixed wing aircraft and six range UH-3 helicopters.

3.3 ELECTRONIC COMBAT

This functional area includes facilities involved in the testing of stand-alone electronic combat systems and electronic combat subsystems that are normally integrated into other weapon systems. It includes the testing of systems or subsystems that have as their primary mission threat warning, testing of systems that provide countermeasures in the RF (radio frequency) spectrum against radars and other RF sensors, systems that provide countermeasures that are used against sensors in the electro-optical or infrared spectrum as well as testing of electronic and C3 countermeasures.

3.3.A Threat Environment (MV I) - Measure of Merit: *Extent to which the capability satisfies weapon system requirements.*

This section does not apply to PMRF. PMRF's electronic warfare resources are used primarily to add the EW dimension to fleet training operations conducted on the range. Additionally, PMRF's EW capability is more appropriate for ships and submarines rather than used against aircraft systems. Finally, PMRF EW is sensor oriented rather than missile defeating. Threat recognition and tactical reaction is the thrust of PMRF's EW resources. PMRF's Range Users Handbook contains a full description of EW systems and capabilities and is available upon request.

-3.3.A.1 What is the number of threats simulated?

Current database includes over 800 threats, but there is no real limit as long as signal parameters are within PMRf's capabilities.

-3.3.A.2 How many simultaneous threats can be simulated? What type (e.g. AI, AAA, SAM)? What is maximum signal density? Average density? What power level? What band? Radiated or injected?

Simultaneous threats simulated is 14.
Types: AI, AAA, SAM, Fire Control, Surface Search, Air Search, Navigational, Target Track, Target Acquisition, and Missile guidance.
Maximum signal density is 14 simultaneous threats.
Average density in major ops is 5 simultaneous threats.
Power Level ranges from 1kW to 150 kW.
Bands are E, F, H, I, & J.
Radiated.

-3.3.A.3 Are the threat software models and simulators (software/hardware) validated? Yes/no. If yes, by whom?

Unknown, however, validation possibly done by NAWCWPNS Pt Mugu.

-3.3.A.4 Do you conduct open loop testing? Reactive? Closed loop? Yes/no for each.

Yes we do conduct open loop testing. Yes, we do reactive testing. Yes we do closed loop.

-3.3.A.5 What is the threat representation (fidelity) and density?

Two of the systems are high fidelity. Maximum threat density of high fidelity signals is 6.

-3.3.A.6 Are you capable of simulating land threats? Sea threats? Combined land/sea threats? Yes/no. If yes, describe.

Yes, we can simulate radars of landbased aircrat and missile systems.
Yes, we can simulate radars of seabased aircraft, submarines, ships & missiles.
Yes, we can orchestrate integrated signals from both land and sea. We can also simulate airborne radars and integrate it with land/sea based systems.

-3.3.A.7 What geographic dispersion can be simulated?

Choke points, coastal areas, open sea, shallow water, mountanous terrain, flat open terrain.

-3.3.A.7.A Threat lay down?

Friendly/hostile threats and commercial ships.

-3.3.A.7.B Representative distance?

Yes.

-3.3.A.8 Are the threats moveable (i.e.dynamic) within a test scenario? relocatable to new scenarios? yes/no

Yes. Three shipmounted systems, three portable systems, and EW pod on RC-12F are movable within a scenario.

-3.3.A.9 Is the facility interlinked with off-site threats? Yes/no. If yes, how are you linked?

No, but plans are being carried out to install BFTT (Battle Force Tactical Trainer) link with Oahu and nationwide systems via T1 line.

-3.3.A.10 Is there a limit on simultaneous users? Yes/no. If no, explain.

Yes.

3.3.B Test Article Support (MV II) - Measure of Merit: *Extent to which test support satisfies weapon system test requirements.*

-3.3.B.1 Is there a size, weight, or other limitation on test operations the facility can support? Yes/no. If so, identify the limits and measures to remove them.
NO

-3.3.B.2 What is the number of simultaneous countermeasures that can be evaluated?
N/A; NO COUNTERMEASURE CAPABILITY

-3.3.B.3 What range of spectra can be tested and evaluated?
NONE

-3.3.B.4 What are the available spectra?
NONE

-3.3.B.5 Do you have a scene generation capability? Yes/no. If yes, describe.
NO

3.4 ARMAMENTS / WEAPONS

This functional area includes facilities involved in the testing of the weapons portion of a weapon system. In those cases where the weapon system is composed almost exclusively of the weapon, it may include system-level and platform integration testing. In other cases, it addresses just the weapon subsystem (e.g., guidance and control, propulsion, warheads, and airframe), while the testing of the weapon system's vehicle is in another functional area.

3.4.A Directed Energy (MV II) - Measure of Merit: *Extent to which the facility satisfies directed energy weapon system test requirements.*

This includes testing of all types of directed energy weapons.

-3.4.A.1 Do you currently test directed energy weapon systems? Yes/no. No.

If yes, explain. Describe the power source(s) you have available. What is your maximum downrange distance?

3.4.B Rocket / Missile / Bomb Systems (MV II) - Measure of Merit: *Extent capability satisfies weapon system test requirements.*

This includes the testing of all types of rocket, missile, and bomb systems at the system/subsystem/component level, both stand alone and integrated into the launch platform. This includes testing of air-to-air, air-to-surface, and surface-to-air missiles.

-3.4.B.1 Ground Space

-3.4.B.1.A What is the area in square miles of the land and water space which you can use to conduct tests of live rocket, missile, or bomb systems?

40,000 square miles.

-3.4.B.1.B How many separate and distinct land and water test areas are available to conduct tests of live weapons? List them and the size of each in acres.

One warning area of 40,000 square miles can be subdivided as required depending on the foot print of the missile, positioning of the participants and performance of the targets. It is feasible to conduct up to three tests simultaneously. More if salvo firings are involved.

-3.4.B.1.C What are the maximum ranges (nautical miles) you can test, by type weapon?

Intercept ranges of 100 plus miles are possible for SAMs. Program contemplating longer intercept ranges are currently being planned for and appear to be feasible on the PMRF range. A Polaris boosted test vehicle was launched from PMRF in to the Kwajalein area with data displayed at both PMRF and Kwajalein from launch to splash. With GPS and over the horizon data systems planned for PMRF, almost anything is possible. Theater missile defense testing is planned for the PMRF range.

3.4.B.2 Test Operations

-3.4.B.2.A For each of your land and water ranges, how many test missions were scheduled in FY92 and FY93 that were required to use safety footprints comparable to those required for the following types of weapons:

--Unguided 2000 pound-class ballistic weapon
---live?
---inert?
--Guided weapon (e.g., GBU-24 class)
---live?
---inert?
--Stand-off weapon (e.g., AGM-130 class)
---live?
---inert?
--Short-range missile (e.g., AIM-9)
---below 5000 feet MSL
---between 5000 and 20,000 feet MSL
---above 20,000 feet MSL
--Long-range missile (e.g., AIM-120)
---below 5000 feet MSL
---between 5000 and 20,000 feet MSL
---above 20,000 feet MSL

--Unguided 2000 pound-class ballistic weapon.

TYPE	*FY-92*	*FY-93*
Live	*0*	*0*
Inert (Total)	*179*	*178*
MK-25	*30*	*43*
MK-36	*72*	*40*
MK-52	*14*	*0*
MK-76	*0*	*46*
MK-82	*20*	*0*
BDU-45	*42*	*49*
B-57	*1*	*0*

Change
N4644-
CPF
MAY 94

—Guided weapon/Stand-off weapon/Short-Range/Mid-Range/Long-Range

Missiles of Air-to-Air variety are normally fired between 5,000 and 20,000 MSL but can be fired either lower or higher depending on the scenarios requrested by the squadron or type Commander.

TYPE	*FY-92*	*FY-93*
Live	*10*	*19*
Inert	*7*	*0*
SHORT RANGE		
AIM-7	*4*	*10*
AIM-9	*6*	*9*
ATM-45	*6*	*0*
LONG RANGE		
ATM-84	*1*	*0*

NOTE: *AIM/ATM-9's can extend into the Mid-Range area. AIM prefix indicates "Live Firing". ATM indicates inert/telemetry round.*

Change
N4644-
CPF
MAY 94

32

Missiles of the Surface to Surface and Surface-to-Air variety in the Short and Medium Range envelope normally exceed the 20,000 MSL, whereas the Long Range variety remains below the 5,000 MSL.

TYPE	*FY-92*	*FY-93*
Live	*30*	*24*
Inert	*15*	*0*
SHORT RANGE		
RIM-7	*1*	*0*
RTM-7	*4*	*0*
MID-RANGE		
RIM-66	*9*	*21*
RTM-66	*6*	*0*
LONG RANGE		
RIM-67	*20*	*3*
RTM-67	*3*	*0*
RTM-84	*1*	*0*
UTM-84	*1*	*0*

NOTE: *RIM indicates live firings. RTM/UTM indicates inert/telmetry firings.*

Change
N4644-
CPF
MAY 94

Long Range Non-Navy

TYPE	*NO. LAUNCHED*	*COMMENT*
Terrier-Malamute	*1*	*Exceeds 20,000 MSL*
STARS	*2*	*Exceeds 20,000 MSL*
PWN-12	*13*	*Exceeds 20,000 MSL*
PWN-11D	*1*	*Exceeds 20,000 MSL*

Rocket Thrown Torpedoes (RTT) and Vertical Launched ASROC (VLA) requiring Safety Footprints.

TYPE	*FY-92*	*FY-93*
SHORT RANGE		
RTT	*15*	*6*
VLA	*21*	*2*

Change
N4644-
CPF
MAY 94

34

Targets Requiring Safety Footprints.

TYPE	*FY-92*	*FY-93*
AQM-37	*1*	*5*
BQM-34	*3*	*9*
BQM-74	*44*	*30*
TALOS	*4*	*0*
VANDALS	*0*	*2*

NOTES: *AQM and TALOS require at sea Safety Footprints. BQM/VANDALS require land and sea Safety Footprints.*

Change N4644-CPF MAY 94

Short Range defined as 0-20 miles.
Mid-Range defined as 20-60 miles.
Long Range defined as over 60 miles.

-3.4.B.2.B Were flight termination systems required? Yes/no.

Yes, for cruise missiles, SAMs and Vandal targets. Flight termination systems are also required on aerial target systems.

-3.4.B.2.C If no missions were scheduled in a category, give the reason(s).

N/A

-3.4.B.2.D Were any scheduled missions canceled before the mission, or terminated/aborted during the mission because of encroachments into the safety footprint? Yes/no. If yes, how many per year.

None were aborted in flight. An average of 2 missions per year are canceled for encroachment, but all are rescheduled or shifted in geometry to accommodate the range fouler and the shooter. There is a lot of flexibility with 40,000 square miles to work with.

APPENDIX A - DATA FORMS AND INSTRUCTIONS

1. Form, General Information

Facility/Capability: Enter the descriptive title for the facility/capability. Avoid using acronyms and abbreviations unless the title defines the acronym. Example: Guided Weapons Evaluation Facility (GWEF).

Origin date: Enter today's date in the format MM/DD/YY.

Military Department: Allowable entries include "N" for Navy, "A" for Army, and "AF" for Air Force. If the facility/capability is managed by an "Other Government Agency" (e.g. ARPA, DNA, ACC) enter the appropriate Agency name.

Organization/Activity: Enter the name (with acronym) for the field activity. Example: White Sands Missile Range (WSMR).

Location: Enter the location where the facility/capability is physically located (installation, city or other common name).

Unit Identification Code (UIC): Enter the UIC.

T&E Functional Area: Enter the single area this facility/capability primarily supports: Air Vehicles, Armament/Weapons, Electronic Combat, or Other.

T&E Test Facility Category: Enter the facility category based on the following definitions:

(1) Digital Models and Computer Simulations (DMS)- Those models and simulations which either provide a simulated test environment or representations of systems, components, and platforms. DMSs are used throughout the development and test process, as analytical tools, as well as tools to drive or control electronic and other environmental stimuli provided, the test articles on Open Air Ranges (OARs), Installed Systems Test Facilities (ISTFs), Hardware in the Loop Test Facilities (HITLs), Integration Laboratories (ILs), and Measurement Facilities (MFs).

(2) Measurement Facilities (MF)- Those facilities used to provide a specialized test environment and/or data collection capability. MFs may be ground based laboratories or open air facilities (often located at or part of OARs).

(3) Integration Laboratories (IL)- Those facilities designed to support the integration and test of various systems and components that will be installed in a host platform. ILs are generally platform specific or unique. However, the simulated stimuli and data collection capabilities required by ILs are often common with those required by HITLS and ISTFs.

(4) Hardware-In-The-Loop (HITL)- Those facilities which provide capabilities to test systems or their components at various stages of development (e.g., brassboard, breadboard, prototype, pre-production, production). HITLs provide stimuli and data collection capabilities to permit test and evaluation of a system/component independent of the host platform.

(5) Installed Systems Test Facilities (ISTF)- Ground based test facilities (usually chambers) that allow test of systems and weapons as installed in the combat platform. ISTFs provide simulated test environments and stimuli and data collection capabilities for the test article(s).

(6) Open Air Ranges (OAR)- Those facilities which consist of controlled or restricted areas to support the test of platforms/systems in a real world, dynamic environment. They are instrumented with data collection, time-space-position information, positive control of test participants, and real or simulated targets and threats as appropriate.

Percentage Use: Enter percentage of time, based on hours, the facility is used to support each of the following (total must sum to 100%):

(1) Test and Evaluation (T&E)- Any facility that is accountable to Military Department and/or OSD T&E management oversight. Operation and sustainment of these facilities are typically funded from 6.5 or procurement program elements. Facilities in this category were developed to support developmental and/or operational test and evaluation and focus on the evaluation of system safety, technical performance, environmental (climatic, electromagnetic, etc.) effects, sustainability and operational suitability, maturity of production processes, and compliance with system specifications and quality standards.

(2) Science & Technology (S&T)- Any facility that is accountable to Military Department and/or OSD S&T management oversight. Operation and sustainment of these facilities are typically funded from 6.1, 6.2, and 6.3a program elements. Facilities in this category were developed to support experimental studies leading to enhanced understanding of new phenomena for new military applications as well as efforts directed toward the solution of problems in the physical, behavioral, and social sciences.

(3) Developmental Engineering (DE)- Any facility that is accountable to Military Department and/or OSD Research, Development and Engineering or acquisition management oversight. Operation and sustainment of these facilities are typically funded from 6.3b through 6.4 or procurement program elements. Facilities in this category were developed to support proof-of-principle and engineering development of systems.

(4) In-Service Engineering (IE)- Any facility that is accountable to Military Department and/or OSD logistics management oversight. Operation and sustainment of these facilities are typically funded from 6.7 or Operations and Maintenance (O&M) program elements. Facilities in this category were developed to support the maintenance facilities. These facilities tend to be system peculiar capabilities to conduct checkouts of the system/subsystems after they have undergone a modification, upgrade or improvement.

(5) Training and Doctrine (T&D)- Any facility that is accountable to Military Department and/or OSD training and doctrine management oversight. Operation and sustainment of these facilities are typically funded from O&M program elements. Facilities in this category were developed to support the training and proficiency of operational forces and/or the development of new tactics, doctrine or force structure concepts.

(6) Other - Any work outside the above.

Breakout by T&E Functional Area: For each of the above categories (T&E, S&T, DE, IE, T&D, Other) enter percentage of time facility is used to support Air Vehicles, Armament/Weapons, Electronic Combat, or Other. Total of breakout areas must sum to top line percentage.

2. Form, Technical Information

Facility Description: Enter a brief description of the facility, including the mission statement.

Interconnectivity/Multi-Use of Facility: Describe any linking/interconnectivity with other T&E facilities. Include physical and/or data linkages (bandwidth, data rate, etc.). Describe any unique characteristics or multiple use of the resource (e.g., operating by rotating crew, availability of resource dependent on ..., equipment will be obsolete by ..., etc.)

Type Tests Supported: Enter specific types of tests accomplished by the Facility (e.g., electromagnetic compatibility, radar cross section, missile miss distance, air-to-air radar simulation, etc).

Summary of Technical Capabilities: Describe technical capabilities at your facility to include:

Instrumentation/Assets: Enter instrumentation and other assets (e.g., jammers, target generators, recording equipment, computer support equipment) associated with the resource.

Provide fact sheets, not to exceed two pages.

Keywords: Enter any keywords (spelled-out with acronyms) associated with functions and capabilities of the facility (e.g., electromagnetic interference/electromagnetic compatibility (EMI/EMC), anechoic chamber, radar cross section (RCS)).

3. Form, Additional Information

Additional Information Form. Enter facility name. Provide personnel numbers for FY93, FY94, and each year in the FY95 FYDP broken out according to officers, enlisted, civilians and contractors. Enter total area square footage of indoor space, test area square footage of indoor space used for T&E purposes, and list office space square footage separately. Tonnage of equipment is the weight of all equipment associated with this facility. Volume of equipment is the volume of all equipment associated with this facility. Annual maintenance cost is self explanatory. Moving costs are estimates for packing equipment at the losing site and reassembly, calibration, etc at the receiving site, not including transportation costs. Capital equipment investments are the current improvement and modernization funds as well as any programs funds earmarked for equipment purchase.

4. Form, Facility Condition

Facility/Capability: Enter the descriptive title for the facility/capability.

Age: Indicate the age of the facility/capability as of the date on the General Information Form.

Replacement Value: Enter the replacement value for the facility/capability. Indicate whether this includes the replacement cost for the equipment.

Maintenance and Repair Backlog: Enter the total dollar amount of the backlog for maintenance and repair items.

Date of Last Upgrade: Date of the last major upgrade to the facility.

Nature of Last Upgrade: Describe the purpose and capability increase from the last major upgrade. Indicate the date this upgrade became available for use.

Major Upgrades Programmed: Enter information on each of the major upgrades that are programmed. Indicate the total programmed amount and provide a summary description of the upgrade.

5. Form, Historical Workload

Use this form to report the workload performed at this facility each year from FY86-93.

Facility/Capability Title: Enter the descriptive title for the facility/capability. Avoid using acronyms and abbreviations unless the title defines the acronym. Example: Guided Weapons Evaluation Facility (GWEF).

T&E Functional Area: For each of these functional areas (Air Vehicles, Armament/Weapons, Electronic Combat, Other Test, and Other), enter direct labor hours, test hours, and/or missions for FY86 through FY93. For open air ranges involving flight testing, report test hours and missions. For all other T&E facilities direct labor hours and test hours must be reported; if available, missions must be reported. If an estimation of test hours based on direct labor hours is necessary, refer to the instructions for Determination of Unconstrained Capacity on page 28.

6. Form, Determination of Unconstrained Capacity

Annual Hours of Downtime, 1: If the facility were required to operate continuously for 24 hours a day, seven days a week, 52 weeks a year, determine the number of hours per day the facility can reasonably operate if it is not constrained by personnel strength? Consider your facilities, equipment, and instrumentation fixed at current levels.

1. Add up the total hours of downtime per year for maintenance, weather, darkness (daylight), holidays, etc. Enter in line 1.

Average Downtime Per Day, 2: Divide line 1 by 365 to get the average downtime per day. Fill in at line 2.

Average Hours Available Per Day, 3: Subtract line 2 from 24 hours to get the average number of hours per day the facility is available for test. Fill in at line 3.

Analyze your historic workload mix to determine the average number and type of tests that have been run simultaneously at your facility. Determine the maximum number of tests that can be run simultaneously if there is no limit to personnel authorizations. Enter the following data from your analysis

Test Types, 4: Enter in column 4 the name of the type of test.

Tests at One Time, 5: List the number of each type of test that can be conducted simultaneously in column 5.

Workload Per Test
Per Facility Hour, 6: List the workload (reported in units as follows: For open air range flight testing, report workload in flight hours and numbers of missions. For all other test facility categories, including open air range other than flight testing, report workload in direct labor hours) represented by each hour the test is run. Do this at line 6.

From the historic workload analysis, determine the average workload per facility hour represented by the average or "typical" test. In the row titled "TYPICAL", in column 5, enter the number of these "typical" tests that can be run in addition to those already listed above. Enter the workload per "typical" test per facility hour in column 6. To estimate test hours from direct labor hours for the Historic Workload Form, divide the facility workload by this number (the number of direct labor hours per "typical" test per facility hour) and enter in the test hour block on the Historic Workload Form.

Workload Per
Facility Hour, 7: Multiply column 5 by column 6. Enter in column 7. Total column 7.

Unconstrained
Capacity Per Day, 8: Multiply the total from column 7 by line 3 to get the unconstrained capacity per average day. Enter in line 8.

Annual
Unconstrained
Capacity, 9: Multiply line 8 by 365 to get the unconstrained capacity per year for the facility. Enter on line 9.

GENERAL INFORMATION

Change
N4644-
CPF
MAY 94

Facility/Capability Title: PACIFIC MISSILE RANGE FACILITY/PMRF

Origin Date: 05/02/94

Service: U. S. NAVY

Organization/Activity: PMRF

Location: KEKAHA, KAUAI, HAWAII

T&E Functional Area: GENERAL MISSION SUPPORT

UIC = N0534A

T&E Test Facility Category MAJOR RANGE DEVELOPMENT AND OPERATION

	T&E	S&T	D&E	IE	T&D	OTHER	=100%
PERCENTAGE USE:	35	0	0	0	65	0	
BREAKOUT BY T&E FUNCTIONAL AREA (%)							
Air Vehicles	N/A						
Armament/Weapons	N/A						
EC	N/A						
Other	35	0	0	0	65	0	

Total in Breakout Must Equal "Percentage Use" on First Line

42

TECHNICAL INFORMATION

Facility/Capability Title: PACIFIC MISSILE RANGE FACILITY/PMRF

Facility Description; Including mission statement:

The mission of PMRF is to provide major range services which facilitate training, tactics development, and evaluation for air, surface, and subsurface weapons system for PACFLT, other DOD agencies, and Foreign Military Forces. In addition it is to maintain and operate facilities and provide services and material to support operations of aviation activities and units of the operating forces of the Navy, other activities and units designated by the Chief of Naval Operations.

PMRF is a training range that also support T&E operations.

Interconnectivity/Multi-Use of T&E Facility:

PMRF can connect voice/data to any T&E facility in the World by use of a portable system and STU III. PMRF is presently connected to Vandenburg, Huntsville, Kwajalein, and NAWCWD.

Type of Test Supported:

All types of missile, whether launched by surface, air or submarine assets. Also torpedo and electronic warfare.

Summary of Technical Capabilities:

PMRF is a multi-faceted range. With the capability of providing simultaneously operation capabilities. Precision tracking radars, cooperative tracking systems, surveillance/safety systems, telemetry, receive/separation/display/record systems, underwater tracking, communications, data distribution/transmission, optical tracking/recording electronic warfare systems, helicopter and fixed wing aircraft and surface support craft.

Keywords:

Multi-faceted range. T&E: Test and Evaluation; STU III: Secure Telephone Unit.

ADDITIONAL INFORMATION
DATA ADDED, CNAP 9405

Change
NO1CP-
CPF
MAY 94

Facility/Capability Title: PMRF Barking Sands

PERSONNEL

	FY93	FY94	FY95	FY96	FY97	FY98	FY99
Officer	27	26	26	26	26	26	26
Enlisted	96	92	89	88	88	88	88
Civilian	*122*	*140*	*131*	*131*	*131*	*131*	*131*
Contractor	474	474	508	508	508	508	508
Total	719	732	754	753	753	753	753

Total Square Footage: 509,759

Test Area Square Footage: N/A; Area used for FLT TRNG and can accommodate the testing. Office Space Square Footage 62,205

Tonnage of Equipment: 1704 Tons Volume of Equipment: 1.15M Cubic Feet

Annual Maintenance Cost: $7.5M Estimated Moving Cost: $6.1M

CAPITAL EQUIPMENT INVESTMENT

FY93	FY94	FY95	FY96	FY97	FY98	FY99
$34.7M	$32.9M	$33.10M	$13.90M	$6.3M	$3.4M	$2.9M

FA[illegible] CONDITIONS
DATA ADDED, CNAP 9405

FACILITY/CAPABILITY TITLE: PMRF Barking Sands

AGE: 53 years

REPLACEMENT VALUE: $368M

MAINTENANCE AND REPAIR BACKLOG: $5M (Critical) $7M (Routine)

DATE OF LAST UPGRADE: 03 JUN 88

NATURE OF LAST UPGRADE: $2.5M RANGE OPS CENTER ADDITION. ADDED THREE TRACK CONTROL ROOMS, COMPUTER ROOM, AND OBSERVATION DECK. TO HOUSE NEW COMPUTER MODERNIZATION UPGRADE TO OPERATIONAL CAPABILITY.

MAJOR UPGRADES PROGRAMMED

1. UPGRADE TITLE: NONE

TOTAL PROGRAMMED AMOUNT:
SUMMARY DESCRIPTION:

2. UPGRADE TITLE:

TOTAL PROGRAMMED AMOUNT:
SUMMARY DESCRIPTION:

HISTORICAL WORKLOAD

FACILITY/CAPABILITY TITLE: PACIFIC MISSILE RANGE FACILITY/PMRF

T&E FUNCTIONAL AREA		FISCAL YEAR 86	87	88	89	90	91	92	93
AIR VEHICLES	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
EC	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
ARMAMENT/WEAPONS	DIRECT LABOR								
	TEST HOURS								
	MISSIONS								
OTHER T&E	DIRECT LABOR	*192.2*	*231.0*	*196.6*	*248.3*	*182.3*	*230.3*	*193.9*	*207.0*
	TEST HOURS	1221	1801	1322	1759	1190	1706	1461	1842
	MISSIONS	833	1001	852	1076	790	998	840	897
OTHER	DIRECT LABOR	*259.8*	*346.3*	*272.3*	*345.6*	*254.1*	*320.7*	*270.2*	*288.5*
	TEST HOURS	2512	3316	2669	3267	2209	3169	2714	3422
FLEET TRAINING	MISSIONS	1501	2001	1573	1997	1468	1853	1561	1667

Change
N4644-
CPF
MAY 94

DETERMINATION OF UNCONSTRAINED CAPACITY

Change
N45-CPF
MAY 94

FACILITY/CAPABILITY TITLE: PACIFIC MISSILE RANGE FACILITY/PMRF

ANNUAL HOURS OF DOWNTIME	1	0
AVERAGE DOWNTIME PER DAY (LINE 1÷ 365)	2	0
AVERAGE HOURS AVAILABLE PER DAY (24 - LINE 2)	3	24

TEST TYPES	TESTS AT ONE TIME	WORKLOAD PER TEST PER FACILITY HOUR	WORKLOAD PER FACILITY HOUR	UNCONSTRAINED CAPACITY PER DAY (LINE 3 X TOTAL Σ)
4	5	6	7	8
"TYPICAL"	4	100	400	*9600*
				ANNUAL UNCONSTRAINED CAPACITY 9
				3,504,000
		TOTAL Σ	400	

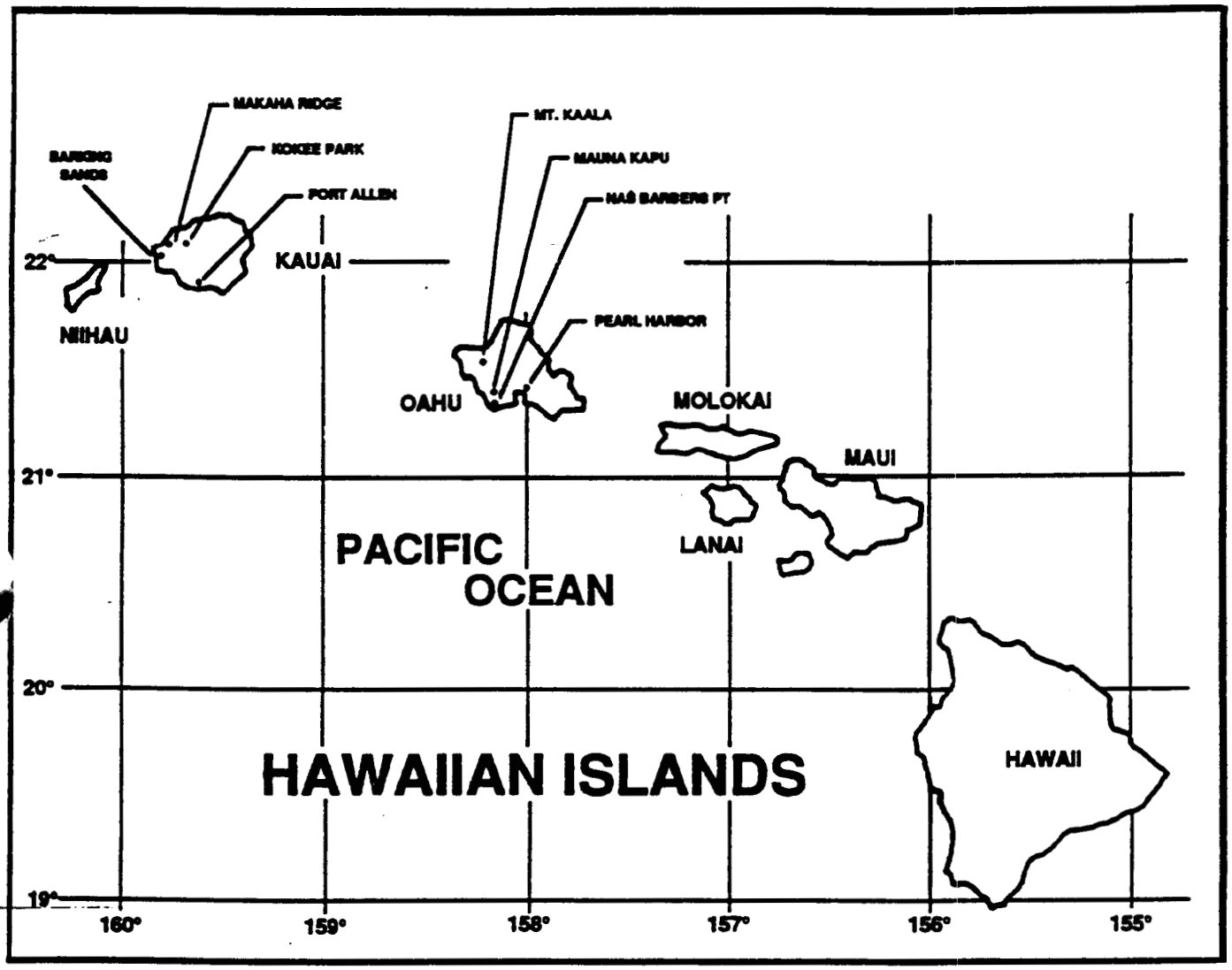


Figure - 1: Locations Of the Pacific Missile Range Facility

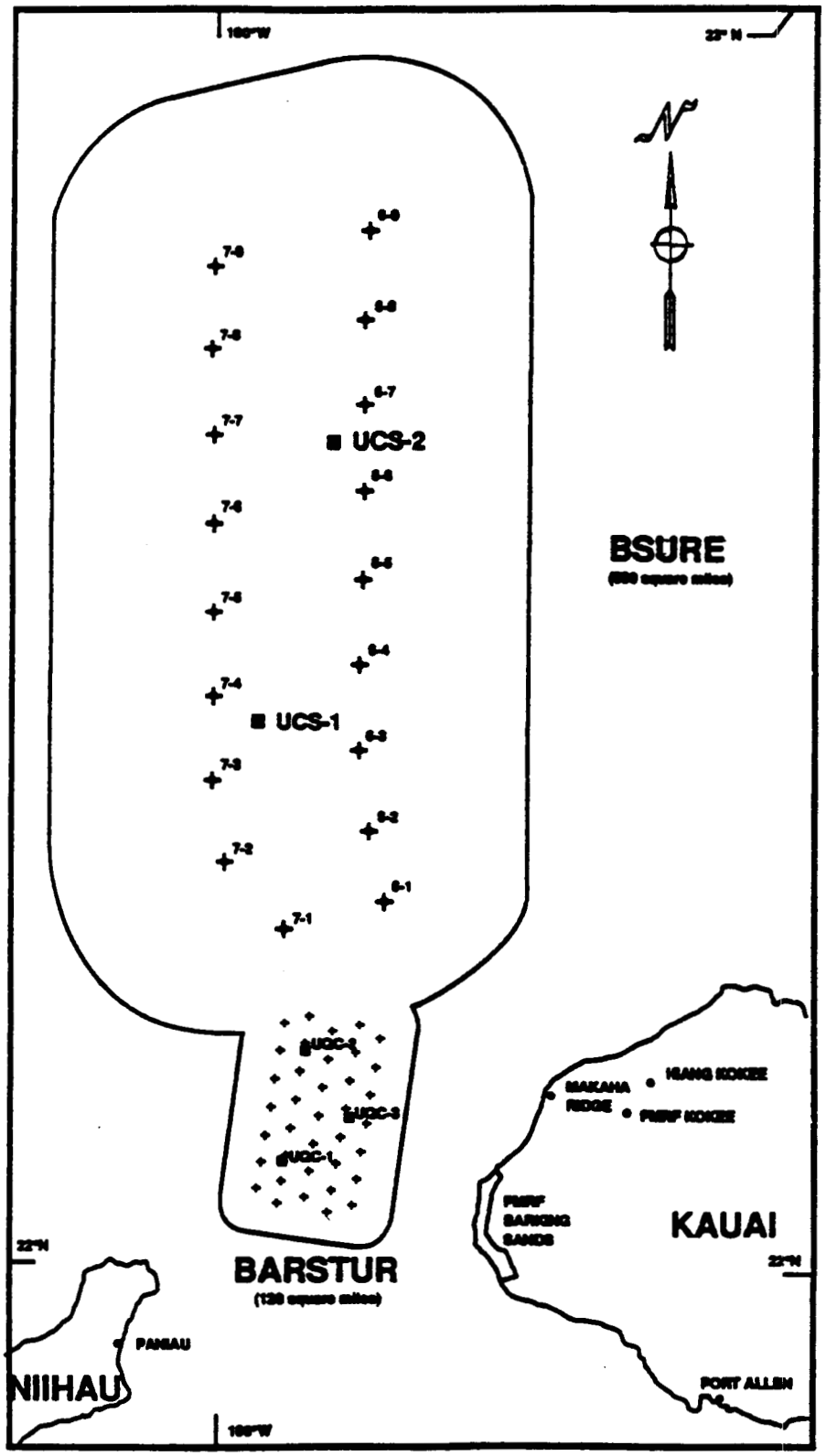


Figure - 2: PMRF Underwater Ranges

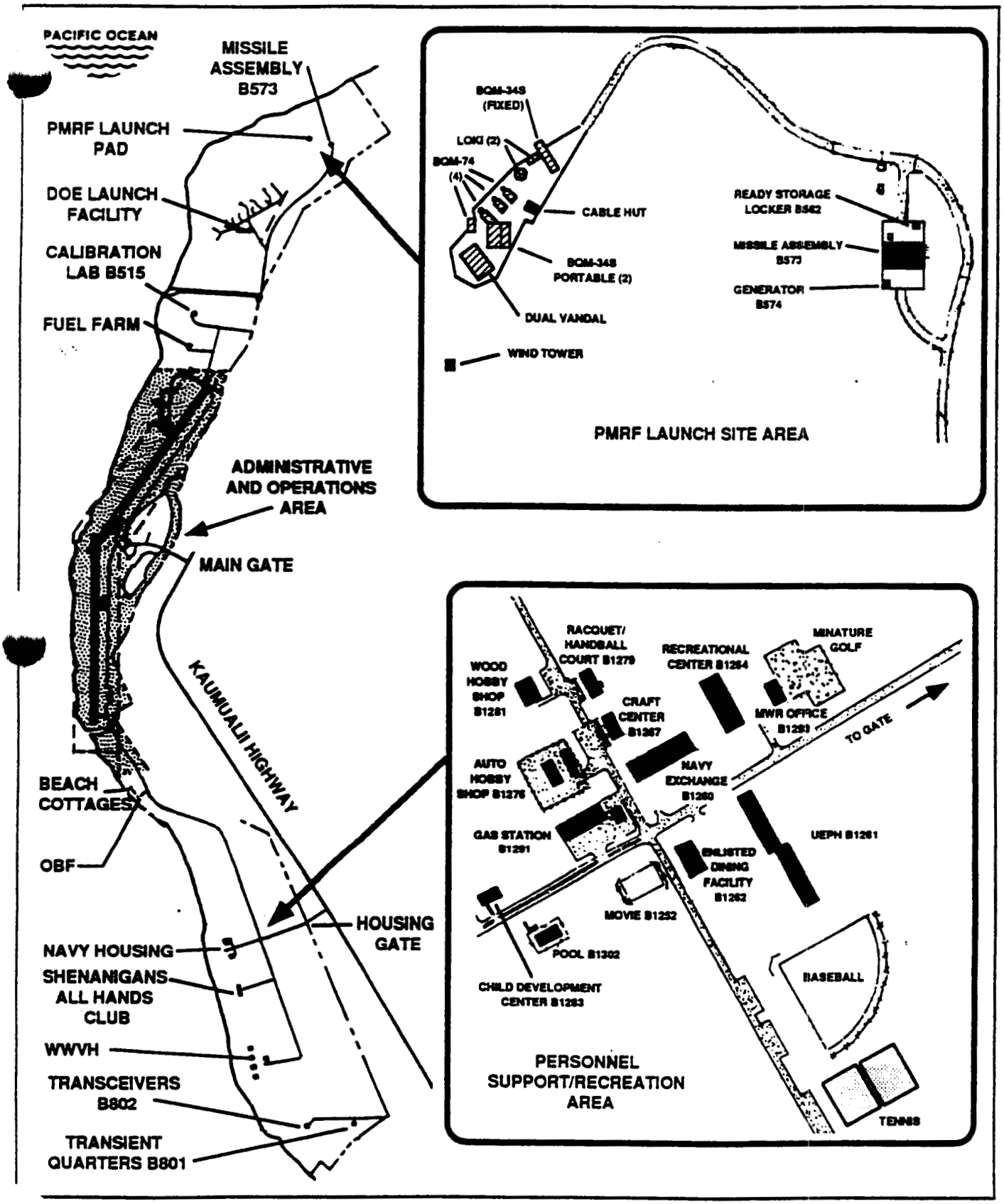


Figure - 3: Barking Sands Area Map

50

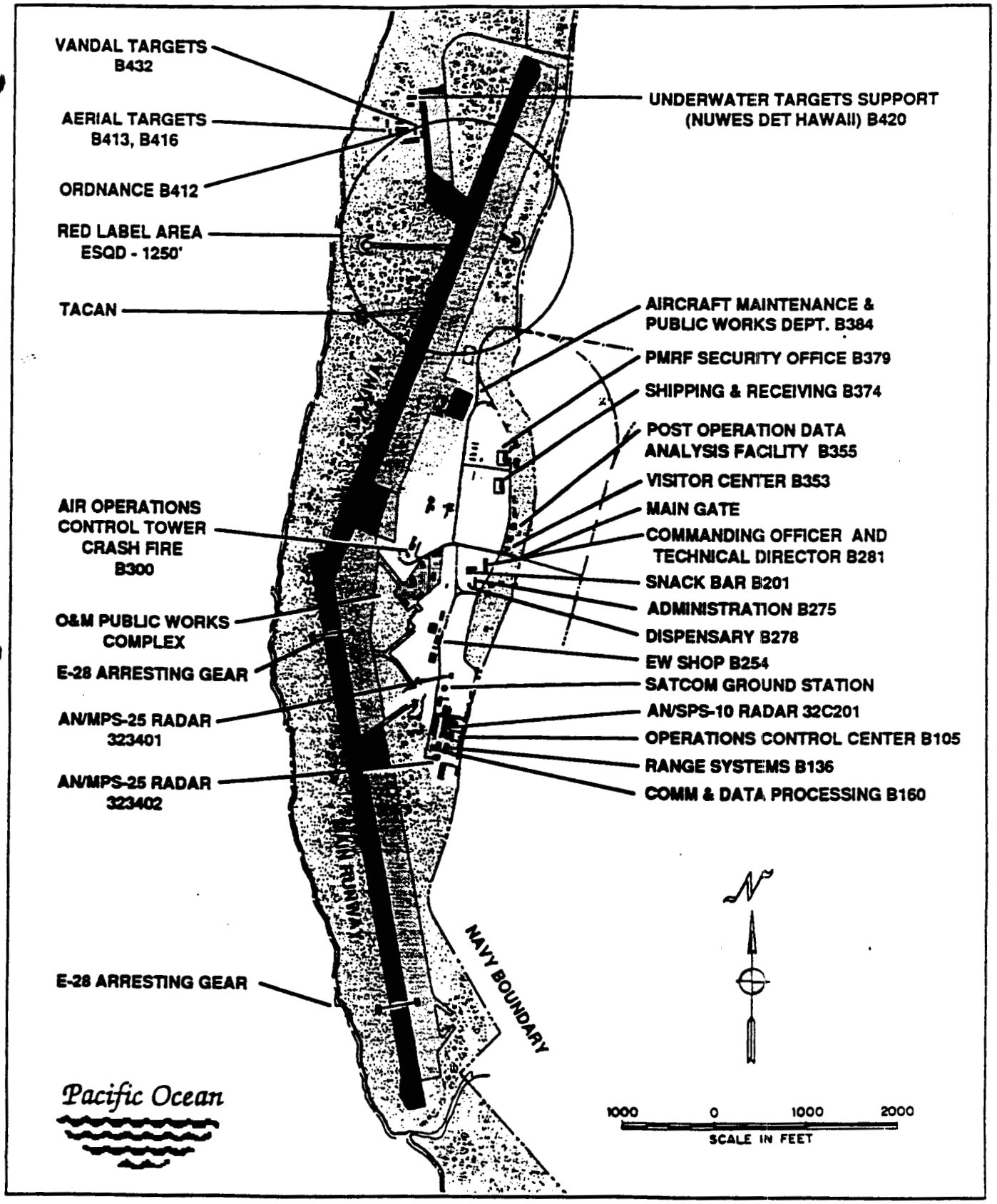


Figure - 4: Administrative and Instrumentation Area Map

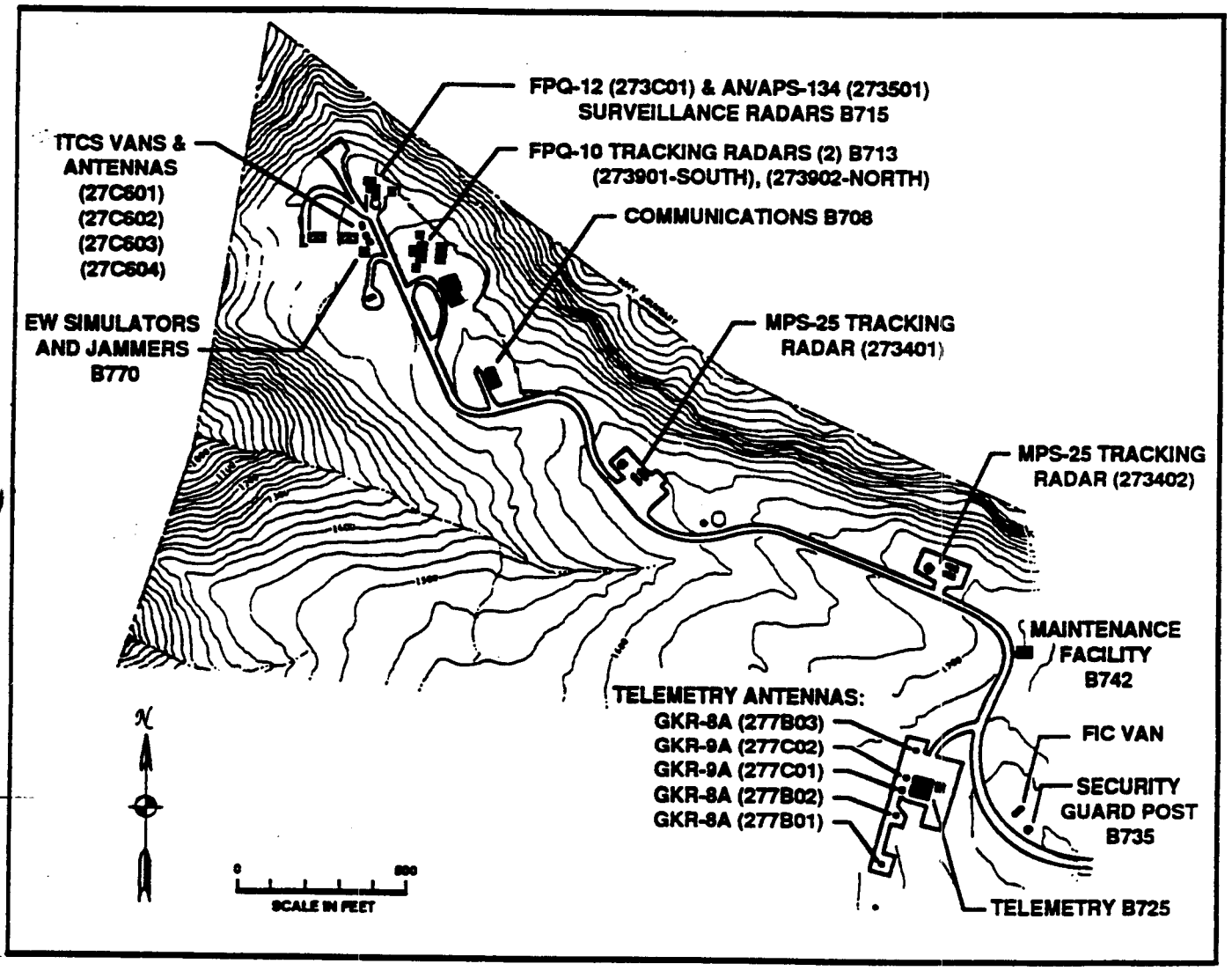


Figure - 5: Makaha Ridge Area Map

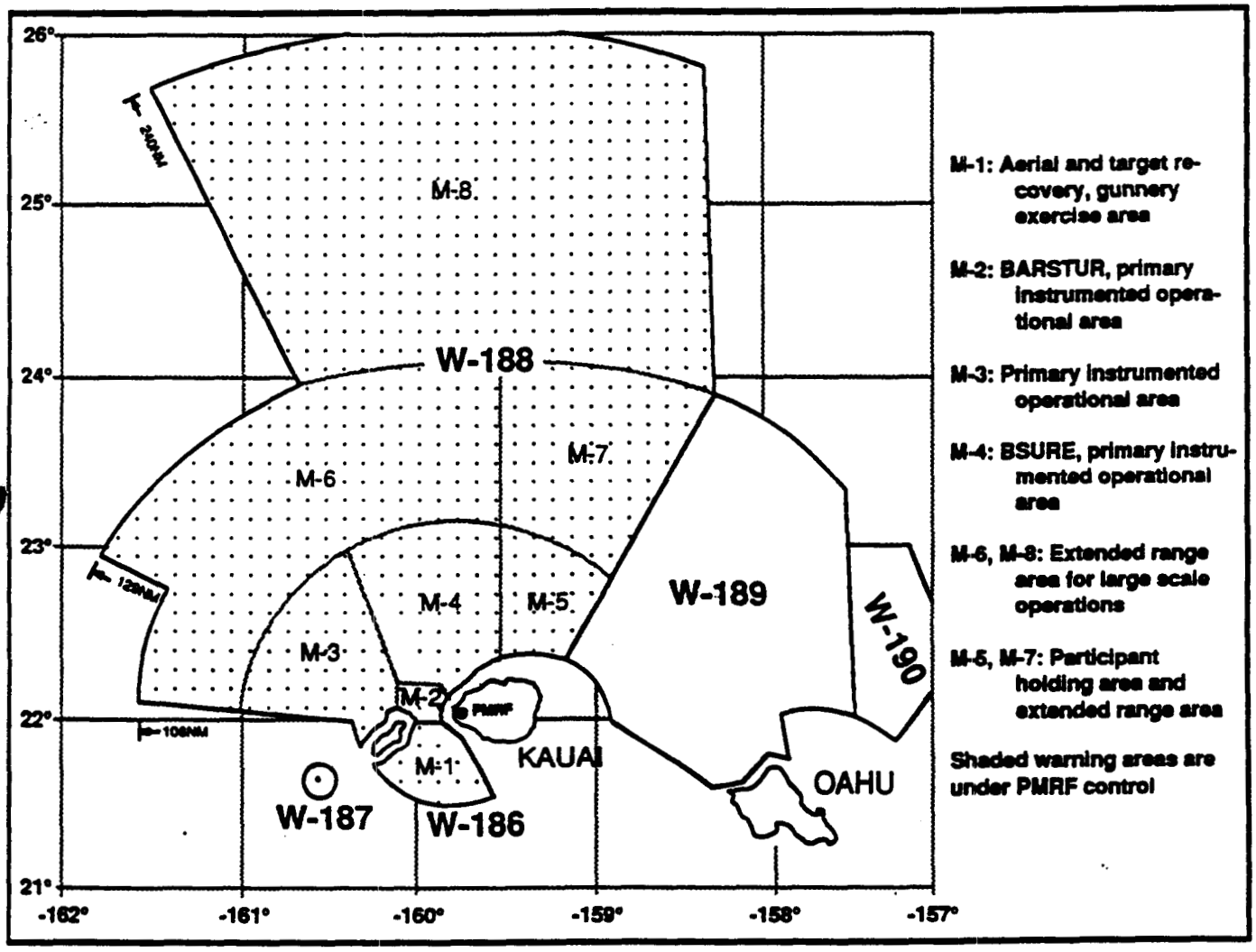


Figure - 8: PMRF Operational Areas

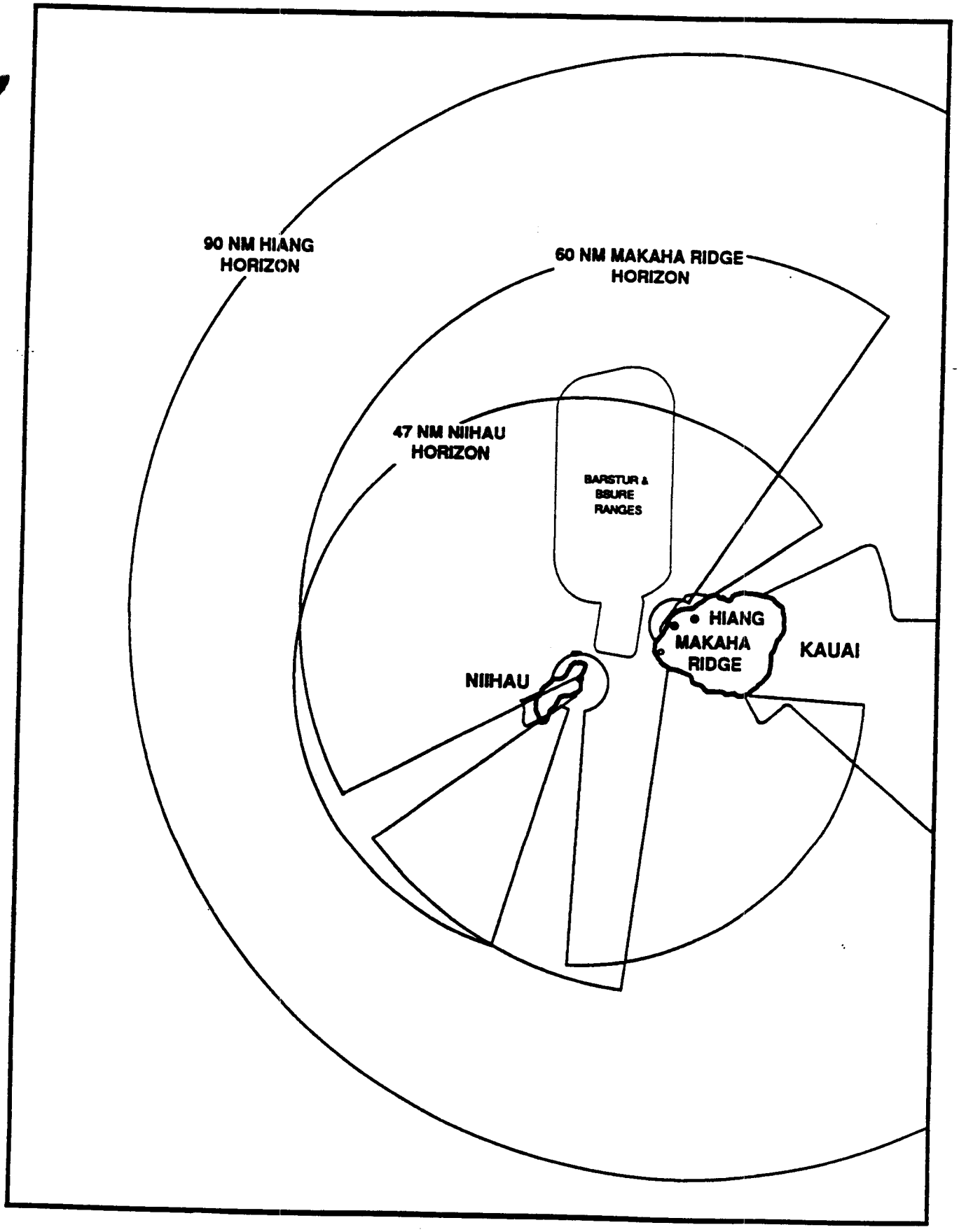


Figure - 10: Surface Search Radar Coverage

DEPARTMENT OF THE NAVY
COMMANDER IN CHIEF
UNITED STATES PACIFIC FLEET
250 MAKALAPA DRIVE
PEARL HARBOR, HAWAII 96860-7000

IN REPLY REFER TO:
11000
Ser N4644/05059
07 JUN 1994

From: Commander in Chief U.S. Pacific Fleet
To: Chief of Naval Operations (N44)

Subj: BASE REALIGNMENT AND CLOSURE 95 DATA CALL NUMBER THIRTEEN

Ref: (a) SECNAV Memo MM-0085-F2 BSAT/MS of 7 Apr 94

Encl: (1) Data Call Thirteen, PMRF Barking Sands

1. In response to reference (a), enclosure (1) is forwarded.

2. The CINCPACFLT point of contact is CDR Lin Wong at DSN 474-6387, COMM (808) 474-6387, Fax DSN 474-5495, COMM (808) 474-5495.

F. P. DiGEORGE, III
Fleet Facilities Officer

Copy to:(w/o encl)
COMNAVAIRPAC
PMRF Barking Sands

58

BRAC-95 CERTIFICATION

Activity:_____
UIC:_____

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

MAJOR CLAIMANT LEVEL

R. J. KELLY, ADM USN
NAME (Please type or print)

Signature

COMMANDER IN CHIEF
Title

Date

U.S. PACIFIC FLEET
Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

DEPUTY CHIEF OF NAVAL OPERATIONS (LOGISTICS)
DEPUTY CHIEF OF STAFF (INSTALLATIONS & LOGISTICS)

J. B. GREENE, JR.
NAME (Please type or print)

Signature

ACTING
Title

6/20/94
Date

BRAC-95 CERTIFICATION
PMRF Barking Sands, Data Call 13

NEXT ECHELON LEVEL (if applicable)

Captain James E. Eckart, USN
NAME (Please type or print)

Signature

Acting
Title

11 May 1994
Date

COMNAVAIRPAC
Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

NEXT ECHELON LEVEL (if applicable)

NAME (Please type or print)

Signature

Title

Date

Activity

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

BRAC-95 CERTIFICATION

Reference: SECNAVNOTE 11000 of 08 December 1993

In accordance with policy set forth by the Secretary of the Navy, personnel of the Department of the Navy, uniformed and civilian, who provide information for use in the BRAC-95 process are required to provide a signed certification that states "I certify that the information contained herein is accurate and complete to the best of my knowledge and belief."

The signing of this certification constitutes a representation that the certifying official has reviewed the information and either (1) personally vouches for its accuracy and completeness or (2) has possession of, and is relying upon, a certification executed by a competent subordinate.

Each individual in your activity generating information for the BRAC-95 process must certify that information. Enclosure (1) is provided for individual certifications and may be duplicated as necessary. You are directed to maintain those certifications at your activity for audit purposes. For purposes of this certification sheet, the commander of the activity will begin the certification process and each reporting senior in the Chain of Command reviewing the information will also sign this certification sheet. This sheet must remain attached to this package and be forwarded up the Chain of Command. Copies must be retained by each level in the Chain of Command for audit purposes.

I certify that the information contained herein is accurate and complete to the best of my knowledge and belief.

ACTIVITY COMMANDER

JON E. THIELE, CDR/USN	Jon E. Thiele
NAME (Please type or print)	Signature
ACTING COMMANDING OFFICER	04 MAY 1994
Title	Date
PACIFIC MISSILE RANGE FACILITY	
Activity	

58