

EATS

The Extended Area Tests System (EATS) is a multilateral, multioperational, multiparticipant cooperative tracking system which provides time, space, position information (TSPI) data to Range users. It is also capable of performing target control functions by relaying messages from the Integrated Target Control System (ITCS) for specially equipped targets.

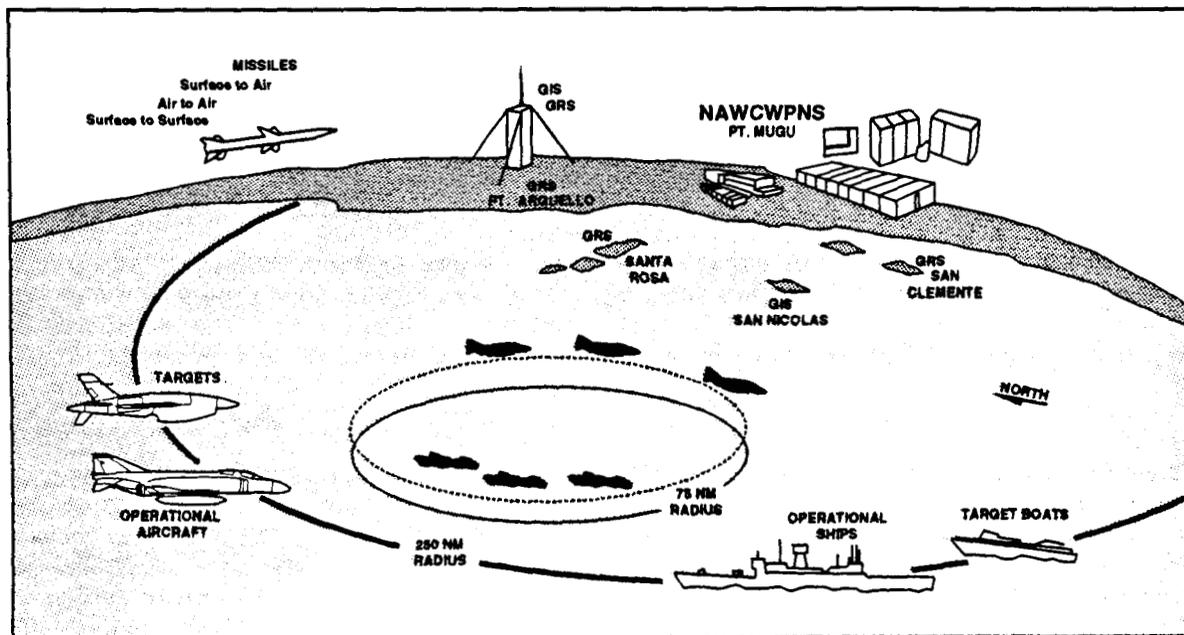
EATS provides the capability to extend the range instrumentation functions of tracking and target control 250 nautical miles (NM) or more seaward from San Nicolas Island (SNI) and covers from Baja California to Monterey Bay by utilizing a network of unmanned ground sites and Airborne Reference Stations (ARS) where necessary. EATS is capable of simultaneously supporting multiple operations by tracking up to 60 or more participants and handling target commands and control information for up to 12 targets.

There are two types of EATS ground stations each located on a surveyed location, Ground Interrogation Stations (GIS) and Ground Reference Stations (GRS). There are four GIS, two located at

Point Mugu and two at SNI, which generate all EATS radio frequency (RF) communications. There are 24 GRS, located on the offshore islands and along the California coast from Big Sur to the Mexican border, which provide range data for tracked vehicles.

R³

All EATS ground sites and each EATS tracked participant must be equipped with a transponder unit known as the R-cubed or R³. It functions as a REPORTER, a RESPONDER, or a RELAY. As a REPORTER, the R³ returns collected range, meteorological and other data; as a RESPONDER it provides ranging data for the REPORTER; and as a RELAY it passes EATS messages to another R³ unit. The R³ unit may be packaged in one of three configurations, known as a Participant Instrumentation Package (PIP), for various host vehicles. Ships are installed with a Ship Instrumentation Package (SIP) and aircraft are either installed with an Internal Aircraft Instrumentation Package or SAIP.

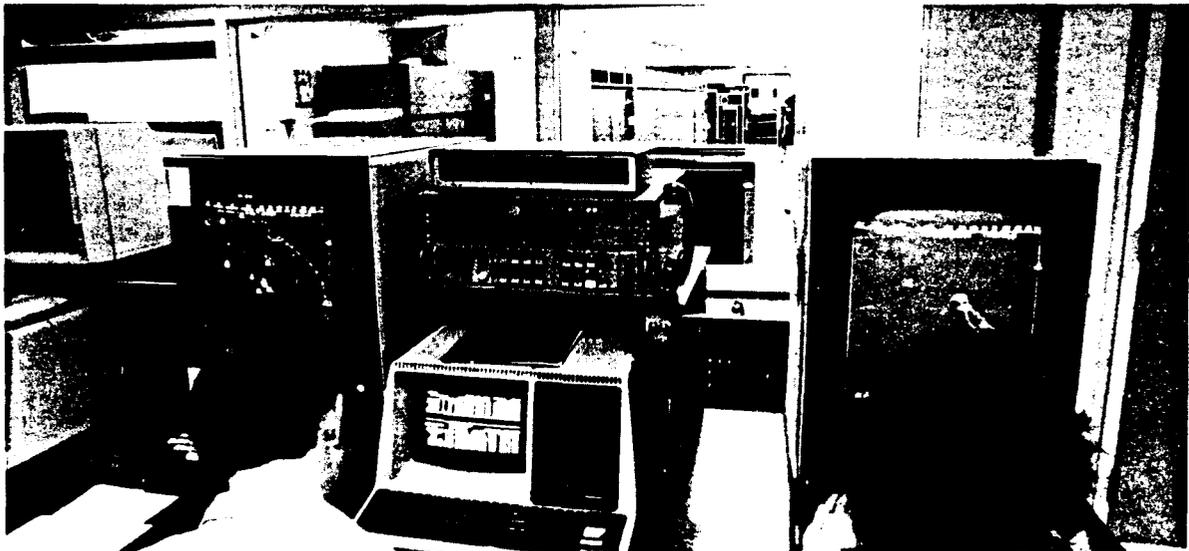


EATS provides state vector data, including X, Y and Z position with associated velocity vector and time for instrumented test vehicles by collecting slant range data from up to eight ground stations and/or other EATS instrumented participants within line-of-sight. Over-the-horizon tracking is accomplished by using up to three levels of relays.

MOCS

The EATS Master Operations Control Station (MOCS) is the EATS mission tracking center and includes the EATS computer room and the EATS operational display and control room. The MOCS computer selects RF communication paths, coordinates the collection of ranging data and calculates TSPI data for each participant.

The EATS MOCS system contains two identical redundant DEC computer systems used for processing, recording and controlling the EATS tracking functions. Each system consists of one KL-10 mainframe and three PDP-11/40 mini computers, with the functions of terminal server, graphics controller and special interface controller. These interfaces include the RII (which connects to the Cyber computer), IRIG timing, the RF subsystem, ITCS, Supersonic Low Altitude Target (SLAT), Southern California Offshore Ranges (SCORE), and the Range Application Joint Program Office Global Positioning System (RAJPO GPS) equipment.



TARGET CONTROL

Target control relay for multiple target drones is achieved by interfacing EATS with ITCS. The ITCS Local Data Processor is the source and destination of target drone commands relayed beyond line-of-sight from SNI and/or Point Mugu ITCS trackers. The EATS target control function is available for a limited number of targets, including BQM34S, Supersonic Low Altitude Target (SLAT) and the ex-STODDARD target hulk.

APPLICATION

Over the years, EATS has successfully supported a variety of missions requiring multilateration tracking of multiple ships, aircraft and targets and occasionally target control. Operations supported by EATS include the numerous versions of the standard Missile System; PHOENIX, HARPOON and TOMAHAWK to name a few. With the increasing complexity and scope of today's modern system configurations, EATS may be beneficial to other programs where over-the-horizon, low-altitude or widely spaced multiple participant scenarios are a constraint.

CAST GLANCE

HISTORY

CAST GLANCE began in 1975 when NAWCWPNS (then PMTC) sponsored the Electro-Optics Branch and the Airborne Photo Support Section at Point Mugu to develop an improved air-to-air photographic system.

TECHNICAL SPECIFICATIONS

Overall System Performance:

Resolutions better than 13 urad have been achieved, that is better than 1 foot at 15 miles. Limiting factors are residual vibration, boundary-layer air flow over the aircraft window, and atmospheric scintillation, and sometimes engine exhaust scintillation:

Primary Optics:

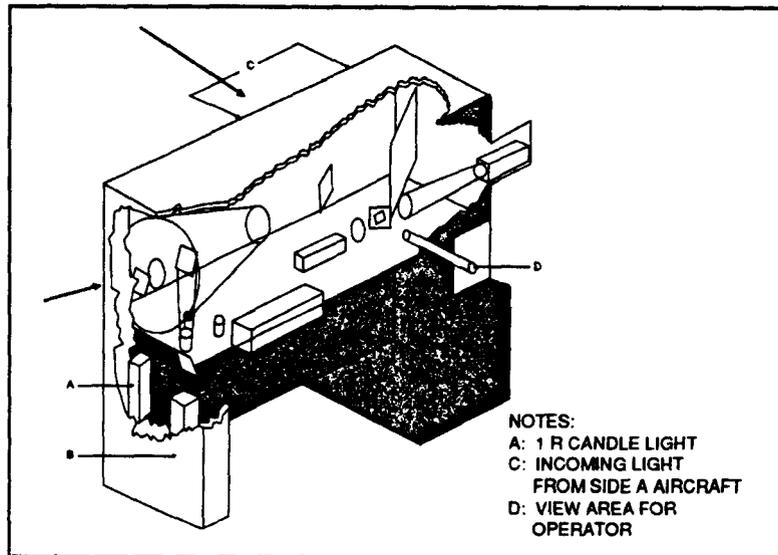
7-inch Aperture Cassegranian-Coude Reflecting Telescope. Resolution approaches the diffraction limit of 3 urad, even for broadband light. Focal lengths of 40", 80", and 120" are selectable in-flight, others can be installed pre-flight.

Wavelengths:

The Coude beamsplitter in the primary optics separates visible (0.4 to 0.7 μm) and near IR (0.7 to 1.1 μm) to different ports. In the usual setup, a beamsplitter further divides the visible to add another port.

Secondary Objects:

A pickoff mirror diverts the light that would have been wasted by the center obscuration of the primary optics. Apertures up to 3.5" can be accommodated. Up



to two camera ports and a visual acquisition sight are provided. Focal lengths from 6" to 40" are typical, and zoom lenses are available.

Cameras:

Film: Photo-Sonics 4-ML 35mm and 1-prn 16mm high speed (up to 400 fps) motion picture cameras, with film loads up to 1,200 feet. The standard film is Kodak 2253 Ektachrom color film (40 lp/mm at 1.6/1 contrast, ie, 1 ft at 15 mi for EFL=80"). Available is Kodak 2415 Techpan high resolution B&W film (200 lp/mm at 1.6/1 contrast).

Video: Various vidicon and CCD cameras, including low-light-level and near-IR.

Specialized Apparatus: Scientific cameras and user optical instrumentation, as supplied.

Data Added On Film:

Range time. Observation direction.

Data Added On Video:

Standard are range time and aircraft intercom audio. Much additional data can be added.

Telemetry:

Video on L-band (1817 Mhz), switchable among four cameras or to a composite of images from four cameras on two systems, fore and aft. Instant replay and still frame transmission.

Aircraft Requirements:

Weight: 350 lbs typical for the optical station plus another 600 to 800 lbs for two 19" racks of electronic equipment.

Space: Two areas of floor space roughly 5' x 5' each for the equipment and at least two operators.

Configuration: Project power outlet with 28 VDC and 115 V 400 Hz, AC COMM outlet, optical quality window, floor and above-window mounts for the optical station, two 19" racks 5' high or equivalent rack space, acquisition sight mounted in the cockpit.

Aircraft Configured:

Two P-3 aircraft with dual right configurations (one with limited rack space), two with aft left, and two more probably configurable for fore left.

CAST GLANCE

INTRODUCTION

There are only two ways to photograph a subject and get a large image size, either be close to the subject or use a long focal length lens. The Naval Air Warfare Center Weapons Division (NAWCWPNS) has built a system known as CAST GLANCE which optimizes both of these factors for range instrumentation photography.

By using an aircraft-mounted photographic system, the camera can be brought as close as possible to the subject, in most cases as close as safety will allow. For a sea test range, this is most important. Ship-based systems are not always available or monetarily practical. By stabilizing the image on the film by sensing the camera motion with a gyro, a long focal length lens can be used from an aircraft, an inherently vibration-ridden platform.

These two concepts, combined with the advances in low-light-level video technology, have allowed NAWCWPNS to perform amazing coverage such as tracking an object moving at a speed in excess of 17,000 miles per hour, at an altitude of over 200,000 feet, using an effective focal length greater than 300 inches, from a P-3 aircraft at night. Such extreme performance capability requirements are, fortunately, the exception rather than the norm. Yet, the key to effective use of the CAST GLANCE photographic system lies in its flexibility. There is no other group anywhere in the world which can offer this versatility and past track record offered by NAWC, and the Center's support can be provided virtually anywhere in the world.

HISTORY

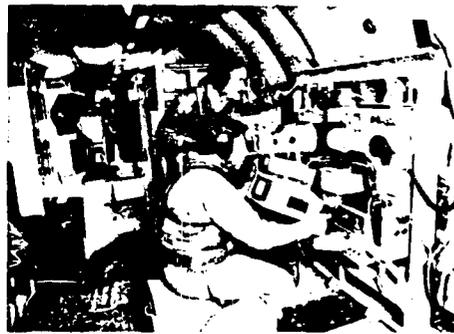
CAST GLANCE had its beginnings in 1975 when NAWCWPNS (then PMTC) sponsored a program to design and build an improved air-to-air photographic system. The present systems are the results of that work, having been designed and assembled by the Electro-Optics Branch and Airborne Photo Support Section at Point Mugu.

The name CAST GLANCE II includes CAST GLANCE IIA and IIB. CAST GLANCE IIA possesses the prototype 7-inch mirror and offers a 40-inch lens, with the capability of changing the focal length to values between 20 to 120 inches (as required) in flight. There is a wide variety of photographic sensors (film, video, low-light-level video, etc.) available for use with the system, covered later in this document. CAST GLANCE IIB offers all the features of CAST GLANCE IIA, but in addition, it has two wide-angle ports available which presently are configured with a 6-inch and 40-inch lens. There are also choices of sensors available for these ports.

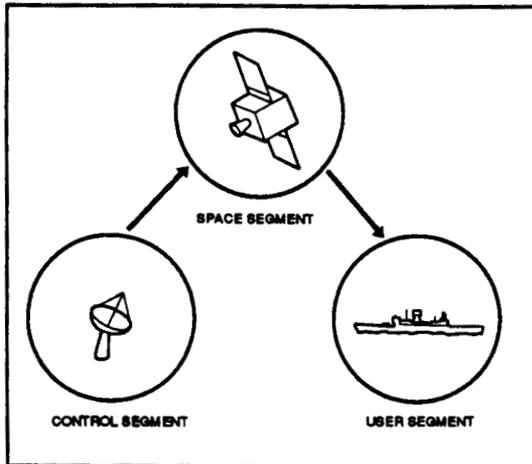
CAST GLANCE Systems have received many varied tasks over the years. At present, the primary aircraft platform is the P-3 Orion, a four engine turboprop airplane, but is suitable for use on many aircraft. It has been used on C-135 and has been tested on a H-46 helicopter. Range Development has also evaluated test flights from a Navy H-46 helicopter.

One NAWC P-3 aircraft can accommodate two CAST GLANCE Systems on the same side allowing multiple coverage of events. Also it is capable of transmitting live television images from four different cameras back to land based operation control rooms via an "L" band transmitter (1817 MHz).

Over the years, CAST GLANCE Systems operated by the Airborne Photo Support Section of the Photo Instrumentation Branch, have supported a variety of missions: Rolling Airframe Missile launches, Close-In Weapons Systems firing, SEA-SPARROW and SIDEWINDER launches, HARPOON, TOMAHAWK, and Japanese Defense Force launches and impacts, and satellite launches from Vandenberg Air Force Base.



CAST GLANCE operated from a range P-3 aircraft



NAWCWPNS (PT. MUGU) GPS DATA LINKS

- EXTENDED AREA TEST SYSTEM (EATS)-PRESENT
GPS NOW BEING INTEGRATED
FREQ - 141 MHz
150 NM RANGE (AIR TO AIR)
COMMAND AND CONTROL
MULTIPLE PARTICIPANT TRACKING
- DATA LINK SYSTEM (DLS)-FUTURE
AVAILABLE AT NAWCWPNs 1993-1994
FREQ - 1350-1420, 1427-1465 MHz
70 NM RANGE (AIR TO AIR)
INTER-OPERABLE - CHINA LAKE, EDWARDS AFB
MULTIPLE PARTICIPANT TRACKING

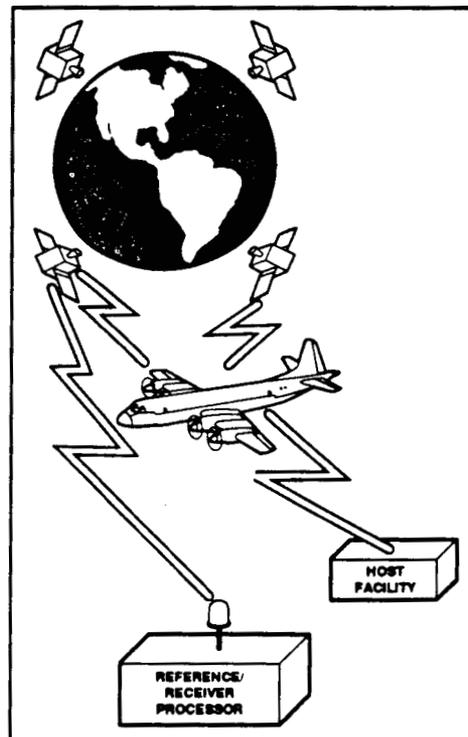
FUTURE PLANS

PODS _____ **32**
PLATES _____ **26**
LOW COST C/A RECEIVERS _____ **24**
TOTAL OF 82 BY YEAR 2000

SUMMARY

- NAWCWPNs WILL HAVE TWO DATA LINKS SYSTEMS TO SUPPORT GPS
- NAWCWPNs IS PREPARING A MIX OF EATS AND DLS* ASSETS
32 - EATS TRACKING ASSETS, 2 - EATS RR/P
26 - DLS RAJPO TRACKING ASSETS, 2 DLS RR/P
24 - C/A CODE RECEIVERS
- AIRCRAFT CERTIFICATION COMPLETED JUNE 1991
- PODS - F-14, QF-4, A-6
- PLATES - A-6, H-46, P-3A
- NAWCWPNs WILL PERFORM ALL PHASE OF EQUIPMENT TEST, STATIC AND DYNAMIC TESTING

* DATA LINK SYSTEM



SYSTEM OVERVIEW

The Navstar GPS (Global Positioning System) was developed to provide highly precise position, velocity, and time information to users. The GPS is designed to provide present and future generation host vehicles with this high-quality global navigation capability anywhere and at any time.

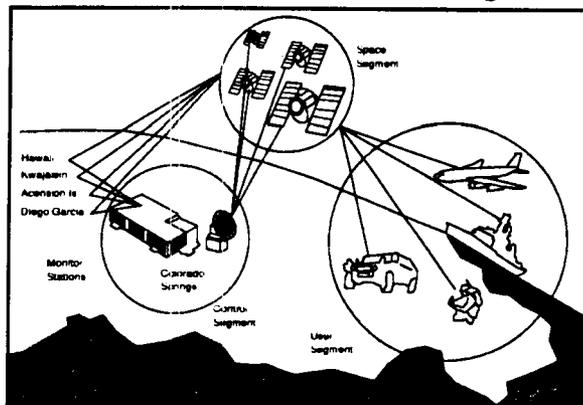
The GPS Space Segment, when fully operational by December 1993, will be composed of 21 satellites (plus three operational spares) in six orbital planes. The satellites will operate in circular orbits at an inclination angle of 55 degrees and with a 12-hour period. The precise spacing of satellites in orbit will be arranged such that a minimum of four satellites will be in view of any user, thereby ensuring worldwide coverage.

The Control Segment includes a number of Monitor Stations and Ground Antennas located throughout the world. The Monitor Stations use a GPS receiver to passively track all satellites in view and thus accumulate ranging data from the satellite signals. The information from the Monitor Stations is processed at the Master Control Station to determine satellite orbits and to update the navigation message of each satellite. This updated information is transmitted to the satellites via the Ground Antennas.

The User Segment consists of User Equipment (UE) Sets and associated support equipment. UE Sets, utilizing data transmitted by the satellites, derive navigation and time information for local use. Of the numerous GPS military applications available, NAWCWPNS utilizes the Range Instrumentation interface

GPS

Global Positioning Station



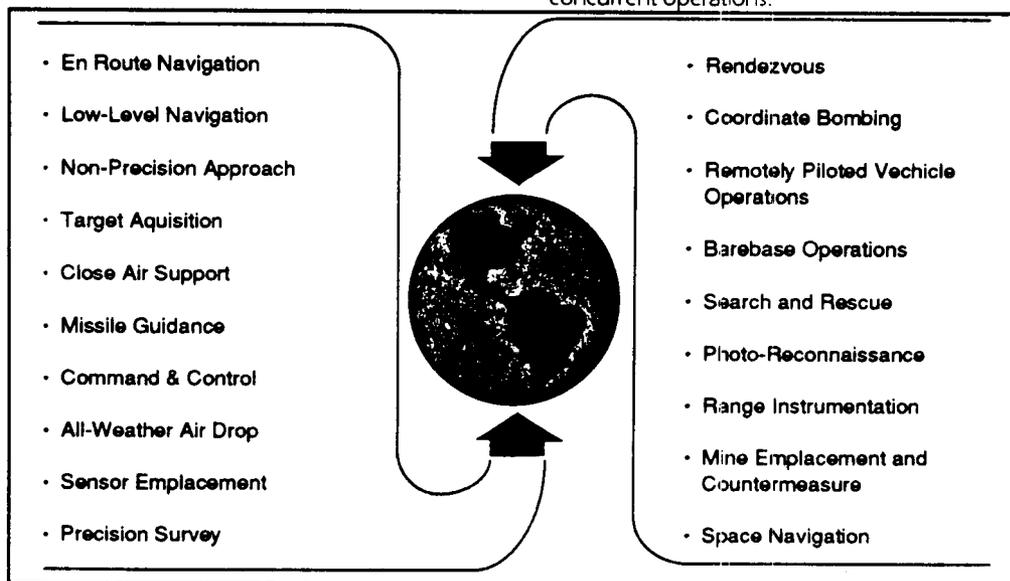
GPS SYSTEM

capability to acquire previously unattainable Time Space Position Information (TSPI) data. This GPS-Range Application is managed as a Tri-Service Program by the Range Applications Joint Program Office (RAJPO) at Eglin Air Force Base.

Fixed wing and rotary wing aircraft can be configured with low-or high-dynamic GPS receivers operated as stand-alone receivers, or coupled with strap-down inertial reference units, solid-state recorders and radio data links. TSPI outputs, as well as aircraft sensor data, are collected for real-time or postmission reconstruction.

By the year 2000 NAWCWPNS will have acquired enough various Range application equipment assets to be able to provide extremely accurate TSPI support to several concurrent operations.

GPS MILITARY APPLICATIONS



INTRODUCTION

The Range Data Processing Center (RDPC) is the hub for operational range data activity. Data from the various range instrumentation systems flows to the RDPC in realtime where it is processed, sent to Operations Control Rooms for operational display, and recorded for later Postflight reduction and analysis. The RDPC provides and applies Realtime processing software to synchronize and condition the data and to fill user-specified realtime displays. The RDPC also maintains a library of Postflight processing software to reduce the data and produce user-specified data packages. In addition to direct support of operations, the RDPC provides a powerful data processing environment for access to users wishing to process operational test or simulation data with their own software applications.

CAPABILITIES

The RDPC is professionally-operated per documented standards and procedures. Operations include requisite safeguards against unauthorized physical and electronic access as well as procedures for failure and disaster backup and recovery. The RDPC is accredited for processing and delivering classified data through the SECRET level. In addition to realtime and batch processing, the RDPC supports interactive user access via remote terminals. The RDPC can be scheduled to provide continuous realtime, batch and interactive processing support on a 24-hour basis in support of peak or special processing requirements.

In realtime, the RDPC can provide simultaneous support of multiple small to medium-sized operations, two simultaneous large-scale operations, or a single very large-scale operation. The RDPC can be configured to provide processing redundancy in support of small to large-scale operations having exacting reliability and safety requirements. Realtime operations can provide simultaneous throughput of data from various metric radars, telemetry streams, range surveillance tracks, target control systems, and other instrumentation systems. Realtime software is applied to perform data synchronization, filtering, engineering unit conversion, display preparation, and recording. The RDPC has the capacity for 6 gigabytes of on-line realtime data storage and virtually limitless capacity with off-line 9-track tape. RDPC personnel monitor system performance and user satisfaction of data requirements. Within limits, RDPC personnel can make software and set-up adjustments

RDPC

RANGE DATA PROCESSING CENTER

during operations in order to modify data flow, processing, and display to meet conditions or results not anticipated by the user. Realtime software can also provide a "quick look" data package upon completion of an operation.

In batch and interactive processing, the RDPC can prioritize and schedule multiple simultaneous jobs, including Postflight data reduction, other scientific batch processes, and up to 60 interactive user processes. Batch and interactive processing supports special media requirements, including 9-track tape library services, removable disk packs, disk and tape cartridges, floppy

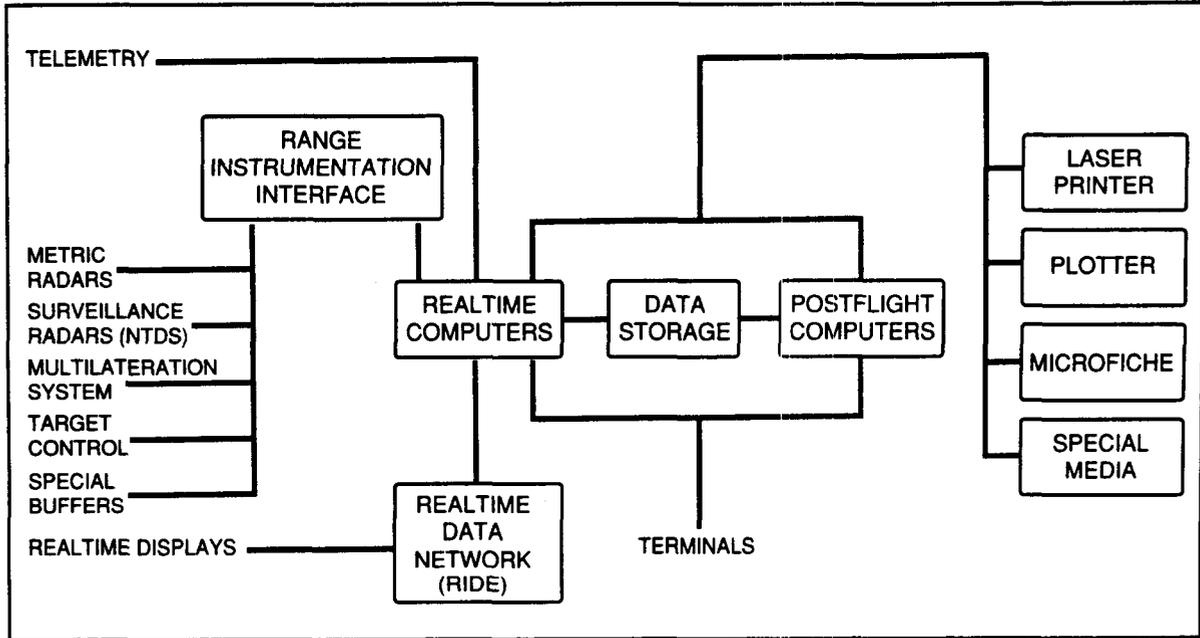


disks, hard-copy plots, high-speed laser printer output, and microfiche output. Users can be granted direct access to their operations data files and have access to system resources which include FORTRAN and COBOL environments.

The RDPC supports both Realtime and Postflight software applications through the maintenance of software libraries which are used to satisfy common user requirements. The realtime system includes over 750 program modules representing over 120,000 lines of maintained software code. The Postflight system includes over 2500 program modules representing over 350,000 lines of maintained code. Both the Realtime and Postflight application areas provide support with customized software to meet new or unusual user requirements.

RDPC

RANGE DATA PROCESSING CENTER



RDPC is supported by systems personnel who are responsible for ensuring overall processing system capability, dependability, and availability. RDPC personnel have extensive computer engineering and systems analysis expertise and are available for consultation, design, and development of specialized systems, including one-of-a-kind system interfaces, instrumentation data buffers, data networks, and high performance processing systems.

FACILITIES

The RDPC occupies approximately 9,500 square feet of operational floorspace within the Range Operations Complex, including areas for data processors, on-line data storage, peripheral input/output equipment, communications equipment, related support areas, and a data tape library. The central processors include two CYBER 875 equivalents (supporting Realtime requirements) and two CYBER 860s (supporting Postflight requirements, user batch processing, and interactive access). On-line disk storage includes over 76 gigabytes of capacity and the data tape library includes over 16,000 reels of 9-track tape representing 1600 gigabytes of data storage. Bulk hard copy output is produced on two XEROX 8700 high-speed laser printers, each capable of up to 70 pages per minute. The facility is supported by a no-break power system with 1500 kva capacity.

FUTURE DIRECTION

The RDPC has initiated a modernization effort, which will realize significant user cost savings, and increased operational flexibility, scalability, and capability. This modernization will replace proprietary mainframe processors and peripherals with a network of inexpensive open-architecture microcomputer systems. Users will benefit from reduced operational costs, and an RDPC that is very responsive to meeting changing needs. As part of this effort, the RDPC is developing an inexpensive mass storage system to store the increased amounts of data generated by newer weapon systems. The modernized RDPC will better support Realtime and Postflight data reduction requirements, and attract additional batch and interactive users whose current operational test and simulation data processing environments cannot match the efficiencies, maintenance, and backup support to be provided by the modernized RDPC.

RP-3A AIRCRAFT

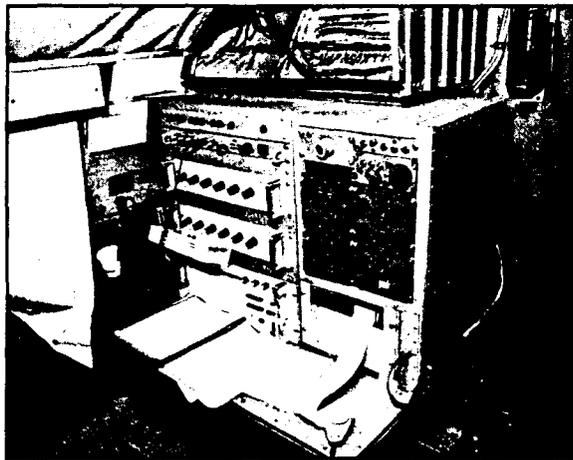
RP-3A AIRCRAFT

The Sea Range Support Aircraft Division operates five RP-3A ORION patrol aircraft for support of a multitude of unique airborne range functions. Organizational Level maintenance is performed by Gruman Technical Services, Incorporated. Intermediate Level maintenance is accomplished by the Naval Air Weapons Station, Point Mugu. Major features which make the RP-3A an ideal airborne range instrumentation station are:

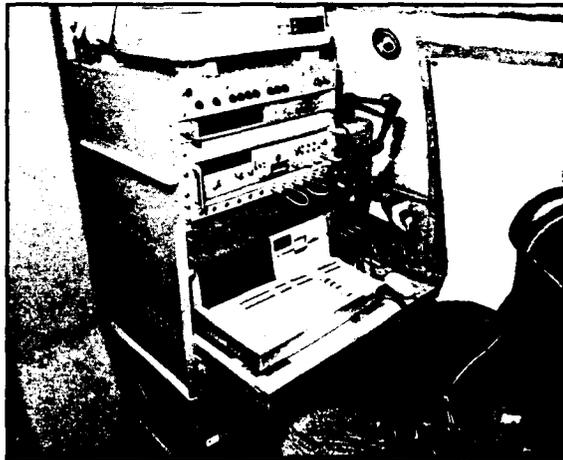
- Four 4,300 shaft horsepower turboprop engines.
- Capable of 12 hour flight durations.
- 330 knots true air speed (KTAS) normal cruise velocity.
- Capable of 405 KTAS below 8,000 feet.
- 160 knots indicated air speed loiter capability.
- 27,000 foot ceiling.
- Capable of operating at 200 feet.
- 8,000 pound range instrumentation payload
- Ditching stations for 18 personnel.

Primary operations performed by the NAWCWPNs RP-3As include:

- Range clearance.
- Multi-lateration precision tracking.



SMILS test director's console



SMILS navigator's console

- Sonobuoy missile impact scoring.
- CAST GLANCE gyro-stabilized photo-instrumentation.
- Telemetry receive, record, display, and retransmission.
- Airborne multisensor pod system operations.
- Streak photography.
- Missile flight safety.
- Launching of HARPOON missiles.
- UHF over-the-horizon voice relay.
- Air launched meteorological soundings.
- Secure UHF satellite communications.

Proper operation of the above airborne systems requires the aircraft to be outfitted with precision navigation. The Sea Range RP-3As are configured with the following sophisticated navigation systems:

- Dual LTN-72 inertials.
- LTN-211 OMEGA VLF.
- Global positioning system receivers.
- AN/ASA-66 tactical displays.
- AN/ASN-124 navigation display set with autopilot interface.

EXTENDED AREA TEST SYSTEM SUPPORT

The Sea Range's extended area test system (EATS) also employs the RP-3As to perform as airborne reference stations (ARS). The NAWCWPNs requires the EATS capability to extend at-sea fleet testing to an ocean environment that is away from the existing congested off-shore test area. The ARS acts as an airborne data relay and recording station between the Sea Range's ground stations and participants within the extended test area. The primary systems involving the RP-3As are:

- Reception and transmission of bi-directional tracking commands.
- Reception, recording, and retransmission of telemetry.
- Reception and retransmission of UHF narrow band and wide band encrypted communications data.

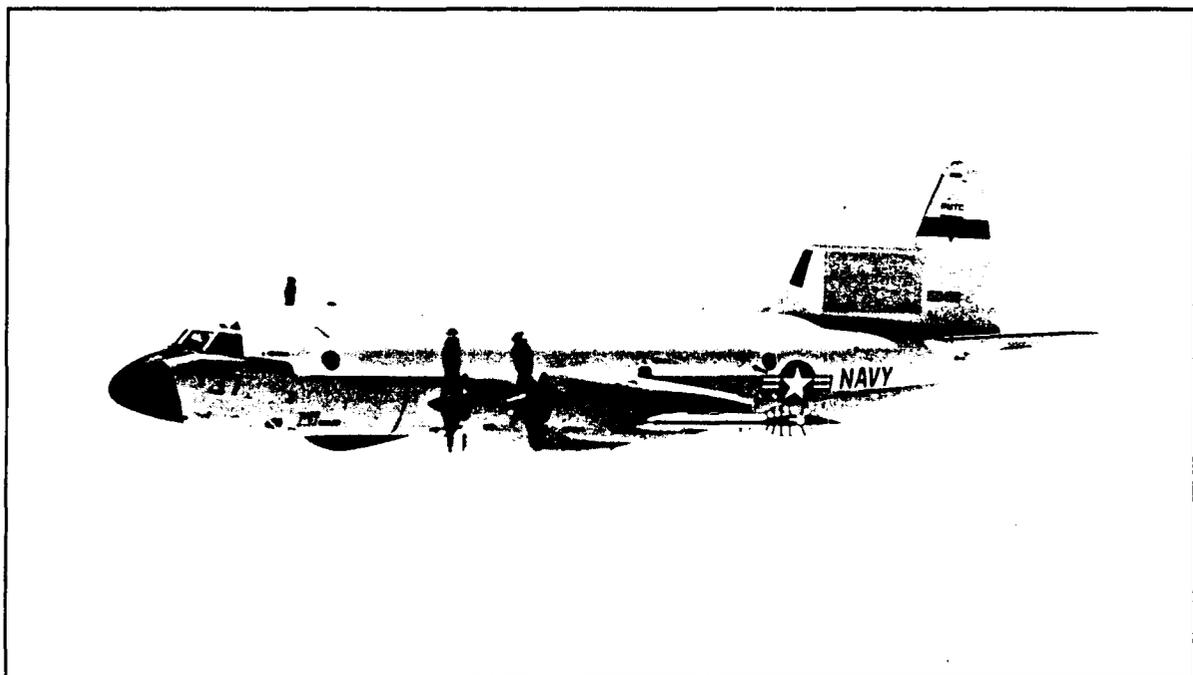
SONOBUOY MISSILE IMPACT LOCATION SYSTEM

The sonobuoy missile impact location system (SMILS) is an operational scoring system. The Pacific Missile Test Center and now the NAWCWPNS have successfully supported strategic missile operations for over nine years. The SMILS was designed to detect and to score the hydro-acoustic signals generated by the actual impact of a missile re-entry body upon the ocean surface. The SMILS has fully met its design goals of operation in the broad ocean areas entirely independent of the existence of nearby shore facilities, and of detection and scoring of multiple impact signals occurring over an interval of just a few seconds. While the SMILS was implemented using the well-established deep ocean transponder (DOT) and airborne anti-submarine warfare (ASW) technologies, it has remained evolutionary in nature with improvements and innovations being incorporated only after thorough testing and demonstration.

Airborne ASW technology contributes two of the three major data gathering subsystems of the SMILS. The first of these is the P-3 aircraft. The air-deployable sensor carrying sonobuoys form the second. Arrays of DOT units, mounted on the ocean bottom, provide the third major data acquisition subsystem. In a given impact area, the DOT array provides geodetic control for the free floating sonobuoy pattern. This pattern is sown onto the ocean surface by the RP-3As. Each sonobuoy in the pattern is an independent collection point for hydro-acoustic data and transmits its data over an individual RF link to the support aircraft where it is recorded on magnetic tape along with timing signals for subsequent analysis.

PHASED ARRAY TELEMETRY SYSTEM

The RP-3A's phased array telemetry system (ATS) includes a "billboard" antenna which has a 132° azimuth and 60° elevation beamwidth. The RP-3A needs only to position a missile anywhere within the 132° window to achieve signal acquisition in 0.2 seconds. The ATS has five independently steerable tracking beams. The beam redundancy reduces the risk of mechanical tracking failure as well as providing the capability to track up to five separate missiles simultaneously. The 132° tracking window of the ATS eliminates the aircraft's slower airspeed relative to missiles from being a factor. Adequate preflight planning in addition to proper aircraft positioning with respect to the 132° window and the missile's flight path easily offsets the speed advantage of the targets. This is due to the fact that a typical tactical mission contains enough turns to allow the RP-3A, flying at speeds up to 350 KTAS, to fly ahead of cruise missiles and, if necessary, vary its heading relative to the missiles to keep them within the 132° window. In effect the ATS tracks by keeping its target within a 132° window on the port side of the aircraft.



RP-3A aircraft configured with ATS antenna

TPS

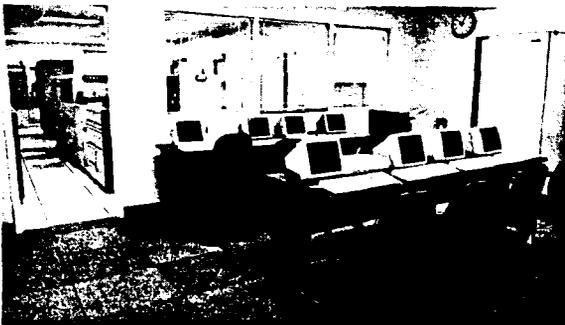
TELEMETRY PROCESSING SYSTEM

TFESS

The Telemetry Front End Subsystem (TFESS) is a highly programmable Aydin-Monitor S2000 capable of supporting the complex multiplexing structures of today's missile and aircraft testing. Each TFESS can handle 4 PCM, 2 PAM, 1 FM and 1 analog-to-digital input. All 8 of these input sources can be multiplexed into 1 data stream. IRIG Timing is inserted and time tagging is provided to 100 microsecond resolution.

TFESS CHARACTERISTICS:

- PCM INPUT BIT RATE - 10 Mbits/second
- PAM RATE - 250,000 channel/second
- FM - STANDARD IRIG CHANNELS
- DATA THROUGHPUT - 500,000 PARAMETERS/SECOND
- 4096 UNIQUE PARAMETERS/SOURCE
- DERIVED PARAMETER PROCESSING



TPSS

The Telemetry Processing Subsystem (TPSS) is the focal point for the setup of the TFESS and control of the operations. Processed data can be recorded to disk or digital tape as either frame oriented "all" data or uniquely ID tagged data. The TPSS utilizes 3 networks to transfer data: (1) the Telemetry Graphics Network to route processed telemetry data to any of the 4 Telemetry Display Subsystems, (2) the Telemetry Data Network in order to pass data to and from the Range Central Site Computers (CYBERS), and (3) the Local Communications Network to allow for the transfer of setup files and support data between the Software Development Subsystem and the host computers. The host computers are Digital Equipment Corporation VAX 6200s running the VMS operating system.

TPSS CHARACTERISTICS:

- NETWORKING FOR CONTROL AND DATA FLOW
- PHYSICAL DISCONNECTS FOR inter-TPS SECURITY CONTROL
- DIGITAL RECORDING:
 - TO DISK - 180,000 parameters/second
 - TO TAPE - 90,000 parameters/second
- HYPERCHANNEL TRANSFER TO REALTIME CYBERS - 100,000 parameters/second



TDSS

The Telemetry Display Subsystem (TDSS) provides both color graphics displays and stripchart data recording. Each display room contains 4 graphics workstations providing user definable displays. These displays are also available on remote monitors in each display room. The 8 digital stripchart recorders provide analog and discrete data recording. The hardcopy capability includes both monochrome copies during real time and color copies printed immediately following the operation. The Color Graphic Workstations are VAXSTATION 3200s and the stripcharts are ASTROMED 95000s. User capabilities include realtime recording via 10 minute "wrap file" and realtime user modifications to the graphics displays.

Each Graphic Workstation can have:

- 25 COLOR GRAPHICS DISPLAY PAGES PLUS
- 25 ALTERNATE DISPLAYS - GROUP DISK RESIDENT
- UP TO 40 PARAMETERS PER DISPLAY PAGE
- UPDATE RATE = 10/second
- LOCAL DISPLAY RECORDING
- RECALL WRAP HISTORY FILE = 10 MINUTES

The ASTROMED 95000s support:

- 8 STRIPCHART RECORDERS/DISPLAY ROOM
- PROGRAMMABLE TO: 8 ANALOG + 8 DISCRETES/RECORDER

SDS

The Software Development Subsystem (SDS) provides the necessary support for the TPS. Although there are 4 identical TPSs, only 1 SDS is required to support all 4 systems. The SDS is networked with all 4 host computers through the Local Communications Network. All setup files are prepared here, which includes assigning up to 4096 unique parameter names (ID's) per data source. Unique range user requirements can be satisfied through Government Developed Applications Software (GDAS), developed on the SDS. The SDS is a Digital Equipment Corporation VAX 6210 running the VMS operating system and supporting 4 interactive CRTs with one VAXSTATION 3100 Color Graphic Workstation.

TPS

TELEMETRY PROCESSING SYSTEM

SYSTEM OVERVIEW TPS

The Telemetry Processing System (TPS) consists of 4 identical Telemetry Processing Systems interconnected by several networks. The data is input to the Telemetry Front End Subsystem (TFESS) for decommutation, frame synchronization, engineering units conversion, data compression, etc. on up to 8 data sources. The data then is provided to the Telemetry Processing Subsystem (TPSS) whose host computers in turn route the data through 3 major networks. The processed data also can be recorded. The Telemetry Display Subsystem (TDSS) is the range user's interface to the TPS. High performance color graphics workstations, with user definable displays, digital stripchart recorders, as well as monochrome and color hardcopy capability are provided in each user room. The Software Development Subsystem (SDS) provides an off-line capability to support TPS as well as develop unique applications software to support user specific requirements.

A goal of the new Telemetry Processing System (TPS) is to provide a faster turn around time between operations. The multiple systems and automated setup for TPS have resulted in a 50% reduction in total turn around time for the TPS. The 4 separate TPSs permits setting up for multiple operations while the current one is being conducted. The flexibility also can accommodate a large multi-participant operation by utilizing any combination of 1 to 4 TFESSs, TPSSs and 1 to 4 TDSSs. The maximum capacity of all four systems is 32 input sources.

PROJECTS SUPPORTED

Weapon programs supported by TPS include the following major Navy missile systems:

- AMRAAM
- HARM
- HARPOON
- PHOENIX
- SIDEWINDER
- SLAM
- SPARROW
- STANDARD MISSILE
- TOMAHAWK
- TRIDENT

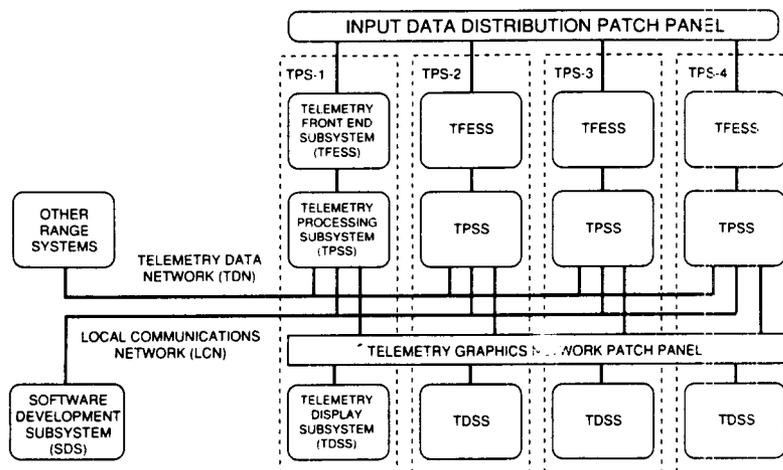
Several Air Force, Army and foreign national weapons programs are also supported with TPS as well as various launch platforms, for example F-14A, F-14D, F/A-18, F-15, and F-16, and targets such as BQM-74, BQM-34, and AQM-37.

Some projects have unique requirements for event driven time critical data processing during the realtime operation. These projects include AIM-7, AIM54C, AIM120, F/A-18, and SANDIA. Other projects have unique requirements for near-realtime tabouts of selected realtime parameters.

TPS provides support for:

- IRIG TELEMETRY FORMAT OF PCM, PAM, FM/FM
- DERIVED PARAMETER CALCULATIONS
- ENGINEERING UNIT CONVERSION
- EVENT DRIVEN TIME CRITICAL DATA PROCESSING
- NEAR REALTIME PRINTOUTS OF SELECTED PARAMETERS
- EMBEDDED TIME CALCULATIONS

TPS SYSTEM CONFIGURATION



COMMUNICATIONS

COMMUNICATIONS

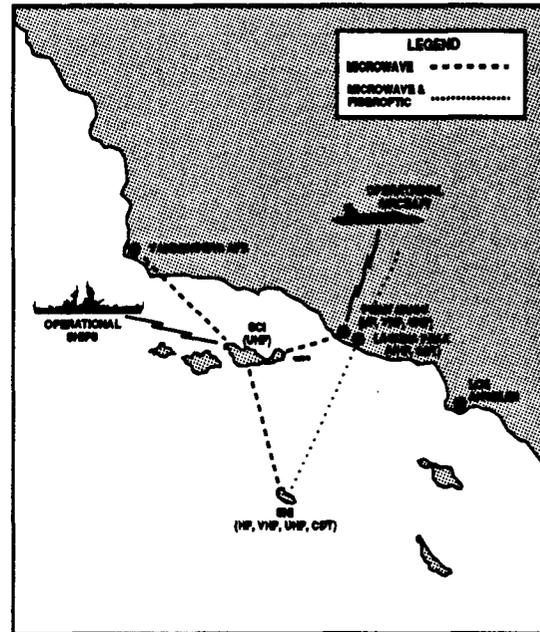
NAWCWPNS COMMUNICATIONS support test and evaluation of Naval weapons systems on the Sea Test Range involving the instrumentation of thousands of square miles of air and sea space. Safety is our number one priority. Knowing where the participants are and what they are doing at all times is made possible through integrated operations displays in the Operations Control Rooms (OCR). The return of position measurement, telemetry, and other sensor information to the OCR's, and the complex voice coordination among the hundreds of dedicated professional men and women involved is made possible through communications services provided by the Communications Systems Division.

NAWCWPNS COMMUNICATIONS Systems Division personnel, working at four major sites throughout the Sea Test Range provide prompt, reliable, error-free operational communications to the range and range users; maintenance and installation of communications equipment and systems; engineering and procurement of major new communications systems and improvements to our capability.

NAWCWPNS COMMUNICATIONS – home of the Navy's first encrypted microwave system – has a long history of innovation in communications. From our quadruple (space and frequency) diversity microwave systems in 1960 through the latest high-bit-rate "smart multiplexer" for telemetry data our engineers have pushed the state-of-the-art for the benefit of Sea Test Range customers.



Communications Headquarters



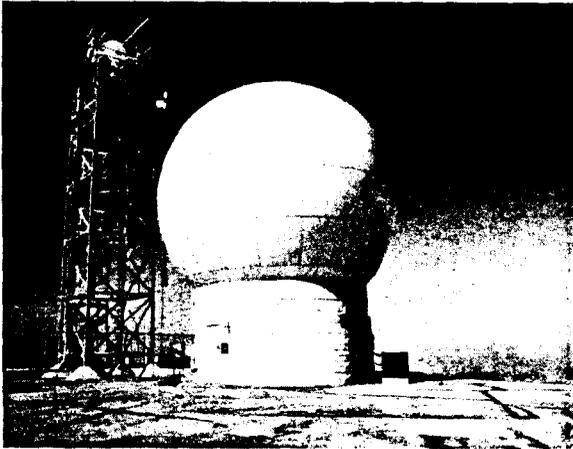
Typical Microwave Link

NAWCWPNS COMMUNICATIONS is advancing with the state-of-the-art. Our new fiber-optic communications undersea system (FOCUS) to our offshore facilities on San Nicolas Island will provide over one gigabit of repeaterless service, the equivalent of over 18,000 voice channels, using newly developed erbium doped optical amplifiers.

NAWCWPNS COMMUNICATIONS new digital voice conferencing system will provide our customers and personnel with 8000 lines of totally SECURE voice communications throughout the range – the only T&E facility so equipped.

NAWCWPNS COMMUNICATIONS capabilities are extensive and varied. Internal communications provide voice, data, video, and instrumentation data distribution throughout the Sea Test Range, as well as directly to Vandenberg Air Force Base, Edwards Air Force Base, and the Utah Test and Training Range. Numerous leased voice and data lines connect NAWCWPNS with various government and other activities throughout the world. For over three decades the west coast DoD test ranges have maintained extensive inter-range communications

COMMUNICATIONS



Communications Supports the Range

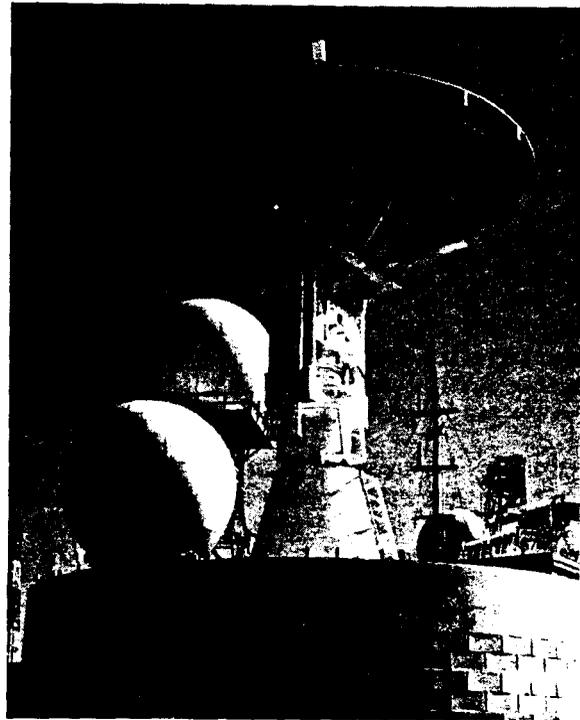
for the cooperative test and evaluation of long-range weapons systems such as B-1 and Tomahawk.

NAWCWPNS COMMUNICATIONS stands ready to provide our customers with multiple secure and non-secure voice and data communications circuits via HF, VHF, and UHF radio circuits, leased satellite circuits via our multiple on-site ground stations, and leased wire and fiber-optic circuits via ground interfaces with GTE, AT&T, and other commercial carriers.

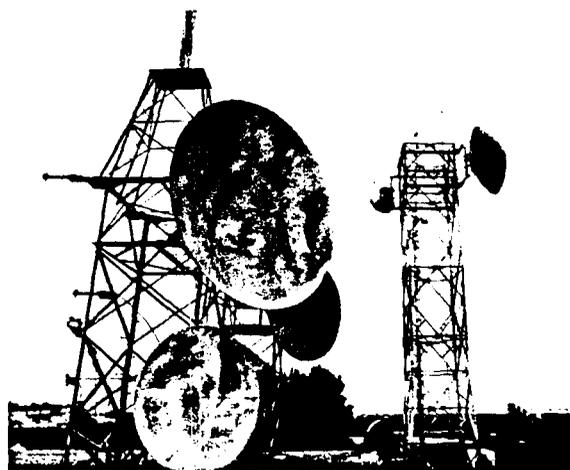
NAWCWPNS COMMUNICATIONS tactical military capabilities include all the above plus ANAWSC-3 UHF Fleetsatcom services including Trident TDMA and DAMA services, as well as our on-site Defense Data Network (DDN) Node and DISNET. UHF wideband secure voice (both baseband and diphase) and narrowband secure voice on HF and UHF are also available to meet your needs.

NAWCWPNS COMMUNICATIONS provide extensive command-control and destruct facilities for safe, controlled testing of unmanned targets, platforms, and missiles, including ballistic missile and other long-range vehicles. Airborne video systems are available for "cockpit piloting" of unmanned vehicles.

NAWCWPNS COMMUNICATIONS - home of the Navy Frequency Coordinator, Western U.S., can readily coordinate requests for frequency authorizations, both routine and experimental. Our "can-do" Test and Evaluation experienced personnel are familiar with telecommunications applications and can speak your language.



Radar, Telemetry, Command Control, and Communications Antennas on Laguna Peak



The Point Mugu Communications Hub

METRIC RADARS

DESCRIPTION

Metric Radars provide precise accurate tracking of participants in exercises on the Sea Range. The Range has seven AN/FPS-16 Radars (reference figure 1), three on San Nicolas Island (SNI) and four at Point Mugu.

The Air Force has two AN/FPS-16 Radars that also can cover the Sea Range. These radars are located at Vandenberg Air Force Base (VAFB) on Tranquillon Peak. This provides a capability to track nine objects on the Sea Range. Two additional single object tracking radars plus a Multiple Object Tracking Radar that can track ten objects are available at VAFB. These radars can cover objects above 30 thousand feet on the Sea Range and areas west of VAFB. Two additional radars are available at Point Pillar (top of Half Moon Bay) that can cover areas off the central California coast. Data from any four tracks from the VAFB radars may be sent to the Sea Range computer center where realtime and post operation data can be provided.

One radar on SNI and one radar at Point Mugu have three megawatt transmitters. These 'Super 16' radars are also equipped for doppler tracking. The other Sea Range radars have one megawatt transmitters.

TRANSPONDER

The metric radars can provide both 'skin' tracking, which is based on reflections from the tracked object, and 'beacon' tracking, which is based on returns from a transponder. Transponder based tracking provides greater accuracy because the location of the transponder antenna is at a known point on the object, whereas with 'skin' tracking the radar can actually track different parts of the object. Transponder tracking also provides longer ranges i.e., up to 32,000 nautical miles. Transponders commonly used have 400, 20, and five watts of transmitted power. Different frequencies and pulse codes can be used to differentiate tracked objects. Figure 2 shows the 400 watt transponder.



Figure 1. Metric Radar Site

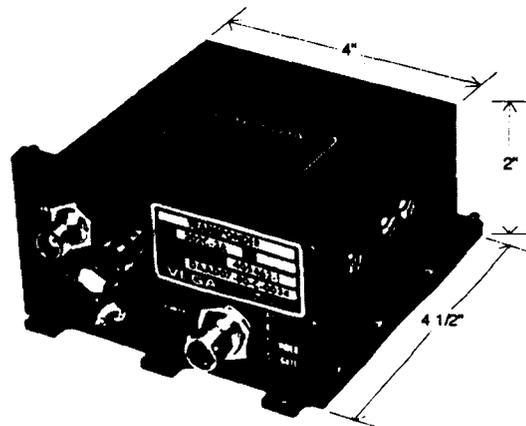


Figure 2. 400 Watt Transponder

CAPABILITIES

The AN/FPS-16 Radars provide .01 milliradian (20 arc seconds) angle accuracy and three yards range accuracy. As an example, for an object being tracked at a slant range of 30 nautical miles the accuracy of the Radars is

30 feet. This accuracy is only attained when the elevation angle of the radar antenna is above one degree. Use of multilateration between two radars can provide a post operation circular error probability of 400 feet at a range of 100 miles from the SNI. The radars can provide .03 meters/second velocity accuracy.

The radars can acquire objects that travel at an angular rate of up to 43 degrees/second relative to a radar and having a maximum range rate of 10,000 yards/second. Maximum angular acceleration is 58 degrees/ second/ second. Real-time data is output 20 times/second.

Each radar can skin track a one square meter cross section object out to 150 nautical miles. Either super sixteen radar can track the same object to about 450 nautical miles.

COVERAGE

Figure 3 shows the area covered by Radar 003004 (Point Mugu) at an altitude of 20,000 feet. Figure 4 shows coverage of 013003 (SNI) at an altitude of 25,000 feet. Such coverage maps can be provided for any site and altitude upon request to the Metric Systems Division.

APPLICATION

The metric radars are primarily used for precision tracking of objects. The metric radars can be used for positive skin track of objects being tested that cannot be modified to hold a transponder. Since the transponders used are small, they can provide minimally intrusive tracking for small objects.

FUTURE PLANS

A new ranger is being procured that will provide the capability to track two objects per radar provided the two objects are within the beam of the antenna. This could be used to track separations if the two objects travel away from or toward the tracking radar.

VAFB has a Multiple Object Tracking Radar (MOTR) that can track ten objects, each with the accuracy of an AN/FPS-16 Radar. This radar is presently located in a low area north of Tranquillon Peak. The Air Force plans to move this radar to Tranquillon Peak in 1994. After relocation it can provide coverage of both Air Force operations and many lower elevation Sea Range Operations.

Installation of a MOTR radar on San Nicolas Island would allow tracking of 40 additional objects in the outer Sea Range.

Since the MOTR radars use electronically scanned beams, they have a greater ability to acquire high speed objects. The VAFB MOTR radar will provide a considerable enhancement to the Sea Range capability when it is moved to the new site to cover both the Sea Range and VAFB launch complexes.

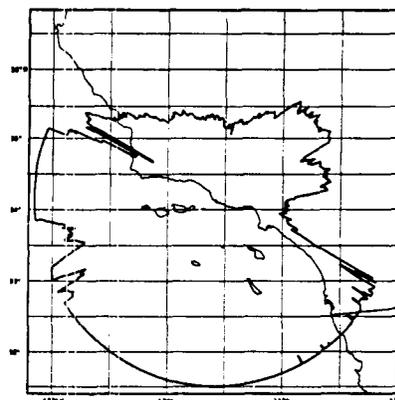


Figure 3. Area covered at 20,000 feet

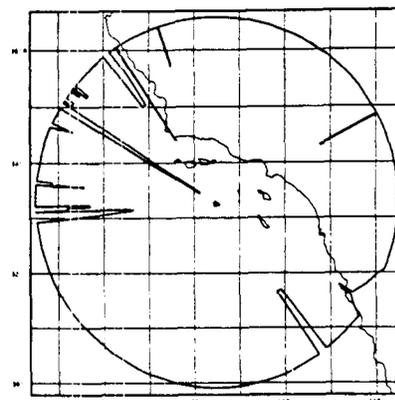


Figure 4. Area covered at 25,000 feet

TELEMETRY COLLECTION FACILITIES

GENERAL

The Telemetry (TM) Collection Facilities of the NAWCWPNS, Point Mugu are comprised of three general locations. These are the ground-based systems located at Point Mugu and at San Nicolas Island (SNI), and airborne systems which are described in the brochure titled *AIRBORNE TELEMETRY SYSTEM AIRCRAFT*. The ground-based TM Collection Facilities are equipped primarily for the reception and recording of TM data. Following reception, the TM data is transmitted over fiber optic cables to the Telemetry Data Center for realtime data analysis and display.* Throughout the entire process operational and physical security requirements are carefully enforced.

The Telemetry Collection Systems at Point Mugu and SNI were engineered and developed to provide efficient and reliable high quality support for the various users of the 36,000 square mile NAWCWPNS Sea Range at Point Mugu. These state-of-the-art TM systems are designed to support both tactical and strategic weapon systems and a wide range of operational scenarios. Examples of programs supported are TRIDENT, PEACEKEEPER, TOMAHAWK, HARPOON, SLAM, MS-2 STANDARD, AIM-7M, AIM-9R4, AIM-54C, AMRAAM, SRAM, F-14D, F-16ADF, F/A-18A, C-17A, B-1B, various surface and aerial targets, and the FLEET. The Sea Range has the capability of providing the FLEET with quick reaction weapon systems operational testing and simulation when required. Foreign programs are also supported such as the Japanese SSM-1, Norwegian PENGUIN and German AMRAAM integration testing. During numerous daily range operations various TM data sources are tracked which may originate from surface, underwater, airborne or space borne platforms. Many of these test operations involve very complex scenarios involving multiple missiles, launch vehicles and targets.

* See the brochure titled "Telemetry Processing System".

PT MUGU FACILITIES

The Point Mugu TM Collection Facility uses four thirty-two foot diameter GKR-11 and two twenty foot diameter GKR-13 antennas for primary operational support. The antennas operate in multiple modes and use a computer bus system to generate look angles for automatic acquisition and reacquisition using sensor inputs from other TM and RADAR antennas. Additional TM data is made available over microwave link and fiber optic cable from SNI, Vandenberg Air Force Base, Pillar Point, Edwards Air Force Base and NAWCWPNS, China Lake in realtime using analog and digital multiplexing. Best source selectors are used to select the best quality signal for use when TM signals are received from multiple sources. The TM receivers are arranged in four stations with twelve receivers each. They are generally operated in pairs using combiners to provide full polarization diversity. In this configuration, six FM data frequencies are available per station.

Ten fourteen-track analog tape recorders are available, arranged in five stations. The units operate up to 240 inches per second providing bandwidths up to 4MHz. Formatters are also available which will allow the tape recorders to record digital signals with data rates up to 35Mbits per second.

The set up and operation of the TM Collection Systems have been automated using computer controllers and electronic switches. The system allows for very fast and accurate configuration and reconfiguration of the TM equipment using stored operational set up configurations.



Pt. Mugu Facilities and GKR-11 Antennas

TELEMETRY COLLECTION FACILITIES

SNI TM COLLECTION FACILITY

The SNI TM Collection Facility uses two thirty foot diameter GKR-8A, one thirty foot diameter GKR-12, and two twenty foot diameter SKR-1 antennas for primary operational support. They operate in multiple modes and have a computer bus system to generate look angles for automatic acquisition and reacquisition.



Telemetry Collection Facility Instrumentation

The TM signals are sent in realtime by a microwave link and fiber optic cable to the Point Mugu TM Collection and Telemetry Processor System sites using analog and digital multiplexing, for recording, analysis and display.

TM receivers are arranged in four stations with twelve receivers each. They are generally operated in pairs with a combiner which provides full polarization diversity. This configuration provides for reception of six FM signals per receiver station.

A total of ten analog tape recorders is available at the main site. Six of these provide fourteen tracks of data using one inch tape. These operate at a maximum of 240 inches per second providing a maximum 4MHz bandwidth. Four of the recorders provide seven tracks of data using half inch tape. These operate at a maximum of 120 inches per second providing a 2MHz maximum bandwidth. Two more of the half inch model tape recorders are available in a remote instrumentation van located on the west end of SNI.

Formatters are available which provide a digital recording capability of up to 35Mbits per second. The set up and operation of the SNI TM Collection Systems are being automated in a similar manner to the TM Collection Systems located at Point Mugu. This will provide faster configuration and reconfiguration of the TM equipment for operational support. Automation will also provide a capability for very quick validation testing of operationally configured systems prior to support of a mission.

FUTURE TM COLLECTION SUPPORT

The TM Collection Facilities located at these sites are being maintained and updated to support future requirements. Periodic equipment additions, upgrades and modifications are performed as new user support requirements become known or anticipated. These periodic equipment upgrades will insure that the unique and outstanding TM collection capabilities located here will remain available to the TM community for the foreseeable future.



Laguna Peak Complex

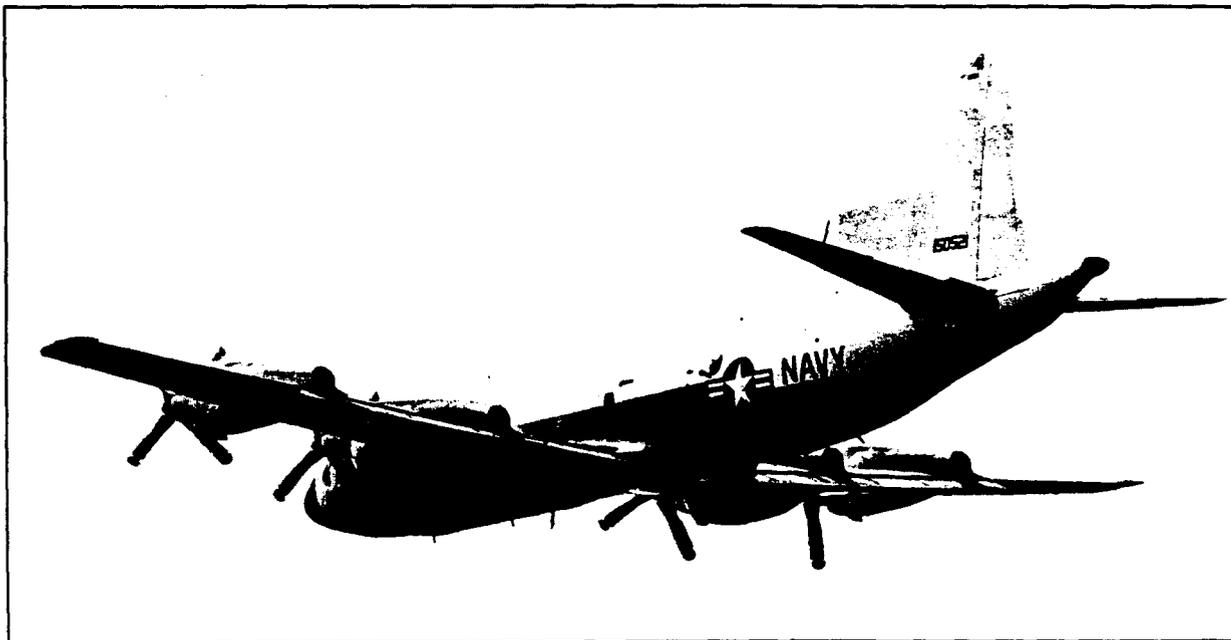
AIRBORNE TELEMETRY SYSTEM (ATS)

ATS OVERVIEW

The Airborne Telemetry System (ATS) aircraft consist of two extensively modified Navy RP-3A Orions which have unique state-of-the-art telemetry support capabilities. These ATS systems were developed to provide optimum airborne telemetry support for tactical and strategic operations conducted locally or off-range. The inherent capabilities of the P-3 aircraft make it an ideal platform for these missions which require a long on-station loitering capability in a marine environment. The ATS aircraft are based at NAWCWPNS, Point Mugu and are capable of providing telemetry support virtually anywhere in the world at established ranges, mobile or temporary ranges, or quick reaction support to the FLEET world-wide. The computer controlled, electronically steered beams enable the system to quickly switch between different telemetry sources providing an extremely flexible and capable system not available elsewhere in the world. The telemetry system was designed to provide support for a wide spectrum of missions including training, operational testing, and research and development operations.

GENERAL ATS ATTRIBUTES

- Phased array telemetry antenna (port side)
- Five S-band telemetry beams
- Computer-controlled receiving elements
- Wide tracking window
- Multiple search, acquisition and tracking modes
- Seven data receiver pairs
- Vertical and horizontal polarization combining
- Highest quality telemetry data
- Two analog 14-track magnetic tape recorders
- Telemetry retransmission equipment
- Telemetry data for range safety
- Flight termination system

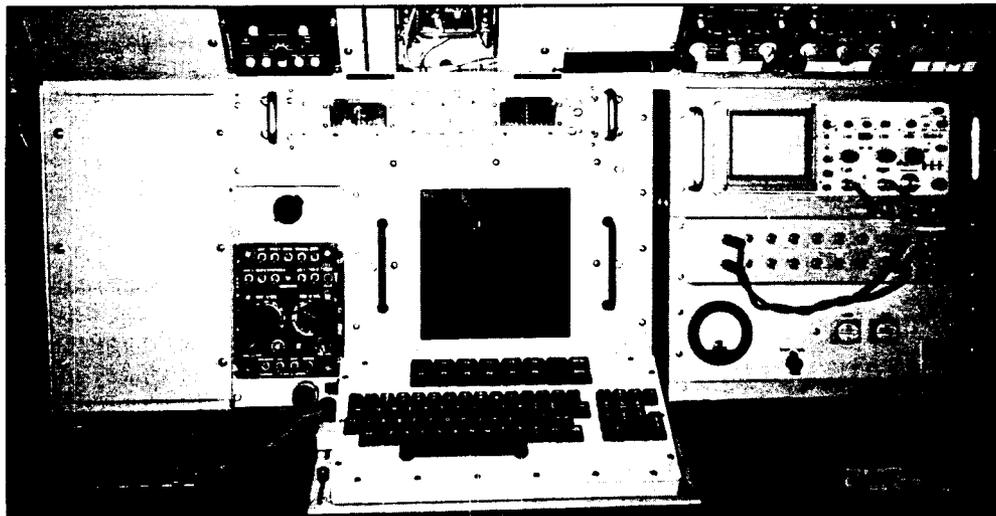


PROJECT & OFF-RANGE SUPPORT

- TOMAHAWK
- HARPOON
- AEGIS
- PEACEKEEPER
- TRIDENT
- FLEET STRATEGIC SUPPORT
- STARS
- Broad Ocean Areas (BOAS)
- PMRF
- Kwajalein
- Guam
- Patuxent River
- Puerto Rico
- Midway

FUTURE ATS SUPPORT

Due to the outstanding capabilities of the ATS aircraft and their extensive current use and success for both tactical and strategic operations they are truly a unique national asset. Plans are in progress to upgrade and improve the ATS aircraft as necessary to support new anticipated future user requirements. Through these future up-grades and modifications the ATS aircraft will remain unique and effective.



ATS AIRCRAFT TECHNICAL CAPABILITIES

■ PHASED ARRAY ANTENNA SYSTEM (Port-side only)

Type	Phase Shifter Fed Array
Frequency Coverage	2200 to 2390 MHz
Polarization	Dual Linear Orthogonal
Simultaneous Beams	5
Figure of Merit (G/T)	8.0 Db/K
Azimuth Coverage	±60 Degrees
Elevation Coverage	+40 to -20 Degrees
Acquisition/Tracking Range	5 to 125 Miles (P dependent)

■ TELEMETRY RETRANSMISSION SYSTEM

Number of Downlink Channels	6 L-Band frequencies
Bandwidth	5 MHz per Channel
Downlink Antenna Coverage	Omnidirectional
Polarization	Linear
Transmitter Output Power	6 to 10 Watts per Channel

■ RECEIVER/RECORD SYSTEM

Receiver type (14 ea)	Microdyne 1200 MRA
Frequency Range	2200 to 2400 MHz
IF Bandwidth	100 KHz to 6 MHz
Demodulators	FM, PM, BPSK and AM
Combiner Type (7 ea)	Microdyne 3200 PC
Type of Combining	Polarization, Optimal Ratio
Recorder Type (2 ea)	Ampex AR-1700, 14-track, WB II FM
Bandwidth	2 MHz at 120 ips max
Frequency Division Multiplexer	1 PBW and 13 CBW IRIG VCO's
Time Code Outputs	IRIG A, B, G and H

■ REALTIME PROCESSING/DISPLAY SYSTEM

Telemetry Data Processor	Acroamatics Dual Stream
Modulation	PCM and PAM
Strip Chart Recorders	Western Graphtec WR-3502
Number of Displayed Parameters	8 Each Chart Recorder
Bit Synchronizers (2 ea)	DSI 7700 (2 ea)
Decryption (2 ea)	KGR-66

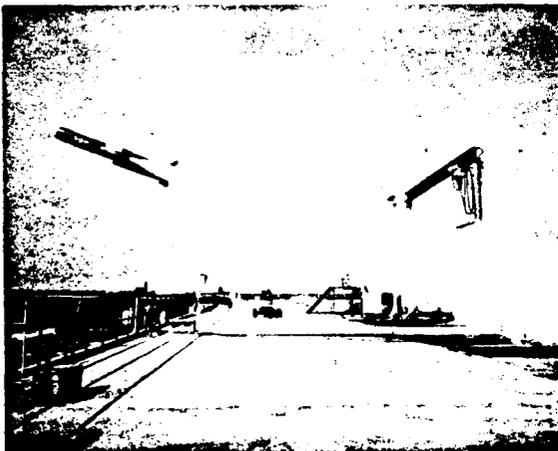
LAUNCH FACILITIES

GROUND LAUNCH AND ORDNANCE CAPABILITIES

Launching and ordnance capabilities consist of the launch pads and blockhouses at Point Mugu; and the launch pads, blockhouses, ordnance assembly buildings, and magazines at San Nicolas Island.

BUILDING 55 LAUNCH COMPLEX AND BLOCKHOUSE

The Building 55 Complex is the major launch complex at Point Mugu, consisting of eight interconnected launch pads (five 20' x 30' and three 20' x 54') located on the reinforced concrete roof of Building 55. The total size of Building 55 is 125' x 346'. Four of the launch pads are dedicated to the BQM-34 target, each equipped with a special rail-type launcher and over head hoist. The other four pads are dedicated to the BQM-74 target and are equipped with BQM-74 launchers. In Building 55, under the launch pads, are four control rooms, a launch distribution center, mechanical and electrical support shops, office spaces, restrooms, a cable terminal room, and storage rooms. Two GOW-5A Launch Sequencers service all eight pads from a single consolidated launch control room. A Hazard Area Control System, which



BQM-74 Target Launch From Pt. Mugu

consists of nine railroad crossing type gates to prevent inadvertent entry into the hazard area during an operation, is available in the control room. Two other control rooms are configured for target control, and the fourth control room is dedicated to a special launch program. Each control room space is 14' x 25' and is equipped with blast resistant windows, water deluge and fire monitor control stations, a Hazard Area Surveillance CCTV monitoring system, and various electronic equipment. Personnel in these control rooms are protected by 24" of reinforced concrete plus a 1/2" thick steel plate.



BQM-34 Target Launch From Pt. Mugu

BRAVO LAUNCH COMPLEX AND BLOCKHOUSE

The BRAVO Complex at Point Mugu consists of a blockhouse and launch pad which are unoccupied and available for installation of range user owned launch support equipment. The launch pad is a reinforced 100' x 100' concrete pad. The blockhouse is equipped with blast resistant windows and mirrors. The approximately regular floor plan of 13' x 27' will comfortably house launch equipment and 6 personnel. The blockhouse is constructed of 18" reinforced concrete walls with earth fill and an overhead of 24" of reinforced concrete with a 1/2" thick steel plate and earth fill. The launch complex has been used in the past to launch the TOMAHAWK, HARPOON, and Japanese Defense Force SSM-1 missiles.

CHARLIE LAUNCH COMPLEX AND BLOCKHOUSE

The CHARLIE Complex at Point Mugu consists of a blockhouse with a GOW-5 Launch Sequencer and threepads, one a 100' x 127' asphaltic concrete apron and two 51' x 58' concrete pads. A universal rail-type launcher, remotely trainable, with a capacity of 4000 pounds, is located on the largest pad. This launcher was formerly used to launch meteorological rockets and the surface launched version of the AMRAAM missile. The other pads are currently unoccupied. The blockhouse, constructed of reinforced concrete, can control launches from all three pads. The blockhouse is equipped with a Hazard Area Surveillance CCTV System, a Hazard Area Control System, and various electronic equipment. It consists of a control room, an anteroom, and power room. The control room is approximately rectangular at 15' x 22' with an anteroom of about 275 square feet. These rooms can accommodate 10 personnel. The blockhouse is constructed of 18" reinforced concrete sides and roof in the control area, and 6" reinforced concrete structuring in the anteroom area. In addition, there is a minimum of three feet of earth fill over both rooms with natural earth slopes on the sides.

The other two pads are situated on a hill overlooking the beach and have become a popular choice for non launch radar tracking operations who set up their mobile units and practice tracking targets of opportunity.



MGM-8 VANDAL Launch From San Nicolas Island

ALPHA LAUNCH COMPLEX AND BLOCKHOUSE, SAN NICOLAS ISLAND

The ALPHA Complex at San Nicolas Island is the second largest launch facility at the NAWC. It was developed to provide a launch complex for the larger vehicles being tested, where Range Safety constraints preclude mainland launches. It consists of a dual control blockhouse with two GOW-3 Launch Sequencers, and six launch pads. A dual TALOS launcher is installed on two pads for the current MGM-8 VANDAL supersonic target program. The blockhouse is a reinforced concrete building approximately 51' x 57'. Personnel in the blockhouse are protected on the sides by 18" of reinforced concrete and overhead by a 5/8" thick steel plate covered by 18" of reinforced concrete. Two blast-resistant windows provide line-of-sight viewing of the launch pads. One pad can be equipped with BQM-74 launchers, when required, and become capable of launching the BQM-74 target. The other three launch pads are unoccupied and are available for installation of range user launch support equipment.

BUILDING 807 LAUNCH COMPLEX AND BLOCKHOUSE, SAN NICOLAS ISLAND

The Building 807 Complex at San Nicolas Island consists of a blockhouse and three concrete pads each of which were correspondingly used to launch the TOMAHAWK, RAM, and NASAMS (surface launched AMRAAM) missiles. Range users must furnish all launch control and support equipment at this site.

ORDNANCE ASSEMBLY BUILDINGS, SAN NICOLAS ISLAND

The two Ordnance Assembly Buildings (OABs) at San Nicolas Island are used primarily for assembly, disassembly, and checkout of various live or inert missiles, targets, and ordnance items. The OABs are 30' x 65' with 7-1/2-ton pneumatic hoists, and have conductive, reinforced concrete floors, reinforced concrete or cinder block/transite walls, frangible roofs, and fire sprinkler systems.

MAGAZINES, SAN NICOLAS ISLAND

All three magazines at San Nicolas Island are special type steel-arch, earth-covered and unbarricaded. Two are 25' x 40', the other is 10' x 14'. The ordnance facilities are used to store all explosive materials over a given size or net explosive weight. Rocket motors, boosters, live warheads, and fuzes are stored in these facilities.

OCRs

OPERATIONS CONTROL ROOMS

BACKGROUND

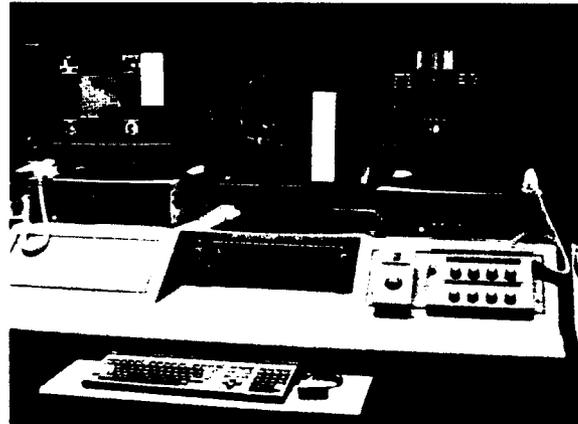
The Naval Air Warfare Center Weapons Division at Point Mugu has three Operations Control Rooms (OCRs); ALPHA, BRAVO, and DELTA. OCRs are the command control centers for all weapons systems tests conducted at the Sea Test Range. Each room provides the necessary displays and data for personnel to conduct operations in a safe and secure environment. Data are provided from all available instrumentation in a format that allows operations conductors, range operations supervisors, range safety engineers, test engineers, and project personnel to make critical real-time decisions.

Each control room is equipped with multiple high performance systems that provide control and display of vehicle and weapons system data. These systems include the General Range Intelligent Display System (GRIDS), the Naval Tactical Data System (NTDS), and the Integrated Target Control System (ITCS). The control rooms are also equipped with a red/black communications system, Command Destruct Consoles, Large Screen Displays (LSDs), color hard copy units, and video/audio recorders

CONTROL ROOM DELTA



GRIDS CONSOLE



CONTROL ROOM CAPABILITIES

GENERAL

- Real-time & Playback Operations
- Unclassified/Confidential/Secret
- High Resolution Displays
- High Performance CPU & Graphics
- Video Windowing System
- Satellite Weather Information
- Send/Receive External Video
- Fiber-Optic Distribution System
- Red and Black UHF/VHF/HF Comm.

DISPLAYS

- Range Maps
- Graphs
- DROs, Meters, Dials
- Gauges, Compasses
- Scrolled & Non-Scrolled
- Tabular
- Relative Position
- Glideslope
- Pitch, Roll, Blank

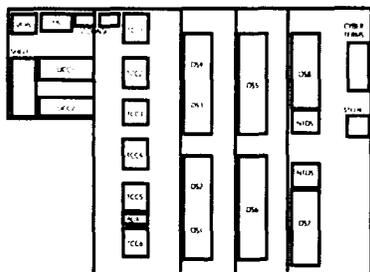
DATA SOURCES

- Radar
- Telemetry
- NTDS
- ITCS
- EATS
- Cyber
- External Video

CONTROL ROOM ASSETS

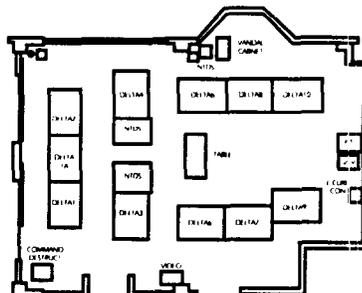
ALPHA (upgraded IOC FY-95)	DELTA	BRAVO
<ul style="list-style-type: none"> - 12 GRIDS Workstations - 2 Large Screen Displays - 4 SVHS/VHS Video Recorders - 4 Color Hard Copy Units - 2 NTDS Consoles - 6 ITCS Target Control Consoles - 2 Universal Control Consoles - 1 Auxiliary Control Console - 8 Red, 250 Black Comm. Ports - 3 Serial Data Controllers - 2 Voice Recorders - 2 STU-III Phones 	<ul style="list-style-type: none"> - 11 GRIDS Workstations - 2 Large Screen Displays - 4 SVHS/VHS Video Recorders - 3 Color Hard Copy Units - 2 NTDS Consoles - 4 Red, 152 Black Comm. Ports - 4 Serial Data Controllers - 2 Voice Recorders - 5 STU-III Phones 	<ul style="list-style-type: none"> - 10 GRIDS Workstation - 2 Large Screen Displays - 4 SVHS/VHS Video Recorders - 3 Color Hard Copy Units - 2 NTDS Consoles - 2 ITCS Target Control Consoles - 4 Red, 175 Black Comm. Ports - 2 Serial Data Controllers - 1 Voice Recorder - 5 STU-III Phones

ALPHA (49'x38')



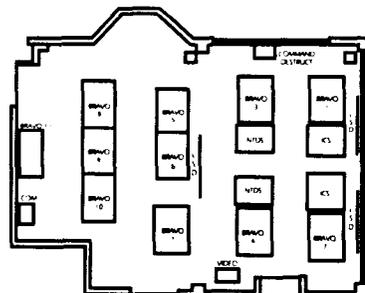
50 Operation Positions
36 VIP Positions

DELTA (42'x31')



24 Operation Positions
10 VIP Positions

BRAVO (41'x31')



26 Operation Positions
10 VIP Positions

MAJOR SYSTEMS

GRIDS - The General Range Intelligent Display System (GRIDS) consists of a distributed set of real-time computer graphics workstations used for the control of range operations. Each workstation provides interactive color graphics displays of range instrumentation systems data including radar, telemetry, NTDS, ITCS, EATS, and Cyber.

ITCS - The Integrated Target Control System (ITCS) is used for remotely controlling subscale and fullscale target vehicles (airborne and seaborne). The ITCS also tracks the targets and process telemetry data received from them. Any combinations of six target types can be controlled and flown simultaneously.

NTDS - The Naval Tactical Data System (NTDS) is a combat direction system that provides rapid processing, evaluation, and correlation of tactical data and coordination of Fleet air defense, anti-submarine warfare, and surface defense operations. The system is used in the control rooms primarily for range safety and surveillance.

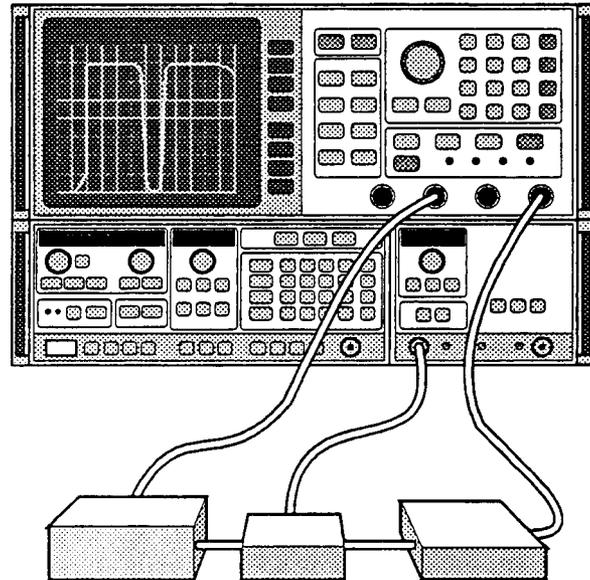
FUTURE DIRECTIONS

The Operations Control Rooms are continually being modernized and upgraded to ensure a state-of-the-art environment for personnel to conduct safe and secure operations. Many enhancements to the GRIDS system are currently being implemented including 3-D color map displays, scenario planning, and debriefing capabilities. The new Advanced Combat Direction System (ACDS) will replace the NTDS system. All three control rooms are scheduled for conversion to strong rooms for increased security. The operations control rooms are operated and maintained by an engineering staff dedicated to implementing the requirements of our Sea Test Range customers and control room users. Requests for new capabilities are continuously being accepted and executed. This ongoing process of improvement and modernization ensures that we maintain state-of-the-art control rooms.

NAVY CALIBRATION LABORATORY

INTRODUCTION

All Test, Measurement and Diagnostic Equipment (TMDE) used for quantitative measurement must be periodically calibrated to be within specified accuracy limits required by supported weapons systems and equipment. The Metrology Division at Point Mugu is responsible for calibration of all on site TMDE. In accordance with the Navy's Metrology and Calibration (METCAL) program. Calibration is performed by comparison of a measurement system or device of unverified accuracy to a measurement system or device of known and greater accuracy to detect and correct any variation from required performance specifications.



Typical microwave test set-up using a network analyzer and sweep oscillator together with rigid coax for voltage standing wave ratio measurements.

SERVICES

The Metrology Division provides calibration of all TMDE that is directly traceable to the National Institute of Standard Technology (NIST) in Boulder, Colorado. We offer pick-up and delivery service for all government-owned equipment. We have several contracts with equipment manufacturers for the repair of government-owned TMDE. We provide a five-day turnaround time for all equipment inducted into our laboratory whether it has come in for calibration or off-base repair. We have a large inventory of government-excessed equipment obtained through the screening of Defense Reutilization Management Office (DRMO) listings. Our inventory is updated daily based on customers' requirements. This equipment is cleaned, calibrated, and redistributed to activities requesting it throughout the world, as well as locally.

FACILITIES

The Metrology Division occupies 22,580 square feet of operational floorspace within the Range Operations complex. It owns more than 20 million dollars of state-of-the-art standards used in the calibration of government-owned equipment. The Metrology Division houses more than 20,000 manufactures' manuals, as well as all Navy-approved calibration procedures used in the calibration of equipment at NAWCWPNS.

PERSONNEL

To ensure that quality measurements are maintained, all calibration technicians assigned to our activity must attend at least one of the Navy-approved calibration training programs. The Metrology Division currently employs thirteen technicians and eight engineers as well as support personnel. Our engineering staff provides assistance in the calibration of TMDE as well as in the development of new calibration procedures and the automation of existing ones.

CAPABILITIES

The diversity of operations at Point Mugu requires that the Metrology Center maintains capabilities in numerous calibration disciplines. The division has proficiency in the following areas of metrology:

DC and Low Frequency

Parameter	Parameter Range	Uncertainty Range
DC Voltage	0 to 30,000 V	1 ppm to 0.02%
DC Current	0 to 300 A	0.005 to 0.02%
AC Voltage	0.5 to 1000 V 10 Hz to 100 MHz	0.003 to 0.02%
AC Current	1 uA to 100A 0.01 to 50 kHz	0.003 to 0.04%
Resistance	0.01 ohm to 100 Mohm 0.1 to 10 Gohm	5 ppm to 0.02% 1%
Phase	0 to 360 deg 0.002 to 200 kHz	2 to 300 arc-sec
Power	0 to 50 kW 0.05 to 1 kHz	0.02%
Inductance	50 uH to 10 H 0.1 to 1 kHz	0.1%
Capacitance	0.01 pF to 1 F	0.01 to 1%
Frequency	0.1, 1, 5, 10 MHz	4/10 ¹²

Physical

Mass	1 to 30 mg	0.05 to 1.4%
	0.05 to 5 g	0.001 to 0.03%
	10 g to 50 kg	7.5 to 10 ppm
Force	10,000 to 30,000 lbf	0.02 to 0.05%
	2g to 10g	3 to 4%
Acceleration	0.01 to 20 kHz	
	0 to 110 in Hg	0.003% read + 0.0003 in Hg
Pressure	8 to 40,000 psi	0.007 to 0.009%
	-38 to 405 C	0.05 C
Temperature	0 to 1000 C	1.5 to 3 C

RF and Microwave

Power	-30 to +57 dBm	1.2 to 10%
Attenuation	0 to 100 dB	0.02 to 2 dB
Impedance (Coax)	0.045 to 26.5 GHz	
Magnitude	0 to 0.35 (Mag)	0.005 to 0.04 (Mag)
Phase	0 to 180 deg	1 to 10 deg
Impedance (WG)	7.05 to 18 GHz	
Magnitude	0 to 0.35	0.01

Miscellaneous

Black Body Radiation	10 to 80 C	0.15 to 0.5 C
	200 to 1100 C	2.5 to 5 C
Spectrophotometry	Transm ssion	3200 to 3600 nm
		1%
Sound	50 Hz to 2 kHz	0.2 to 2 dB
Optical Alignment	0 to 360 deg	1 arc-sec

FUTURE DIRECTION

In an effort to reduce cost and increase efficiency, the Metrology Division is developing automated test stations for the calibration of government-owned TMDE. These stations will allow us to provide the customer with detailed calibration reports. Several new areas of capability are currently being investigated, some of which include the development of fiber-optic and flow measurements.

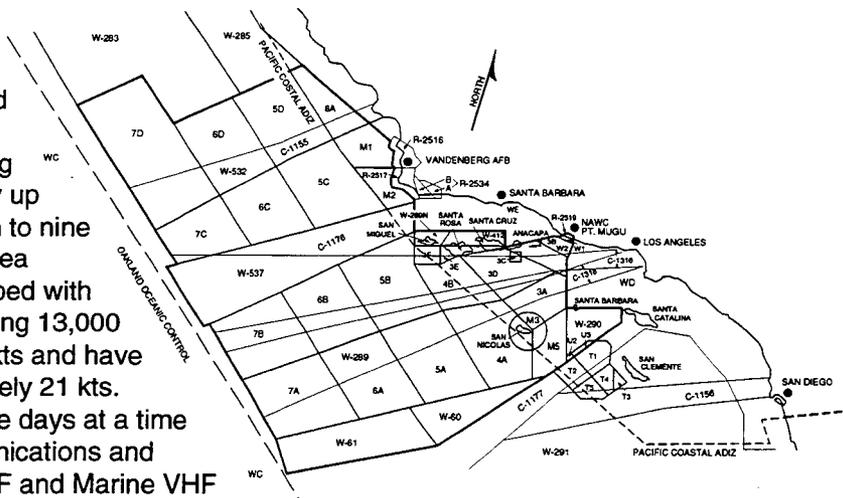
SURFACE CRAFT DIVISION

DESCRIPTION

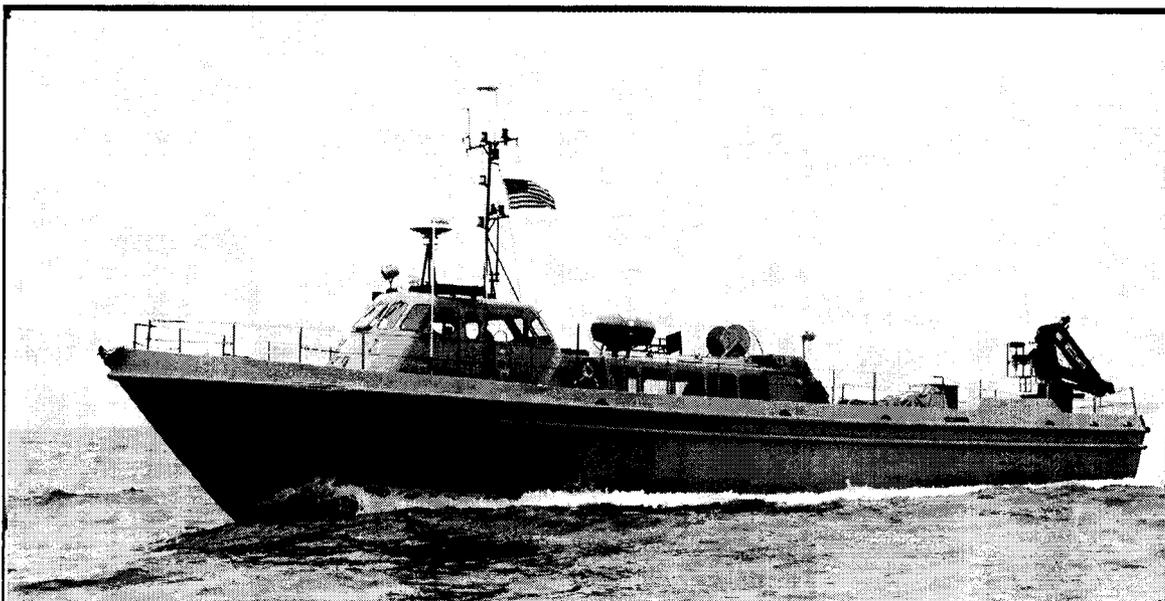
The Surface Craft Division provides at-sea support for all Sea Range users. This support includes surface target escort and recovery, aerial target recovery, range clearance, buoy deployment and recovery, radar reflectors, dive platform services and passenger and logistics support for the off-shore islands.

CAPABILITIES

Services are provided by four 85', 30-ton Aviation Rescue Vessels and one former Coast Guard 82', 35-ton Patrol Boat. Normal rotation keeps four boats in the water and available to support range users, while one boat is in drydock being overhauled. The boats can carry up to 25 people, including the seven to nine person crew, depending on the sea conditions. The boats are equipped with HAIB Sea Cranes, capable of lifting 13,000 lbs. The boats can cruise at 14 kts and have a maximum speed of approximately 21 kts. They can stay at sea for up to five days at a time in the Sea Range. Their communications and positioning capabilities include HF and Marine VHF satellite navigation systems and LORAN "C".



At-sea support in the range areas is provided to all range users by various surface craft, such as the one pictured below, which are instrumented for all types of specialized uses that are required during complex test and test range conditions.



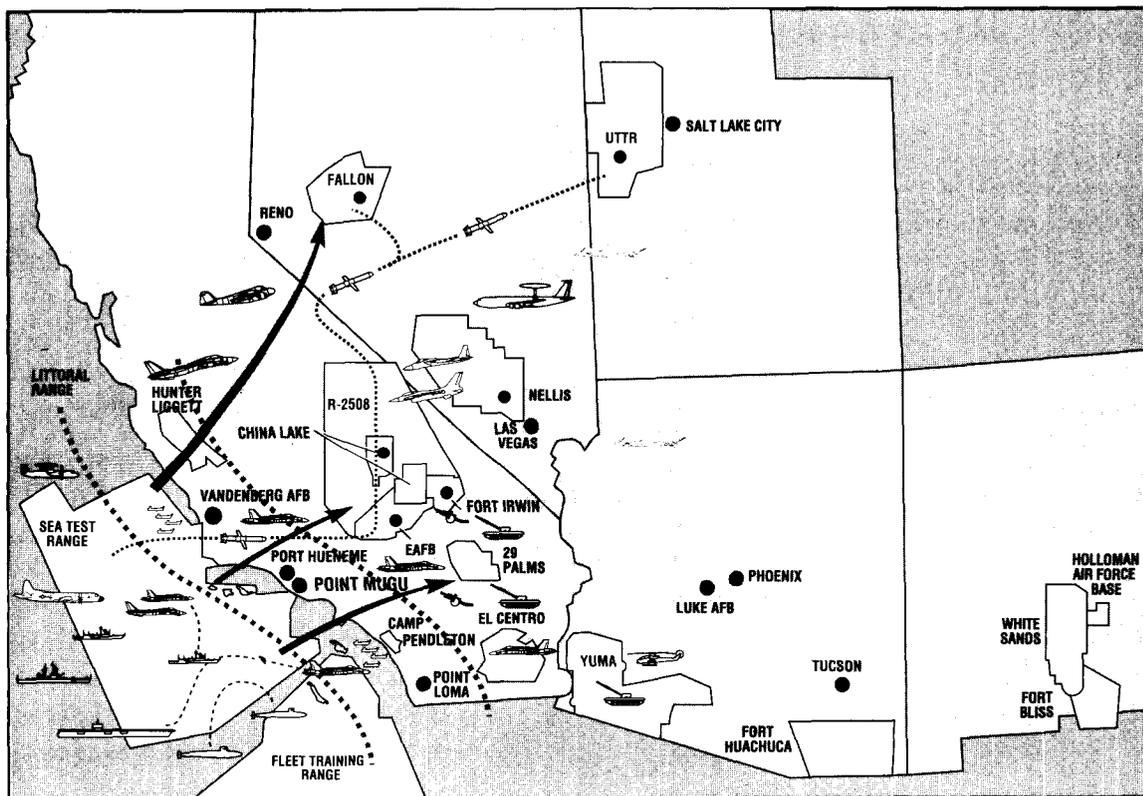
BITE*

Recent international conflicts involving the U.S. have strengthened emphasis on the requirement for testing and training in a joint-service, interoperable environment. Recent DOD policy revisions have directed that systems under development undergo testing in these complex environments.

Since the test ranges are common ground for supporting such requirements, they are also the logical place for the solution of such needs. The test ranges must support many different users with their test geometries, test instrumentation suites, threat environments, test schedules, etc. Test ranges are also often used to conduct training, particularly complex life fire scenarios.

A concept called Battle Management Interoperability Test and Evaluation/Training Exercise, has been developed and implemented at the Naval Air Warfare Center Weapons Division (NAWCWPNS) Sea Range. BITE offers a low-cost option which provides continuing periodic opportunities to immerse combat and weapons system and personnel into realistic joint warfare environments without significant increases in costs.

The Fleet uses the range to conduct most training exercises where firings are involved. About once a month, one or more ships come to the range to conduct their intermediate training exercises. Prior to BITE, these



Battle Management Interoperability Center (BMIC) provides middle ground arena between the laboratory and Fleet environments, which allows a flexible mix of laboratory control and operational dynamics.

**Battle Management Interoperability Test and Evaluation/Battle Management Interoperability Training Exercise.*

exercises typically involved several missiles being fired at one or two targets. Surface gunnery against a target hulk and tracking operations against manned aircraft were often included. Using these ship training exercises as a foundation, the BITE planning team expands the exercises to add Navy, Marine and Air Force assets which are incorporated as strike missions, manned-raids, and electronic warfare testing. Of particular importance is the C³I battle management aspect coupled to the live missile firing events.

The major innovation involved in BITE is that Range, acting as a requirements network, links up various users and their individual test and training requirements into single evolutions which greatly enhance the Fleet ships' training and accomplish test and training objectives of other users.

The evolution is staged over a four- to ten-hour period with various raids and attacks by air-surface threats, simultaneous warfare (anti-air and anti-surface) engagements, force projection including strike, mining, and bombing, and recently, carrier air operations which included airwing strikes into Electronic Combat and North ranges of China Lake.

A total of 31 BITES have been conducted successfully over the 38-month period since the first BITE. Each evolution was different although nearly all involved Navy ships and aircraft and Air Force aircraft. All have addressed anti-air and anti-surface warfare training requirements for the participants.

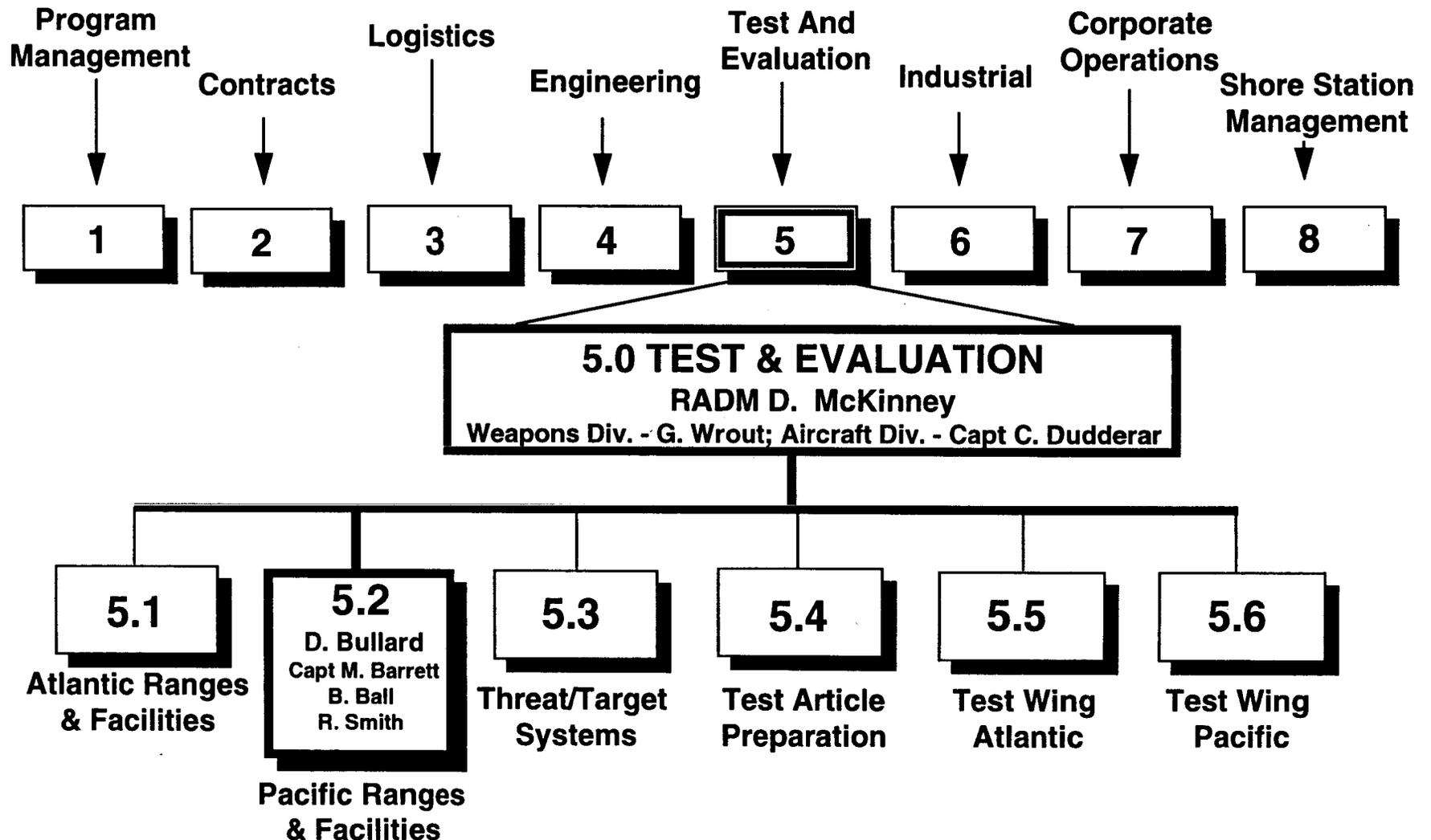
The conduct of exercises with data collection by range instrumentation provides for weapons and tactics effectiveness evaluation in a well defined environment. All aspects of force and unit training are brought together in one series of events during a relatively short time period. The cost effectiveness and return from the effort expended for exercises is very high.

The ultimate goal is to be able to provide a capability to support major test and training events covering joint military operations to a theater level including: littoral warfare, joint air defense, joint land warfare, joint sea warfare, theater missile defense, and joint special operations.

Through this approach, DOD will be able to meet the increasing challenges of testing and training in an even more diverse mission requirements world without major investments in the test and training infrastructure.

NAVAL AVIATION SYSTEMS TEAM

A COMPETENCY ALIGNED ORGANIZATION





LES FARRINGTON



Issue Alert

Public Affairs Office, Code C0803 (619) 939-3511
Naval Air Warfare Center Weapons Division
Naval Air Weapons Station, China Lake, CA 93555-6001

10 May 1995

Value of Point Mugu to Navy remains high

From: RADM Dana B. McKinney, Commander, NAWCWPNS

Now that the Base Realignment and Closure Commission has voted to add the Point Mugu site for closure or realignment consideration, our task will be to show the commissioners the value of the site and the necessity of continued operation of the range and all of our other critical facilities. This will be an "All Hands" effort, with members from both the Point Mugu and China Lake sites working hand-in-hand to ensure the continued viability of NAWCWPNS as we know it today.

The Point Mugu site of the Naval Air Warfare Center Weapons Division was not a part of the Department of the Navy's (DoN) or Department of Defense (DoD) recommendations for closure because of the high military value of the site and the associated sea range. Nothing has happened to change the Navy's position that Point Mugu should remain open as a vital part of the Navy's T&E infrastructure.

-more-

Issue Alert 10 May 1995, P-2

I would remind the public, and the NAWCWPNS work force, that even though Point Mugu has been added for consideration, there are still many steps to take before any base is closed or realigned. I am confident that, in the end, the BRAC commissioners will see and understand the reasons for keeping the Point Mugu site open.

The BRAC process is consistent with other ongoing initiatives to ensure that the Department of the Navy is able to fulfill its roles and missions in the 21st century. This process is difficult, but necessary for the Navy's long term efforts to provide the best national defense within budget constraints.

I ask all of you to pull together, take on this challenge and demonstrate the qualities of professionalism and dedication to excellence which have made NAWCWPNS what it is today.

-end-



Area Information Package

Naval Air Warfare Center Weapons Division
Protocol Office, Code 08AE00E
Point Mugu, California 93042-5001
Phone: (805) 989-8672/7532
DSN: 351-8672/7532
FAX: (805)989-4358

REGIONAL SHOPPING CENTERS

Buenaventura Mall

363 S. Mills Rd.
Ventura, Ca. 93003
642-5530

Major stores include The Broadway, JC Penney, plus 90 other shops and restaurants.

Centerpoint Mall

2655 Saviers Rd.
Oxnard, Ca. 93033
487-1142

This indoor shopping complex features Mervyn's and 44 other shops and restaurants.

Esplanade Shopping Center

195 Esplanade Dr.
Oxnard, Ca. 93030
485-1146

Major stores include Sears, Robinson's May Company, and 80 other stores and restaurants.

The Oaks Shopping Mall

225 West Hillcrest Drive
Thousand Oaks, Ca. 91360
497-4636

Indoor shopping mall which includes Bullocks, JC Penney, Robinson's May Company, and 40 other stores and restaurants.

HOSPITALS

Community Memorial Hospital

147 N. Brent St.
Ventura, Ca. 93003
652-5011

Pleasant Valley Hospital

2309 Antonio Ave.
Camarillo, Ca. 93010
484-2831

St. John's Regional Medical Center

1600 N. Rose Ave.
Oxnard, Ca. 93030
988-2500

Ventura County Medical Center
3291 Loma Vista Rd.
Ventura, Ca. 93003
652-6000

PUBLIC LIBRARIES

Camarillo
3100 Ponderosa Dr.
Camarillo, Ca. 93010
482-1952

Oxnard
251 South "A" St.
Oxnard, Ca. 93030
385-7507

The Ray D. Prueter Port Hueneme
510 Park Ave.
Port Hueneme, Ca. 93041
486-5460

Soliz El Rio
2820 Jourdan St.
Oxnard, Ca. 93030
485-4515

South Oxnard Center
200 E. Bard Rd.
Oxnard, Ca. 93033
385-8129

CALENDAR OF EVENTS

DURING THE YEAR

Anacapa Whale Watch

Recording: 642-7688

From late December through mid-April, gray whales migrate along the Pacific Coast. Join the whale-watching excursion sponsored by the Oxnard Parks and Recreation Department - Ventura Harbor, Oxnard.

City Hall Concert Series

Information: 658-4726

A series of concerts throughout the year held in the City Hall Atrium-Ventura.

Concerts in the Chamber Series

Information: 987-7847

This concert series is held at the United Methodist Church from February through April - Anacapa Drive, Camarillo.

Concerts in the Park

Information: 987-7847

Sponsored by the Camarillo Arts Council, free concerts are offered May through September - Constitution Park, Camarillo.

First Sunday in the Park

Information: 658-4742

This event is held monthly and offers fine crafts, food, live music, plus art projects for the children. Admission is free - Plaza Park, Ventura.

JANUARY

Rose Bowl Football Game

Recording: 1-818-577-3106

The contest between the winning teams of the Pacific 10 and the Big Ten conferences, held every New Year's Day - Rose Bowl, Pasadena.

Tournament of Roses Parade

Recording: 1-818-577-3106

The Rose Parade, initiated in 1889 to display California's climate, is a festival of flowers, music and equestrian splendor. It is hailed as the most photographed event in the world - Pasadena.

FEBRUARY

Ventura County All-Breed Dog Show

Information: 648-3376

This kennel show is sponsored by the Ventura County Dog Fanciers Association - Ventura County Fairgrounds, Ventura.

MARCH

Annual Plant Sale

Information: 455-1030

The Topanga/Las Virgenes Conservation District sponsors a native and drought tolerant plant sale on the district office grounds in Topanga Canyon. Plant experts are present to answer questions and make recommendations - Topanga.

Craft-A-Rama

Information: 498-9441

Crafters present their creations at this annual fund-raiser for the Stagecoach Inn Museum - Thousand Oaks Community Center, Thousand Oaks.

GTE West Classic Senior PGA Event

Information: 646-8126

This GTE co-sponsored event is a Senior PGA and a Pro-Am Golf Classic - Ojai Country Club, Ojai.

Spring Arts and Crafts Festival

Information: 498-3124

Over 100 local artisans sell original handmade arts and crafts. Also featured are entertainment, children's craft areas and a variety of refreshments - Borchard Community Center, Newbury Park.

APRIL

California Beach Party

Information: 654-7830

A weekend of lively entertainment begins with a concert on the beach, and a full schedule of sporting events follows. Free Admission - Ventura Beach Promenade, Ventura.

Channel Islands Harbor Food and Wine Festival

Information: 985-4852

A three day festival featuring food and beverage samplings, entertainment and fun for all ages. Admission fee - Channel Islands Harbor, Oxnard.

Conejo Valley Days Western Celebration

Information: 499-1993

A month-long celebration with live music, entertainment, a carnival, rodeo, food and game booths, exhibits, a county fair, chili cookoff, beauty pageant, parade and a special children's day - Route 23 and Janss Road, Thousand Oaks.

Cottontail Canyon Day

Information: 658-4726

An exciting day of games, egg hunts, entertainment and food - Arroyo Verde Park, Ventura.

Countywide Earth Day

Information: 385-8060

Environmental exhibitions and celebration, co-sponsored by the Oxnard Refuse Department - Oxnard College, Oxnard.

Ojai Valley Tennis Tournament

Information: 646-1872

"The Ojai" has been held on the same courts for over 100 years and is the largest amateur tennis tournament in the United States. The four-day tournament hosts over 1,400 amateur participants playing on 102 courts - Libbey Park, Ojai.

Ventura County Special Olympics Swimming Competition

Information: 644-9391

Special Olympians compete for top awards which are given at the ceremony which follows - Pleasant Valley Pool, Camarillo.

MAY

California Strawberry Festival

Information: 483-3921

Highlighting the Oxnard agricultural industry, the festival celebrates the state's most bounteous harvest fruit, strawberries. Events include the famous shortcake-eating contest, the strawberry blond contest, a 10K run and two-mile fun run, an arts and crafts show and live entertainment - College Park, Oxnard.

Cinco De Mayo Celebration

Information: 486-0266

A commemorative event to celebrate the Battle of Guadalupe in 1862. Puppet shows, mariachi music with folkloric dancing and other activities are offered - Plaza Park, Oxnard.

Conejo Gem and Mineral Club - Pageant of a Thousand Gems

Information: 498-4081 or 373-1569

Show features fossil, mineral, gem and lapidary displays, plus dealers, children's games, and a country store. Free admission - Borchard Park Community Center, Newbury Park.

Ventura County Rodeo

Information: 648-3376

Sponsored by the Ventura County Deputy Sheriff's Association, the rodeo features traditional events - Ventura County Fairgrounds, Ventura.

Ventura County Special Olympics, Track and Field

Information: 644-9391

Provides an opportunity for more than 500 athletes, ages 2-65, to demonstrate their skills - Larabee Stadium, Ventura High School, Ventura.

JUNE

ArtWalk

Information: 373-0054

An outdoor two-day juried fine arts and designer crafts exhibit. ArtWalk is presented by the Conejo Valley Art Museum and is held yearly on the first weekend of June - corner of Hillcrest Drive and Wilbur Road, Thousand Oaks.

Oakleaf Music Festival

Information: 499-4355

Enjoy three concerts at this weekend festival. The concerts feature classical, jazz and popular music. Also featured will be an arts and crafts fair - Conejo Community Park, Thousand Oaks.

Ojai Music Festival

Information: 646-8126

Classical and serious new music concerts are performed in one of California's most picturesque valleys - Libbey Park, Ojai Festivals Bowl, Ojai.

JULY

Fourth of July "Spectacular"

Information: 482-1996

The day includes a celebrity softball game, entertainment, food, and the county's largest aerial fireworks display. Sponsored by the Camarillo Pageant Association and the Pleasant Valley Recreation and Park District. Admission fee - Freedom Park, Camarillo.

Fourth of July Street Festival

Information: 654-7830

An all day celebration with food booths, entertainment, games and over 600 artists who display their works. Fireworks will be featured at dusk - Ventura.

Old Adobe Days

Information: 658-4726

Enjoy a fiesta celebrating early California rancho life with music and dancing, a mock bullfight, pinatas and plenty of food - Olivas Adobe Historical Park, Ventura.

Surfside Chili Festival

Information: 488-3625

An ICS-sanctioned chili festival with food booths, craft displays, live entertainment, children's rides and activities - Hueneme Beach Park, Port Hueneme.

AUGUST

Maritime Days

Information: 985-4852

A nautical weekend of classical yachts on display features waterside chowder cook-off, entertainment, arts and crafts, children's activities and contests. Admission free - Channel Islands Harbor, Oxnard.

Ventura County Fair

Information: 648-3376

One of the highlights of the year, the fair includes a carnival, rodeo, parade, and arts and crafts exhibits - Ventura County Fairgrounds, Ventura.

SEPTEMBER

Point Mugu Air Show

Information: 989-8094/8548

The Point Mugu Air Show is Ventura County's largest two-day event which provides wholesome family entertainment. Featuring top-flight military aircraft, acrobatic and stunt flying, parachutists, commercial exhibits and static displays. Admission free - NAWA Point Mugu.

Oxnard Air Show and Air Rally

Information: 483-3921

A spectacular show featuring acrobatic and stunt flying, parachutists and commercial exhibits. Weekend events also include the Oxnard Celebrity Air Rally, pancake breakfasts and a Saturday evening hangar party - Oxnard Airport.

Camarillo Fiesta Days

Information: 484-4383

Events are held at various locations throughout Camarillo, and include a bell ringing ceremony, a parade, barbecue and blessing of the animals - Camarillo.

Fiestas Patrias Parade and Celebration

Information: 483-3921

To commemorate Mexico's Cry for Independence, a parade, food booths, games, crafts, folkloric dancers, mariachi bands and a beauty pageant are the highlights - Plaza Park, Oxnard.

Gold Coast Regional Senior Olympics

Information: 648-2829

Held at various locations, seniors compete in a variety of events including lawn bowling, a 5K walk and run, tennis, shuffleboard and horseshoes - throughout Ventura County.

Santa Paula Harvest Festival

Information: 525-5561

An annual street festival with plenty of live entertainment, food booths and arts and crafts - Santa Paula.

Senior Ball

Information: 648-2829

Get out your dancing shoes for this gala formal affair held especially for seniors - City Hall, Ventura.

OCTOBER

Coastal Clean Up

Information: 658-4632

A clean-up event held the first Saturday in October. Sponsored by the Ventura County Sanitation District - throughout Ventura County.

Conejo Century Classic

Information: 495-4674

A 25-, 50-, and 100-mile bike ride through rolling hills, green valleys and shimmering lakes of Conejo Valley and surrounding communities - Thousand Oaks Community Center, Thousand Oaks.

Harbor Days

Information: 488-6993

Enjoy treasure hunts, a sand sculpture contest and parade during this two-day celebration - Surfside Drive, Port Hueneme.

NOVEMBER

El Dia de los Muertos

Information: 486-7063

This traditional Mexican celebration includes a mask-making workshop in October, a community procession and a cultural presentation of dance, music and theatre, free - Ojai.

Holiday House

Information: 492-2461

This extravaganza features over 140 exhibitors selling unique handcrafted items and holiday gifts - Thousand Oaks Community Center, Thousand Oaks.

DECEMBER

Christmas Parade

Information: 482-1996

Starting at Temple, continuing down Las Posas Avenue and finishing at Carmen, this parade features 120 floats, bands, horses and Santa Claus - Camarillo.

Holiday Street Festival

Information: 654-7830

Billed as one of the state's largest arts and crafts shows, included are food booths, games, a holiday bazaar and live entertainment from local choir groups - Main Street, Ventura.

Parade of Lights

Information: 985-4852

A nautical parade of elaborately decorated and lighted boats sail the harbor at night. Festivities begin at sunset with a Santa flyover. Enjoy the many games and activities on shore - Channel Islands Harbor, Oxnard.

PERFORMING ARTS

Arlington Theatre

1317 State Street

Santa Barbara, Ca 93101

963-4408

Features major performances from symphonies to rock concerts.

California Lutheran University

60 W. Olsen Rd.

Thousand Oaks, Ca. 91360

492-2411

This four-year college hosts Thousand Oaks Professional Theatre presenting open-air summer productions and the Conejo Symphony Concert Series.

Camarillo Arts Council

P.O. Box 466

Camarillo, Ca. 93011

987-7847

The council is a non-profit community arts organization which supports the performing and visual arts in Camarillo. Concerts are held in the City Hall Chamber and Constitution Park in Camarillo.

Camarillo Community Center

1605 E. Burnley St.
Camarillo, Ca. 93010
388-5716

The center presents films, lectures, musicals and dramatic plays throughout the year.

Constitution Park Pavilion

601 Carmen Dr.
Camarillo, Ca. 93010
987-7847

This open-air pavilion has informal seating and presents a summer concert series of "easy listening" music.

Gavin Theatre

Santa Barbara City College
West Campus
721 Cliff Dr.
Santa Barbara, Ca. 93109
965-5935

Home of the Santa Barbara City College Theatre Group which showcases renowned theatre professionals, students and talented community artists.

Hollywood Bowl

2301 N. Highland Ave.
Los Angeles, Ca. 90078
213-850-2000

This open-air concert facility is located in a large natural amphitheatre setting.

Lobero Theatre

33 E. Canon Perdido
Santa Barbara, Ca. 93101
963-0761

Built in 1872 by Jose Lobero, the theatre is home to the Pasadena Playhouse and Santa Barbara Chamber Orchestra and is one of the city's major entertainment centers.

Moorpark Melodrama and Vaudeville Company

45 E. High St.
Moorpark, Ca. 93021
529-1212

Enjoy an evening of old-fashioned melodrama theatre. Seven productions are presented each season.

Thousand Oaks Civic Arts Plaza

2100 E. Thousand Oaks Blvd.

Thousand Oaks, Ca. 91360

449-2787

The 1,800 seat auditorium and the 400 seat theatre feature chamber music, choral concerts, rock 'n' roll concerts, and top name performers.

Music Center of Los Angeles County

135 N. Grand Ave.

Los Angeles, Ca. 90012

213-972-7211

Features a variety of visual and performing arts theatres, including the Dorothy Chandler Pavilion, the Mark Taper Forum and the Ahmanson Theatre.

Ojai Center for the Arts Theatre

113 S. Montgomery St.

Ojai, Ca. 93023

646-0117

This theatre features a variety of dramas, musicals and concerts.

Ojai Festivals Ltd.

P.O. Box 185

Ojai, Ca. 93024

646-2094

The Ojai Festivals hosts numerous educational and community outreach programs throughout the year.

Oxnard Civic Auditorium

800 Hobson Way

Oxnard, Ca 93030

Box Office: 486-2424

Home to the Ventura County Symphony, the Ventura County Master Chorale and the Channel Islands Ballet of Oxnard.

Pantages Theatre

6233 Hollywood Blvd.

Los Angeles, Ca 90028

213-480-3232

One of the nation's foremost examples of Art Deco Renaissance architecture, showcasing top-name actors in dramatic and comedy productions.

Plaza Player Theatre

34 N. Palm St.
Ventura, Ca. 93001
643-9460

This theatre hosts dramas, musicals and comedies performed by local community theatre companies.

Santa Paula Theatre Center

125 S. Seventh St.
Santa Paula, Ca. 93060
Administration Office: 525-3073
Box Office: 525-4645

This professional theatre group features five mainstage and two children's productions a year.

Shubert Theatre

2020 Avenue of the Stars
Los Angeles, Ca. 90067
800-233-3123

Offers major Broadway musicals throughout the year.

Universal Amphitheatre

100 Universal City Plaza
Universal City, Ca. 91608
818-980-9421

A fully enclosed year-round entertainment complex featuring top-name performers.

Ventura College Arts Theatre

4667 Telegraph Rd.
Ventura, Ca. 93003
654-6459 or 648-8922

The theatre is the cultural center of Ventura College and offers concerts, drama and dance productions, string ensembles, various seminars and a travel film and sailing adventure series annually.

Ventura County Multicultural Arts Council

Information: 385-7222

Established in 1980 to serve as a voice for ethnic, rural and cultural arts issues in Ventura County.

MUSEUMS AND ART GALLERIES

Albinger Archaeological Museum

113 E. Main St.
Ventura, Ca. 93001
648-5823

More than 3,500 years of area history and five cultural groups are revealed at this site next to Mission San Buenaventura. In the museum numerous artifacts are displayed and nearby is the oldest standing structure in Ventura County, the mission's water filtration building.

C.E.C. Seabee Museum

Code 223, Building 90 NCBC
Port Hueneme, Ca 93043
982-5163

Located at the Naval Construction Battalion Center, the museum was established as a lasting monument to the history and the fighting spirit of the Seabees and Naval Engineer Corps.

Carnegie Arts Museum

424 South "C" St.
Oxnard, Ca. 93030
385-8157

Features four changing exhibits per year, ranging from contemporary art to French Impressionism. Call for events and educational programs.

Channel Islands National Park

Visitors Center
1901 Spinnaker Dr.
Ventura, Ca. 93001
658-5730

The visitors center is a good place to prepare for a visit to the Channel Islands. The exhibits in the center include photo displays, Chumash Indian artifacts, a simulated ghost forest, a native plant display and an indoor tidepool.

The East Wing Art Gallery

501 N. Poli St.
Ventura, Ca. 93001
654-7800

Located in San Buenaventura City Hall on the second floor, the gallery offers a variety of exhibits by local artists.

Fillmore Museum and Historical Society

447 Main St.

Fillmore, Ca. 93015

524-0948

Fillmore is the entrance point of the Sespe Wildlife Area of the Los Padres National Forest, home of the California condor. A large mural inside the museum depicts Fillmore around 1910. The museum is housed in the former Southern Pacific Railroad depot which was built in 1887.

Gallery of Historical Figures

McNeil Road, north of Reeves Road

Ojai, Ca. 93023

646-6574

The work of historian and artist George Stuart is showcased at this unique gallery. Over 100 famous figures elaborately dressed in costumes of the 18th and 19th centuries are displayed. Exhibits change monthly. Open Saturday and Sunday only.

J. Paul Getty Museum

17985 Pacific Coast Highway

Malibu, Ca. 90265

310-459-7611

The museum houses an extensive collection of Greek and Roman antiquities, illuminated manuscripts, decorative arts and photographs. The building itself is a re-creation of a classic Mediterranean-style villa, with interior and exterior gardens. Reservations required. No admission fee.

Gull Wings Children's Museum

418 W. Fourth St.

Oxnard, Ca. 93030

483-3005

A hands-on museum where children can combine fun and learning. Exhibits are on various careers and hobbies.

Malibu Lagoon Museum - Historic Adamson House

23200 Pacific Coast Highway

Malibu, Ca. 90265

Recording: 310-456-8432

The Adamson House contains examples of the intricately designed ceramic tile produced by Malibu Potteries from 1926 to 1932. The adjoining museum depicts the history of Malibu from the prehistoric Chumash Indians, through the early ranching days and the famed movie colony.

Natural History Museum of Los Angeles County

900 Exposition Blvd.

Los Angeles, Ca. 90007

213-744-3466

Fossil dinosaurs, gems and minerals, animal life, pre-Columbian artifacts and Southwest history are explored in the many exhibits at this museum.

Ojai Valley Historical Society and Museum

109 S. Montgomery St.

Ojai, Ca. 93023

646-2290

Displayed in this museum are artifacts of both the Oak Grove and Chumash Indian tribes that were discovered in various excavations in the Ojai Valley area.

George C. Page Museum of La Brea Discoveries

5801 Wilshire Blvd.

Los Angeles, Ca. 90036

213-936-2230

The museum beautifully houses prehistoric fossils recovered from the renowned La Brea Tar Pits, the world's richest source of Ice Age mammal and bird fossils. Several fenced pits may be viewed throughout Hancock Park, including one active excavation.

Port Hueneme Historical Museum

220 N. Market St.

Port Hueneme, Ca. 93041

488-2023

The museum houses many artifacts and exhibits featuring the early history of Port Hueneme and Ventura County. The building was originally the Bank of Hueneme.

Santa Barbara Museum of Natural History

2559 Puesta del Sol Rd.

Santa Barbara, Ca. 93105

682-4711

Exhibits at the museum feature mammals, birds, fish, reptiles, plant life and the geology of the Pacific Coast and Channel Islands. Special features include a diorama of prehistoric Indian life and a planetarium.

Santa Paula Society of the Arts Gallery

963 E. Santa Barbara St.

Santa Barbara, Ca. 93060

525-1104

Founded by local artists to promote artistic growth and art appreciation, the gallery offers numerous exhibitions of local talent.

Stagecoach Inn Museum

51 S. Ventu Park Rd.
Newbury Park, Ca. 91320
498-9441

Once a stagecoach stop and hotel for overnight travelers, this historic landmark features many exhibits and artifacts.

Strathearn Historical Park and Museum

137 Strathearn Place
Simi Valley, Ca. 93065
526-6453

This park and museum offer exhibits which explore the lives of the Chumash Indians and the Spanish and English pioneers.
Educational classes are also offered.

Thousand Oaks Community Gallery

2331-A Borchard Rd. at Michael Dr. (adjacent to the Newbury Park Branch Library)
Newbury Park
498-4390

Exhibits, featuring the work of local and regional artists, change monthly. Artistic styles and techniques are always diverse, and the media can include painting, drawing, prints, graphics, fiber, photography, arts, ceramics, and sculpture. Each exhibit hosts an artist reception for the public. Open Thursday through Sunday, 1-5 p.m. Admission is free and there is plenty of convenient parking.

Unocal Oil Museum

1001 E. Main St.
Santa Paula, Ca. 93060
933-0076

Located in the historic Union Oil Company building, this completely restored and expanded museum displays artifacts of the history and technology of the oil industry.

Ventura County Museum of History and Art

100 E. Main St.
Ventura, Ca. 93001
653-0323

Exhibits include collections of American Indian, Hispanic and pioneer artifacts. Also included is a research library on local history and the George S. Stuart Collection of Historical Figures.

HISTORICAL SITES

Covarrubais Adobe and Historic Adobe

715 Santa Barbara St.
Santa Barbara, Ca. 93101
966-1601

The Covarrubais Adobe, built in 1817, is reported to be the site of the last Mexican capitol of California. The adjacent adobe is believed to have served as the headquarters for Col. John Fremont in 1846.

Fernald House and Trussell-Winchester Adobe

414 W. Montecito St.
Santa Barbara, Ca. 93101
966-1601

Fernald House, a multi-gabled Victorian mansion, is handsomely furnished in original Victorian furniture. The mansion features a circular mahogany staircase and music room. Next door stands Trussell-Winchester Adobe built with adobe bricks and timbers from the wrecked ship Winfield Scott.

Mission Santa Barbara

2201 Laguna St.
Santa Barbara, Ca. 93105
682-4713

Founded in 1786, Mission Santa Barbara is the only mission church with two towers and was the tenth of the California missions founded by the Spanish Franciscans.

Olivas Adobe Historical Park

4200 Olivas Park Dr.
Ventura, Ca. 93001
644-4346

The large adobe was the first two-story adobe in Ventura County. It was built in 1847 by Raymundo Olivas to accomodate his wife and their 21 children.

Ortega Adobe Historical Residence

215 W. Main St.
Ventura, Ca. 93002
658-4726

The Ortega Adobe, built about 1857 by Emigdio Ortega, stands as the sole reminder of the many adobes that once lined Main Street. Ortega and his wife raised 13 children in this home, the youngest, Emilio, became quite successful as the first commercial chili manufacturer. Ortega chili products are still manufactured today.

San Buenaventura City Hall

501 N. Poli St.
Ventura, Ca. 93001
654-7850

Constructed in 1912 originally as the county courthouse, the building's most elegant features are the Indian marble entryway, lobby and the statue of Father Junipero Serra in front of the building.

San Buenaventura Mission

211 E. Main St.
Ventura, Ca. 93001
643-4318

The mission was the ninth founded by Father Serra in 1782; the church was not completed until 1809. An earthquake in 1812 did severe damage but the mission has been beautifully restored. A garden containing an old olive press and water pump surrounds the mission which became famous for its vast fruit orchards.

ARENAS AND STADIUMS

Anaheim Stadium

2000 Gene Autry Way
Anaheim, Ca. 92806
714-254-3000

Home to the California Angels baseball and Los Angeles Rams football teams.

Del Sol Soccer Stadium

1500 Colonia Rd.
Oxnard, Ca. 93030

Adult soccer games, community events and concerts are held here annually.

Dodger Stadium

1000 Elysian Park Ave.
Los Angeles, Ca. 90012
213-224-1500 - Ticket Office: 213-224-1448

Home to the Los Angeles Dodgers baseball team.

The Great Western Forum

3900 W. Manchester Blvd.
Inglewood, Ca. 90306
310-419-3100 - Events: 310-673-1300

Home to the Los Angeles Lakers basketball team and the Los Angeles Kings hockey team.

Los Angeles Memorial Coliseum

3939 S. Figueroa St.

Los Angeles, Ca. 90037

213-748-6131

Home to the Los Angeles Raiders and the USC Trojans football teams. The coliseum hosts a variety of entertainment and sporting events throughout the year.

Los Angeles Memorial Sports Arena

3939 S. Figueroa St.

Los Angeles, Ca. 90037

213-748-6131

Home to the Los Angeles Clippers basketball team, the arena hosts a variety of sports and entertainment events throughout the year.

Rose Bowl

1001 Rose Bowl Dr.

Pasadena, Ca. 91103

818-577-3100 - Events: 818-577-3106

Site of the classic Rose Bowl game each New Year's Day, as well as other football games and events throughout the year. Home to the UCLA Bruins football team.

University of California Santa Barbara Gauchos

Santa Barbara, Ca. 93106

Tickets: 893-3292

* **Harder Stadium** - Home to UCSB's men's and women's soccer teams.

* **Thunderdome** - Home to UCSB's basketball team and other sporting and entertainment events throughout the year.

Ventura County Fairgrounds

10 W. Harbor Blvd.

Ventura, Ca. 93001

648-3376

This large arena features 4-H horse shows, rock concerts, swap meets, canine shows and other events annually.

GARDENS

Conejo Valley Botanic Garden

P.O. Box 1382

Thousand Oaks, Ca. 91360

Recording: 494-7630

Located on a 35-acre hill with a spectacular view of Conejo Valley, this developing community garden offers five miles of trails, a small orchard of exotic fruit trees, a variety of California oak species and a small forest of Sequoia saplings. Open daily, free admission.

Santa Barbara Botanic Garden

1212 Mission Canyon Rd.

Santa Barbara, Ca. 93105

682-4726

Located in one of California's most picturesque settings, the Santa Barbara Botanic Garden covers 65 acres and has over five miles of trails winding through the beautiful flora. The historic Mission Dam was constructed in 1806-1807 by Chumash Indians under the direction of the mission fathers. Docent-guided tours are available.

THEME PARKS

Disneyland

1313 Harbor Blvd.

Anaheim, Ca. 92803

714-999-4565

The most popular amusement park in the world offers over 60 rides and attractions, spread throughout eight different theme areas. Open daily, year around. Seasonal hours vary.

Knott's Berry Farm

8039 Beach Blvd.

Buena Park, Ca. 90620

714-220-5200

Covering 150 acres, this famous amusement park offers over 160 rides and attractions, and live entertainment. Open daily, except Christmas. Call for hours and special events.

Six Flags Magic Mountain

26101 Magic Mountain Pkwy.

Valencia, Ca. 91355

818-367-5965

This 260-acre amusement park offers an array of rides, entertainment, attractions and fun shows for all ages. Open daily from Memorial Day to Labor Day, school holidays, and weekends only throughout the rest of the year, except Christmas.

Universal Studios Tour

100 Universal City Plaza

Universal City, Ca. 91608

818-777-3750 - Group Reservations: 818-777-3771

See the world behind the movie camera at the world's largest motion picture and TV studio. An entertaining tram ride throughout the studio grounds is complemented by live action shows. Hours vary.

POINTS OF INTEREST

Fisherman's Wharf

Corner of Channel Islands Blvd. and Victoria Ave.

Oxnard, Ca. 93035

985-4852 or 483-3921

This New England-style village is clustered around a cobblestone square at the water's edge. Shops, restaurants and entertainment are available.

Historic Ventura

Main Street

Ventura, Ca. 93001

648-2075

San Buenaventura's rich history is evident in Ventura's mission, museums and architecture, the fishing pier, promenade and beaches - all within walking distance.

Mission Plaza Park

Main Street

Ventura, Ca. 93001

658-4726

The city's oldest park contains one of the largest Moreton Bay fig trees in the state. Under the tree are the buried foundations of a large 12-room adobe building believed to have housed the soldiers who protected the mission.

Moorpark College Exotic Animal Program

7075 Campus Rd.

Moorpark, Ca. 93021

378-1441

Animal performances and lectures about animal habitats and behavior are featured at Sunday performances for children age 3 and older. Special circus performances are held on Sundays in March. Picnic areas are available.

Nature Conservancy Visitor Center

213 Stearns Wharf

Santa Barbara, Ca. 93101

962-9111

Features exhibits of Santa Cruz Island and other Nature Conservancy preserves throughout California. Highlights include an island scale model, videos and island fox and peregrine falcon displays. Information on island trips is also available.

Ojai Valley Trail

A nine-mile equestrian, hiking and bicycling trail which links Foster Park in Ventura with Soule Park in Ojai. The trail is always open and free to the public.

Padre Serra Cross

Grant Park
Ventura, Ca. 93001
654-7850

The Padre Serra Cross on Mission Hill offers an impressive view. The first cross was erected on this spot by Father Junipero Serra on March 31, 1782. Annual Easter sunrise services held.

Paramount Ranch

818-889-0781

Gentle rolling hills spread below Sugarloaf Mountain, making an inviting place for walking, equestrian use and picnicking. A western town movie set is used by television and movie companies. Tours are conducted by park rangers.

Ronald Reagan Presidential Library

40 Presidential Dr.
Simi Valley, Ca. 93065
522-8444

The library has an archival collection of documents and records created or received by the President and White House staff during his presidential terms. It also houses artifacts, tracing Reagan's life from a small boy to his years as president.

Santa Barbara Zoological Garden

500 Ninos Dr.
Santa Barbara, Ca. 93103
962-6310

The zoo features exotic animals in a pleasant garden setting. There are many attractions for children, including a petting zoo, playground and a miniature train ride.

Santa Paula Depot

963 E. Santa Barbara St.
Santa Paula, Ca. 93060
933-1277

The Santa Paula Chamber of Commerce and the Arts Society are housed in the only depot in the county still on its original site. Built in the late 1800's by the Southern Pacific Railroad Company, the depot is often used by the movie and television industry in films and productions.

Sea Center

211 Stearns Wharf
Santa Barbara, Ca. 93101
962-0885

The center serves to educate the public on the Santa Barbara Channel Islands and focuses on the waters surrounding these islands.

Stearns Wharf

Foot of State Street

Santa Barbara, Ca. 93101

966-6624

Stearns Wharf, the oldest operating wharf of the Pacific Coast, was built in 1872 by lumberman John P. Stearns. Local fishing fleets offload their catch within view at the Navy pier.

BEACHES

Carpinteria State Beach

Information: 684-2811 - Camping reservations: 800-444-7275

Facilities include picnicking, fishing and beach swimming. Campsites are available with hookups for motor homes and trailers. Located on 224th Street in Carpinteria.

Leo Carrillo State Beach

Information: 818-880-0350 - Camping reservations: 800-444-7275

Picturesque and popular with divers, rock piles form interesting configurations containing caves to explore and spots perfect for picnicking. Camping is available.

McGrath State Beach

Information: 654-4744 - Camping reservations: 800-444-7275

This beach offers developed campsites which include fresh drinking water and hot showers. Sand dunes between campsites overlook the surf and the beach.

Oxnard State Beach

Information: 654-4611

This beach features a large barbecue area, volleyball area, picnic table and restrooms. Located on South Harbor Boulevard in Oxnard.

San Buenaventura State Beach

Information: 654-4611

This day-use-only beach offers swimming, picnic areas, a bicycle trail and a snack bar.

Ventura River Group Camp

Information: 654-4611

This mile-long beach in Ventura offers fishing, picnic areas and hiking trails. Group camping only. Located at the end of Main Street in Ventura.

PARKS

Oxnard Parks and Recreation Department

325 S. "A"

Oxnard, Ca. 93030

Recreation: 385-7995 - Parks: 385-7950

Pleasant Valley Recreation and Park District

1605 E. Burnley St.
Camarillo, Ca. 93010
482-1996

Port Hueneme Recreation and Community Services

250 N. Ventura Rd.
Port Hueneme, Ca. 93041
986-6555

Ventura County General Services Agency Recreation Services

800 S. Victoria Ave.
Ventura, Ca. 93009
654-3963

Camarillo Grove County Park

Information: 654-3951

This park offers an abundance of recreational facilities including picnic and barbecue areas, two covered pavilions, a recreation hall and children's play equipment. Located three miles east of Camarillo, adjacent to Highway 101.

Camp Comfort County Park

Information: 654-3951

This park offers hiking trails, sports facilities and a large barbecue area for picnickers, group or individual campers. Located two miles south of Ojai on Creek Road.

Channel Islands National Park

Information: 658-5730 - Island Packers Information: 642-7688 - Reservations: 642-1393

The Channel Islands offer a unique opportunity to observe an exceptional blend of marine and bird life. Camping trips may be arranged leaving daily from Ventura. Camping permits are required from Channel Islands National Park and admission is free. Visitors must bring their own food and water and arrange their own transportation which can be done through Island Packers.

Lake Casitas Recreation Area

Information: 649-2233 - Reservations: 649-1122

Lake Casitas offers picnicking, camping, fishing, and boating. Located off Santa Ana Road and Highway 150 in Ojai.

Los Padres National Forest

Information: 646-4348

The forest features a network of hiking and backpacking trails, steep gorges, mountain streams, waterfalls and a wide variety of wildlife and plants. Visitors may ride horses,

mountain bikes or motorcycles, pilot hang gliders, hike, hunt, fish and rock climb. Picnic areas and developed rustic campgrounds are available.

Point Mugu State Park

Information: 818-880-0350 - Camping reservations: 800-444-7275

Campgrounds, sandy beaches, picnic areas, barbecues and hiking trails can be found 15 miles southwest of Oxnard on Pacific Coast Highway in Malibu.

Santa Monica Mountains National Recreation Area

Information: 818-597-9192

This area offers docent or ranger guided programs and hikes. Contact the number above for park listings. Located between Highway 1, Interstate 101 and Interstate 405.

Steckel County Park

Information: 654-3951

Located four miles north of Santa Paula on the Ojai Highway 150, the park has RV and tent campsites and a youth camping area. Other attractions include fishing, hiking trails and a newly renovated bird aviary.

Emma Wood Beach County Park

Information: 654-3951

A popular spot for campers and picnickers alike, this park is located on the beach adjacent to Highway 101 on the Rincon Parkway.

PUBLIC GOLF COURSES

Buenaventura Golf Course

5882 Olivas Park Dr.

Ventura, Ca. 93003

642-2231 or 485-3050

Camarillo Springs Golf Course

791 Camarillo Springs Rd.

Camarillo, Ca. 93010

484-1075

Elkins Ranch Golf Course Starter

1386 Chambersburg Rd.

Fillmore, Ca. 93015

524-1440

Mountain View Golf Course
16799 South Mountain Rd.
Santa Paula, Ca. 93060
525-1571

Olivas Park Golf Course
3750 Olivas Park Dr.
Ventura, Ca. 93003
642-4303

River Ridge Golf Course
2401 W. Vineyard Ave.
Oxnard, Ca. 93030
983-4653

Saticoy Regional Golf Course
1025 S. Wells Rd.
Ventura, Ca. 93004
647-6678

Soule Park Golf Course
1033 E. Ojai Ave.
Ojai, Ca. 93024
646-5633

AIRPORTS

Burbank Airport
2627 N. Hollywood Way
Burbank, Ca. 91505
818-840-8840 - Parking: 818-840-8837

Los Angeles International Airport (LAX)
1 World Way
Los Angeles, Ca. 90009
Information and parking: 310-646-5252

Oxnard Airport
2889 W. Fifth St.
Oxnard, Ca. 93030
385-8685
Several daily commuter flights are available to LAX.

Santa Barbara Municipal Airport

601 Firestone Rd.

Goleta, Ca. 93117

683-4011

Offers airline service with daily scheduled flights connecting major terminals.

LOCAL TRANSIT

Camarillo Bus Lines

Information: 800-438-1112

Serves Camarillo.

Senior Dial-A-Ride

Information: 986-4000

Provides transportation for seniors to medical appointments, banks and grocery stores.

Serves Oxnard and Port Hueneme.

Senior Minibus

Information: 385-8021

Serves Oxnard.

South Coast Area Transit (SCAT)

Information: 487-4222

Serves Oxnard and Port Hueneme.

Survival Mobile Transportation

Information: 652-7810

Free services to seniors to medical appointments; once a month use only.

Ventura County Transportation Commission

Dial-a-Route

Information: 800-438-1112

RAILWAY PASSENGER SERVICE

Amtrak

Information and reservations: 800-872-7245

Local Station

201 E. Fourth St.

Oxnard, Ca. 93030

487-8787

MENU GUIDE

Camarillo

Antonios Italian Restaurant

64 Daily Drive
484-3608

Chester's Asia Chinese Restaurant

2216 Pickwick Drive
482-6564

Pastabilities Authentic Italian Restaurant

4910 Verdugo
383-3388

McCarthy's Restaurant

1101 Daily Drive
388-5552

Oxnard

Armando's Italian Restaurant

641 S. Ventura Rd.
984-4500

Champs Steakhouse

1900 Victoria
984-8015

China Doll

1201 Saviers Rd.
483-6050

Yolanda's Mexican Restaurant

2801 Saviers Rd.
487-3895

Jake's Restaurant

2330 N. Vineyard
983-6995

Little Tony's Italian Restaurant

1441 Redwood St.
486-3619

Loops Home Style Restaurant

3600 S. Saviers Rd.
385-6345

Quincy Street BBQ/Pasta

2405 Roosevelt
984-6262

Port Hueneme

Golden Buddha

248 E. Scott St.
986-2868

Mandarin House

475 W. Channel Islands
985-5955

Ventura

Alexanders - American

1050 Schooner Dr.
658-1212

Cactus Grill Mexican

5968 Telegraph Rd.
644-2772

Hudson's Grill

4722 Telephone Rd.
642-4349

Hornblower's

Spinnaker Dr.
658-2202

Information in this guide is subject to change without notice. Neither the U.S. Navy or any other part of the Federal Government officially endorses any company in this listing or their products or services.

TENANT COMMANDS

UNIT	OFFICER/ENLISTED/CIVILIANS
Air Test & Evaluation Squadron 9 (VX-9)	39/279/5
Antarctic Development Squadron Six (VXE-6)	74/359/2
Branch Clinic (Medical)	4/15/9
Branch Dental Clinic	3/5/2
ComThirdFleetRep (C3FR)	1/1/0
DECA (Commissary)	0/3/16
Explosive Ordnance Disposal MU Three Detachment (EOD)	1/10/1
Helicopter Combat Support Squadron 5 (HCS-5)	8/93/0
Marine Aviation Detachment (MAD)	6/11/0
Naval Satellite Operations Center (NAVSOC)	6/29/74
Naval Air Reserve Forces (NAVAIRES)	12/98/17
Naval Investigative Service (NIS)	0/0/1
Naval Engineering Service Unit Detachment (NAESU)	0/1/2
Naval Audit Office (NAO)	0/0/7
Naval Research Laboratory Site Detachment (NRL)	3/19/0
Navy Campus Field Activity (NCFA)	0/0/2
Naval Military Personnel Command (NMPC)	1/16/0
Naval Publishing & Printing Service Detachment Office (NPPSDO)	0/0/2
Patrol Squadron 65 (VP-65)	8/111/0
Personnel Support Activity Detachment (PSD)	1/21/19
Resale Act Det (Navy Exchange)	4/3/75
Resident Officer in Charge of Construction (ROICC)	4/0/9
Defense Finance and Accounting Service	0/0/13
Federal Bureau of Investigation (FBI)	0/0/10
SPINTCOMM (NIACN)	0/1/0
Cumulative Officer/Enlisted/Civilian in above commands:	175/1,075/266

HISTORY

"Mugu" beach is believed to be the site where Juan Cabrillo landed October 10, 1542. "Murru" was the capital village of the Chumash Indians located along the shores of Mugu Lagoon. Most of its early history centers around ranching, farming and the famous Mugu fish camp.

The history of most of the Navy's guided missile and drone programs is the early history of the Navy at Point Mugu. During World War II, the Navy simultaneously had efforts underway to develop sites where both missiles and pilotless aircraft could be tested. In 1947 Congress appropriated funding to establish a permanent Navy presence here for this purpose.

Since the mid 1940's, Point Mugu has had several "Center names," all with the mission to develop, test and evaluate missiles and related systems and for drones to use in naval test programs. Missiles such as Oricle, Lark, Gorgon, Regulus, and many others have been developed and tested at Point Mugu. Many roads aboard the base bear these names. A park on Navalair Road proudly displays many of the contributions and developments for which Point Mugu has received world wide acclaim.

In January 1992, the Pacific Missile Test Center was disestablished and the Naval Air Warfare Center Weapons Division was formed which aligned technical functions with those of the former Naval Weapons Center China Lake, California. At the same time the Naval Air Station Point Mugu was disestablished and the Naval Air Weapons Station was commissioned.

Today, with a combined military/civilian/contractor team effort, the Point Mugu Naval complex continues to provide development and testing of weapons that work.

- October 1, 1946 - U.S. Naval Air Missile Test Center
- August 1, 1949 - Naval Air Station
- June 16, 1958 - Pacific Missile Range
- January 7, 1959 - Naval Missile Center
- April 26, 1975 - Pacific Missile Test Center
- January 21, 1992 - Naval Air Warfare Center Weapons Division
- January 21, 1992 - Naval Air Weapons Station

NAVAL AIR WARFARE CENTER WEAPONS DIVISION

Point Mugu is part of the Naval Air Warfare Center Weapons Division (NAWCWPNS) the Navy's full spectrum research, development, test evaluation and in-service engineering center for weapons systems associated with air warfare (except for antisubmarine warfare systems), missiles and missile subsystems, aircraft weapons integration and assigned airborne electronic warfare systems. NAWCWPNS also maintains and operates the air, land and sea Naval Western Test Range Complex (NWTRC). The Weapons Division includes the Naval Air Weapons Station (NAWS), Point Mugu, California, the Naval Air Weapons Station (NAWS), China Lake, California, and the Ordnance Missile Test Station (NOMTS), White Sands, New Mexico.

NAWCWPNS integrates the activities of these organizations thereby providing an expanded capability for research, development, test, evaluation and support throughout the life cycle of Department of Defense weapon and aircraft weapons systems. Additionally, NAWCWPNS organizations also contribute to naval surface missile systems and tactical as well as strategic deterrent weapons, and support various Department of Defense and other government agencies for special projects.

NAVAL AIR WEAPONS STATION

The Naval Air Weapons Station, Point Mugu, operates and maintains station facilities and provides support services for NAWCWPNS and assigned tenants and activities at Point Mugu. These services include air terminal, air traffic control, fire fighting and crash crews and an outlying landing facility at San Nicolas Island. A multi-talented, dedicated work force of military and civilian personnel provide public works support, including facilities engineering and maintenance, utilities and transportation for Point Mugu and offshore islands. NAWS employees also provide supply, administrative and military community programs, explosive ordnance handling, storage and disposal service and physical security services.



Commander, Naval Air Weapons Station
Public Affairs Office, Code 750000E
521 9th Street
Point Mugu, CA 93042-5001
(805) 989-8094 Autovon 351-8094
FAX (805) 989-1785 (03-15-95)

NAWC

NAWS

NAWC

NAWS

NAWC

NAWS

NAWC

NAWC

NAVAL AIR WARFARE CENTER

NAWS PT. MUGU

NAWS

NAWC

NAWS

NAWC

NAWS

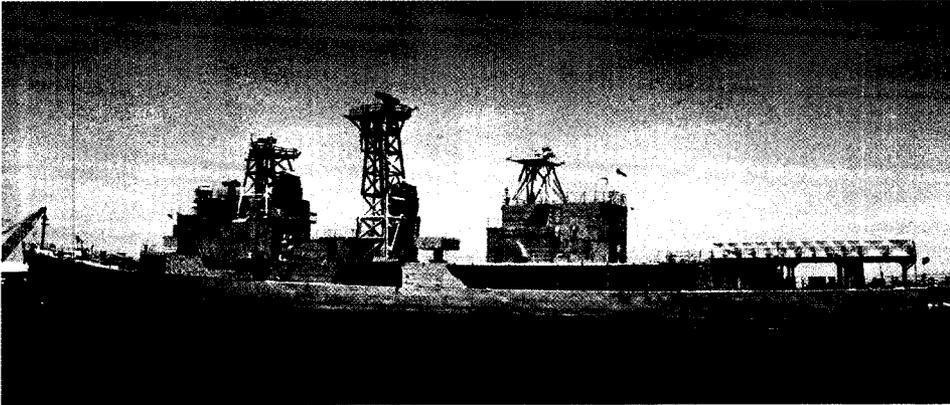
Naval Air
Weapons Station
Point Mugu, California

Fact
Finder
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SDTS

S E L F D E F E N S E T E S T S H I P



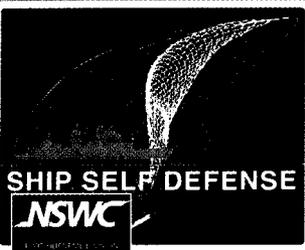
BACKGROUND

Originally decommissioned in 1983, the former USS DECATUR (DDG 31) was selected for conversion to a test ship in 1988. Now known as the Self Defense Test Ship, or SDTS, ex-DECATUR is a unique Navy asset; a ship with but one mission: Weapon Systems Engineering, Test and Evaluation.

In response to the 'new era' national defense strategy and to reduced defense budgets, the Navy is changing its force structure to meet the current and anticipated future emphasis on littoral operations and expeditionary warfare missions. New and improved capabilities are required in several areas including ship self defense systems which must be fully integrated and fully tested. Robust testing of self defense systems has never been possible in manned vessels because of the danger to ship personnel.

MISSION

To provide the Navy with an at sea, remotely controlled, self defense weapons engineering, test and evaluation platform for the conduct of advanced weapons evaluation without risk to personnel.



DESCRIPTION

The Self Defense Test Ship (SDTS) is designed primarily for unmanned operation on the Point Mugu Sea Test Range. The SDTS can be piloted remotely and its systems can be operated remotely, thereby eliminating the safety constraints on manned vessels. During remote operations the ship is controlled by the Naval Air Warfare Center Weapons Division, Point Mugu, CA. The combat systems installed aboard SDTS are controlled remotely by the Port Hueneme Division, Naval Surface Warfare Center, Port Hueneme, CA.

A crew can also go aboard to pilot the ship and operate the installed systems and equipments whenever necessary to meet test objectives. The ship can support fifty four people (50 male/4 female) for up to 30 days.

Berthed at Port Hueneme's deep water harbor, SDTS is expected to operate on the average of one month per quarter over an expected 15 year life. During typical operations, air launched threats and/or surface launched threats will attack the SDTS. The system under test, whether a new combat system configuration or an individual element (sensors, weapon systems, etc.), will respond to these threats to defend the ship. Since SDTS represents a considerable Navy investment, it will tow a decoy barge 150 feet behind the ship. Attackers will fly directly at the ship until terminal engagement of the barge. Testing of CIWS was successfully completed in ex-STODDARD using similar decoy barges.

CHARACTERISTICS

- Displacement 4500 Tons
- Length 418 Feet
- Beam 44 Feet
- Draft 20 Feet
- Propulsion:
 - Two 1200 Hp Diesel/Two Outdrives
 - Bowthruster
- Power:
 - Two 550 kW, 60 Hz Diesel
 - Generator, Three 400 Hz,
 - 100 kva Frequency Converter
- Remote Operations:
 - Ship Piloted from NAWCWPNS,
 - Point Mugu
 - Combat System Operated from
 - SWEP, PHD NSWC, Port Hueneme
- Sea Trials 7/94
- IOC 10/94

September 1994

ABBREVIATED COMMAND BRIEF

SLIDE

1. CALIFORNIA MAP

2. VENTURA COUNTY MAP

3. MISSION SLIDE WITH AERIAL

-HOME OF THE PACIFIC SEABEES

-TWO CHAINS OF COMMAND, TWO COMMANDS, ONE
COMMANDING OFFICER

-SUPPORT TRAINING AND MOBILIZATION OF SEABEES IS
MISSION (HOMEPORT AND DEPLOYED)

-DEPLOYED MATERIAL SUPPORT

-ACTIVE AND RESERVE UNITS

4. KEY STATISTICS

-1600 + ACRES

-29 MILES OF ROAD

-10 MILES OF RAILROAD

-SURROUNDED BY PORT HUENEME/OXNARD

-GOOD RELATIONS WITH THE COMMUNITY

-APPROXIMATELY 12,300 PEOPLE ON BASE (Oct 94 stats)

-MILITARY - 4,100

-CIVILIAN - 4,600

-CONTRACTORS/NON-CIVIL SERVICE - 1,200

-FAMILY MEMBERS - 2,400

5. CONSTRUCTION PROJECTS

RECENT

-RESERVE CENTER

-HAZMAT WAREHOUSE

-2 BEQs

-DAVISVILLE WAREHOUSE

IN PROCESS OR NEAR FUTURE

-NAVAL FACILITIES ENGINEERING SERVICES CENTER

-NAVY EXCHANGE/COMMISSARY

-MAJOR UPGRADES IN FAMILY HOUSING UNITS

6. ECONOMIC IMPACT (FY94)

-CONTRIBUTE ABOUT \$590M/YR TO ECONOMY

TOTAL	\$590,085,000
Payroll	\$ 378,805,000
Military	84,725,000
Civilian	294,080,000
Local Expen.	\$211,280,000
Procurement.	63,077,000
Contr. Svcs.	102,634,000
Constr. Contr.	36,400,000
Utilities	7,224,000
Lease Fees	1,945,000

7. PORT (FOREGROUND ESC)

-NAVY OWNED PORT

-PARTIALLY JOINT USE

-CENTERPIECE TO WHAT MAKES US ATTRACTIVE TO GOVERNMENT

-DEEP WATER PORT (35 FEET)

-10 MILES OF RR - GOES PIERSIDE + MARSHALING YDS

-LOTS OF STAGING AND LAY DOWN AREA

-PRESENTLY USED MOSTLY FOR CARGO (MILITARY TRAFFIC MANAGEMENT COMMAND) 400,000 MEASUREMENT TONS (MT) (VERY POPULAR DURING DESERT STORM)

-75,000 FOR SEABEES

-145,000 MT SEABEES, ARMY, AIR FORCE & MARINES

-PRESSURE FROM COMMUNITY BUILDING TO INCREASE
JOINT USE OF PORT

8. **WAREHOUSING**

-STORE PRE-POSITIONED WAR RESERVE MATERIEL AND
EQUIPMENT

-EACH OF 8 ACTIVE + 12 RESERVE BATTALION SHOULD
HAVE ALL EQUIPMENT AND MATERIAL TO SURVIVE FOR
30 DAYS

-1.5 MILLION SQ FT OF COVERED STORAGE

9. **MAJOR TENANT**

NAVAL SURFACE WARFARE CENTER, PORT HUENEME
DIVISION

10. **NAVAL SUPPORT FORCE ANTARCTICA**

WE DO ALL PACK UP AND RETROGRADE FOR THEM EACH
YEAR

11. **CIVIL ENGINEER CORPS OFFICER SCHOOL (CECOS)**

- BASIC ORIENTATION FOR NEW CEC OFFICERS
- REFRESHER COURSES DURING CAREER
- TRAIN 3900 STUDENTS PER YEAR
 - MILITARY - 2,400
 - CIVILIAN - 1,500
- APPROX 20% OF CEC GO TO SEABEES ON FIRST TOUR

12. **LEASING**

- MAZDA LEASES 59 ACRES TO PREP AND SHIP CARS (COMING FROM AND GOING TO JAPAN)
- CARS UNLOADED ON COMMERCIAL SIDE AND PREPARED ON BASE
- MAZDA SHIPS BY TRAIN AND TRUCK CARRIER
- LEASE BRINGS IN APPROX \$1.8M THAT WE CAN USE ON FACILITIES MAINT OF WHAT THEY USE (I.E., RAILROAD, ROADS, STAGING AREAS)

13. **BERTHING (NEW BARRACKS COMPLETED IN NOV/DEC 94)**

- MCON'S IN 92, 93 & 95 BRING US TOTAL REPLACEMENT OF OLD BARRACKS
- SPACES FOR 1,700 ENLISTED

14. **HOUSING**

-800 SETS OF QUARTERS (77 OFF/723 ENL). BASE HOUSING LAST HOUSING PROJECT IN LATE '60's.

-LAST 801 BEFORE LEGISLATION EXPIRED

15. **MWR**

-GYM IS MOST USED FACILITY

-NEWLY RENOVATED WEIGHT AND EXERCISE ROOM

16. **CHILD/YOUTH SUPPORT**

-RECEIVED HIGHEST GRADE FROM BUPERS

-NEW ADDITION TO CHILD CARE CENTER COMPLETE

-HOME CARE PROVIDERS

BULK OF CHILD CARE 20 HOMES/130 CHILDREN

-YOUTH ACTIVITY CENTER

-SINGLE SAILOR/SEABEE PROGRAM

-ROAD TRIPS (DISNEYLAND, MAGIC MOUNTAIN, DODGERS GAMES, CAMPING, TV TAPINGS)

-HOLIDAY PROGRAMS

-LEISURE SKILLS DEVELOPMENT

-COMMUNITY CENTER

-TONIGHT SHOW/MAGIC MOUNTAIN

-USE OUR BUS AND MOST ALL ACTIVITIES INEXPENSIVE

17. **FSC**

-HAVE RELOCATION ASSISTANCE PROGRAM/TEMPORARY ASSISTANCE MANAGEMENT PROGRAM (RAP/TAMP) UP AND RUNNING

18. **SEABEES - 31ST NCR SEAL**

-A LITTLE BACKGROUND ON SEABEES AND OUR PART IN KEEPING THE PACIFIC SEABEES READY

-MOUNT OUT

-MOBILIZE

31ST NCR SUPPORTS 4 ACTIVE DUTY BATTALIONS NMCB-3, 4, 5, & 40 AND SUPPORTS 16 SEABEE RESERVE OR AUGMENT UNITS (SIX RESERVE UNITS: NMCB 15, 17, 18, 22, 25, 28; TWO RESERVE REGIMENTS, 1 & 9; CBMU 303; NCFSU 2; AND AUGMENT UNITS FOR 31ST NCR & NMCB 3, 4, 5, & 40 OF ABOUT 150 PERSONS EACH)

19. **DEPLOYMENT SITES (NMCB'S)**

-FOUR AROUND WORLD

-7 MONTHS DEPLOYED, 7 MONTHS HOMEPORT

-EACH BATTALION APPROX 600 PEOPLE

- WOMEN RECENTLY INTEGRATED

-100 NON-SEABEE RATINGS

-TOTAL SELF SUFFICIENT (DK'S, MS'S, SK'S, ETC.)

-WE PROVIDE MATL SUPPORT TO PAC DEPLOYED NMCB'S

20. **31ST NCR HOMEPORT TRAINING SITES**

-USE MANY PLATFORMS TO PROVIDE TRAINING

-COLD WEATHER TRAINING BRIDGEPORT

-DESERT TRAINING AT 29 PALMS

-FULL BATTALION MILITARY TRAINING AT SEVERAL SITES
LIKE FORT HUNTER LIGGETT NEAR FORT ORD

21. **NCTC**

-CONSORT WITH ONE MAJOR TENANT. NCTC TO
PROVIDE INDIVIDUAL AND CREW TRAINING FOR SEABEES

-CNET COMMAND BUT VERY FLEET SENSITIVE

-PROVIDE BASIC/ADVANCED TRAINING TO SEABEES

-TOGETHER WE SHARPEN THE MANY CONSTRUCTION
SKILLS FOUND IN A SEABEE BATTALION

-ITRO - FUTURE

22. **BUILDERS**

TRAIN THEM IN CONTINGENCY/FINISH CARPENTRY

23. **ELECTRICIANS**

FROM HIGH VOLTAGE ELECTRICITY TO CENTRAL OFFICE
TELEPHONE EXCHANGES

24. **MECHANICS (SEABEE REPAIRING VEHICLE)**

PAINTING VEHICLES TO MAJOR OVERHAUL

25. **ENGINEERING AIDES**

USE OF NUCLEAR DENSOMETERS TO SIMPLE SURVEYING

26. **EQUIPMENT OPERATORS**

EARTH-MOVING TO PAVING AND QUARRYING

27. **STEELWORKERS**

WELDING POST FOR A TARGET

28. **UTILITIESMEN**

BOILER OPERATION TO WATER/SEWER LINE INSTALLATION

29. **MILITARY TRAINING (SEABEE RIFLE RANGE)**

-TEACH INDIVIDUAL WEAPONS LIKE 45, M-16 AND
50-CALIBER MACHINE GUN

-HAVE CADRE OF MARINES ASSIGNED TO HELP

30. **MILITARY TRAINING**

-SMALL UNIT LEADERSHIP AND DEFENSIVE TECHNIQUES

-COMM TECHNIQUES

31. **MILITARY TRAINING**

CREW SERVED WEAPONS LIKE M-60 MACHINE GUN,
60MM MORTAR, 50 CAL MACHINE GUN, MK 19
GRENADE LAUNCHER

32. **EMBARKATION**

PRACTICE ON EMBARKING BY SHIP OR BY AIR

33. **CCCT**

-SPECIALTY TRAINING LIKE CONTINGENCY TYPE
CONSTRUCTION

-SWA HUT

34. **BAILEY BRIDGE**

BAILEY BRIDGE CONSTRUCTION

35. **WELL DRILLING**

36. **COMBAT STRUCTURE-TIMBER TOWER**

37. **CBC SEAL**



Channel Islands Blvd.

BLDG	DESCRIPTION
2/20	FACSO
6	USMCRTC
11	SECURITY DEPARTMENT
14	CBC ADMINISTRATIVE BUILDING
19	CAFETERIA/MPPSO
40	CEISO ADMINISTRATIVE
44	CECOS
50	COMSTORE
61	ENLISTED DINING FACILITY
90	REGIONAL MEDICAL CLINIC/NAVY RELIEF
101	HOUSING OFFICE/PERSONAL PROPERTY
102	FAMILY SERVICE CENTER
104	NTCC ADMIN
137	THIRTY-FIRST NCP ADMINISTRATIVE
225	MILITARY AFFAIRS DEPARTMENT/PSD/RED CROSS
233	GOLF CLUB HOUSE/ROLLER SKATING RINK
267	SERVIMART
360	SPECIAL SERVICES
372	COLD STORAGE
445	NEWSSES ADMIN
448	CPO CLUB
465	PMTC SURFACE TARGETS DIV
471	TUB BOAT OFFICE
494	PORT SERVICES DEPARTMENT/TUB CREW BARRACKS
510	RECEIVING SECTION, SUPPLY DEPARTMENT
511	TRAFFIC OFFICE, SUPPLY DEPARTMENT
513	DEFENSE PROPERTY DISPOSAL OFFICE
528	VETERINARY
541	PMTC SURFACE CRAFT DEPARTMENT
543	MARINE TERMINAL, SUPPLY DEPARTMENT
560	NAVAL CIVIL ENGINEERING LABORATORY
573	CONSTRUCTION EQUIPMENT DEPARTMENT
590	PUBLIC WORKS DEPARTMENT
914	DENTAL CLINIC
1164	COM OPEN/LOPH
1169	NAVY EXCHANGE RETAIL STORE
1172	NAVY LODGE
1184	UEPH

VICTORIA GATE

Victoria

MARINA GATE

VENTURA ROAD GATE

BARD ROAD GATE

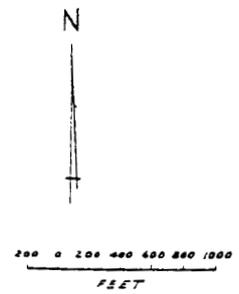
PLEASANT VALLEY ROAD GATE

SURFACE TARGETS

SURFACE CRAFT

CEL GATE

MARITIME ROAD



NAVAL CONSTRUCTION BATTALION CENTER
PORT HUENEME, CALIFORNIA

This document is too large to be scanned
in for electronic view. It is a map of the
U.S. Naval Construction Battalion
Center Port Hueneme California

PACIFIC RANGES AND FACILITIES
DEPARTMENT OVERVIEW

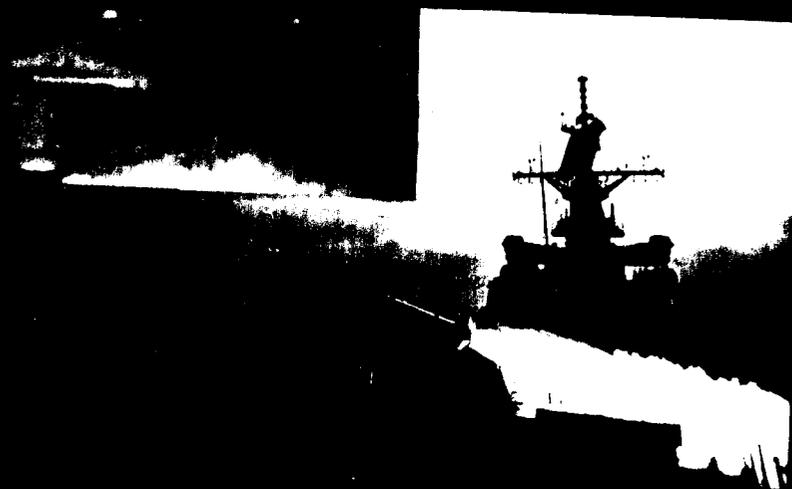


PR&F
DEPARTMENT

PACIFIC RANGES AND FACILITIES DEPARTMENT

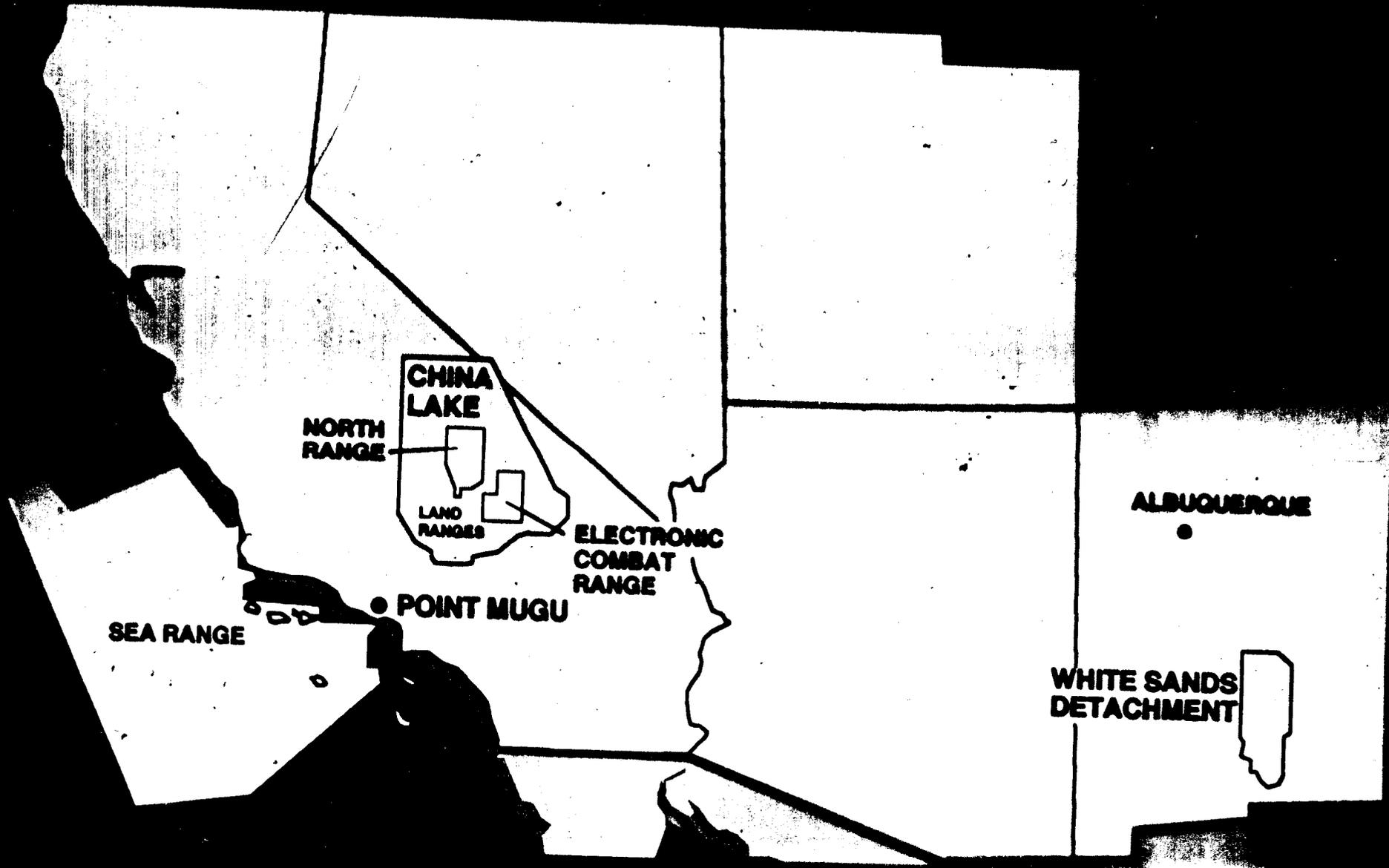
PR&F
DEPARTMENT

- *A competency aligned organization operating and developing major range and test facilities and threat systems for air, land, and sea environments for DoD RDT&E, operational, international and commercial customers*
 - CHINA LAKE LAND RANGES
 - POINT MUGU SEA RANGE
 - WHITE SANDS DETACHMENT
- PROVEN STRENGTHS
- BROAD-BASED EXPERIENCE
- EXTENSIVE EXPERTISE
- UNIQUE RESOURCES AND CAPABILITIES

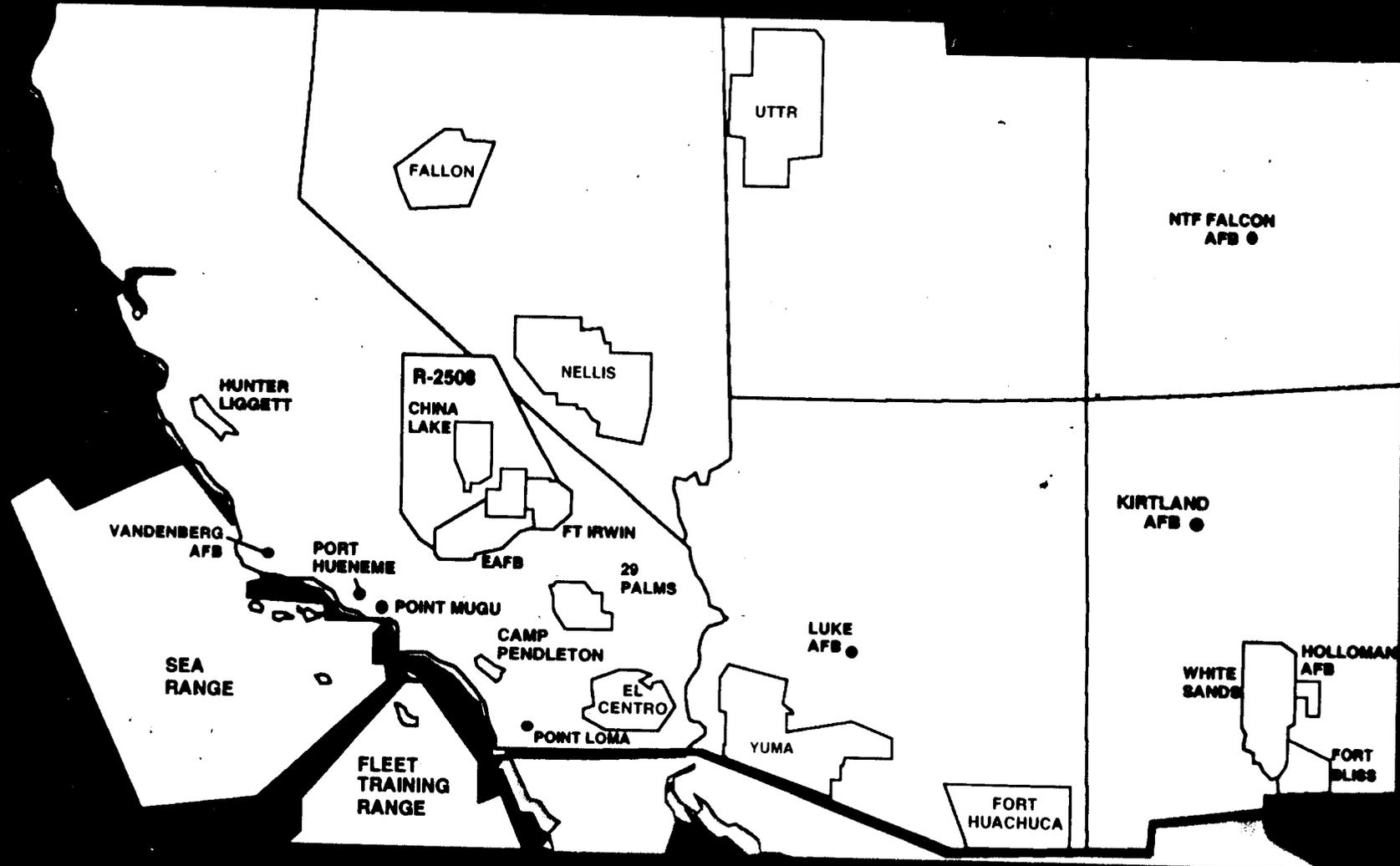


PACIFIC RANGES AND FACILITIES DEPARTMENT

PR&F
DEPARTMENT



SOUTHWESTERN RANGE COMPLEX





LEVEL 1

5.0

TEST & EVALUATION

**DEPUTY
(ATLANTIC)**

**DEPUTY
(PACIFIC)**

- JOINT SVC T&E
- NAVY MRTFB MGMT
- ACC
- DEVELOPMENT MGMT

**ALL LEVEL 2 AND 3
LOCATED IN THE FIELD**

LEVEL 2

5.1

**ATLANTIC
RANGES &
FACILITIES**

5.2

**PACIFIC
RANGES &
FACILITIES**

5.3

**THREAT/
TARGET
SYSTEMS**

5.4

**TEST ARTICLE
PREPARATION**

5.5

**TEST WING
(ATLANTIC)**

5.6

**TEST WING
(PACIFIC)**

LEVEL 3

— TEST OPERATIONS

— METRIC AND TSPI
SYSTEMS

— TELEMETRY

— COMMUNICATIONS
& DATA LINKS

— DATA PROCESSING
AND DISPLAYS

— SIMULATION AND
STIMULATION

— E 3

— CARRIER SYSTEMS

— TEST OPERATIONS

— METRIC AND TSPI
SYSTEMS

— TELEMETRY

— COMMUNICATIONS
& DATA LINKS

— DATA PROCESSING
AND DISPLAYS

— SIMULATION AND
STIMULATION

— ORDNANCE HANDLING

— TARGET SYSTEMS

— TARGET OPERATIONS

— AIRBORNE THREAT
SIMULATION

— COMBAT
ENVIRONMENT
SIMULATION

— ASM THREAT
SIMULATION

— TEST ARTICLE
CONFIG DESIGN

— AIRCRAFT
INTRUMENTATION

— WEAPONS
INSTRUMENTATION

— TEST ARTICLE
RECONFIG

— OPERATIONS

— MAINTENANCE

— SAFETY

— OPERATIONS

— MAINTENANCE

— SAFETY

PACIFIC RANGES & FACILITIES DEPARTMENT

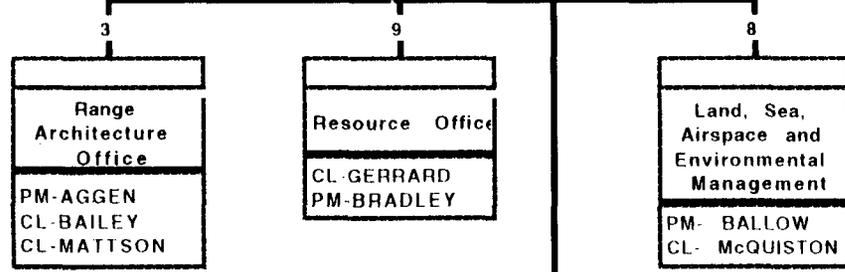
7

HEAD
BULLARD

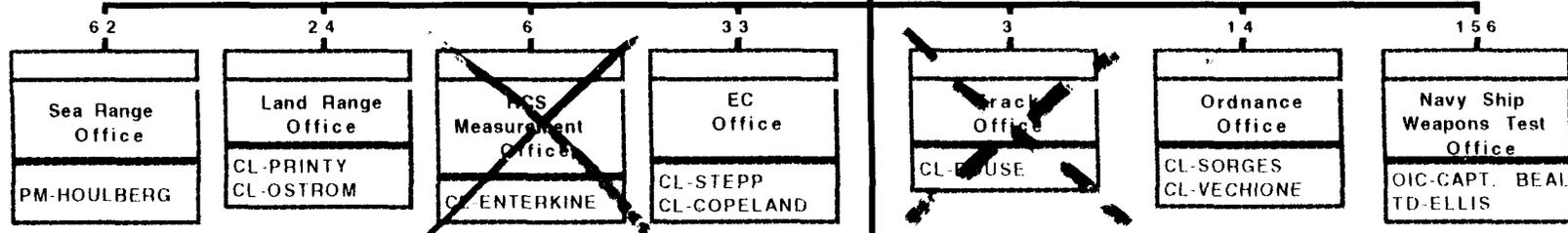
ASSOCIATE BALL	DEPUTY CAPT. BARRETT	ASSOCIATE R. SMITH
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PACIFIC RANGE & FACILITIES WORKFORCE			
	CIV	MIL	TOT
PM (E)	653	98	751
CL (D)	509	4	513
WS (F)	76	80	156
TOTAL	1238*	182	1420

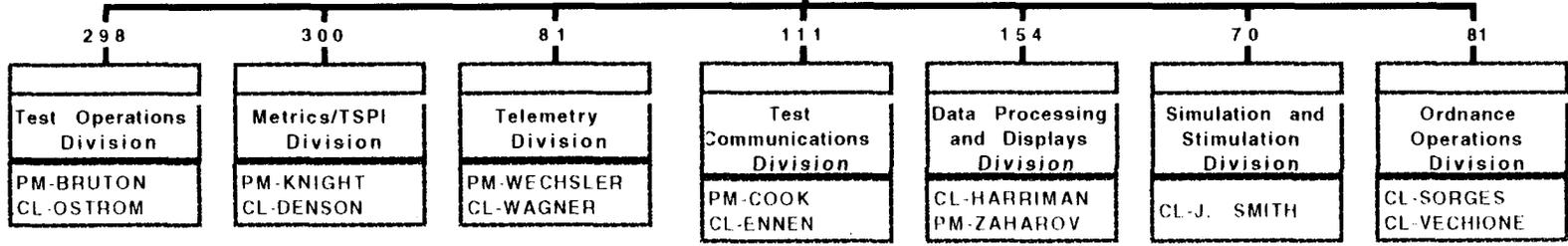
Data as of 31 Jan 95



20



298



1095

*LWOP excluded

OCEAN

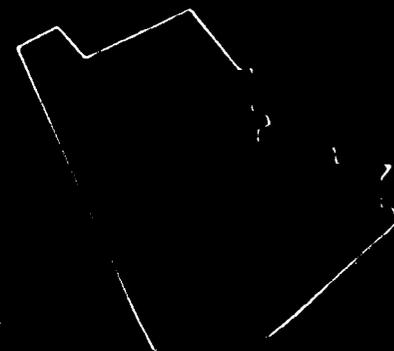
- LARGE AND UNCLUTTERED OPERATING AREAS
- PROXIMITY TO FLEET
- PROXIMITY TO OTHER DoD SEA AND LAND RANGES
- ACCESS TO IR200/IR206

ISLANDS

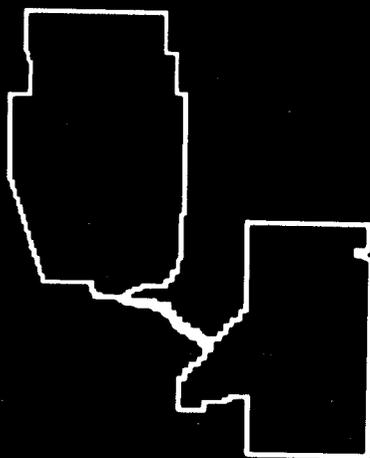
- HEAVILY INSTRUMENTED
- 55-MI STANDOFF (SAFETY)
- 55-MI ADDITIONAL INSTRUMENTATION REACH
- BLUE WATER
- LITTORAL SCENARIOS
- ISOLATED RUNWAY/FACILITIES
- FULL SCALE TARGETS
- COMMON RELAY SITES
- ELECTROMAGNETICALLY CONTROLLED QUIET ARENA

- MULTIPLE INSTRUMENTED AIR/GROUND/SEA SITES CHANNEL ISLANDS, COASTAL MOUNTAINS
- PROXIMITY TO OTHER T&E FACILITIES
- PRINCIPAL TEST SITE FOR MANY NAVY WEAPONS
- PRIMARY TEST SITE FOR SHIP BORNE WEAPONS, INCLUDING SELF DEFENSE SYSTEMS, MINE SCORING, COMBINED DOT&E/OT&E/FOT&E AND TRAINING
- BATTLE MANAGEMENT INTEROPERABILITY CENTER
- DEEP WATER PORT
- LITTORAL SCENARIO TESTING
- LARGE MIX OF AIRBORNE TARGET TYPES AND SEA SURFACE TARGETS
- CAST GLANCE--AIRBORNE OPTICAL PHOTOGRAPHY
- ANTENNA RANGES
- MODELING AND SIMULATION
- COMPLEX MANY-ON-MANY TEST AND TRAINING SCENARIOS
- INTERRANGE TESTING WITH POINT MUGU EDWARDS AFB, FT IWRIN, UTTR

- HEAVILY INSTRUMENTED
- 55 NM STANDOFF FROM POPULATED COAST (SAFETY)
- TRUE SEA ENVIRONMENT - NOT COASTLINE
- LITTORAL SCENARIOS
- COMMUNICATIONS RELAY
- SENSITIVE PROJECTS - CONTROLLED AIRFIELD AND SUPPORT FACILITIES
- ELECTROMAGNETICALLY CONTROLLED QUIET ARENA



- LAND RANGES PROVIDE SECURE, HIGHLY INSTRUMENTED, HIGHLY CONTROLLED LAUNCH, FLIGHT AND RECOVERY OR IMPACT CAPABILITIES FOR TOTAL SYSTEM T&E
- 1,722 SQ. MILES OF LAND UNDERLYING THE R-2505 AND R-2524 AIRSPACE
- REALISTIC, SECURE, SAFE ENVIRONMENT FOR AIR AND SURFACE TESTS
- TEST AND TRAINING ARENA FOR JOINT SERVICE EXERCISES
- HEAVILY INSTRUMENTED RANGES AND FACILITIES
- ISOLATED TEST AREAS
- LIVE WARHEAD TEST



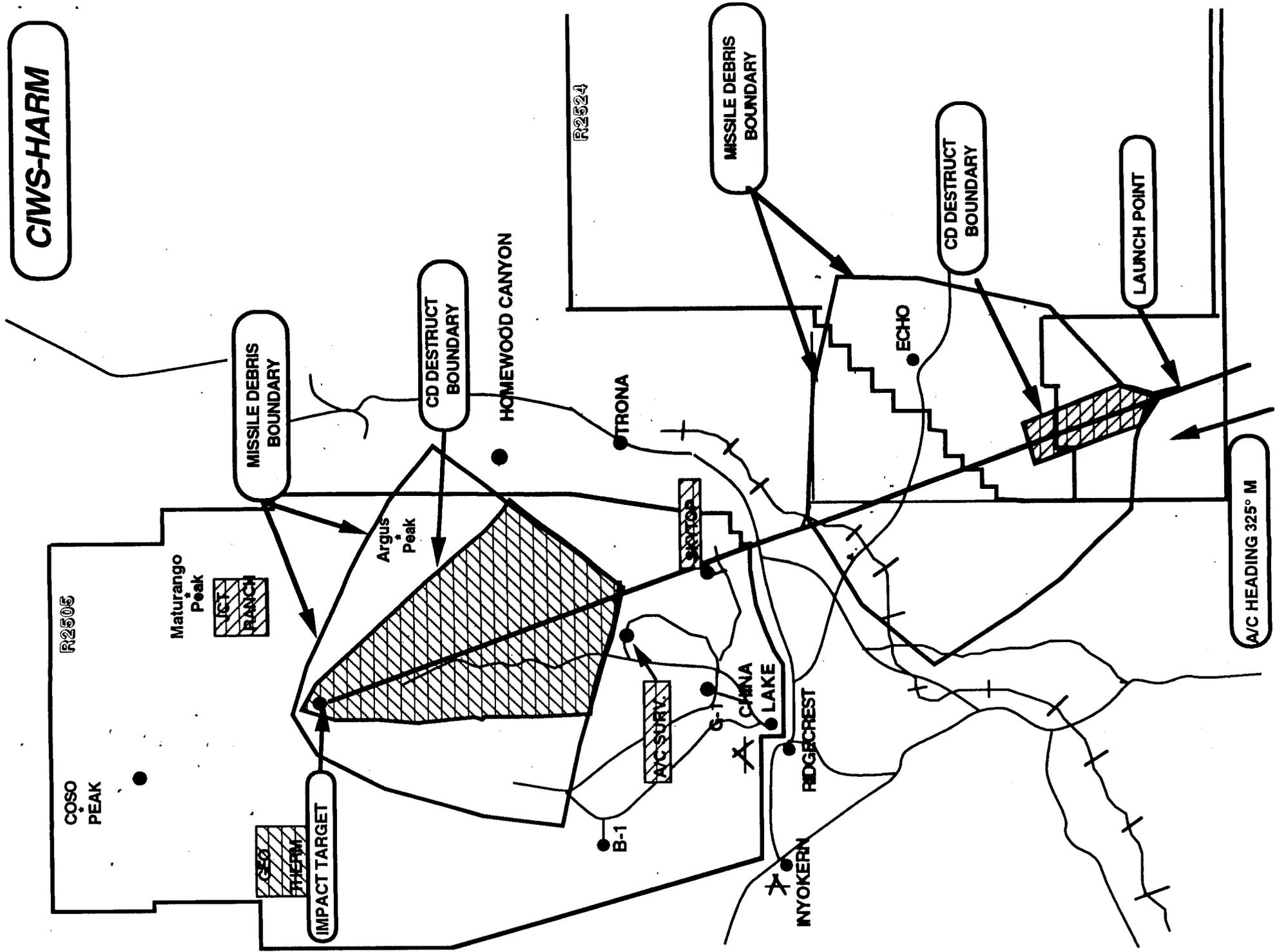
Drone Scheduling @ China Lake

- Informal Process
- Test Manager usually requests target from Pt Mugu
 - Sometimes customer requests targets / costs
 - Ex. MAD requested targets for LAV program
 - Targets Dept provides cost estimate
- Test Manager coordinates scheduling w/
 - Customer
 - Pt Mugu Targets Department
 - Range Scheduling
 - ITCS Support group at China Lake

Navy Full-Scale Aerial Target (QF-4) Allocation Process

- **Five Major Claimants can request Navy QF-4s (NAVAIR, NAVSEA, OPDEVFOR, SPAWARS, MARINES)**
- **Non-Navy Program needs Navy Claimant Sponsorship to get Navy QF-4 Allocation**
 - **Must convince Sponsor Program will benefit Navy**
- **OPNAV (N-912) allocates QF-4s**
- **Claimant does not bear cost of QF-4s allocated**
 - **Budgeted separately**
- **Allocations made in Sept for following FY**
- **Allocations from existing inventory which depends on previous year's budget decisions and QF-4 expenditure rate**
 - **Potential competition for limited number of drones**
- **Qtrly Adjustments to Allocations**
 - **Expenditures/New Rqmts**

CIWS-HARM



PRF

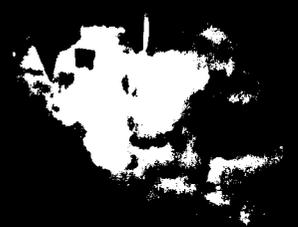
OFFICIAL PUBLICATION



JUNCTION RANCH

ELECTRONIC
COMBAT RANGE

WARHEAD



PROPULSION

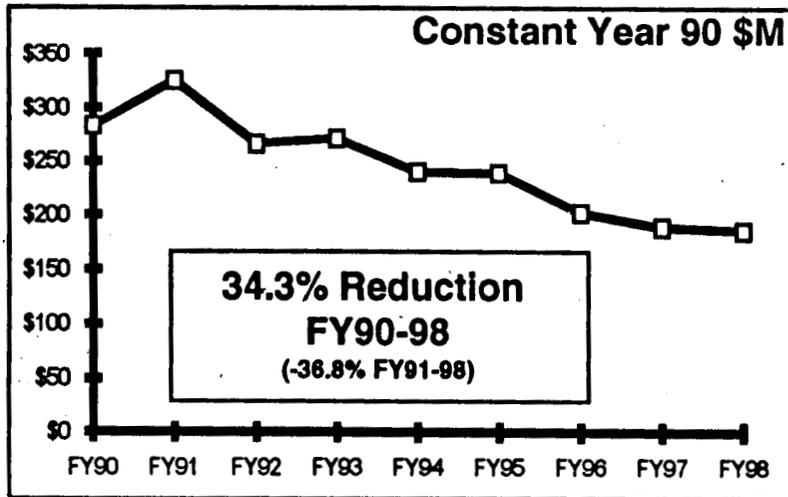


SNORT

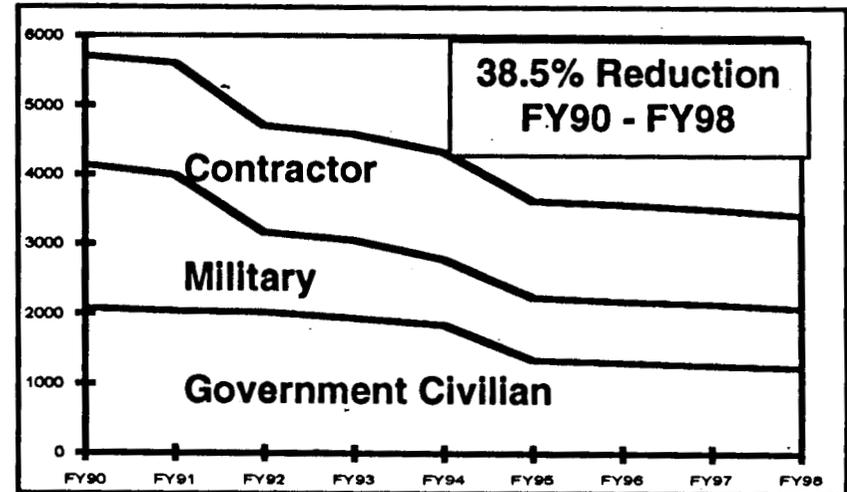
SAN NICOLAS ISLAND

MRTFB BUSINESS TRENDS

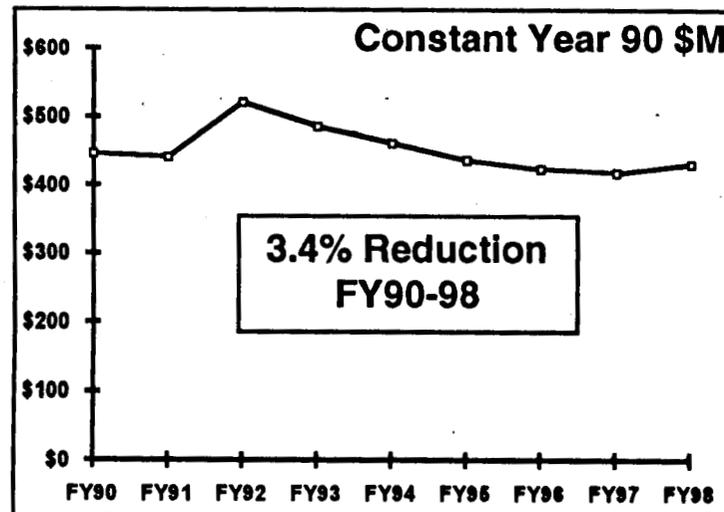
INSTITUTIONAL FUNDING



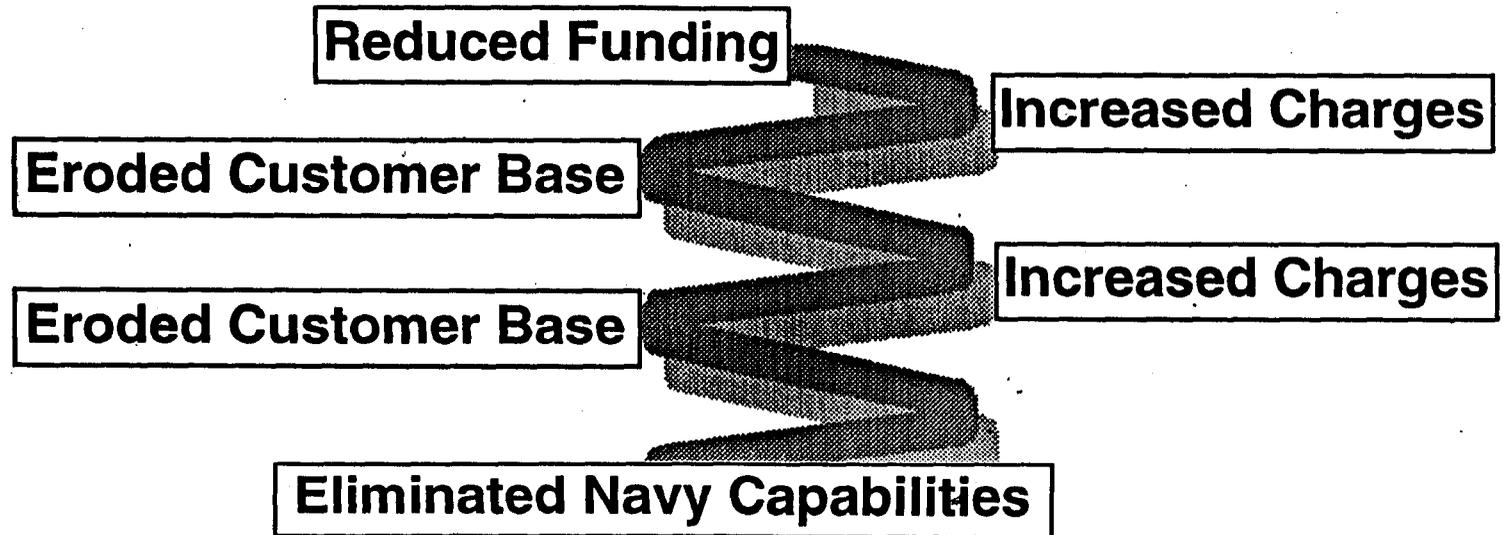
INSTITUTIONAL PERSONNEL



WORKLOAD

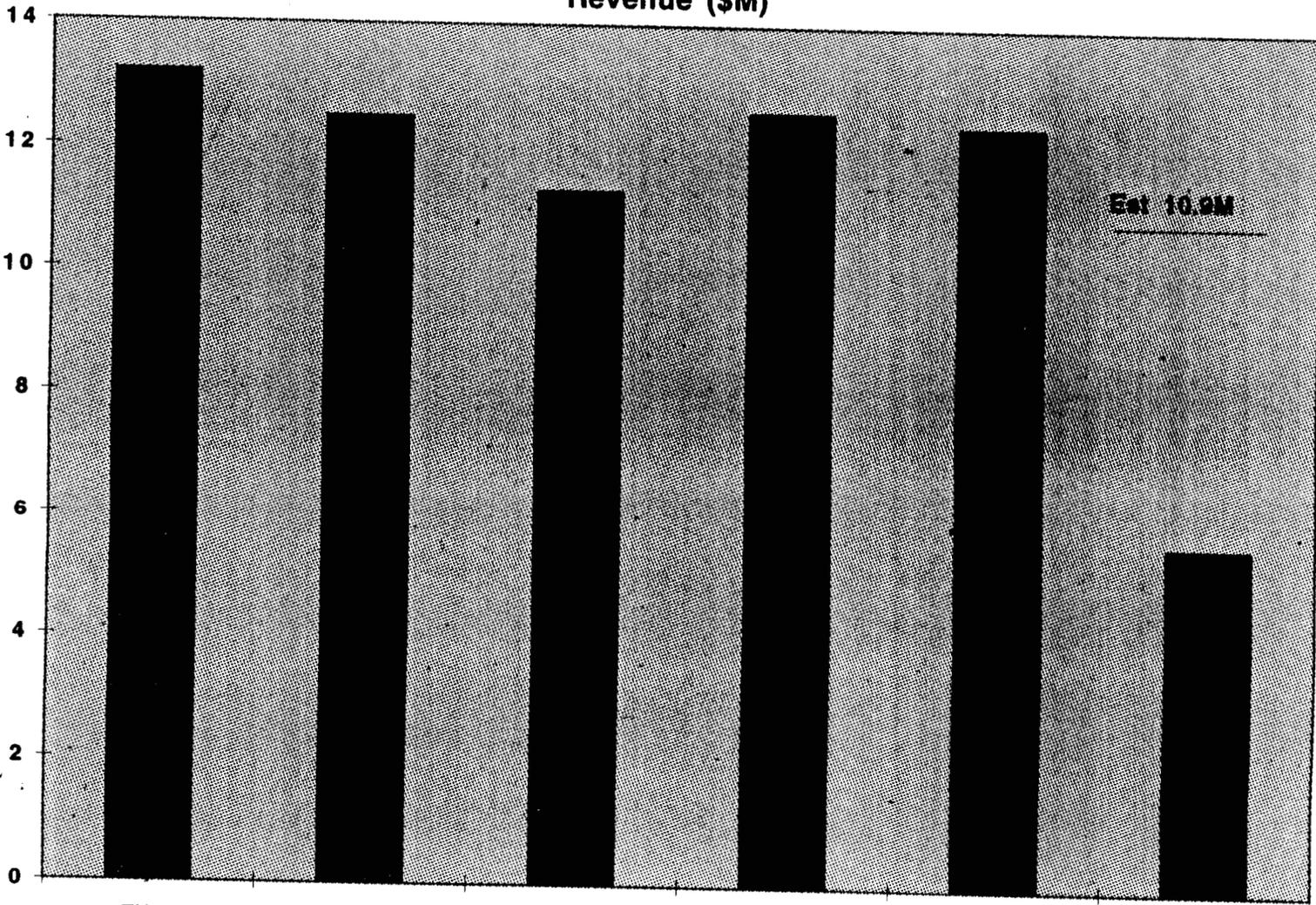


Downward Spiral Possible



- **Increased Charges Leads to...**
 - Less program testing.
 - Less fleet training.
- **Eliminated Navy Capabilities Leads to...**
 - Additional programs seeking services outside DoN.
 - Other services seeking Navy TOA.

**North Range
Revenue (\$M)**



Est 10.9M

FY90

FY91

FY92

FY93

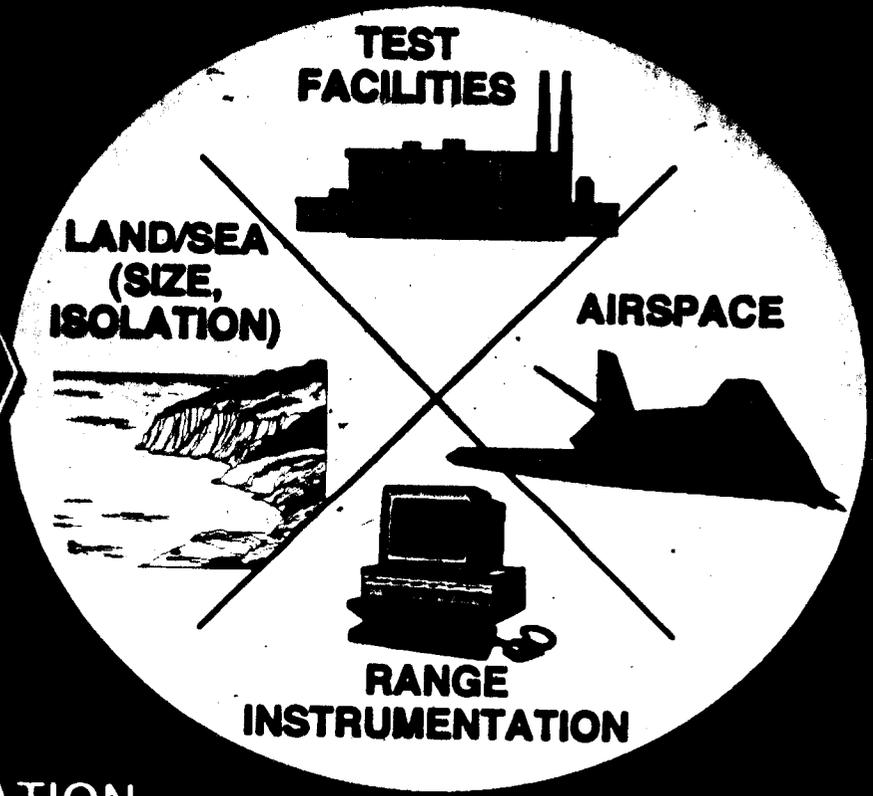
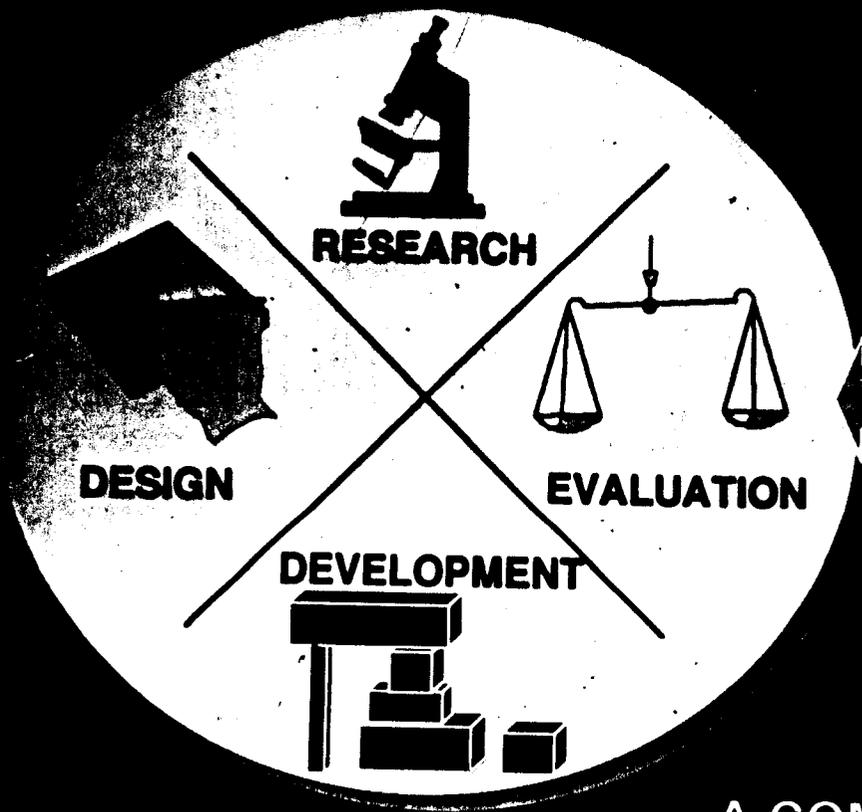
FY94

FY95*

* Actuals thru wk 31

LABORATORIES

RANGES



A COMBINATION
NOT DUPLICATED ELSEWHERE

NEWS CLIPPINGS FROM:

L.A. TIMES (West Ventura Co. Edition)

DAILY INDEPENDENT (RIDGECREST)

DATE: 05/31/95

Ventura County STAR

OTHER: _____

Section/Page: B1

2 Federal Panel Members Tour Point Mugu

■ **Base closures:** Commissioners say they are undecided about whether to relocate its naval facilities to China Lake.

By KENNETH R. WEISS
TIMES STAFF WRITER

Two members of a federal base-closing commission Tuesday toured the labs that test missiles fired by fighter jets featured in the movie "Top Gun," examined assorted flying objects the Navy tries to blow from the sky and ventured into a darkened room full of radar screens that looks like a miniature Mission Control.

Commissioners Benjamin F. Montoya and Rebecca Cox visited Point Mugu to find out if they can save tax dollars by moving its extensive missile-testing operations to another Navy base.

"I want to assure you that if we find otherwise, this is one commissioner who will gladly vote to leave it [Point Mugu] alone," Montoya said at a news conference before the tour.

Montoya and Cox assured reporters and a roomful of naval officers that they had made no decisions on the proposal to mothball most of the base and move its testing labs 160 miles to the China Lake naval base in the upper Mojave Desert.

They promised to pass along what they learned on their tour back to the six other members of the base-closing commission who will decide the fate of Point Mugu and 180 other bases being weighed for closure or realignment.

The commission must complete its work and submit its closure list to President Clinton by July 1.

Montoya, a retired admiral who spent the early 1960s as a Seabee stationed at the nearby Port Hueneme Navy base, was the commissioner who nominated Point Mugu for addition to the Pentagon's list of recommended closures.

But Montoya said he felt a fondness for Ventura County, where he was stationed from 1962 to 1967.

"It's nice to be in an area I used to think of as home," Montoya said. "I spent five years here as a young naval officer. I think we had our fourth child here in town. I had a lot of fun on the beaches of Point Mugu."

Montoya and Cox are seen by Point Mugu backers as the pivotal commissioners in the upcoming decision on Point Mugu. Other members of the Defense Base Closure and Realignment Commission are likely to seek their advice, given Montoya's extensive Navy background and that he and Cox were the only commissioners to actually tour the base.

Point Mugu supporters also view them as potentially the most friendly.

Cox, a United Airlines executive and former Reagan Administration official, is the wife of Rep. Christopher Cox (R-Newport Beach). She is well-known to members of the California congressional delegation and sensitive to their concerns about losing more military jobs in a state that has suffered 22 base closures in recent years.

Furthermore, Congressman Cox has been a political ally to Rep. Elton Gallegly (R-Simi Valley), who is aggressively lobbying on behalf of Point Mugu. With about 9,000 jobs, the base is the biggest employer in Ventura County.

At Tuesday's news conference, Cox said her only direct experience with Point Mugu was arriving on a

plane with then-President Reagan, who used to land Air Force One there when coming home to California.

She declined to speculate on the odds of Point Mugu's closure. "It's really too early to say at this point," she said. "We are just going through the fact-finding part."

Gallegly and Rep. Anthony C. Beilenson (D-Woodland Hills), who represents the Conejo Valley, accompanied the commissioners on their tour.

So did nearly all of the top officers from Point Mugu and two visiting admirals who have wide influence over Navy policy.

Adm. Ronald J. Zlatoper, commander in chief of the Pacific Fleet, and Adm. John A. Lockard, head of all naval aviation, said they each took red-eye flights Monday night to get to Point Mugu because they wanted to show their commitment to the base.

"This is a vital complex," Zlatoper said.

Lockard said Point Mugu and its missile-testing range over the Pacific Ocean are critical to the Navy's needs to test-fire weapons.

"Clearly, this area offers an opportunity that doesn't exist anywhere else," he said. "To duplicate this would be very expensive."

Among other places the 28-person entourage visited the lab that tests missiles for the F-14 Tomcat, a staging area filled with unmanned aircraft the Navy uses as missile targets and the control center for Point Mugu's missile testing range that stretches across 36,000 square miles of the ocean.

Routed to:

- Code 000000D Commander
- Code 00A000E Vice Commander
- Code 05A000D Executive Assistant
- Code 500000E Competency Leader, T&E
- Code 700000D Corporate Operations
- Code 750000D PAO
- Code 750000E PAO
- Code 830000E NA WS PM CO/XO
- Code 833000E NA WS PM PWO
- Code 844300E NA WS PM Environmental
- Code 835000E NA WS PM Air Ops
- Code 839000E OIG/SNI
- NAVAIRSYS COM PAO
- NAVINWEST

OTHER: BRAC / FARRINGTON

more

In addition to touring Point Mugu in four vans, the group flew to China Lake to visit the other principal base that makes up the Naval Air Warfare Center, Weapons Division.

At the morning briefing, Montoya said he had not studied the details of the Pentagon audit that helped inspire staff to consider closing Point Mugu. But he said he was familiar with its promise of \$1.7 billion in savings over 20 years.

"If someone thinks they can save almost \$2 billion . . . you need to examine that," he said.

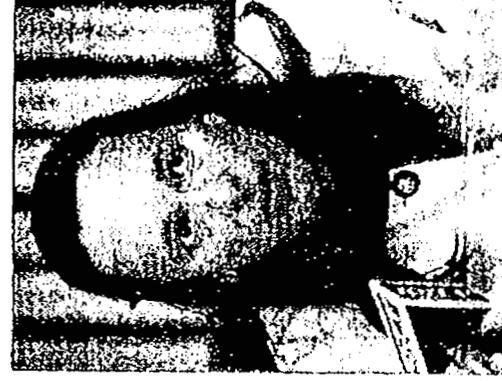
He said he had just learned of the Navy's calculations, which figure the consolidation would cost taxpayers \$436 million during the same 20-year period. "That's a lot

of money," he said. "I have just enough background to ask a few questions about those numbers."

Moreover, he said the commissioners feel compassion for the impact of their decision on the lives of local residents.

"We understand the difficulties that communities would face in the closing of a base," Montoya said. "And we understand the trauma that families would be subjected to if a base were to be closed.

"But the reality of life is that our armed forces have gone down in large numbers over the past few years," he said. "It is incumbent upon us to recognize that and shrink the shore establishment to be somewhat commensurate with the operating forces."



Commissioners Benjamin F. Montoya and Rebecca Cox visited Point Mugu to find out if they can save money by moving its facilities.

pg 2 of 3

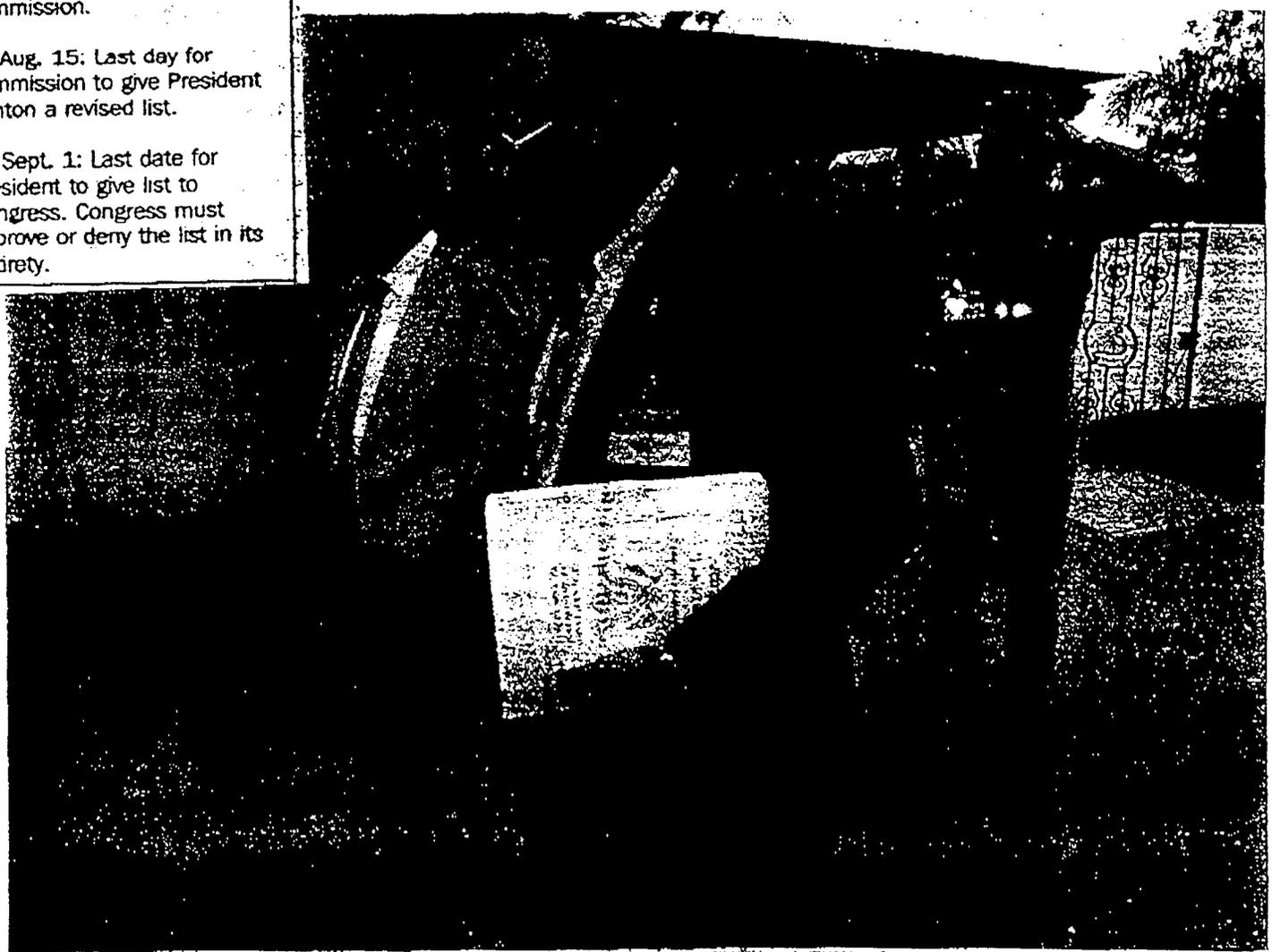
pg 2002

WHAT'S NEXT

- June 12 and 13: Members of Congress testify before the Defense Closure and Realignment Commission. Around the same time, the Department of Defense will testify about the bases.
- June 22: The commission begins final voting.
- July 1: The commission gives final list to President Bill Clinton.
- July 15: Last day for president to approve recommendations and forward changes, if any, back to the commission.
- Aug. 15: Last day for commission to give President Clinton a revised list.
- Sept. 1: Last date for president to give list to Congress. Congress must approve or deny the list in its entirety.



BEFORE TOUR: Retired Rear Adm. Benjamin F. Montoya, left, and Rebecca Cox, both members of the base-closure commission, conduct a press conference before touring Point Mugu.



BASE TOUR: Rep. Eiton Gallegly, R-Simi Valley, left, retired Rear Adm. Benjamin F. Montoya of the base-closure commission, and Vice Adm. John Lockard, commander of the Naval Air Systems Command, tour Point Mugu. *Staff photos by Juan Carlo*

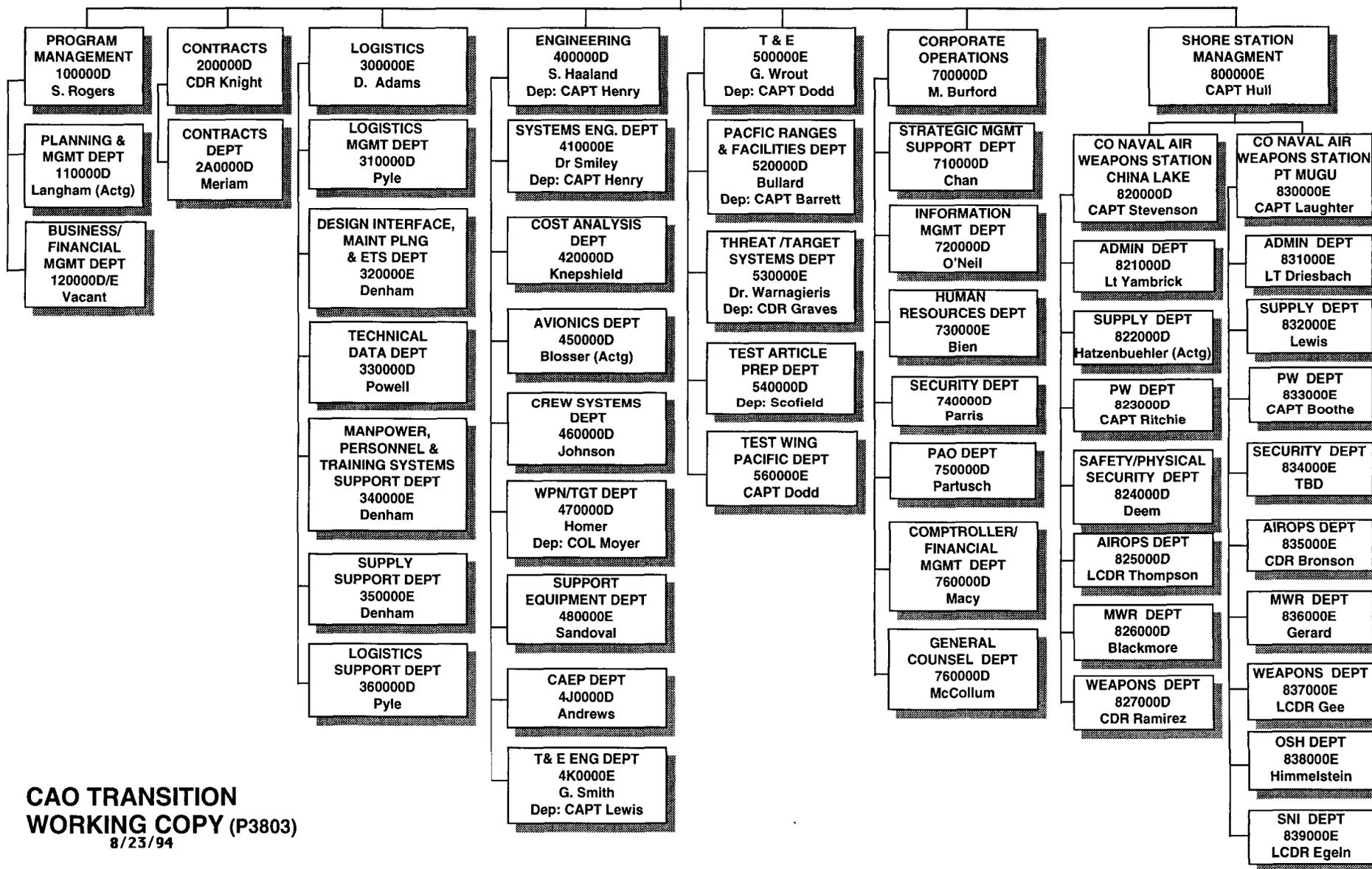
Tomahawk — The Total Weapon System



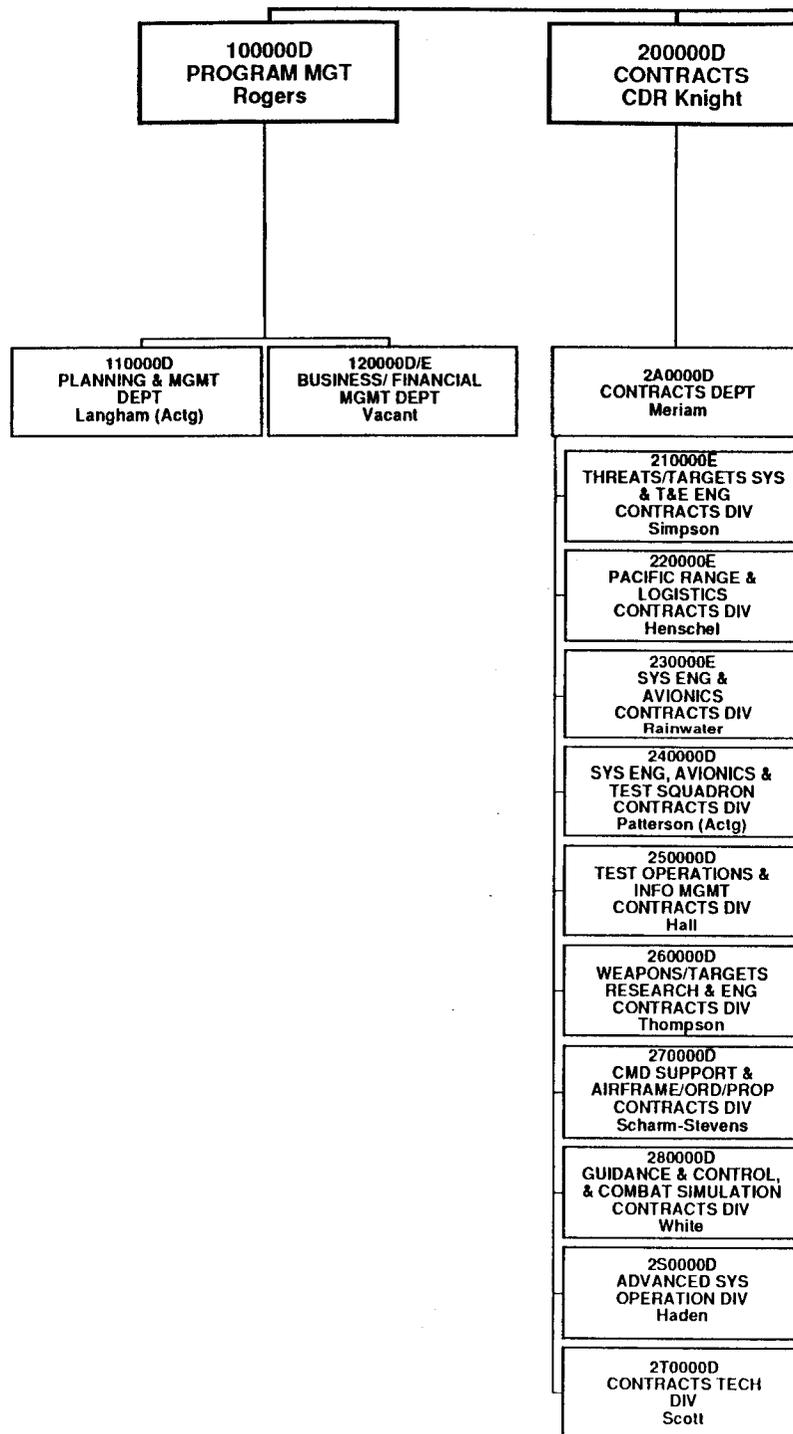
NAVAL AIR WARFARE CENTER - WEAPONS DIVISION

COMMANDER
Code 000000D RADM McKinney

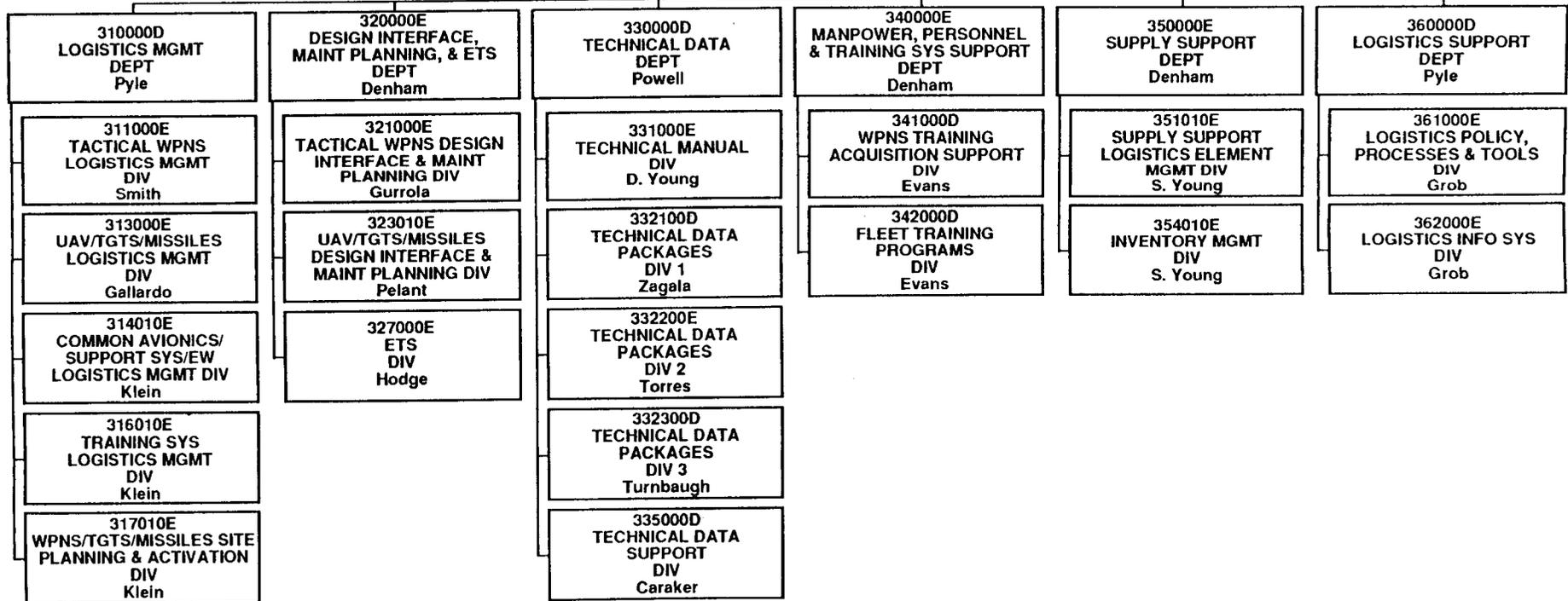
VICE COMMANDER
Code 00A000E CAPT Hull



CAO TRANSITION
WORKING COPY (P3803)
8/23/94



30000E
LOGISTICS
Adams



40000D
ENGINEERING
Haaland *
Deputy - CAPT Henry

48000D
S&T COORD
Dr. Derr

41000E
SYS ENG
DEPT
Dr. Smiley
Deputy - CAPT Henry

41100D
CARRIER-BASED TACT
A/C DIV
Bruckman

41200D
SHIPBOARD-CAPABLE
VERT. LIFT A/C DIV
Bruckman

41400D
TACAIR WEAPONS
SYS DIV
Campbell

41500E
UAVs/TARGETS SYS
DIV
Clark

41600D
RELIABILITY/
MAINTENANCE DIV
Terry

41700D
E-CUBED DIV
Southworth

41800D
SURVIVABILITY/
VULNERABILITY DIV
Horton

41900D
MANUFACTURING
ENG DIV
Terry

41J00D
SYSTEM SAFETY
ENG DIV
Terry

41L00E
PLATFORM INTEG
FACILITIES ENG DIV
Jutzi

42000D
COST ANALYSIS
DEPT
Knepshield

42300D
MISSILES, TGTS & UAV
DIV
Knepshield

42600D
CONTRACTOR
PERFORMANCE
MEASUREMENT DIV
Knepshield

42700D
COST PROCESSES,
METHODOLOGIES &
DATA BASES DIV
Knepshield

45000D
AVIONICS
DEPT
Blosser (Actg)
Deputy - Vacant

45100E
AVIONICS SYS
DIV
Dahl

45200E
INFO WARFARE
SYSTEMS DIV
Stolsig

45400E
EW DIV
Kinghorn

45500D
MISSION & SENSOR
DIV
Hageman

46000D
CREW SYSTEMS
DEPT
Johnson

46100D
SYSTEMS DEV
DIV
Kato

46200D
PARACHUTE
OPERATIONS
DIV
Geikie

46300D
FLEET SUPPORT
DIV
Smith

47000D
WPNS/TGTS
DEPT
Homer
Deputy - COL Moyer

47100D
WPNS/TGTS
INTEGRATION DIV
Gilbert

47200D
G&C SYSTEMS DIV
Higgins

47300D
AIRFRAME/ORD/
PROP DIV
Goss

47400D
R&T DIV
Dr. Derr

47500D
WPNS
PROTOTYPE DIV
Johnson

48000E
SUPPORT EQUIP
DEPT
Sandoval

48200E
AIRCRAFT SUPPORT EQUIP
DIV
Ashley

48600E
WPNS & TGTS SUPPORT
EQUIP
DIV
Tatum

4J000D
CAEP
DEPT
Andrews

4J100D
ANTI-AIR WARFARE
ANALYSIS DIV
Galloway

4J200D
STRIKE & ASUW
ANALYSIS DIV
Galloway

4J400D
CAMPAIGN ANALYSIS
DIV
Galloway

4J500D
WEPTAC WARGAMING
DIV
Stone

4J600D
CONCEPTUAL DESIGN
DIV
Stephens

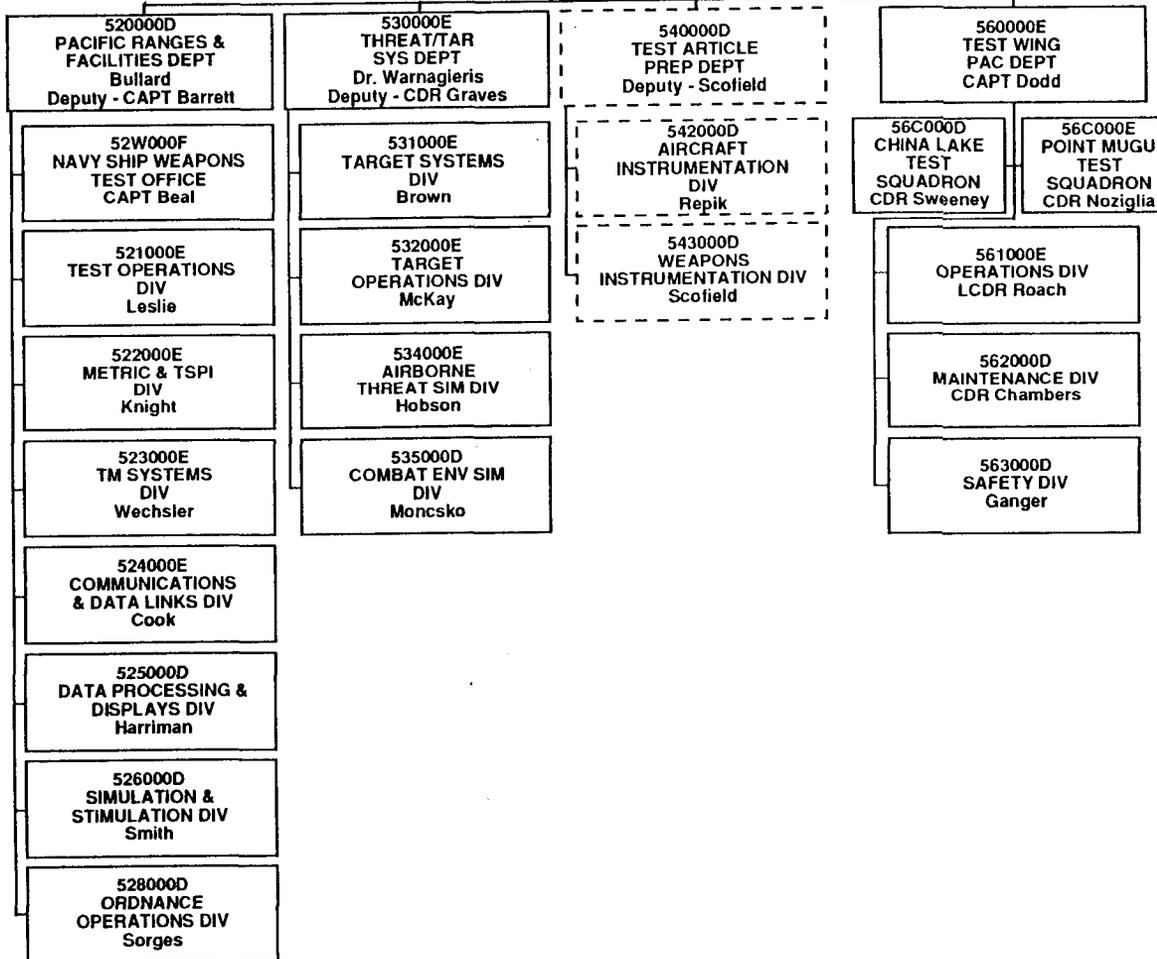
4J800D
THREAT ANALYSIS &
SUPPORT DIV
Stephens

4K000E
T&E ENG
DEPT
Smith
Deputy - CAPT Lewis

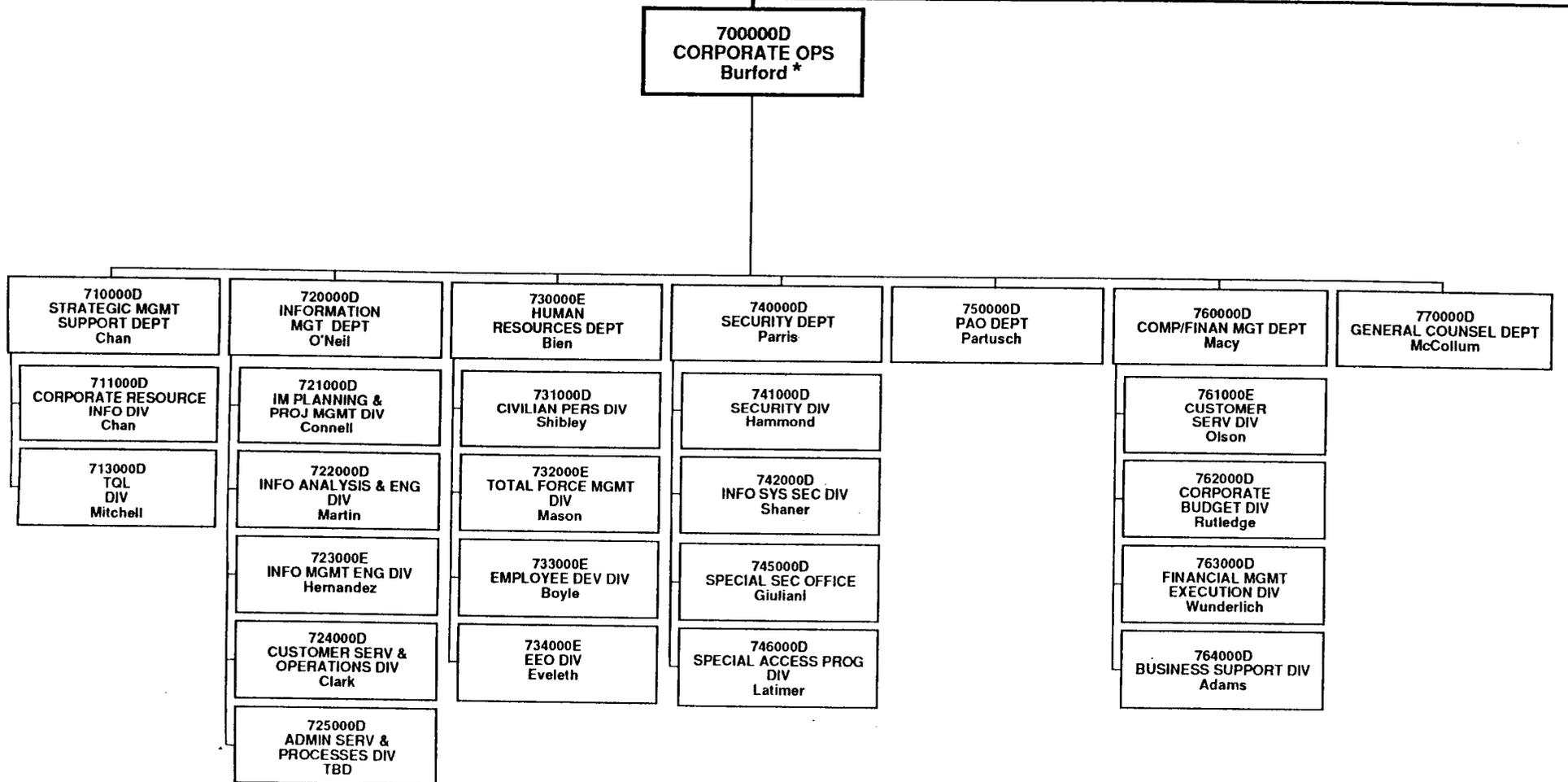
4KL00E
STRIKE SYSTEMS
DIV
Ayub

4KM00E
AIR INTERCEPT
SYSTEMS DIV
Banks

50000E
T&E
Wrout *
Deputy - CAPT Dodd



- DIRECT REPORT OUTSIDE OF WD. ADMIN SUPPORT ONLY FROM WD



80000E
SHORE STATION
MANAGEMENT
CAPT Hull *

82000D
NAWS CHINA LAKE
CO - CAPT Stevenson
XO - CDR Seal

830000E
NAWS POINT MUGU
CO - CAPT Laughter
XO - CDR Kelly

DIRECT REPORTING STAFF:
82000D - BUSINESS FIN MGR
82E000D - CHAPLAIN
82C000D - JAG
82B000D - CMD MASTER CHIEF
82G000D - SPACE RESOURCES MG
82H000D - NAVY EXCHANGE
82H00D - TREATY COORD OFFICE

DIRECT REPORTING STAFF:
83D000E - BUSINESS FIN MGR
83G000E - CHAPLAIN
83H000E - JAG
83C000E - CMD MASTER CHIEF
83H000E - SPACE RESOURCES MG
83H000E - NAVY EXCHANGE
83H000E - CMO / TRAINING
83F000E - FAM SERVICE CENTER

DIRECT ADVISORS:
750000D - PAO
00AC00D - PROTOCOL
741000D - SECURITY
82C000D - LEGAL COUNSEL
563000D - AIRFIELD SAFETY
82F000D - CMD CAREER COUN
823E00D - ENVIRONMENTAL

DIRECT ADVISORS:
750000E - PAO
00AC00E - PROTOCOL
741000E - SECURITY
83H000E - LEGAL COUNSEL
563000E - AIRFIELD SAFETY
83HF00E - CMD CAREER COUN
83ED00E - ENVIRONMENTAL

821000D
ADMIN DEPT
LT Yambrick

831000E
ADMIN DEPT
LT Driesbach

822000D
SUPPLY DEPT
Hatzenbuehler (Actg)

832000E
SUPPLY DEPT
Lewis

823000D
PW DEPT
CAPT Ritchie

833000E
PW DEPT
CAPT Boothe

824000D
SAF/PHY SEC DEPT
Deem

834000E
SEC DEPT
TBD

825000D
AIROPS DEPT
LCDR Thompson

835000E
AIR OPERATIONS
DEPT
CDR Bronson

826000D
MWR DEPT
Blackmore

836000E
MWR DEPT
Gerard

827000D
WPNS DEPT
CDR Ramirez

837000E
WEAPONS DEPT
LCDR Gee

838000E
OSH DEPT
Himmelstein

839000E
SNI
LCDR Egelin



STRIKE WEAPONS TEST & EVALUATION

- **FUNCTION**

- Full spectrum T&E support to current and advanced strike systems through a balanced mix of laboratory, simulation, captive, and free flight testing

- **CAPABILITY**

- 25 years experience in the planning, management, and execution of T&E for cruise and strike weapons
- Laboratories and simulations to evaluate pre-launch to impact performance of missiles and associated mission systems

- **REPLACEMENT COST**

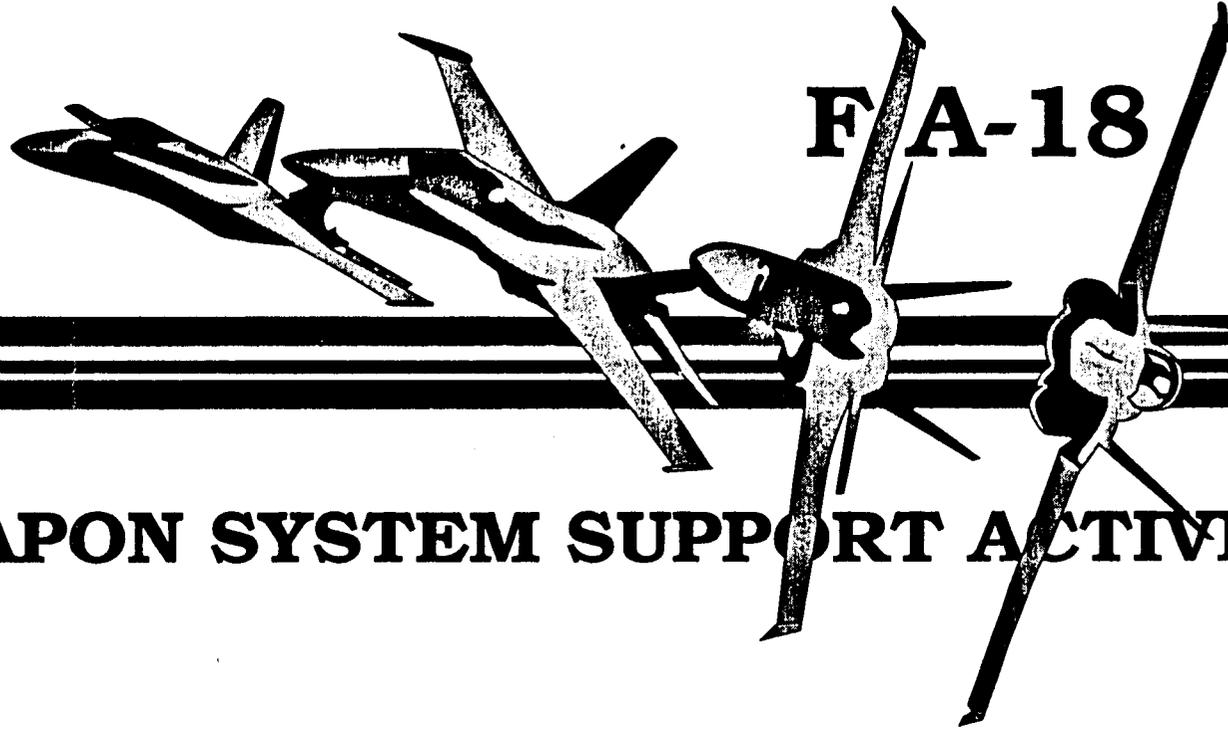
- \$17.0M (\$8.2M Equipment + \$8.8M Facility)

- **SIGNIFICANT ISSUE**

- Loss of rapid response capability to address fleet generated missile seeker issues

- **IMPACT OF MOVE**

- Higher recurring costs to customers for additional flight time to reach the sea range where test operations will be conducted
- Disruption of major weapon systems test schedules



WEAPON SYSTEM SUPPORT ACTIVITY

FUNCTIONS AND PROCESSES



AIRCRAFT WEAPON SYSTEM SUPPORT ACTIVITY (WSSA)

MISSION

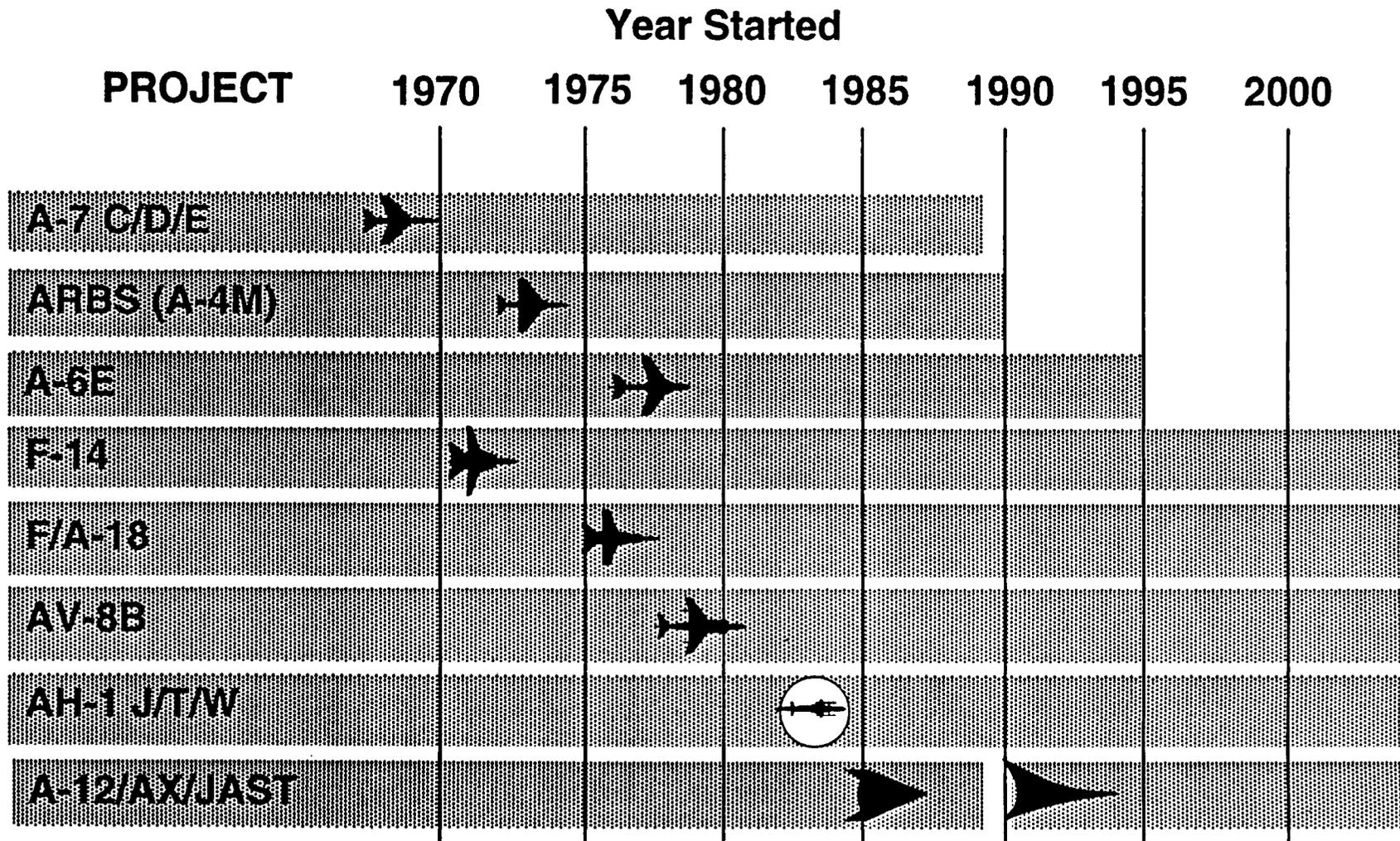
To provide life-cycle Systems Engineering for Tactical Aircraft Weapon Systems (Fighter, Attack, Assault) including both Offensive and Defensive Mission Systems

CHARTER

- Mission System / Software upgrades
- Combat and Combat Control Systems development
- Aircraft Weapons Integration



TACTICAL AIRCRAFT PROJECT LIFE-CYCLE

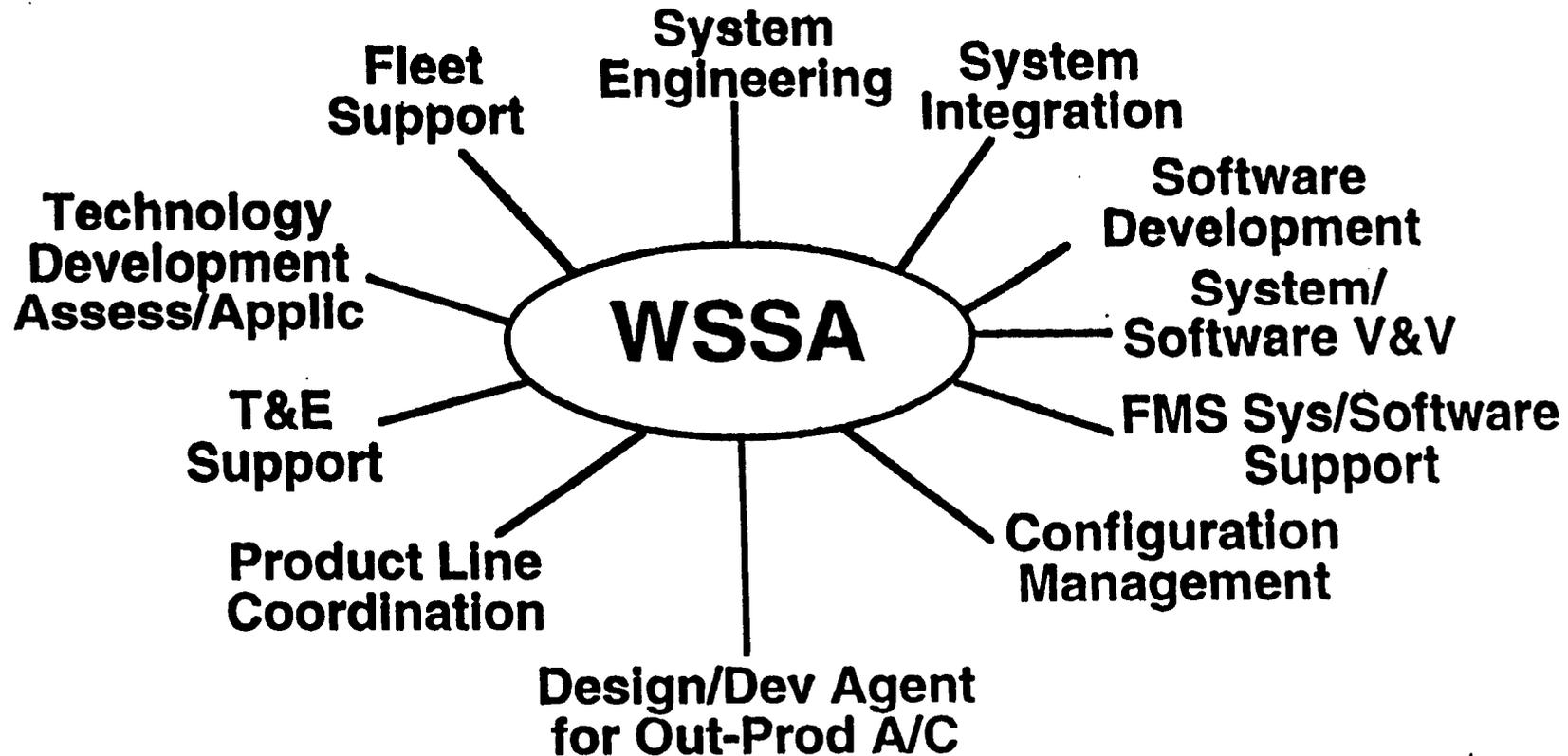




WEAPONS SYSTEM SUPPORT ACTIVITY (WSSA) FUNCTIONAL CHARTER

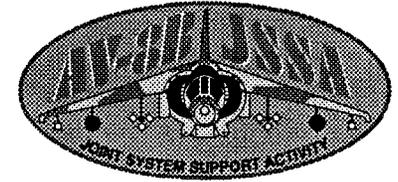


- Navy Activity Responsible for Weapon System/
Software Support Throughout its Life-Cycle





AV-8B AIRCRAFT WEAPON SYSTEM SUPPORT ACTIVITY (WSSA)



MISSION

To provide life-cycle Systems Engineering for AV-8B Aircraft Weapon Systems including both Offensive and Defensive Mission Systems.

CHARTER

- System / software design agent for day attack / night attack aircraft
- System / weapon integration / validation / verification for radar aircraft
- Combat and combat control systems development for all aircraft

ANNUAL BUDGET

\$49M

MAN POWER

Civil Service	106 Man Years
Local contractors	93 Man Years
Other contractors	48 Man Years

SPACE

Office	27,500 Square Feet
Laboratories	8,800 Square Feet

AH-1W WSSA

- **MISSION:** Provide life-cycle systems engineering and organic mission systems development expertise in support of the Marine Air-Ground Task Force (MAGTF) mission requirements for the AH-1W Tactical Aircraft Weapon System
- **CHARTER:**
 - Provide IPT with system definition/development/integration for com/nav and weapon enhancements
 - As sole AH-1W organic development facility for mission systems, develop and implement enhancements into aircraft architecture
 - Provide ready source of engineering expertise to resolve USMC fleet readiness issues resulting from software and avionics issues
- **Average Annual Budget:** \$12,700K
- **Average staffing level:**

Civil Service:	41
Contractor:	25
-
- **Space:**

Staff:	10,360 Ft²
Laboratory:	2,900 Ft²



F/A-18 WEAPON SYSTEM SUPPORT ACTIVITY (WSSA)



F/A-18 Project Office

MISSION

To provide life-cycle Systems Engineering for USN/USMC and FMS F/A-18 Mission Systems

CHARTER

- Mission System Development/Test Activity for In-production USN and FMS F/A-18 C/D Aircraft
- System/Software Design Agent for F/A-18 A/B Mission Systems
- System Engineering Support and Software Development Activity for the F/A-18 E/F EMD Program.

ANNUAL BUDGET

\$180M

MANPOWER

Civil Service	212 Man Years
Local Contractors	193 Man Years
On-site Prime Contractors	45 Man Years

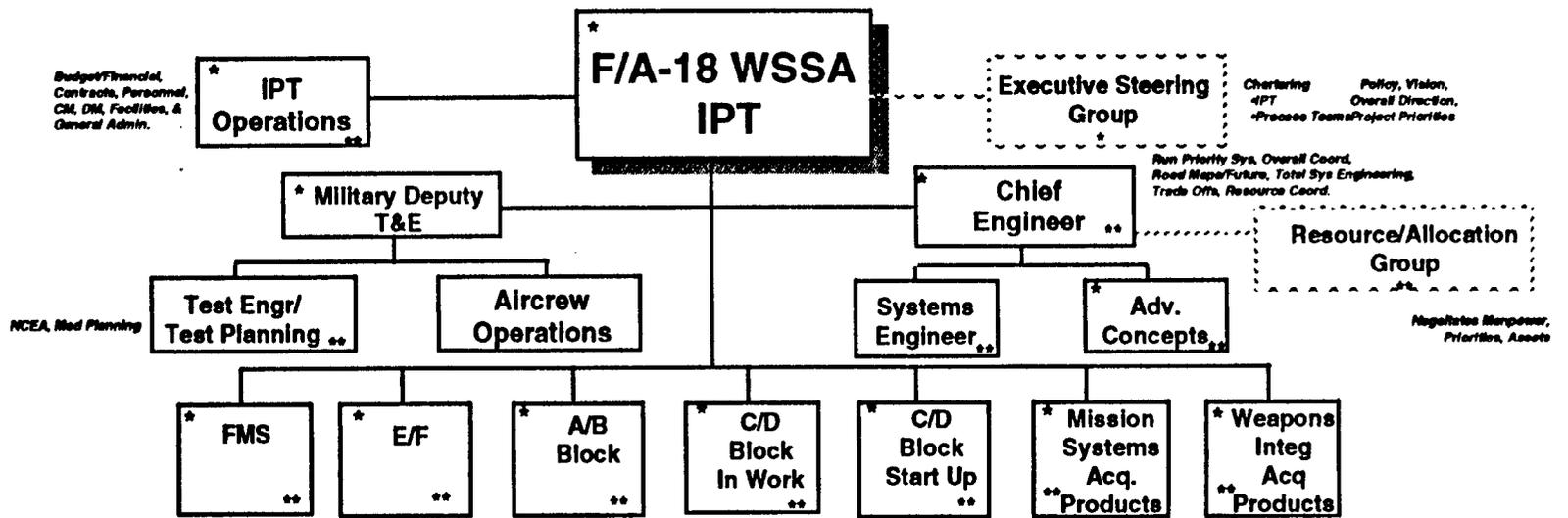
SPACE

Office (Including on-site Contractors)	42,400 Sq Ft
Laboratories	19,600 Sq Ft



WSSA PRODUCTS

- **The WSSA supports two types of products**
 - **Fleet products—mission system functionality (new capability, new weapons) provided to the Fleet as Block Upgrades (09C, 10A, 11C etc.)**
 - **Acquisition Products—mission system functionality provided to support program acquisition milestones (09=RUG DT, 11C= JSOW DTIIC; 09C = AIM 9X technology demo)**

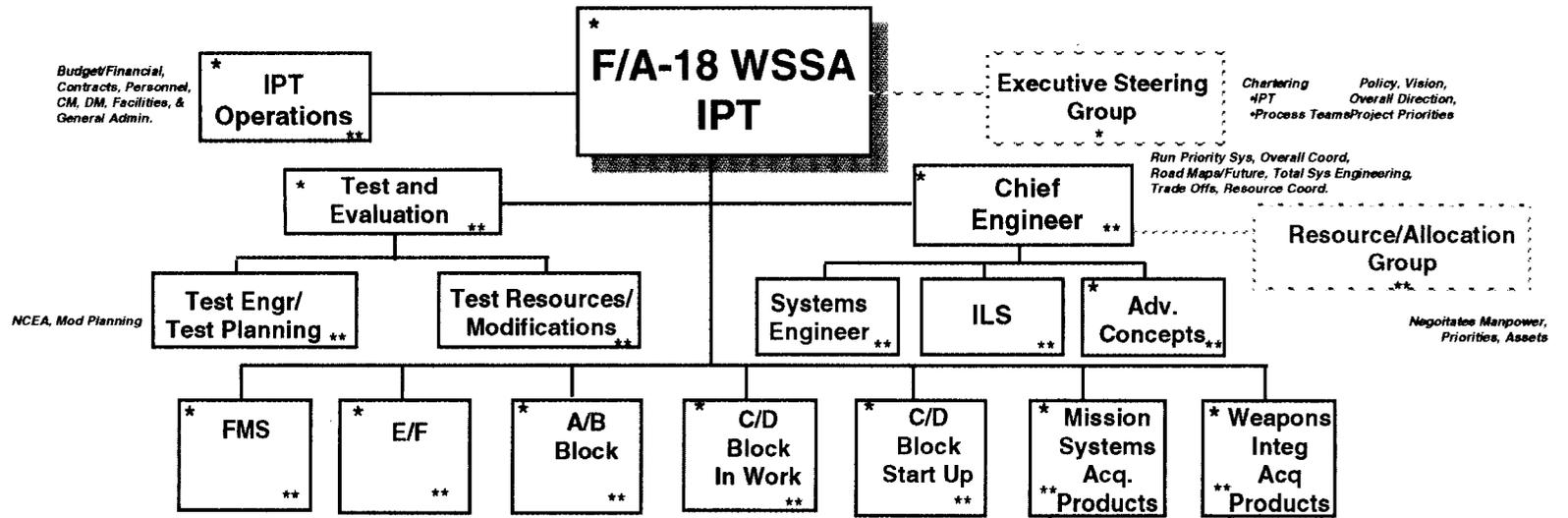


**F/A-18 IPT
Task Teams**

Facilities/Data Services	X	X	X	X	X	X	X
Test Support	X	X	X	X	X	X	X
FMS Engineering	X			X	X		
Mission Support		X		X	X	X	X
Radar			X	X	X	X	X
Air Vehicle Mgmt Sys			X	X	X	X	X
SOF	X		X	X	X	X	X
Air/Air		X	X	X	X	X	X
A/G Smart		X	X	X	X	X	X
A/G Free Fall		X	X	X	X	X	X
EW		X		X	X	X	
EO/IR			X	X	X	X	X
S/W Development	X		X			X	X
CNI		X	X	X	X	X	
Systems Analysis	X	X	X	X	X	X	X

FY95 Notional
Concept To Be
Determined By
The
Resource/Allocation
Group





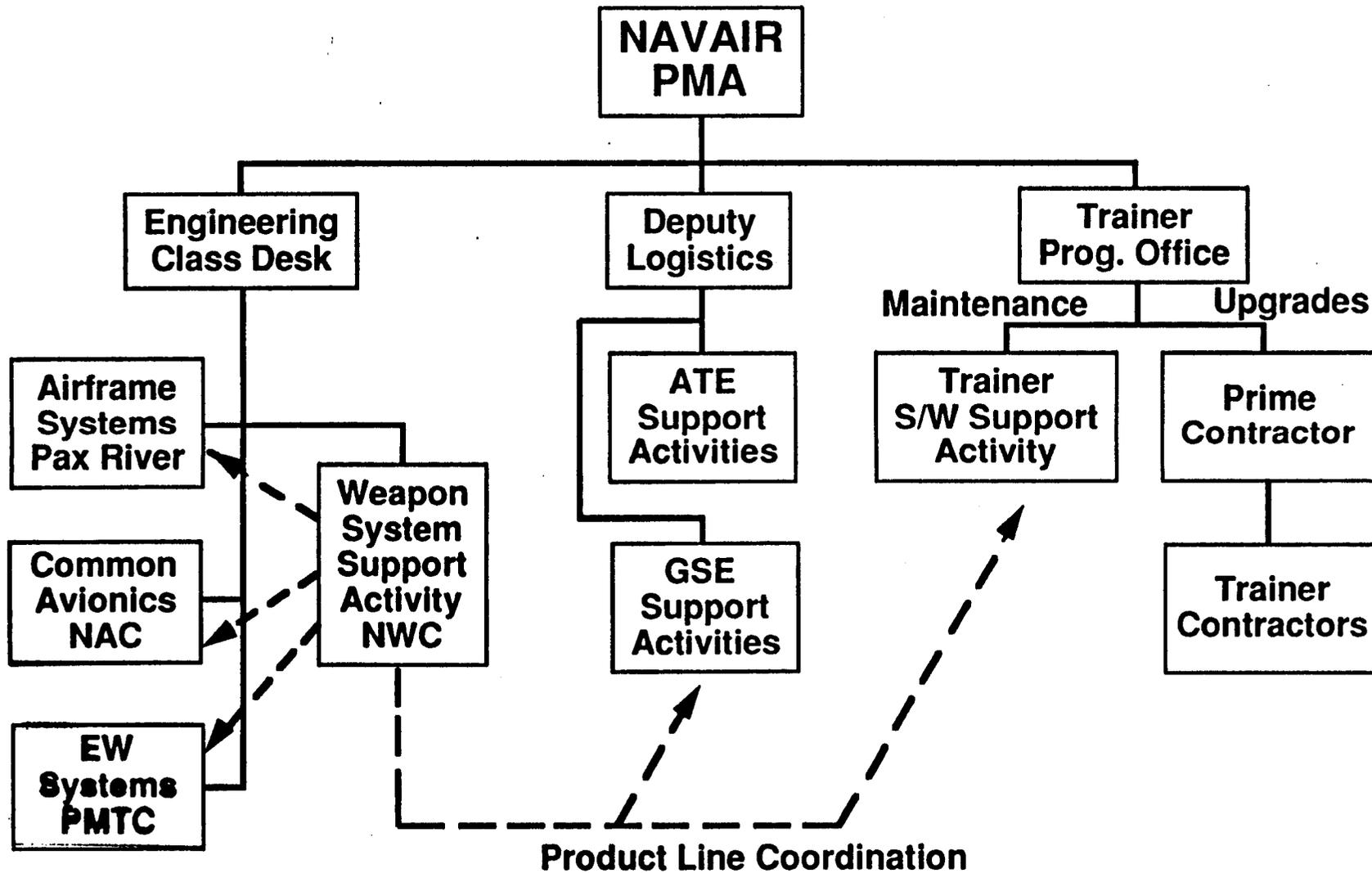
**F/A-18 IPT
Task Teams**

Facilities/Data Services	X	X	X	X	X	X	X
Test Support	X	X	X	X	X	X	X
FMS Engineering	X			X	X		
Mission Support		X		X	X	X	X
Radar			X	X	X	X	X
Air Vehicle Mgmt Sys			X	X	X	X	X
SOF	X		X	X	X	X	X
Air/Air		X	X	X	X	X	X
A/G		X	X	X	X	X	X
EW		X		X	X	X	
EO/IR			X	X	X	X	X
S/W Development	X		X			X	X
CNI		X	X	X	X	X	
Systems Analysis	X	X	X	X	X	X	X

FY95 Notional Concept To Be Determined By The Resource/Allocation Group



USN MANAGEMENT CONCEPT





NAVAL WEAPONS CENTER TYPICAL WSSA TASKING (POST FSD)



- **Lead Field Activity for Systems Engineering, Responsible to the PMA/Class Desk for the Technical Quality of the System**
- **Lead Lab for Systems/Software Development and Testing**
 - **Block Upgrades ECPs**
 - **Weapons Integration**
 - **Sensor Development**
- **Contract to Prime for S/W Development (In-production A/C) "Golden Rule"**
- **Design/Dev Agent for Out-production A/C**
- **Implement "Principle Site" Concept**
- **Perform Joint DT/OT Testing**
- **Implement/Manage the STR Process for all SYS/SW Problems/Changes**
- **Coordination of Product Lines for Synchronized Fleet Release**

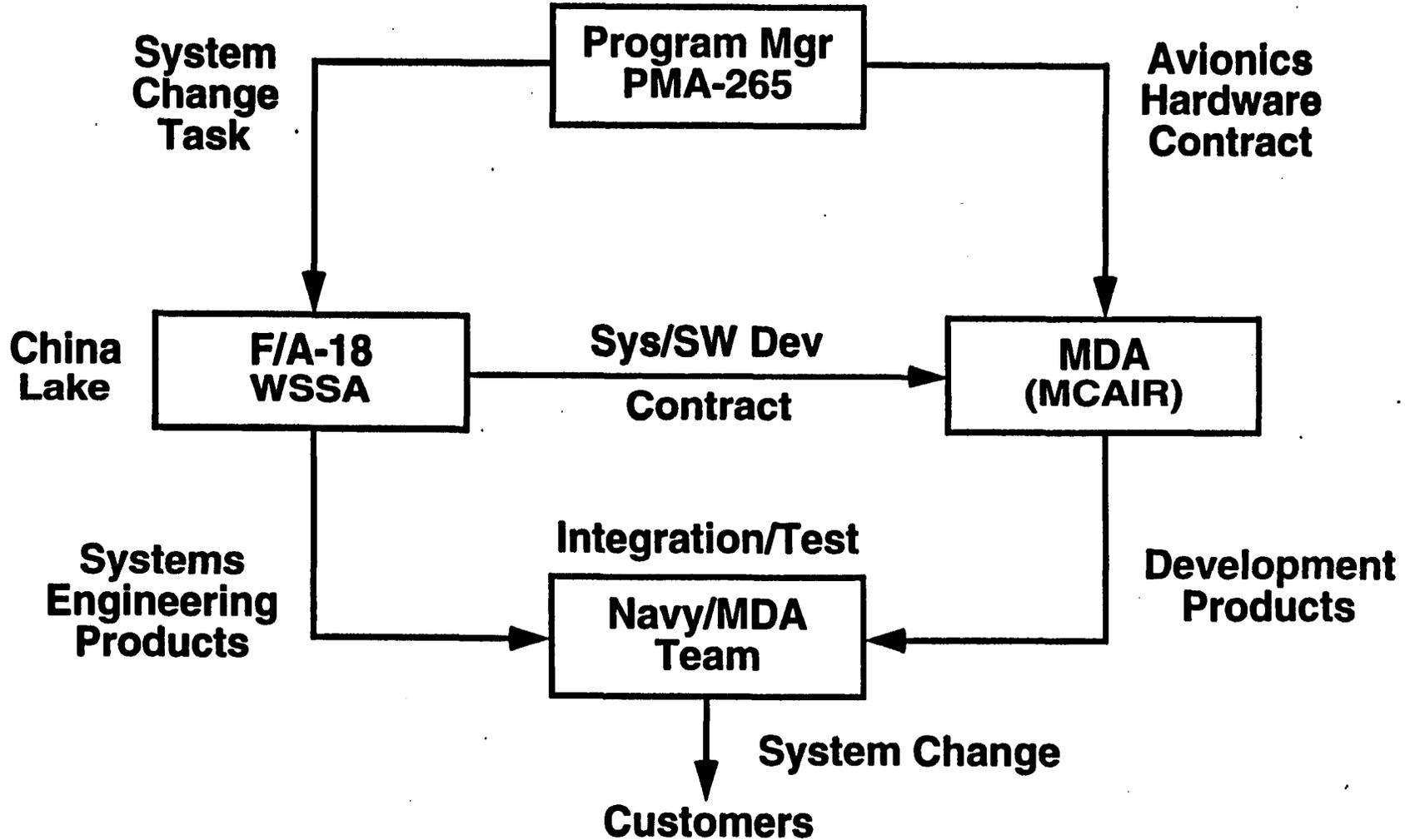
VX-9 OPTENFOR



F/A-18 MISSION SYSTEMS (AVIONICS AND SOFTWARE)



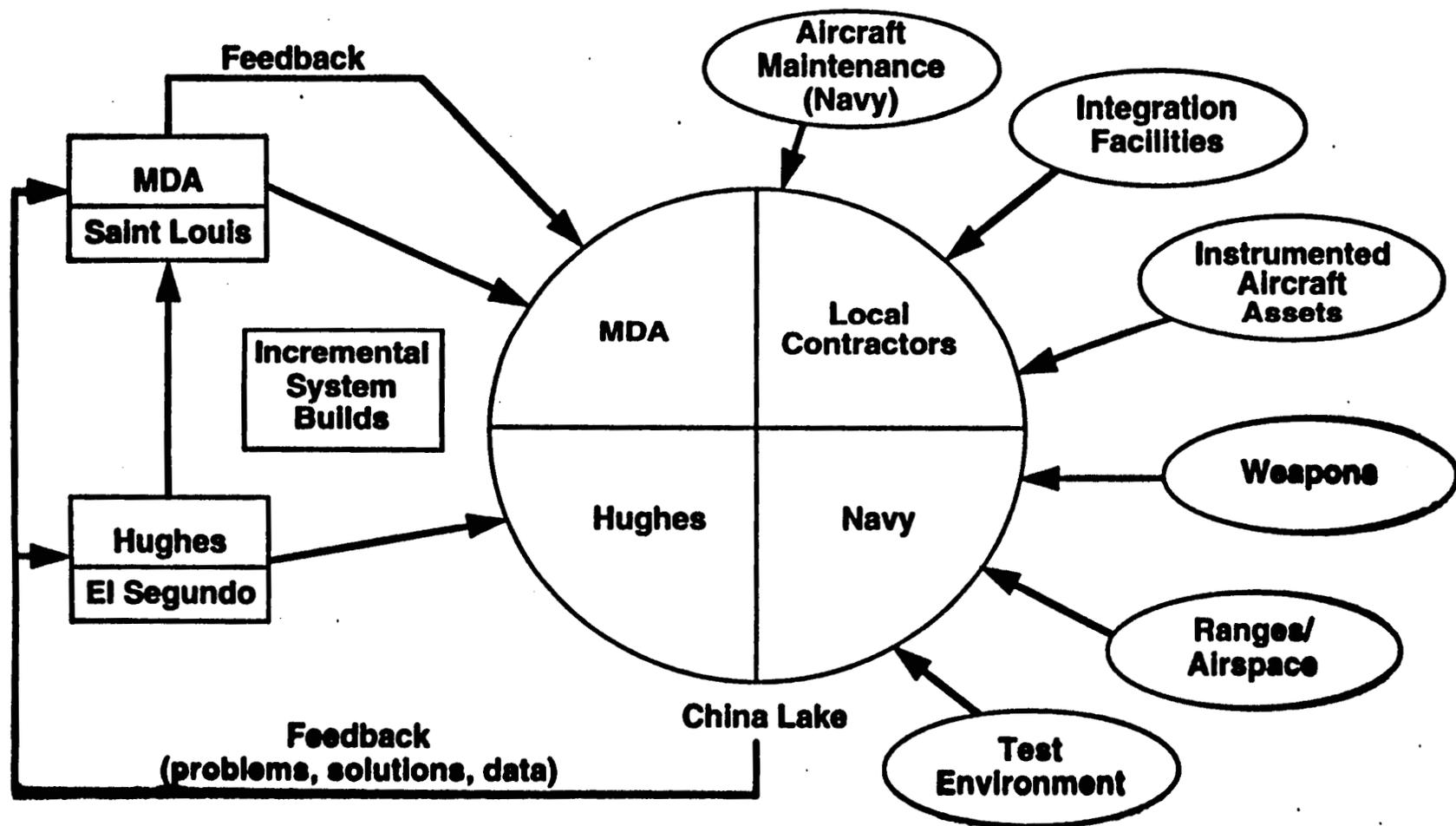
F/A-18 Program Team





PRINCIPLE SITE CONCEPT

- Contract for incremental system updates
- Single integrated development/test team responsible for product





JOINT DEVELOPMENTAL/ OPERATIONAL TESTING



- **Joint DT/OT Concept/Process Approved by NAVAIR and Operational Test Command (OPTEVFOR)**

- **DT/OT Concept Allows**
 - **Shared Assets**
 - **Early Looks**
 - **OT Participation in V&V Phase**
 - **Shared Results (One Data Base)**
 - **All Problems Reported Using STRs (System Trouble Reports)**

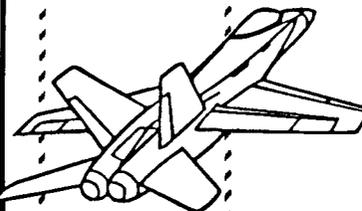
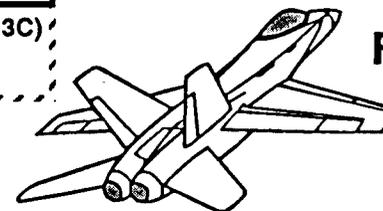
- **OPTEVFOR Retains**
 - **Separate OT Plans but Coordinated**
 - **Separate OT Reporting**
 - **Termination Rights**



F/A-18 HORNET CHANGE SCHEDULE (B)



F/A-18 Program Team

F/A-18 PRODUCTION CONFIGURATION												
CY 1994	1995	1996	1997	1998	1999	2000	2001	2002				
 <p>F/A-18E/F</p>				OPEVAL CONFIG →				FY 1997 (13E) LOT XXI LRIP I Eng Bay Gs Gen Sys SMS WAT ECS Air flow for Avionics		FY 1998 (16E) LOT XXII LRIP II AIM-9X/JHMCS	FY 1999 (16E) LOT XXIII LRIP III MAWS CIT MIDS DMS/DTED ⁵	FY 1900 (18E) LOT XXIV Full Prod. Avionic Rec EmIt Loc Add ALE-47 Disp Adv FLIR ⁵
				EMD (09E) E1-4, F1 MPCD UFCD EFD New Engines FADEC Mod. FCC Air Data Snr Mod. SDC RATS & DIP Update IECMS	EMD (11E) E5, F2 3rd Wing Sta Low Drag Pyl ALE-50 ALE-47 Disp Add UFCD formats GPWS LIW	Beyond 02 Adv MC (04) HSDB (04) Terr Ref Nav (04) Active Array (08) C ² W variant (05)		Potential (not sched) MFDs/DCs Reconfig FCC Inter Voice EGI RUG φII Expand 4/5 ⁶ Podless Datalink ⁶ High res MDI ⁶				
FY 1992 (09C) LOT XVI RUG φI ARC-210 IFEI Bright M61 A2 Gun MSI φII JSOW φI ACE II (test) TLAS	FY 1993 (09C) LOT XVII Adv FLIR PAO GPS Prov. CVRS Finland MC Upgrade DMS Chipset	FY 1994 (11C) LOT XVIII ALE-47 GPS (prod.) 6th MUX AIM-120 Improve (test) GPWS MSI Update JSOW φII MIDS φI (test) SLAM ER φI Dn-Sz CLC JDAM_OCS φI Switzerland Finland	FY 1995 (11C) LOT XIX SMS Upgd CIT ALR-67 ASR Malaysia	FY 1996 (13C) LOT XX RUG φII JSOW Kuwait MIDS φII SLAM ER φII AIM-120 Imp JDAM φII ATHS EGI AIM-9X (test) JHMCS (test) Finland Switzerland EMR	FY 1997 (13C) LOT XXI	 <p>F/A-18C/D</p>						

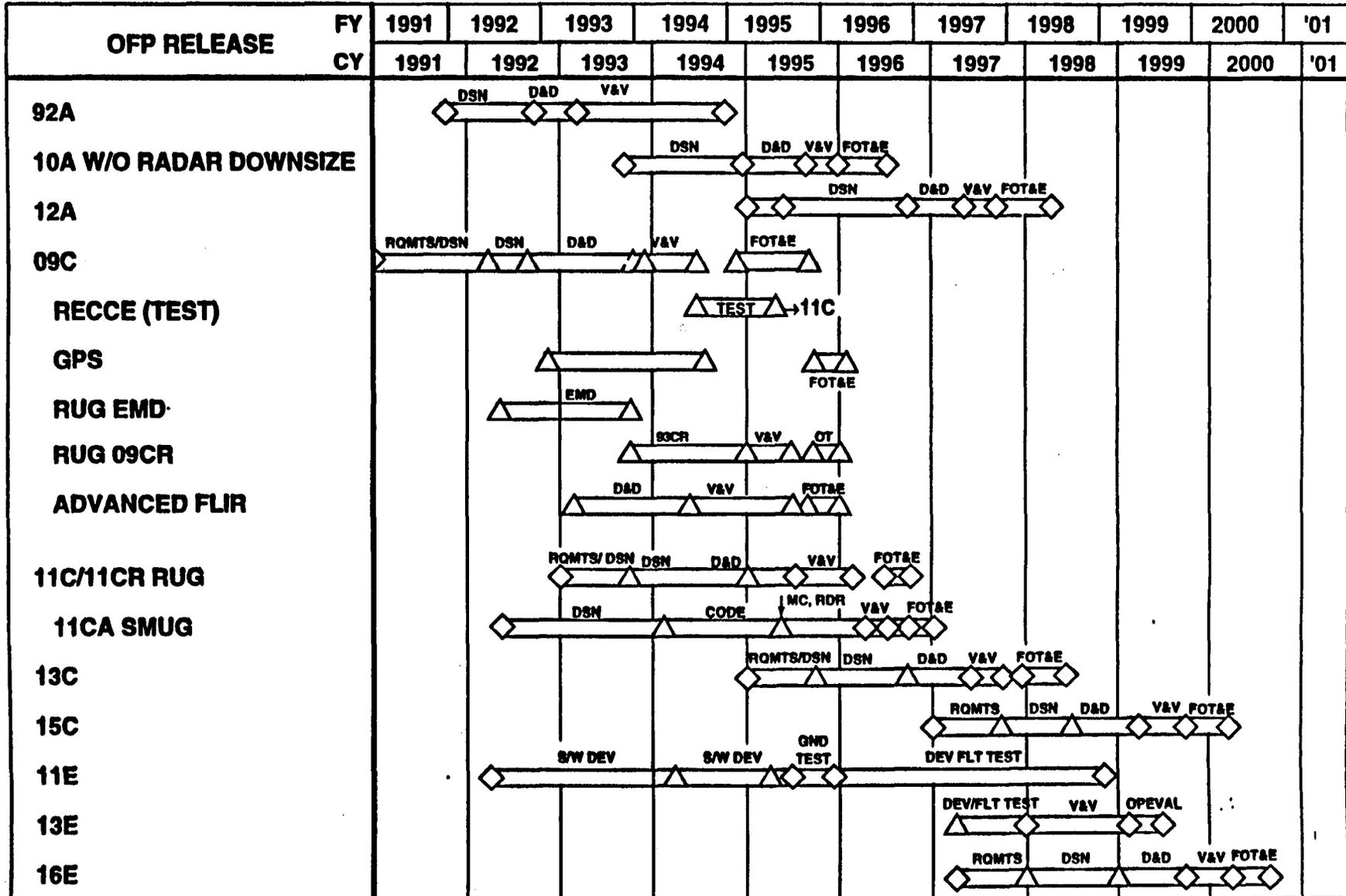
- 1 = 6th MUX bus is baseline for E/F
- 2 = SMS upgrade is prerequisite for E/F
- 3 = Not in E/F EMD
- = Bridge provisions (elec., cool., vol.)
- = Software only



OFF DEVELOPMENT SCHEDULE



F/A-18 Program Team



4/19/95



PROGRAMS DEPENDENT ON 13C/E SCHEDULE



F/A-18 Program Team

Program	FY CY	1995				1996				1997				1998			
		1995				1996				1997				1998			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
13C/E		Requirements/Design/Code				Sys/Lab Test				D&D Test		V&V Test		FOT&E			
						Build				13E Test Tape		Fleet Release					
ATARS		Requirements/Design/Code				Sys/Lab Test				D&D Test		V&V Test		FOT&E			
RUG (Phase II)		<-Start Nov 94 Requirements/Design/Code/Test								D&D Test		V&V Test		FOT&E TBD			
										Radar Release w/RECCE							
MIDS (Phase II)		Requirements/Design/Code				Need 13C				Lab Integration Test				DT-IIB		DT-IID	
						MIDS Build				H/W Delivery				OT-IIA			
AIM-9X Test Tape		Requirements/Design/Code				Development				Sys/Lab Test				D&D Test			
														DT-IIB			
JDAM (Phase II)		Requirements/Design/Code				Sys/Lab Test				D&D Test		V&V Test					
						Need 13C				DT-IIB		OT-IIB					
JSOW (Phase III)		Requirements/Design/Code				Sys/Lab Test				D&D Test		V&V Test		FOT&E			
SLAM ER (Phase II)		Requirements/Design/Code				Sys/Lab Test				D&D Test		V&V Test		OT Report			
						1st Missile				DT-IIB		DT/OT		OT-IIB OPEVAL			
AMRAAM (Improvements)		Requirements/Design/Code				Sys/Lab Test				D&D Test		V&V Test		FOT&E			
		<---AIM-120B Rel (5R2) 3rd Qtr 94				AIM-120C (7A) with 11C								AIM-120C Rel (7B)			
JSOW P3I						OFF-LINE TEST TAPE								DT-IIB Jan 99 >			
CIT						Fixes from IIC				V&V DT/OT		FOT&E					
ATHS/EGI		Requirements/Design/Code				Sys/Lab Test				D&D Test		V&V DT/OT		FOT&E			
IDECM						RFCM OFF-LINE TEST TAPE								DT-IIB Jan 99 >			



13C FMS SCHEDULE



FA-18 Program Team

Program	FY CY	1995				1996				1997				1998			
		1995				1996				1997				1998			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
13C		SYS DESIGN	S/W RQM	S/W DESIGN	S/W CODE	LAB TEST	D&D TEST		V&V TEST		FOT&E		FLEET RELEASE				
		▲ SCR	▲ SDR	▲ PDRs	▲ CDRs	▲ BUILDS	▲ TEST REL	▲ BUILD REL									
Finland		SYS DESIGN	S/W RQM	S/W DESIGN	S/W CODE	LAB TEST	D&D TEST		V&V TEST		IN-COUNTRY TESTS						
Switzerland		SYS DESIGN	S/W RQM	S/W DESIGN	S/W CODE	LAB TEST	D&D TEST		V&V TEST		IN-COUNTRY TESTS						
Kuwait		SYS DESIGN	S/W RQM	S/W DESIGN	S/W CODE	LAB TEST	D&D TEST		V&V TEST		IN-COUNTRY TESTS						

Note: Australia and Malaysia pending

4/19/95



C/D AND E/F TASK/OPF DEPENDENCIES



FA-18 Program Team

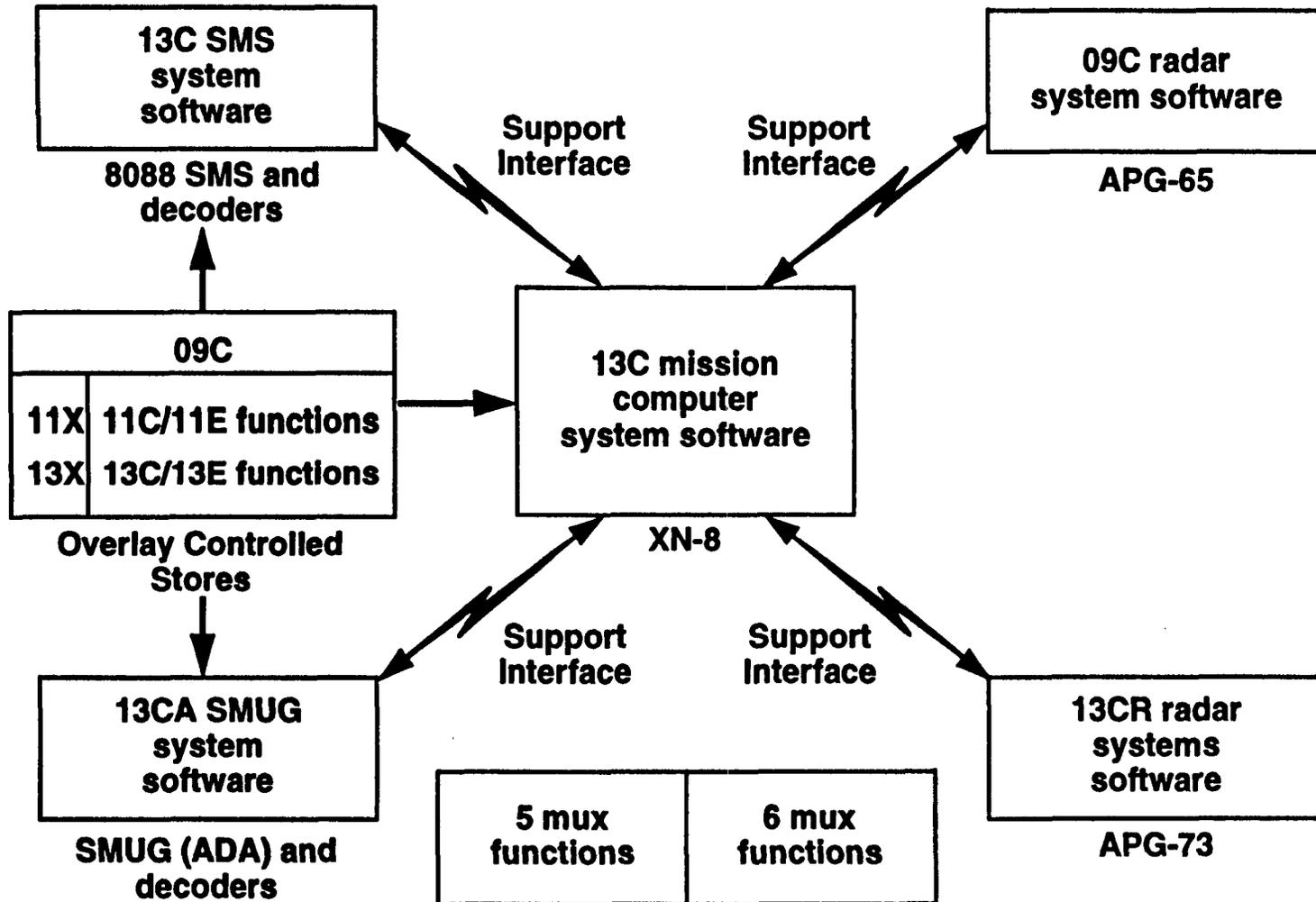
	09C	09CR	11C	11CA	11E	13C	13E	15C	16E
RUG		OPEVAL/ IOC	x			Phase II			
FLIR 38B	IOC								
JSOW	DT-IIB		DT-IIC OT-IIA/B			IOC			
JSOW P ³						DT-IIB OT-IIA		DT-IIC OT-IIB IOC	
JDAM			DT-IIB OT-IIA			DT-IIB OT-IIB IOC			
GBU-24	IOC								
SLAM ER						DT-IIB OT-IIB IOC			
ALE-47	IOC								
GPWS	Demo 92A		IOC						
ALR-67 (ASR)	DT-11		OT/IOC						
GPS/EGI	IOC GPS					IOC EGI			
ATARS/DL	Test		OA/INTERIM			OT/IOC			
SMUG				IOC					
MIDS ATHS			Lab Test			Test IOC		IOC	
AUSTRALIA			x			?			
FINLAND	x		x			x			
KUWAIT	x								
MALAYSIA			x						
SPAIN								MIDS	
SWITZERLAND	x		x			x			
AIM-9X	91C(V) TT DEM/VAL DT-IIA					DT-IIB		DT-IIC/D OT-IIB	
JHMCS	Demo TT					DT-IIB OT-IIB IOC			
IDECMS						Test			OT
CIT/PID			OT/IOC						



OFF/HARDWARE CONFIGURATION COMPATIBILITY (13C EXAMPLE)



F/A-18 Program Team





Improving Full Systems Testing by Networking NAWC Facilities



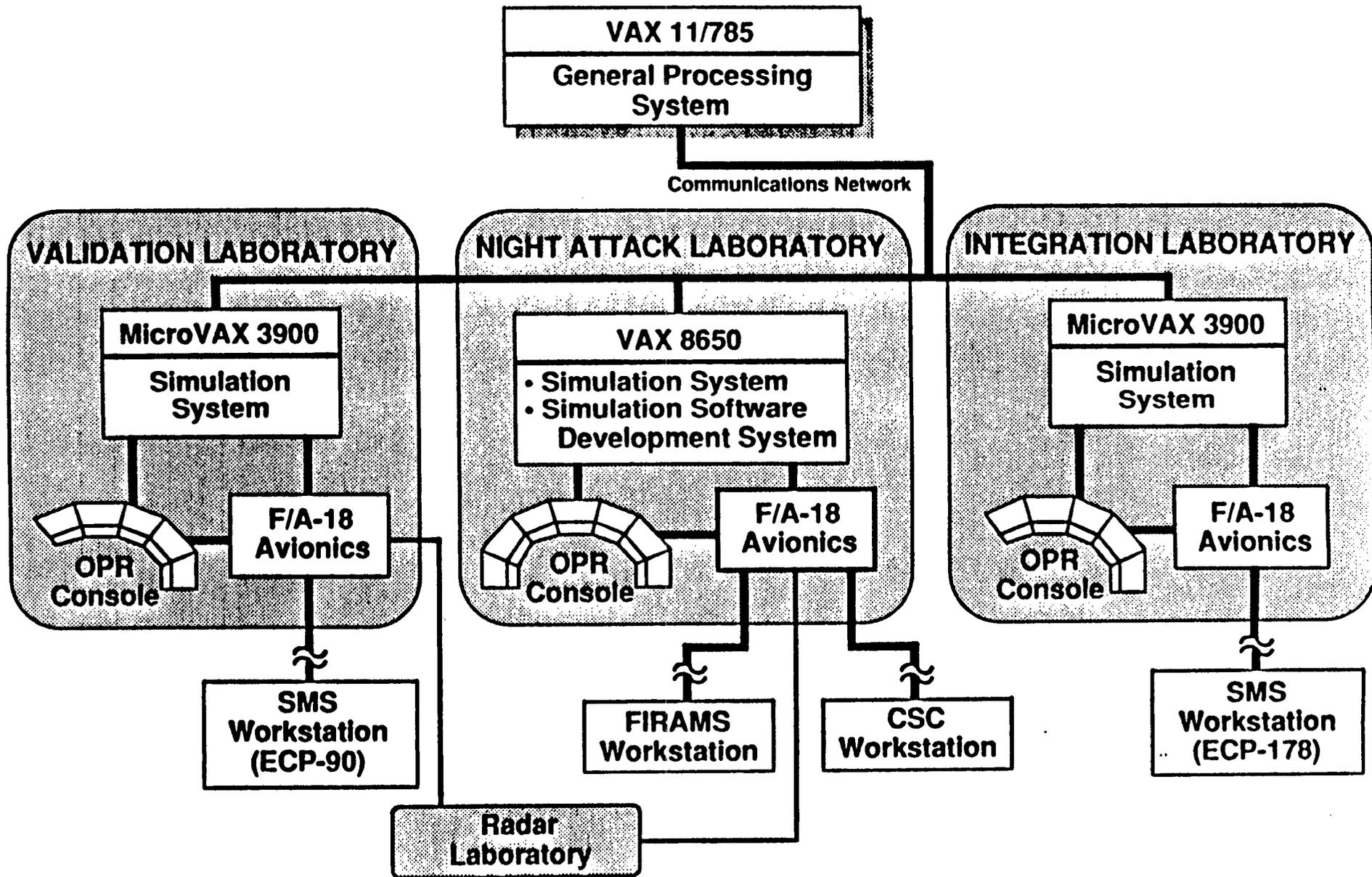
WEAPONS SYSTEM SUPPORT FACILITY (WSSF)



- The WSSF is a Simulation/Integration Facility for the
 - Development
 - Integration
 - Test
 - Evaluation
- of Tactical Software and Weapon Systems

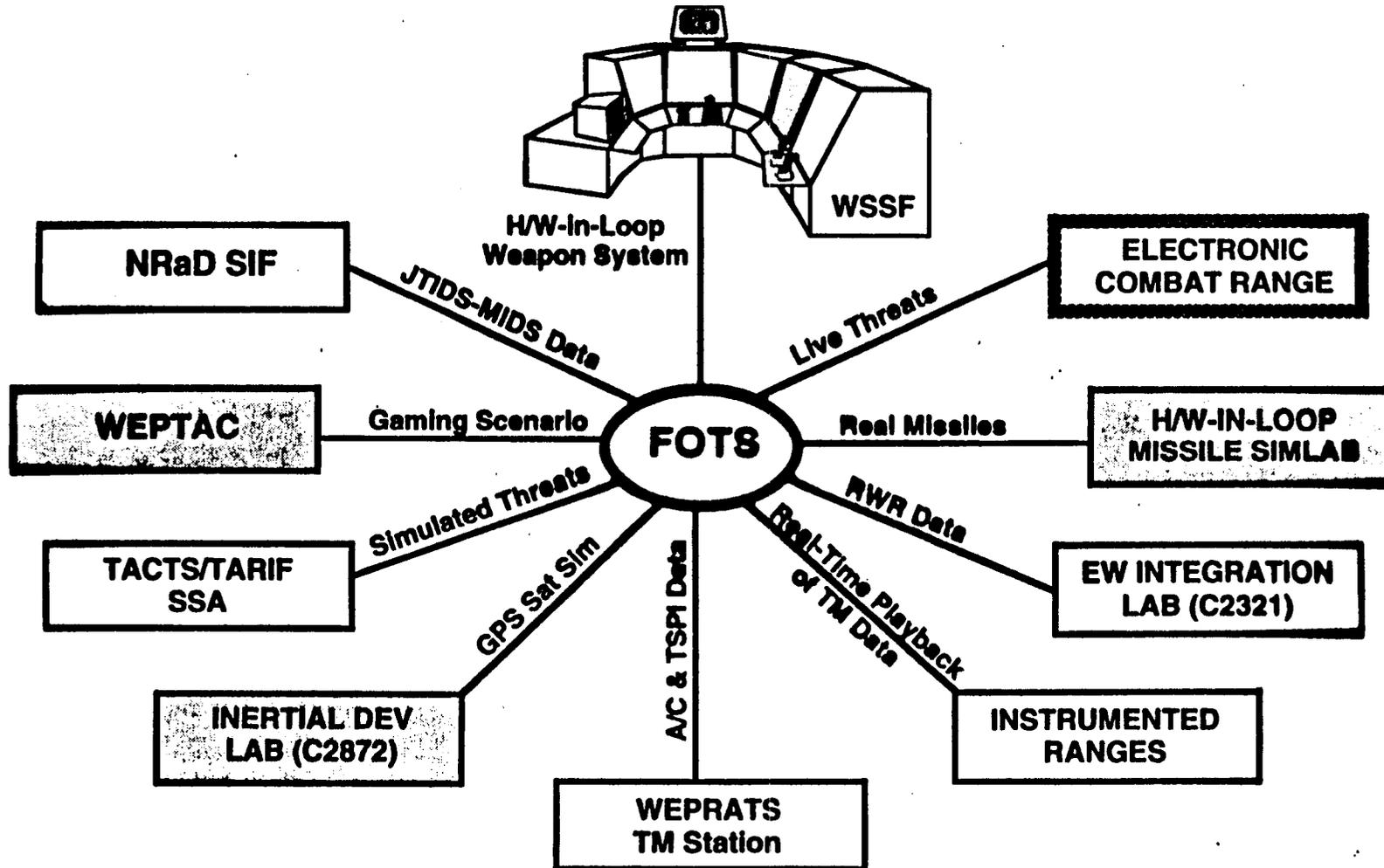


F/A-18 WSSF CONFIGURATION OVERVIEW





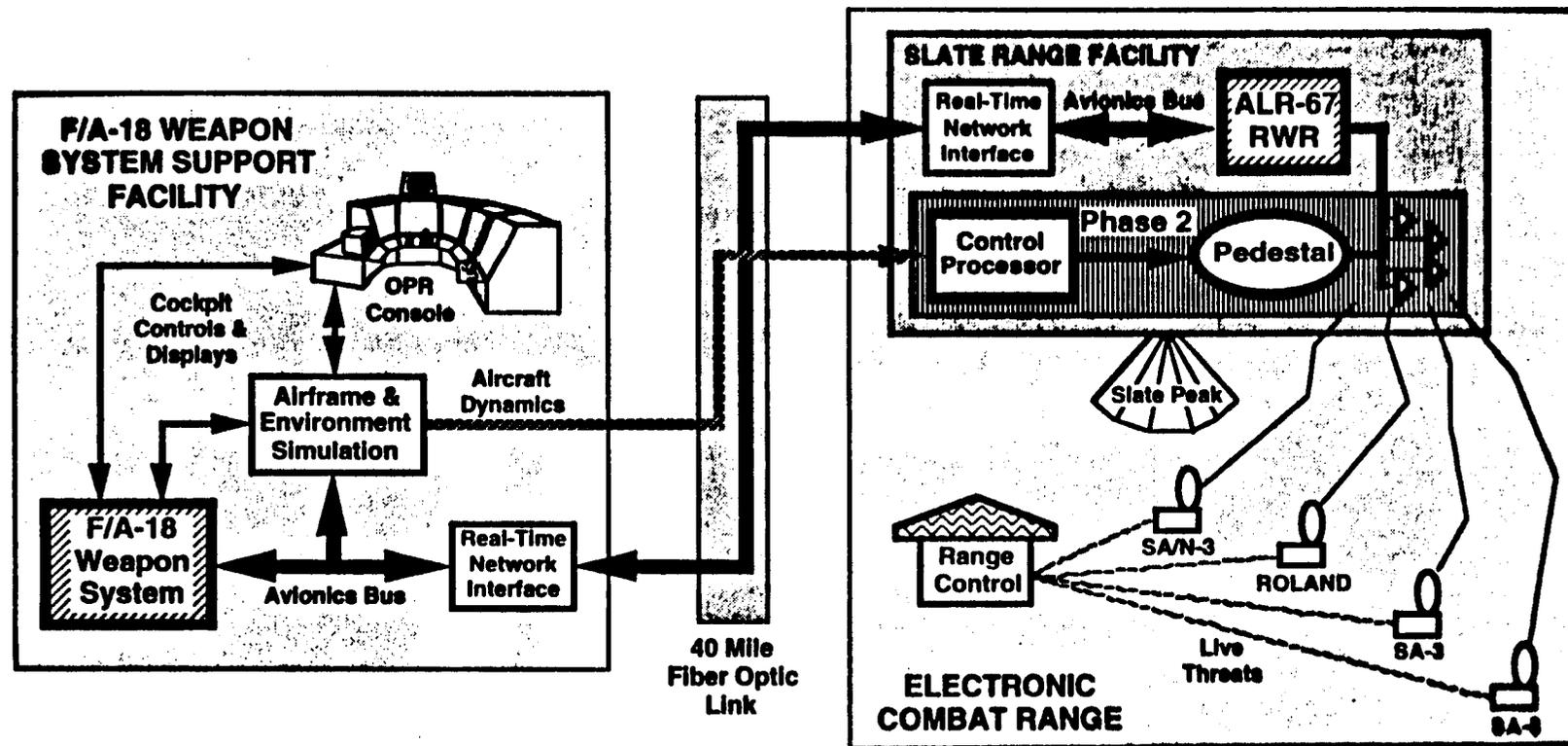
NAWC INTERNET FOR WEAPON SYSTEMS TESTING





REAL-TIME F/A-18 WSSF AND ECR LINK

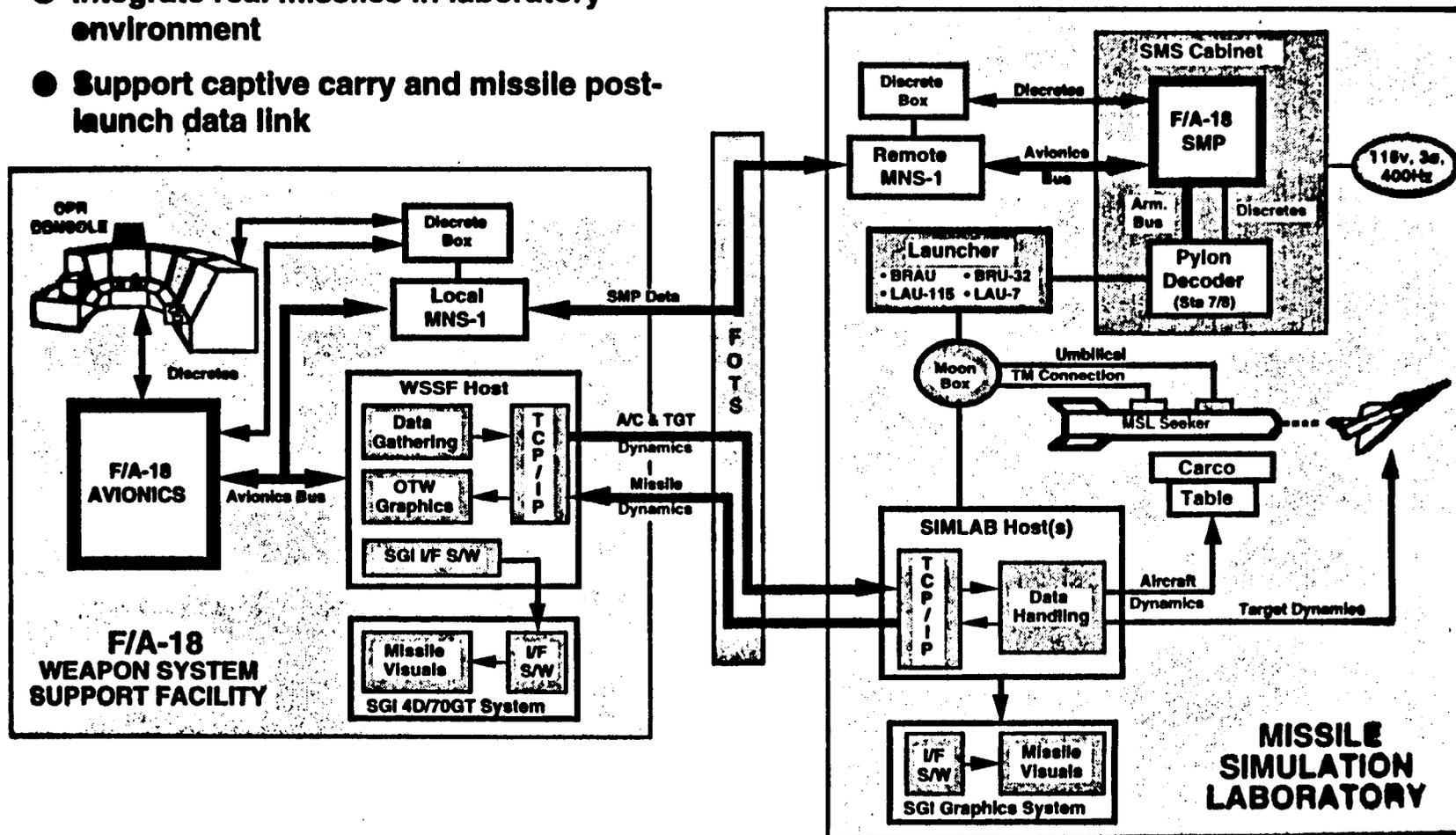
- "Bring" real threats into laboratory environment
- Demonstrate high-speed real-time link concept
- Expand and adapt to other NAWCWPNS resources





WSSF - MISSILE SIMLAB LINK

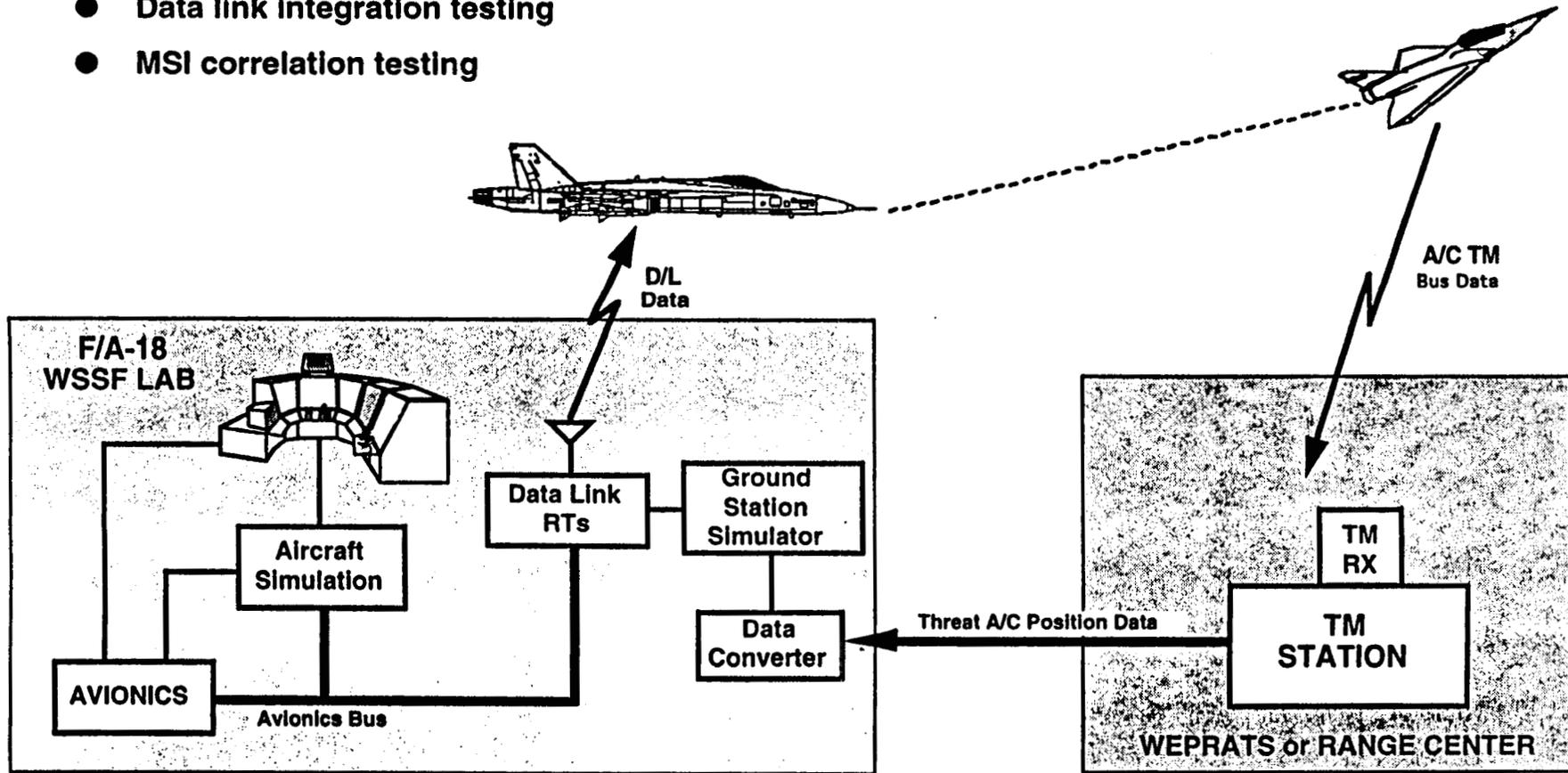
- Integrate real missiles in laboratory environment
- Support captive carry and missile post-launch data link





Data Link Test Connectivity

- Aircraft data link software I/O testing
- Data link integration testing
- MSI correlation testing



PROGRAM
FOR
REAR ADMIRAL BENJAMIN F. MONTOYA, USN (RET)
COMMISSIONER, DEFENSE BASE CLOSURE AND REALIGNMENT COMMISSION
MS. REBECCA COX
COMMISSIONER, DEFENSE BASE CLOSURE AND REALIGNMENT COMMISSION

30 MAY 1995

TUESDAY, 30 MAY

0730 CONVENE IN THE POINT RESTAURANT

NO-HOST CONTINENTAL BREAKFAST

0745 PRESS AVAILABILITY

0800 PROCEED TO BUILDING 7020, CONFERENCE ROOM

0810 NAVAL AIR WARFARE CENTER WEAPONS DIVISION (NAWCWPNS) OVERVIEW

REAR ADMIRAL DANA MCKINNEY, USN
COMMANDER, NAVAL AIR WARFARE CENTER WEAPON DIVISION

0840 F-14 WEAPON SYSTEMS SUPPORT ACTIVITY (WSSA) BRIEF AND FACILITY TOUR

MR. BRAD GILMER
CARRIER-BASED TACTICAL AIRCRAFT DIVISION
SYSTEMS ENGINEERING DEPARTMENT
RESEARCH AND ENGINEERING GROUP

0855 F-14 WSSA FACILITY TOUR

MR. BRAD GILMER

0930 PROCEED TO BUILDING 3008 VIA BEACH ROAD

0940 EA-6B WSSA BRIEF AND FACILITY TOUR

MR. TERRY CLARK
HEAD, CRUISE MISSILES/UAVS/TARGET SYSTEMS DIVISION
SYSTEMS ENGINEERING DEPARTMENT
RESEARCH AND ENGINEERING GROUP

1010 PROCEED TO BUILDING 333

1015 TARGETS/THREAT SYSTEMS BRIEF AND FACILITY TOUR

COMMANDER SCOTT GRAVES, USN
MILITARY DEPUTY, THREAT/TARGETS SYSTEMS DEPARTMENT
TEST AND EVALUATION GROUP

MR. ALLEN VINES
THREAT/TARGETS SYSTEMS TEAM LEADER
TEST MANAGEMENT OFFICE
THREAT/TARGETS SYSTEMS DEPARTMENT
TEST AND EVALUATION GROUP

1045 PROCEED TO BUILDING 3015

1050 BI-STATIC CHAMBER

DR. DAVE BANKS
HEAD, AIR INTERCEPT SYSTEMS DIVISION
TEST AND EVALUATION ENGINEERING DEPARTMENT
RESEARCH AND ENGINEERING GROUP

MR. DON HILLIARD
HEAD, RADAR IMAGING BRANCH
AIR INTERCEPT SYSTEMS DIVISION
TEST AND EVALUATION ENGINEERING DEPARTMENT
RESEARCH AND ENGINEERING GROUP

1110 PROCEED TO BUILDING 53

1115 RANGE CONTROL CENTER BRIEF AND FACILITY TOUR

CAPTAIN MIKE BARRETT, USN
DEPUTY, PACIFIC RANGES AND FACILITIES DEPARTMENT
TEST AND EVALUATION GROUP

MR. RICK SMITH
ASSOCIATE HEAD, PACIFIC RANGES AND FACILITIES DEPARTMENT
TEST AND EVALUATION GROUP

1145 PROCEED TO PORT HUENEME VIA BUS

1200 ARRIVE BARD MANSION

NO-HOST WORKING LUNCH

NAVAL CONSTRUCTION BATTALION COMMAND OVERVIEW

CAPTAIN JIM DELKER, CEC, USN
COMMANDING OFFICER, NAVAL CONSTRUCTION BATTALION COMMAND
PORT HUENEME

1220 PROCEED ON WINDSHIELD TOUR

1245 RETURN TO POINT MUGU PASSENGER TERMINAL

1300 DEPART NAWS POINT MUGU TO NAWS CHINA LAKE VIA C-12/METRO LINER

1345 OVERHEAD AT CHINA LAKE/OVERFLY CHINA LAKE RANGES

1400 ARRIVE PASSENGER TERMINAL

PROCEED TO WEAPON SYSTEMS SUPPORT ACTIVITY (WSSA), ROOM 206

F/A-18, AV-8, AND AH-1W WSSA BRIEF AND FACILITY TOUR

MR. RICH BRUCKMAN
HEAD, CARRIER-BASED TACTICAL AIRCRAFT DIVISION
SYSTEMS ENGINEERING DEPARTMENT
RESEARCH AND ENGINEERING GROUP

1500 PROCEED ON WINDSHIELD TOUR

1520 MISSILE ENGAGEMENT ENCOUNTER SIMULATION ARENA (MESA)

MR. RICK LAMP
HEAD, RF MISSILE SYSTEMS SECTION
WEAPONS/TARGETS DEPARTMENT
RESEARCH AND ENGINEERING GROUP

1545 RETURN TO PASSENGER TERMINAL

1600 VICE ADMIRAL LOCKARD, USN, COMMISSIONERS COX AND MONTOYA, WILL
DEPART VIA MILITARY AIRCRAFT TO LAX AND JOHN WAYNE AIRPORT. ALL
OTHERS WILL DEPART VIA METROLINER AIRCRAFT BACK TO NAWC POINT MUGU

OFFICIAL NAWCWPNS HOST:
REAR ADMIRAL DANA MCKINNEY, USN



NAVAL AIR WARFARE CENTER
HEADQUARTERS



FACSIMILE TRANSMISSION SHEET

PAGES: 1 + COVER	DATE: 5 MAY 95
FROM: NAWCHQ	TO: Distribution
NAME: Ward Leslie	ALEX -
CODE: NAWC-21D	ATTACHED FY 94 ACTUAL WORKLOAD FUNDING TOTALS PROVIDED BY RADM MCKINNEY IN RESPONSE TO YESTERDAY'S TELECON.
PHONE: (703) 604-6033 EX 2237	COMPARISON IS WITH AUDITORS TOTALS ON DES TO REPORT P. 44
FAX: (703) 604-1267	W.L. WARD LESLIE

Distribution:

Phone

Fax

ALEX YELLIN

(703) 696-8504 x185

WD FY94 FUNDING PROFILE

FY94 FUNDING PROFILE					
PROGRAM	CARRYOVER	NEW ORDERS RECEIVED	DIRECT CITE	TOTAL	DOD IG NUMBER
A-6E	9,707.8	3,442.1	0.0	13,149.9	21,800.0
AH-1	1,506.6	13,577.7	0.0	15,084.3	6,500.0
F/A-18	2,430.0	102,097.5	91,225.8	195,753.3	15,700.0
F-14	22,405.0	82,393.0	0.0	104,798.0	30,600.0
AV-8B	8,025.2	38,625.9	3,680.5	50,331.6	7,700.0
EA-6B	4,037	12,301.0	1,449.0	17,787.0	11,300.0
JSOW-AIWS	3,580.9	12,616.1	313.1	16,510.1	13,000.0
AMRAAM	3,292.9	28,591.9	150.0	32,034.8	20,900.0
HARPOON/SLAM	17,802.1	33,660.2	275.0	51,737.3	30,600.0
PHOENIX	3,281.4	13,898.0	46.0	17,225.4	800.0
SIDEWINDER	18,134.9	26,413.3	2,346.0	46,894.2	16,500.0
SPARROW	8,253.7	18,549.3	592.0	27,395.0	16,100.0
TOTAL	102,457.4	386,166.0	100,077.4	588,700.8	193,500.0