

Space  
and  
Naval  
Warfare  
Systems  
Center  
San  
Diego

**BIENNIAL  
REVIEW**  
**2001**

Space  
and  
Naval  
Warfare  
Systems  
Center  
San  
Diego

# BIENNIAL REVIEW 2001



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**FROM THE COMMANDING OFFICER AND THE EXECUTIVE DIRECTOR**

We are pleased to present the first edition of the Biennial Review, a publication that reflects the innovative research, diverse expertise, and unique capabilities of Space and Naval Warfare Systems Center, San Diego (SSC San Diego).

The Center's vision is to be the Nation's pre-eminent provider of integrated command, control, communications, computers, intelligence, surveillance, and reconnaissance (C<sup>4</sup>ISR) solutions for warrior information dominance. This publication features a collection of papers describing significant C<sup>4</sup>ISR research and development—a representative sampling of the many technical efforts at the Center in support of our Nation's warfighters. In addition to delivering programs designed to provide C<sup>4</sup>ISR capabilities, SSC San Diego pursues a unique range of work in other vital leadership areas, such as ocean engineering, environmental science, marine mammals, and the military application of robotic systems.

SSC San Diego encourages its scientists and engineers to explore new ideas through an independent research program and through the development of advanced technology concepts. This Biennial Review showcases not only the range of scientific and engineering work conducted at the Center but the talent and creativity of our technical staff. We are proud of their efforts.

June 2000 marked the 60th Anniversary of SSC San Diego. We look forward to a bright and productive future, continuing a rich tradition of providing our country's warfighters with C<sup>4</sup>ISR technology and systems support—and to contributing to the Navy/Marine Corps goal of achieving information dominance.

We sincerely hope you will find the unique ideas and technical insight presented in this publication both useful and interesting.



Dr. Robert C. Kolb  
Executive Director



Captain Ernest L. Valdes, USN  
Commanding Officer

# INTRODUCTION

## ABOUT SSC SAN DIEGO

Space and Naval Warfare Systems Center, San Diego (SSC San Diego) was established in June 1940 as the Navy Radio and Sound Laboratory, the Navy's first West Coast lab. For more than six decades, the Center, under a variety of names and organizational structures, has provided American warfighters with significant capabilities in the form of weapon systems and electronic technology. Currently, the Center's focus is in the essential area of command, control, communications, computers, intelligence, surveillance, and reconnaissance (C<sup>4</sup>ISR).

SSC San Diego occupies more than 550 acres at the original site of the Navy Radio and Sound Laboratory—the Pt. Loma peninsula to the south and west of downtown San Diego. Nearby is the Old Town Campus, the latest major addition to the Center's extensive complex of laboratories, test facilities, and offices. To the east, SSC San Diego maintains a small but highly productive branch office in Philadelphia. To the west, strategic locations in Pearl Harbor, Hawaii; Barrigada, Guam; Yokosuka, Japan; and Bahrain provide development, engineering, and fleet support capabilities to Navy units operating throughout the Pacific and Indian oceans.

With a rich tradition of technical experimentation and innovation, strategic locations, unique facilities and network connectivity, a workforce that includes 1,800 scientists and engineers and nearly 800 other technical professionals, and a strong partnership with private industry, SSC San Diego is uniquely qualified to provide the full spectrum of C<sup>4</sup>ISR capabilities, from basic research and prototype development, to extensive test and evaluation services, through systems engineering and integration, to installation and life-cycle support of fielded systems.

While most of the Center's project work address the requirements of the Navy and the Marine Corps, SSC San Diego also actively supports programs of the Defense Advanced Research Projects Agency, the Army, the Air Force, and the Coast Guard. The nature of the Center's assigned responsibilities necessitates active involvement with a variety of other government agencies at the national, regional, and local levels.

Key to the Defense Department's Joint Vision 2020, the Navy's vision of "Forward...from the Sea," and the Marine Corps doctrine of "Operational Maneuver from the Sea" is information superiority, or, in SSC San Diego's vision, warrior information dominance. SSC San Diego is at the leading edge of technologies that support the transformation of data into information, information into knowledge, and knowledge into understanding. It is clear understanding of the battlespace, and the resultant ability to make and execute effective decisions based on that understanding, that provide the warfighter a decisive advantage over an adversary. As SSC San Diego looks forward into the new century, its overriding challenge will continue to be providing our nation's warfighters the resources they need to achieve battlespace information dominance.

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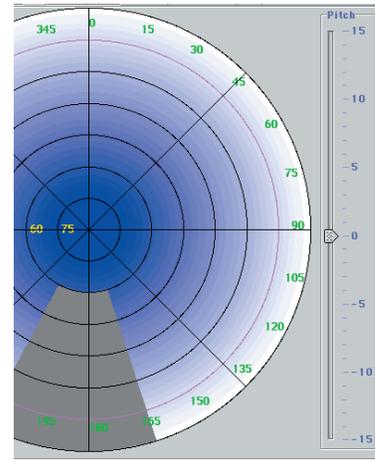
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