Program Element: # 12431F

Title Defense Support Program
Budget Activity ____ Strategic Programs #3

RESOURCES (PROJECT LISTING): ($ in thousands)

Project Number	Title	FY 1977 Actual	FY 1978 Estimate	FY 1979 Estimate	FY 1980 Estimate	Additional to Completion	Total Estimated Costs
	TOTAL FOR PROGRAM ELEMENT	24,600	28,800	32,300	29,200	Continuing	Not Applicable

BRIEF DESCRIPTION OF ELEMENT AND MISSION NEED: The Defense Support Program (DSP) is the key element of the Worldwide Military Command and Control System (WWMCCS).   The system's current deployment consists of satellites   and two dedicated ground readout stations

BASIS FOR FY 1979 RDT&E REQUEST: This request includes funds for continuing the development of payload modifications for compatibility with Shuttle/Titan III/Inertial Upper Stage (IUS). Development of improved spacecraft data transmission capability will be completed. A command and status capability   will be developed for the Simplified Processing Station, as will UHF uplink to airborne command posts.

OTHER APPROPRIATION FUNDS:

	FY 1977 Actual	FY 1978 Estimate	FY 1979 Estimate	FY 1980 Estimate	Additional to Completion	Total Estimated Costs
Procurement (3020)*	24,800	96,400	138,400	186,100	Continuing	Not Applicable
(Quantity)			4(Retrofit)	1		
Procurement (3080)*	13,646	2,003	18,211	25,173	Continuing	Not Applicable

*Includes Titan IIIC Ground Support Equipment Update (3020) and Initial Spares (3080)

340

Program Element: # 12431F

Title: Defense Support Program

Budget Activity   Strategic Program

DETAILED BACKGROUND AND DESCRIPTION: The Defense Support Program (DSP)

The system is operational

Two dedicated ground stations, one overseas and one within the Continental United States (CONUS), receive, process,   The Joint Chiefs of Staff (JCS) have designated the Aerospace Defense Command (ADCOM), Strategic Air Command (SAC), National Military Command System (NMCS), Atlantic Command (LANTCOM), Pacific Command (PACOM), European Command (EURCOM),
as users of DSP data.

Evolutionary satellite improvements are intended to prolong the useful life of each satellite, make the satellite more survivable   , increase the viewing area of each satellite, and increase the accuracy of data
. Modifications under development will ensure that the DSP payloads are compatible with Shuttle/TIIIC/Inertial Upper Stage (IUS) capabilities. The Simplified Processing Station will provide for emergency backup to the current ground stations

RELATED ACTIVITIES:

Defense Satellite Communications System (33110F) provides data communications routing. Space Boosters (35119F) provides launch support. Space Vehicle Subsystem Advanced Development (63401F) is developing technology for improved reaction wheels. The National Emergency Airborne Command Post (32015F) and Post-Attack Command and Control System (11312F) are potential users of DSP data. DSP is the key element of the Worldwide Military Command and Control System (WWMCCS)
Space Shuttle (12449F) will provide launch support following DSP transition. After transition to the Space Shuttle, Space Launch Support (35171F) will provide IUSs and Space Shuttle flights for DSP missions.

341

Program Element: # 12431F

WORK PERFORMED BY: Commander-in-Chief, Aerospace Defense Command (CINCAD), maintains operational control of DSP for the Joint Chiefs of Staff. System operation and technical management responsibilities have been delegated to the USAF Aerospace Defense Command (ADCOM). Air Force Systems Command's Space and Missile Systems Organization (SAMSO), Los Angeles, CA, has overall development and procurement management responsibility. The Air Force Logistics Command (AFLC) provides engineering and logistics support. Air Force Weapons Laboratory, Kirtland AFB, NM, will provide facility support. Air Force Materiel Laboratory, Wright-Patterson Air Force Base, OH, is developing technology for an improved reaction wheel. The Air Force Test and Evaluation Center (AFTEC), Kirtland Air Force Base, NM, participates in test and evaluation of selected system segments. TRW, Redondo Beach, CA, is the prime contractor for the spacecraft and satellite integration. Aerojet ElectroSystems Company (AESC), Azusa, CA, is the prime contractor

Ford Aerospace and Communications Corporation, Western Development Laboratories, Palo Alto, CA, is the prime contractor for the User Display and Data Acquisition and Communications segments. The Martin Company, Denver, CO, provides the TITAN IIIC booster. The Energy Research and Development Agency (Sandia Corporation) has responsibility IBM, Thousand Oaks, CA, is the prime contractor for all software efforts. IBM, Thousand Oaks, CA, and TRW, Redondo Beach, CA, are teamed on the Simplified Processing Station, with IBM as prime. The Aerospace Corporation, Inglewood, CA, furnishes general systems engineering/integration for the DSP System Program Office.

PROGRAM ACCOMPLISHMENTS AND FUTURE PROGRAMS:

1. FY 1977 and Prior Accomplishments: Significant accomplishments to date include procurement of 13 satellites and 12 TITAN IIIC boosters, construction of two data processing facilities, and provision of user displays, software, communications and a training facility (also used for software development and mission data analysis) completion of Research and Development (R&D) for modifications to satellites 10-12 to improve survivability and to provide data survivability, completion of R&D for an improved focal plane for satellite 13 and initiation of development of hardware and software for the Simplified Processing Station (SPS). Development, initiated in FY 1976, continues on an improved sensor to provide increased viewing area.

' In June 1976, a software package was delivered
Development of modifications for satellite retrofit to improve survivability   . R&D support for DSP
Augmentation was completed. Ground station modifications
were completed. Satellite Tracking Set Training Equipment was delivered.

2. FY 1978 Program: Expenditures include sensor development and payload/shuttle/Titan III/Inertial Upper Stage (IUS)
compatibility development. The improved sensor development will be completed. The new sensor will be retrofitted on
two satellites currently in the storage inventory and will be incorporated on all new satellites. The sensor will
enable the system to provide more accurate data   Intensive development of
shuttle/payload compatibility modifications is initiated for retrofit on two satellites and inclusion on satellite 14,
procured in FY 1980. Funds to insure TITAN III/IUS compatibility for retrofit on two other satellites are included.
Improved spacecraft data transmission capability development is initiated to incorporate state-of-the-art technology
and increase reliability. Funding for the Simplified Processing Station (SPS) Initial Operational Test and Evaluation,
Operation/Maintenance demonstration and engineering change orders continues through FY 1978. The SPS will be delivered
in April 1978. Satellite improvement studies and analysis of data gathered from orbital operations will continue. The
increase of $1.2 million from the program shown in last year's summary reflects a reallocation of funds to conduct a
satellite calibration experiment

3. FY 1979 Planned Program:A major part of the FY 1979 funds will be applied to the continuing development of the pay-
load/Titan III/Shuttle/IUS compatibility modifications. This will ensure that Defense Support Program (DSP) satellites
are compatible with the Shuttle and IUS interfaces and will support the transition to the Space Shuttle launch capa-
bility. In addition, to provide the most optimum use of satellite resources, the program includes development of the
capability to launch two satellites on Titan III/IUS vehicles. Development efforts include consideration of launch
loads, safety requirements, interface compatibility and contamination protection. Improved spacecraft data trans-
mission capability development to incorporate state-of-the-art technology and increase reliability will be completed.
                                                                              This will allow the SPS to
_monitor the housekeeping functions of the DSP satellites and command them as appropriate.
                                                       The C&S capability will provide for a
more complete SPS emergency backup capability. An Ultra High Frequency (UHF) uplink capability from the SPS to air-
borne command posts will be developed. Orbital operations data analysis and satellite improvement studies will con-
tinue. The increase of $6.9 million from the program shown in last year's summary reflects the C&S and UHF uplink
development for the SPS and a refinement in payload/Titan III/IUS integration development funding requirements.

4. FY 1980 Planned Program: Plans include continuing development of payload/Shuttle/TIII/IUS compatibility to ensure
smooth DSP transition;   continuing SPS C&S and uplink capability development; satellite improvement studies; and
analysis of orbital operations data. The increase of $8.4 million from the program shown last year reflects the SPS
C&S/UHF development and an increase in Titan III/IUS/payload integration development.

5. Program to Completion: This is a continuing program. RDT&E funding will support continuing satellite/system
development in support of DOD requirements. Primary emphasis will be directed toward eliminating or minimizing
deficiencies discovered during operational employment and the development of the capability to use the space shuttle
and/or TITAN III/IUS in lieu of the TITAN IIIC booster.

6. Milestones:

		Date
A.		
B.		
C.		
D.	Delivery of Satellite #5	Mar 73
E.		
F.	Delivery of Satellite #6	Jul 73
G.		
H.	Delivery of Satellite #8	May 74
I.	Delivery of Satellite #7	Oct 74
J.	Delivery of Satellite #9	Mar 75
K.		
L.		
M.		
N.	Satellite 10-12 Retrofit Complete *(Nov 77)	Apr 78
O.	Delivery of Prototype Simplified Processing Station *(Jan 78)	Apr 78
P.	Delivery of Satellite #13 *(Mar 78)	Jun 78
Q.	Retrofit of TIII/IUS Compatible Satellite Complete	3QCY80
R.	Retrofit of Shuttle/IUS Compatible Satellite Complete	4QCY81
S.	Next satellite launch	As Required

* Date presented in FY 1978 Descriptive Summaries.

Test and Evaluation Data

1. **Development Test and Evaluation:** The Defense Support Program (DSP) has been designed, developed, tested and deployed as an operationally functional system. The system is a classified space program consisting of ground control and readout stations that receive data from satellites, process the data, and present it to the National Command Authorities and military commanders for decision making purposes. Development Test and Evaluation/Initial Operational Test and Evaluation (DT&E/IOT&E) has been completed. Follow-on Operational Test and Evaluation (FOT&E) is the responsibility of the operating command (Aerospace Defense Command). All discrepancies and deficiencies uncovered to date have been resolved or are planned to be resolved jointly by Aerospace Defense Command (ADCOM) and Air Force Systems Command (AFSC). Maintainability and reliability testing of the system were conducted by AFSC during system development and continue to be conducted by the system operator.

2. **Operational Test and Evaluation:** Current Air Force Test and Evaluation Center (AFTEC) testing activity of the DSP is limited to the combined test program (DT&E/OT&E) of the Simplified Processing Station (SPS). The combined test program of the prototype SPS is scheduled to begin in January 1978 and be completed by August 1978. The tests will be conducted at IBM, the prime contractor; TRW, the integrating contractor; Air Force Weapons Laboratory at Kirtland AFB, NM; Vandenberg AFB, CA; and at a CONUS site yet to be selected. Testing of the prototype at Vandenberg AFB will include 70 days of actual (not simulated) operations. The IOT&E at the CONUS location will consist of 60 days of live world operations. An AFTEC test team composed of personnel from AFTEC, ADCOM, Air Force Logistics Command (AFLC), Air Training Command (ATC), Strategic Air Command (SAC), Air Force Communications Service (AFCS), USAF Security Service (USAFSS), will conduct the IOT&E portion of the test. The purpose of the IOT&E is to provide data and associated analysis of the operational effectiveness, suitability, and military utility of the SPS prototype to assist in any production decision and to recommend necessary changes in any follow-on production SPS models.

3. **System Characteristics:** The DSP Simplified Processing Station (SPS) operational prototype contract has been awarded to a contractor team comprised of IBM and TRW. The SPS will be a transportable, minimally manned, lower cost version of the current large, fixed, dedicated DSP ground stations. It is intended to act as a backup to current ground stations
                                                  -- Technical characteristics will equal or exceed the mission data processing capabilities and availabilities of the existing large processing stations. Demonstrated performance characteristics will be available in May 1978.