Program Element: # 12431F   Title Defense Support Program (DSP)
                                                        Budget Activity Strategic Programs 4)

RESOURCES (PROJECT LISTING):   ($ in thousands)

Project Number	Title	FY 1978 Actual	FY 1979 Estimate	FY 1980 Estimate	FY 1981 Estimate	Additional to Completion	Total Estimated Costs
	TOTAL FOR PROGRAM ELEMENT	28,745	32,300	44,400	53,200	Continuing	N/A

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 1980 RDT&E REQUEST: Includes funds for continuing the development of payload modifications for compati-
bility with Shuttle/Titan III(34)D/Inertial Upper Stage (IUS). Begin design/development of a highly mobile, truck
mounted readout terminal and associated satellite modifications. Conduct preliminary satellite 14 design definition.
Simplified Processing Station satellite status readout development continues.

OTHER APPROPRIATION FUNDS:

	FY 1978 Actual	FY 1979 Estimate	FY 1980 Estimate	FY 1981 Estimate	Additional to Completion	Total Estimated Costs
Procurement (3020)*	94,100	123,400	103,062	63,230	Continuing	N/A
(Quantity)		4 (Retrofit)				
Procurement (3080)*	345	17,258	25,574	77,374	Continuing	N/A

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

Program Element: # 12431F

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

The system's current deployment consists of a satellite over the Eastern Hemisphere and satellites over the Western Hemisphere

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 (EUCOM)
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/TIII(34)D/Inertial Upper Stage (IUS) capabilities. The Simplified Processing Station will provide for emergency backup to the current ground stations and enhance mission data survivability

RELATED ACTIVITIES:
Appropriate procurement phasing with the follow-on DSP program is being addressed in program planning. 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)
After transition to the Space Shuttle, Space Launch Support (35171F) will provide IUSs and Space Shuttle flights for DSP missions.

Program Element: #12431F

Title: Defense Support Program (DSP)
Budget Activity: Strategic Programs, #3

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 Command Center Processing and Display System and Data Acquisition and Communications segments. The Martin Company, Denver, CO, builds the TITAN IIIC booster. The Energy Research and Development Agency (Sandia Corporation) 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 1978 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

R&D

support for DSP Augmentation was completed. Ground station modifications were completed. Satellite Tracking Set Training Equipment was delivered.

Critical Design
Review (CDR) was conducted in June 1978 on a new sensor
         The decision was made to return to the use of lead sulphide detectors, instead of mercury cadmium telluride. This change results in a lengthening of the development period, but has no impact on operational support of the system. Funding ensuring TITAN III/Shuttle/Inertial Upper Stage (IUS) compatibility continued. In June 1978, the prototype Simplified Processing Station (SPS) was shipped to Vandenberg AFB, CA for conduct of Development Test and Evaluation and Initial Operational Test and Evaluation. The SPS will be delivered in December 1978, rather than the previously reported April 1978. It will be configured to receive two mission data streams from one satellite. A satellite calibration experiment was performed

2. FY 1979 Program: Expenditures include completion of improved sensor development and the continuation of Payload/Shuttle/TITAN III/IUS compatibility development. A sensor structural test model is funded to verify sensor loads compatibility with the planned launch vehicles. The improved sensor will be retrofitted on two satellites currently in the inventory and will be incorporated on all new satellites. The funds for payload/launch vehicle compatibility ensure the DSP satellites are compatible with Shuttle and IUS interfaces and support the program transition to the Space Shuttle launch capability. The development efforts include consideration of launch loads, safety requirements, interface compatibility and contamination protection. The program also includes development of a capability to launch two satellites on TITAN III(34)D/IUS vehicles to provide the most optimum use of satellite resources. Improved spacecraft data transmission capability development will incorporate state-of-the-art technology and increase reliability. Development of a Satellite Link II status receive capability will be initiated for the SPS. This will allow the SPS personnel to monitor the health and status of the satellite in support of the SPS emergency backup role. The SPS itself will be delivered to the Government   in December 1978. A concept feasibility study for a highly mobile satellite receiving terminal will be conducted. Orbital operations data analysis and satellite improvement studies will continue.

3. FY 1980 Planned Program: A major part of the FY 80 funds will be applied to continuing development of the payload/TITAN III/Shuttle/IUS compatibility and the SPS satellite Link II status capability. The sensor structural test model is continued. Preliminary design/definition of our next new satellite is conducted. The development of a highly mobile satellite receiving terminal will be initiated. The concept is to provide a truck mounted terminal which can be readily moved to new locations to complicate the enemy targeting capability. The development of the accompanying satellite high power downlink modification to enable the satellites to be read out by the mobile terminal's small (8'-12') antennas will also be initiated. The development of the mobile terminals will significantly enhance the survivability of the DSP data in support of the National Command Authorities (NCA). Satellite improvement studies and analysis of data gathered from orbital operations will continue.

Program Element: # 12431F   Title Defense Support Program (DSP)
                                                                   Budget Activity Strategic Programs #3

4. FY 1981 Planned Program: Plans include continuing Shuttle/TITAN III(34)D/Inertial Upper Stage (IUS) compati-
bility effort and delivery of the Simplified Processing Station Satellite Link II status capability. Design/definition
of satellite 14 will be completed. The development of the satellite and ground segments of the mobile terminal con-
cept continues and the user interface compatibility development is initiated. The design definition of the require-
ments for computer replacement at the mission ground stations will be initiated. The current computers are approach-
ing obsolescence and nonsupportability. Satellite improvement studies and orbital operations data analysis continue.

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 oper-
ational employment deficiencies, the use of the Space Shuttle and/or TIII(34)D/IUS in lieu of the TITAN IIIC, the
development of the mobile ground terminal capability and the adequacy of the ground station data processing capa-
bility.

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.   Jun 7.
L.
M.
N. Satellite 10-11 Retrofit Complete   *(April 78)   Nov 77
O. Delivery Prototype Simplified Processing Station   *(April 78)   Dec 78
P.   * (Not Forecast)
Q. Deliver SPS Link II Status Capability   * (Not Forecast) 4Q CY 80
R. Retrofit of TIII(34)D/IUS Compatible Satellite Complete   * (3Q CY 80)   3Q CY 81
S. Retrofit of Shuttle/IUS Compatible Satellite Complete   * (4Q CY 81)   1Q CY 82
T. Satellite Launches   As Required

        *Date presented in FY 1979 Descriptive Summaries

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EXPLANATION OF MILESTONE CHANGES

The change in deliveries of satellites 12 and 13 and the IIII(34)D/Inertial Upper Stage (IUS) Retrofit schedule reflects the phasing of satellite 12 and 13 deliveries to the retrofit schedule to preclude paying for acceptance testing twice. Satellite 12 will be delivered in August 1980 and Satellite 13 in July 1981.

The change in Shuttle/IUS Retrofit reflects a refinement in schedule. Satellite 5 will be delivered in December 1981 and Satellite 6 in March 1982.

The Simplified Processing Station (SPS) delivery reflects the anticipated delivery to the Government. Development Test and Evaluation has been completed.

7. Comparison with FY 1979 Budget Data: The increase in FY 1980 of $15.3M reflects incorporation of the development of the mobile ground terminal and the accompanying satellite high power downlink modifications. Within this program funding increase is a reduction in SPS funding, continuation of the sensor structural test model and allocation of satellite design funds. Development of the mobile ground terminals will significantly improve the DSP data survivability in support of the National Command Authorities (NCA) and military decision makers.

Budget Activity: Strategic Programs, #2

Program Element: #124311, Defense Support Program (DSP)

Test and Evaluation Data

1. Development Test and Evaluation: The Defense Support Program (DSP) has been designed, developed, tested and deployed as an operational system. The system is a classified space program consisting of ground control and read-out 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. There is a continuing effort to upgrade the satellites and ground facilities for improved system performance.

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/IOT&E) of the Simplified Processing Station (SPS) with IBM. The combined test program of the prototype SPS began on 26 August 1978 and will be completed in May 1979. 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 Cornhusker Army Ammunition Plant, NE. Testing of the prototype at Vandenberg AFB will include 70 days of actual (not simulated) operations. The IOT&E at the Cornhusker 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 and suitability of the SPS prototype and to identify deficiencies and recommend necessary changes.

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, low 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 standard data processing capabilities and availability of the existing large processing stations. Demonstrated performance characteristics will be available in May 1979.

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