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(S) NATIONAL RECONNAISSANCE OFFICE

WASHINGTON, D.C.

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Office of the Deputy Director

24 July 1979

MEMORANDUM FOR DEPUTY TO THE DCI FOR RESOURCE MANAGEMENT
DEPUTY TO THE DCI FOR COLLECTION TASKING
DEPUTY DIRECTOR FOR SCIENCE AND TECHNOLOGY

SUBJECT: IRSSS Phase II METSAT Options

Attached is the latest draft of the METSAT Options paper prepared 23 July 1979. I have also included the codeword annex to the paper. Members of the Study Group are currently examining the document to determine if any basic flaws exist. I am providing the latest version for your information and possible comment.

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Charles W. Cook

Attachment:
METSAT Options, 23 July 1979

NRO, OSD, NSC and NASA review(s) completed.

On file DOC release instructions apply.

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CLASSIFIED DOD METEOROLOGICAL SATELLITE REQUIREMENT

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The Defense Meteorological Satellite Program (DMSP) was initiated as a National Reconnaissance (NRO) program in 1960 to provide dedicated, timely weather support for satellite and aircraft intelligence collection. In 1965, management of DMSP was transferred to the Air Force in order to improve support of the Vietnam conflict and other JCS operations. It is now a tri-service program. The critically important role played by DMSP in the Son Tay Raid, Mayaguez Rescue, [redacted] along with its routine use in air and naval force movements emphasize DMSP's importance to unique DOD operations. However, the highest priority mission of DMSP continues to be NRO support.

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The baseline NRO-DOD requirement for DMSP consists of at least two sun-synchronous polar orbiting satellites continuously on orbit with nodal crossing times selected to meet the stringent NRO mission requirements. [redacted]

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The DMSP satellites are the major element of the weather support to the NRO [redacted] Future systems will continue to depend on this type support to include the interactive tasking of complementary systems.

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The value to the nation of the cloud free imagery which DMSP adds to our intelligence systems is measured not only in reduced system operating costs, but also in the more vital area of satisfaction of intelligence requirements such as SALT monitoring, indications and warning, crisis monitoring, etc. The NRO systems are a vital element of our nation's capability to monitor SALT and DMSP is an integral part of the performance and efficiency of these key NRO systems. Any actions taken concerning the current or future DMSP development, management or operations must not degrade this essential NRO capability.

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National Aeronautics and
Space Administration

Washington, D.C.
20546

Office of the Administrator

Honorable Frank Press
Director, Office of Science and
Technology Policy
Executive Office of the President
Washington, DC 20500

Dear Frank:

In response to your office's request of July 6, 1979, I am forwarding an interagency Task Force options paper, "Polar Meteorological Satellite Program Options." I am forwarding Annex 1, which is highly classified, under separate cover.

Very truly yours,

Robert A. Frosch
Administrator

Enclosure

XI

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bcc: (Less Annex 1)

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POLAR METEOROLOGICAL SATELLITE PROGRAM OPTIONS

PREPARED BY THE INTERAGENCY TASK FORCE ON INTEGRATED REMOTE SENSING SYSTEMS (PHASE II)

JULY 23, 1979

[redacted]

Review for Downgrading on July 1, 1985

This document consists 38 pages
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POLAR METEOROLOGICAL SATELLITE

PROGRAM OPTIONS

I. ISSUE FOR DECISION

Should there be further consolidation or convergence of the military and civil polar orbiting meteorological satellite (METSAT) programs for the 1985-1992 period and, if so, to what extent or under what policy ground rules? (U)

II. BACKGROUND

A. Task.

PD/NSC-42 directed, "In the FY 1980 budget review, OMB--in cooperation with Defense, the DCI, NASA, and NOAA--will conduct a cross-cut review of meteorological satellite programs to determine the potential for future budgetary savings and program efficiency. Based on this cross-cut, the Policy Review Committee (Space) will assess the feasibility and policy implications of program consolidation...." The operational civil geostationary METSAT program is not an issue here. (U)

B. Current Programs.

1. Major civil METSAT requirements are the global acquisition of quantitative data and domestic and international dissemination of environmental data for improved weather, climate and environmental monitoring and forecasting. The civil DoC program

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is open and unclassified, to encourage national and international use of the data, and to encourage international cooperation and collaboration in establishing the capabilities of the satellite systems themselves, even to the point of other nations providing some on-board sensors and data processing systems. (U)

2. The military METSAT requirements include global coverage for both imagery and quantitative data in support of national security objectives (see Annex 1), worldwide intelligence collection, and strategic and tactical military operations. While the DoD program is operated primarily to meet national security needs, archived DoD METSAT imagery is primarily available to the civil and international community. All DoD METSAT data are available to NOAA for operational use. (C)

3. There are significant differences between the civil and military programs in the priority of individual data needs and accuracies; spectral, temporal, and spatial resolution requirements; orbit selection; system survivability criteria; and data formatting, processing, and dissemination.

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Command, control, and management procedures are also significantly different between the two sectors. This leads to the differences in spacecraft instrumentation, ground support hardware, and operational philosophies, as noted in Tables 1 and 2. (U)

4. Some technical convergence has already been achieved with the joint use by DoD and DoC of a common basic spacecraft, the DMSP Block 5D of DoD design. Civil requirements are accommodated by modification to the basic spacecraft and supporting subsystems. Each agency operates two spacecraft for its own requirements; there is a useful degree of METSAT data exchange and cross-servicing between the civil and military sectors, especially in the event of spacecraft malfunctions. (U)

C. Continuity.

In FY 1981, both DoD and DoC must initiate budgetary actions to maintain continuity of data services beyond the 1984-85 period, when the current buy of spacecraft will have been exhausted. (U)

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TABLE I

CIVIL POLAR-ORBITING OPERATIONAL METEOROLOGICAL SATELLITE SYSTEM

The following NOAA missions receive major support from the data acquired from polar orbiting satellites. The geostationary satellites (U.S. and foreign) also contrib to these missions, but their highest priority is the provision of images for severe stor warnings.

NOAA Missions (in priority order)

1) Numerical weather analysis and forecasting (global and local)
2) Marine environment monitoring and prediction
3) Flood forecasting and water management
4) Climate monitoring
5) Support of communications, high altitude flight, power transmission
6) Other environmental support (agriculture, oil spills, research, etc.)

Polar Satellite Data Requirements (in priority order)

1) Atmospheric temperature and humidity (earth's surface to the upper stratosphere; global; 200 km. grid; four/day; accuracy: temperature, 1°C; humidity, 20%)
2) Water surface temperature (global, 100 km @ 1°C; local, 10 km @ 0.5°C)
3) Snow and ice cover; detect melting (global, 10 km; local, 1 km)
4) Earth heat balance for climate change
5) Particles and x-rays from solar storms
6) Variations in atmospheric gases (e.g. ozone)
7) Multispectral imaging for other environmental uses
8) Location of major ocean surface currents
9) Extent of floods (highest resolution available)

NOTE: Data supplement those from GOES in providing short range forecasting of severe sto and local weather.

System Requirements

Continuity and Reliability: Two spacecraft in orbit at all times with replacement of a f spacecraft within 120 days. Deliver data products and services with reliability of bett than 95%, with no breaks longer than six hours.

Survivability: Space and ground system must survive the phenomena it is to detect. Survive hostile threats as required by DoD.

Command and Control: Must provide immediate response to changes in tasking resulting fr floods, severe storms, unusual changes in ice and snow cover, oil spills, special exper etc., and from system failures.

Coverage: Global, 4/day, plus 1 km imagery programmable for up to 25% of globe/day.

Orbits: Sun synchronous; at least 850 km; crossing the equator at 0730L ± 1 hr and 1330 ± 1 hr to meet input needs of U.S. and international numerical forecast models.

Timeliness: Data must be processed within minutes as input for accurate numerical weath forecasts and prompt warning of potential natural disasters; value of data for these purposes decays rapidly with time.

Special Data Communications: Data collection/location subsystem is needed for special observations in support of data requirement one. Satellite observations must be broadca directly to local users throughout the world for prompt storm warning.

Other Factors

- Reduce U.S. costs by providing for international participation through contributions of subsystems and satellites.
- Contribute to U.S. foreign policy objectives through training, data exchange, direct broadcast of vital data, etc.
- Assure U.S. benefits from U.S. participation in international programs, such as the Global Atmospheric Research Program and World Weather Watch.
- Provide flexibility to meet unexpected, priority needs, and back up DMSP.
- Provide internationally acceptable platform for search and rescue mission.

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The following information summarizes the DOD METSAT missions. Details of the DOD METSAT mission requirements are covered in JCS memoranda, the POOMSCOB report, and the Phase I IRS[3] report. Special access DOD METSAT requirements are provided in a separate classified annex (Annex 1). These special access requirements have top DOD priority.

DOD METSAT MISSIONS (See Annex 1 for additional missions)

1) Support to special military operations (air, ground, and sea), e.g., Son Tay Raid, Mayaguez Recovery, air war over North Vietnam.
2) Provide support to electro-optical reconnaissance and weapon delivery systems.
3) Support of National Defense Communications Systems.
4) To provide data to the tactical battlefield for military forces engaged in combat.
5) Support to air defense and early warning radar systems.
6) Support to ocean surface and undersea systems.
7) Support to land forces, trafficability, and other surface activities.
8) General weather support for worldwide military operations.

DOD METSAT DATA REQUIREMENTS (In priority order)

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2) Thermal Mapping
3) Snow Cover
4) Ice Cover
5) Ionospheric Electron Density
6) Precipitation Mapping
7) Space Environment, particle flux, type
8) Soil Moisture content
9) Vertical temperature and moisture Profiling
10) Atmospheric Constituents
11) Extent of floods

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DOD METSAT SYSTEM REQUIREMENTS (See Annex 1 for additional system requirements)

1) Continuity and Availability - A minimum of two spacecraft continuously on-orbit at all times. DOD METSATS must be able to launch within 45 days of notification of need into a sun-synchronous orbit with any ascending/descending node time specified. Each satellite is launched into an orbit specifically dictated by the military needs at the time of launch.
2) Survivability - Satellites must be protected from on-orbit attack so that military data support will continue uninterrupted during conflict periods.
3) Command and Control - DOD requires command and control and payload management for at least two satellites continuously on-orbit so that payload tasking under routine or limited capability operations will not expose military operations or plans.
4) Coverage - Global, 4 times per day, constant resolution data, both day and nighttime visible data.
5) Orbits - At least two sun synchronous orbits, one usually an early morning (app 0630) ascending/descending node time and the other usually near noon (1000-1200) node time orbits parameters must remain flexible to meet classified requirements.
6) Timeliness - Complete automated/computerized processing of all sensor output must be provided to insure processing within minutes of data receipt. Data must be available to support military crisis and tactical operations.
7) Data Accuracy - DOD has uniquely rigid spacecraft pointing accuracy and constant resolution data requirements.
8) Data Security - Data must have the capability for encryption so that transmission can be effected without compromise of data during crisis periods and the command and control links must be encrypted to avoid erroneous commanding from hostile sources.
9) Logistical Support - Training and logistics must be compatible with enlisted personnel skill levels.

OTHER FACTORS (See Annex 1 for additional factors)

1) Contributes to the security and operations of NATO and other US allies.
2) DMSP permits major reductions in other USAF and Navy weather reconnaissance assets.
3) DOD METSAT data routinely provided by fixed communications link to NOAA.
4) All DOD METSAT imagery data are archived at the University of Wisconsin for use by civil and international consumers.
5) DOD supports civil requests to participate in international programs such as

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III. KEY CONSIDERATIONS

A. Current Policy Framework.

The DoC and DoD METSAT programs operate today under a body of legislation, agreements, policy, and tradition. PD/NSC-42, PD/NSC-37, the Space Act and other Congressional actions, UN treaties, and a broad range of international agreements and arrangements. Some of the major policies applicable to the METSAT issue for decision are: (U)

1. "The United States will maintain current responsibility and management relationships among the sectors focused on civil, defense, and national intelligence objectives." PD/NSC-37 (C)

2. "The United States will pursue space activities to increase scientific knowledge, develop useful civil applications of space technology, and maintain United States leadership in space." PD/NSC-37 (U)

3. "The United States will conduct international cooperative space-related activities that are beneficial to the United States scientifically, politically, economically, and/or militarily." PD/NSC-37 (U)

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4. "The United States will develop and operate on a global basis active and passive remote sensing operations in support of civil, military, and national intelligence objectives. Such operations will occur under conditions which protect classified technology, deny sensitive data, and promote acceptance and legitimacy of such activities." PD/NSC-37 (C)

5. "Close coordination, cooperation, and information exchange will be maintained among the space sectors to avoid unnecessary duplication and to allow maximum cross-utilization, in compliance with security and policy guidance of all capabilities." PD/NSC-37 (C)

6. "Data and results from the civil space programs will be provided the widest practical dissemination, except where specific exceptions defined by legislation, Executive Order, or directive apply." PD/NSC-37 (C)

7. "... each Department or Agency of the Federal Government which develops, launches and operates meteorological satellite systems, takes action as a matter of urgency to insure that the National Command Authority is able to (a) maintain control of U.S. meteorological satellite systems in the face of a determined effort by a hostile nation to assume

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control and (b) control direct access to data transmitted from these systems when such action is considered to be in the interest of national security." USCSB 3-12 (S/NF)

8. "... activities peculiar to or primarily associated with the development of weapon systems, military operations, or defense of the United States... shall be the responsibility of and directed by the Department of Defense..."; NASA shall conduct civil space R&D. Space Act (U)

B. Current METSAT Management.

1. The USAF is the DoD program manager for research, development, design, acquisition, and operation of the military METSAT program in response to operational Defense, intelligence community, and treaty monitoring requirements, such as the Limited Test Ban Treaty and Comprehensive Test Ban Treaty. Budgeting and management are centralized; data are widely disseminated to military users, including direct readout to aircraft carriers, overseas commands, and the military weather services. Much of the data acquired by the military METSATS are unclassified and made available to the domestic civil and international communities. (S)

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2. The NOAA is the DoC organization that manages the operational civil METSAT system, both geosynchronous and polar orbiting. The NOAA program responds to a broad spectrum of environmental data requirements from a variety of users. Users include: DoC, USDA, DoT, USDI, WMO, NASA and foreign weather services. The NOAA budgets centrally for space and ground segment acquisition and operations, and uses NASA as its procurement agent for the space segment. NASA, using its own funds but in response to NOAA requirements, conducts space R&D and prototype development and demonstration. (U)

3. The two DoD METSATs fly in orbits that are to meet individually changing operational needs, but usually sun-synchronous orbits with nodal crossing times of around 0630 and in the 1030-1200 window. The NOAA polar METSATs currently have crossing times of about 0730 and 1500 in order to meet the requirements for repetitive global observations at about 6-hour intervals to support the synoptic computer models. (U)

C. Potential Costs and Savings.

There are two different elements of costs and savings associated with merged METSAT programs: possible reduction in the number of spacecraft, and decisions on developing new spacecraft. The costs and disadvantages of each are treated separately below. (U)

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1. Studies of the aggregate civil and military sensor mix to meet the stated operational METSAT requirements of DoC and DoD suggest that three satellites rather than four could carry the necessary sensors under idealized operating conditions. These same studies have indicated that a potential saving of

[redacted]

FY 1981 to FY 1992 might be realized from a reduction in the number of spacecraft. With military and civil sensors redistributed among three satellites, all vehicles would have to carry both civil and military sensors and both agencies would have to share data from each satellite. A three satellite system has some inherent disadvantages: DoD must have flexibilit in setting the orbits of its current vehicles,

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times for those satellites used for direct

* Estimates of savings projected over such extended periods are necessarily questionable.

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transmission to foreign ground satellites were changed significantly, scheduling of weather forecasts all over the world would be affected. A three-satellite system is less flexible and therefore less responsive to changing user requirements and it provides less information with higher risks of service interruption with only three satellites. The loss of one would have greater impact on the civil, Defense, and national security missions. Increasing the number of instruments on each satellite increases the likelihood of partial payload failures requiring full payload replacement. (C)

2. The other element of possible savings would be the decision not to develop a new basic spacecraft for either a three- or four-spacecraft constellation for operations in the 1985-1992 period. This would result in one-time near-term cost avoidance of

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[redacted]

It would, however, reduce flexibility and constrain growth until the 1992 period and might result in one or the other agency having to buy a more expensive or less competent satellite than would otherwise be necessary. (U)

* Values derived from parametric models are questionable.

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D. Management Considerations.

1. Budget. In any merged approach that requires integrating multiple sources of funds (i.e., from DoC and DoD), runs a risk in any year of program disruption from Congressional actions taken in relation to individual agency budgets rather than in relation to the program as a whole. There is no means to guarantee agency shares in a joint funding program, given the current legislative and appropriation committee structure. Further, within the Executive Branch, different internal agency budget priorities would affect a joint program. (U)

2. Coordination. Any merged approach would require complex interagency coordination to assure that the needs of all users are met, especially those users without a METSAT operational role but who depend on METSAT data and information for their legislated responsibilities (e.g., USDA, DoT). This presumes negotiation of service and schedule priorities from quite different but valid bases of requirements, a difficult task in an environment of constrained technical and budgetary resources. (U)

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E. International Considerations.

1. Data Availability. United States civil meteorological satellite data are available to foreign users on an open unclassified, and non-discriminatory basis, either through direct readout from the satellite or via ground-to-ground communication services. The concepts under consideration would continue this practice. [redacted]

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[redacted], although most of the data are unclassified and openly distributed. DoD data would continue to be handled in this mode. Civil data would continue to be openly disseminated, subject to denial to foreign users for national security reasons in cases of national emergency. The current guidelines for data availability and for implementing emergency denial capability provide for high level interagency review with provision for appeal to the President. (S/NF)

2. Benefits to the U.S.. Foreign cooperation in U.S. civil METSAT space systems has benefited the U.S. through general worldwide good will and acceptance of U. S. systems as international assets; concomitant absence of technological competition; foreign funding of shared instruments and spacecraft that is saving the U.S. [redacted] through 1985;

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greater access to foreign meteorological data through bilateral and WMO channels; and, commitment by our cooperating partners to the objectives of U.S. systems. (U)

3. Foreign participation. Foreign cooperation has taken place in the ground segment, in the provision of foreign instruments on a cooperative basis to NOAA's polar orbiting satellites (the British have provided a radiometer and the French a data collecti system), and in the provision of three foreign satellites in the coordinated global network of five geostationary satellites. This contribution of geostationary satellites was at least partially predicted on the continuing U.S. commitment to operate a polar satellite-system providing direct readout, sounding data, and other present services on an international basis. Thus, continued growth in foreign participation in the totality of civil meteorological satellite activities will be affected by U.S. decisions on the operational polar satellite

4. Foreign perceptions. Merged systems will raise the visibility of the U.S. military space program and might give impetus to claims that the U.S. is militarizing its space program and to existing

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proposals in the UN and elsewhere for limits on military space activities and extension of limits on civil activities to cover military programs. However, to the extent that foreign countries perceive no change in the basic US policies on data availability and international cooperation, adverse foreign reaction should be manageable. In the case of a merged METSAT system under civilian management, or a merged system under joint civil/military management, foreign countries would probably view as credible a U.S. commitment to continued data and cooperation policies. Allied or potential adversary nations would probably view civil control of an operational METSAT system supporting the military as a "cover" for intelligence activities. In the case of a military managed, merged system, where civil programs were included in the Defense budget and the management office would be under Defense authority, it might be difficu to persuade other countries that merging would not risk significant reductions in the level of international activities now associated with the civil METSAT system. In such a case, the problem of foreign perceptions could become acute and, in the worst case, lead to international actions reducing

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international acceptance and legitimacy of all U.S. civil and military remote sensing programs. (C)

F. National Security Considerations.

1. In addition to the special national security mission (Annex 1), military weather satellite data acquisition and processing are important to the combat effectiveness of both tactical and strategic forces. In the case of tactical and naval air operations, the effectiveness of munitions delivery and aerial reconnaissance is highly dependent on the accuracy of weather forecasts for the target area. Inaccurate forecasting increases the risk of combat losses, improper ordnance selection, mission diversion, or ineffective application of combat assets. (C)

2. Strategic forces use military satellite weather data daily to support strategic operations plans and strategic reconnaissance, including sensor selection for both targeting and weapons damage assessment. In targeting, meteorological support is important to gauging missile impact accuracies which affects force application options. In assessment, the proper sensor package must be installed on the aircraft, thereby improving the probability that the desired information is collected (e.g., SLAR vs PHOTO). (S)

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3. Responsiveness of a military METSAT data system is key to satisfying constantly changing military requirements. In order to be responsive, any METSAT system supporting the DoD must permit tasking priority, flexibility, and freedom to respond rapidly to Unified or Specified Commands involved in combat operations. (C)

G. Stated Positions of DoD and DoC.

The Secretaries of Defense and Commerce did not agree on the management approach to further consolidation or convergence. Both agreed that, potential cost savings notwithstanding, the requirements of the military and civil programs can best be met by maintaining separate systems (Annexes 2 and 3). (U)

IV. ALTERNATIVES

Under the alternatives for policy consideration outlined below there is a presumption of continued shared data processing responsibilities and separate but coordinated civil and milita information dissemination functions. The alternatives assign to different agencies the responsibilities for spacecraft and sensor specification, design, and procurement; continued supporting R&D; orbit selection; on-orbit command and control; meeting tasking priorities; and, data reception, protection,

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and initial processing. Three basic management alternatives have been identified for policy consideration. Each assumes that technical decisions on the number and design of the future operational spacecraft will be made by the responsible agency or agencies. (U)

A. These alternatives are:

1. Coordinated dual DoD and DoC programs with increased emphasis on data, hardware, and technology sharing. (U)

2. A jointly managed consolidated DoD-DoC program to meet both civil and military needs. (U)

3. A fully converged METSAT program under a single agency (either DoD or DoC) committed to meeting the needs of both communities. (U)

B. The key management elements of these alternatives, together with their advantages and disadvantages, are further outlined below:

1. Coordinated Dual Programs.

a. Description. This would be an extension of the present arrangements under which NOAA and USAF manages their own programs in close coordination and cooperation with each other and with their respective user constituencies. If warranted by service and economic considerations, the 1985-1992 civil and military spacecraft systems could be dissimilar in design and technical

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capabilities, but would take maximum advantage of technology and hardware exchange. Where advantageous, there would be common use of spacecraft, subsystems, and instruments, with further economies possible through coordinat single-source procurement. NOAA and USAF plans to increase nonduplicative METSAT data processing shared between civil and military centers, in addition to continuing the exchange of data between the two communities. Examples are atmospheric soundings, derivation of sea surface temperatures, and global three-dimensional cloud analyses. No new management structure would need to be developed, as USAF and NOAA already have in place efficient systems to meet their full range of responsibilities, from specificatio through operations to information dissemination. DoC would continue to use NASA as its agent for R&D and spacecraft procurement, and the coordination mechanisms of the Federal Coordinator for Meteorological Services and Supporting Research, Polar Orbiting Operational Meteorological Satellite Coordination Board (POOMSCOB),

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Aeronautics and Astronautics C ordination Board (AACB), Program Review Board (PRB), and Policy Review Committee (Space) (PRC(S)), would provide for continuing and improving coordination, cooperation, and cross-servicing. The present DoD, DoC, and NASA budget responsibilities would remain independent. (C)

b. Advantages.

1. Retains the maximum flexibility, reliability, and capability to respond to evolving user needs in both the civil and military sectors while providing opportunities for continued economies through common use of developed or new hardware; retains and expands upon existing successful coordination mechanisms and budget structures. (U)

2. Would not require changes to existing policy or law. (U)

3. Preserves the option for future further integration of civil or military remote sensing functions within existing civil or military management structure. Examples are the provision of certain land and ocean

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services from the civil or military METSAT itself or use of the civil or military METSAT spacecraft with different instruments. (U)

4. Supports all domestic and international civil, military, and national security program objectives. (U)

c. Disadvantages.

1. Would not realize a potential 1981-1992 cost saving through reduction in number of spacecraft. (U)

2. Might encourage unnecessary duplication. (U)

3. Maintains present manpower levels. (U)

2. Joint DoD-DoC Management of a Consolidated Program

a. Description. Under this approach, a joint USAF-NC management organization would be established to design, develop, procure, operate, and task the METSAT space segment. Supporting research and space segment development and procurement would be tasked from the joint office to USAF and NASA, as appropriate, either with or without reimbursement. This would take the form of a joint office staffed by both agencies with the Director designated by the Secretaries of DoC and DoD; the office essentially would be an

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institution separated from both its parent agencies. To assure that all U.S. interests were adequately represented, there would need to be a new mechanism established--an "Executive Committee"--composed of senior program and policy officials from all vitally involved agencies (e.g., State, Agriculture, Interior, Commerce, Defense, DCI, NASA, EPA) to validate requirements, priorities and data service tradeoff Decisions of the Executive Committee could be raised by an agency head to the PRC(S). Budgeting would be divided among the three main technical agencies (USAF, NOAA, NASA). If present international cooperation and data policies were continued, this alternative would not cause unmanageable foreign reactions. (U)

b. Advantages.

1. Might allow reduction to a 3-spacecraft METSAT system with a consequent reduction in cost. (U)

2. Reduces the number of independent spacecraft and instrument developments. (U)

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3. Provides a broader interagency consumer/user forum for data service requirements. (U)

4. Preserves the option for future further integration of remote sensing functions under joint management, such as providing certain land and ocean services from the METSAT itself or using the METSAT spacecraft with different instruments. (U)

c. Disadvantages.

1. Requires a new and complex interagency management and budget structure to provide for adequate services to both the civil and military communities. (U)

2. Might reduce responsiveness of the overall system to its principal users, DoD and DoC. (U

3. Funding priority decisions in any year by any one agency or its respective Congressional authorization or appropriation Committees could put the entire program in jeopardy. (U)

4. Might require changes to existing policy or law. (U)

5. Would take considerable time to implement and to resolve conflicts. (U)

6. Would increase risk of service interruption to one sector or the other if a three-spacecr system were chosen. (U)

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3. Converged Program Under Single Agency Management.

a. Description. Under this approach, there are two suboptions: either DoC or DoD would be selected by the President to fund, develop, procure, and operate a single polar orbiting METSAT space segment for the U.S. responsive to all national interests. The selected operating agency (USAF or NOAA) would establish an interagency advisory board (representing State, USDA, DoI, DoC, DoD, DCI, NASA, EPA) to assure that external requirements are understood and that the operational system is responsive thereto. Trade-offs and operational constraints that affect external requirements would have to be appealed by the concerned agency head to the PRC(S). (U)

b. Advantages.

1. Might allow reduction to a three-spacecraft METSAT system with a consequent reduction in cost. (U)

2. Reduces the number of independent spacecraft and instrument developments. (U)

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3. Streamlines budgetary, development, procuremen and management activities through centralizati in a single agency. (U)

4. If converged under NOAA, would be manageable in terms of foreign reactions. (U)

c. Disadvantages.

1. Requires a potentially adversary interagency coordination structure to assure the lead agency understanding of external requirements, and encourages conflict between the lead agency and the others (excessive claims for service from agencies not required to pay for them, and valid complaints of non-responsiveness). (U)

2. Places either USAF or NOAA in the role of developing and operating systems for another sector, which might require changes in policy and law. (U)

3. If managed by NOAA, could comprise DoD's requirements for operational orbital flexibility, command and control, and support to military operations. If managed by USAF, could comprise NOAA's ability to meet its civil and international responsibilities. (U

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ANNEX 2

THE SECRETARY OF DEFENSE
WASHINGTON, D.C. 20301

JUN 4 1979

MEMORANDUM FOR DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET

SUBJECT: Further Convergence of Polar Meteorological Satellite Programs

(U) In response to your memorandum of 1 February 1979, the Polar-Orbiting Operational Meteorological Satellite Coordinating Board (POOMSCB) has forwarded to you their draft report on further convergence. This report examines several alternatives and concludes that further convergence is functionally feasible. Your memorandum raised other issues concerning organizational responsibilities, timing, and cost effective utilization of the Shuttle. I would like to make clear my position on these subjects.

(U) I believe that further convergence offers potential savings in the overall federal budget. Our ability to capture this potential without unduly compromising operational missions depends, however, upon the effectiveness of the converged program and management structure. Because of the importance of the Defense Meteorological Support Program (DMSP) to national security missions, I have concluded that further convergence is viable only by augmentation of the DMSP to support civil needs, while retaining DoD management. Such a converged system and the operational factors which dictate this approach are described in the enclosed Defense Position Paper (Enclosure 1).

(U) Should further convergence be directed, I will be fully committed to assuring that DMSP truly serves the civil, as well as military users. You will note that the position paper retains significant responsibility for the program within Defense. This is based upon several factors which I believe must be maintained in any convergence scheme.

(U) First, a single agency line management organization is essential to execution of a dynamic and cost effective program. Secondly, the program must have a stable funding profile and should avoid multiple agency budgeting systems, justification processes and appropriations. If necessary, I am willing to have all program funds included in the Defense line. Finally, a continuous operational capability must be maintained. I request a decision on convergence of the operational polar meteorological systems no later than 16 July, in time for my budget activities in August. Decisions on other convergence issues can be made on the basis of the meteorological convergence outcome.

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(U) Concerning Shuttle utilization, the Defense goal is to use the Shuttle to achieve our missions at the lowest practical cost. As you know, we have studies ongoing which are examining many alternatives for Shuttle usage, including the potential for retrieval and refurbishment, for a range of operational and experimental missions. We are seeking the most cost-effective engineering approach for convergence and I do not believe that the engineering options are convergence issues. Here again, an early decision on convergence will help assure that all critical needs are included in these studies.

(signed HAROLD BROWN)

Enclosure

cc: Secretary of Commerce
President's National Security Adviser
Director, Office of Science and Technology Policy
Chairman, Joint Chiefs of Staff
Administrator, NASA

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Department of Defense Position on Further Convergence of DoD and Civil Polar Orbiting Meteorological Satellite Systems

DoD supports the further convergence of military and civil polar orbiting satellite systems, if satisfaction of the operational military requirements detailed below is maintained.

Certain high priority DoD missions require responsive, high quality meteorological support. In order to retain adequate support such as DoD has received from the Defense Meteorological Satellite Program (DMSP) and to ensure that future support will be equal to the military needs, DoD must retain a significant level of control over the development, management, operation, and command and control of any future polar orbiting meteorological satellite program which would supercede DMSP.

DoD has participated closely with the National Weather Service and has made full use of civil products and services where applicable. However, neither military nor civil meteorological sources, including the civil TIROS satellite system, were able to provide all the needed information. A military satellite program (currently designated DMSP) was created to fulfill critical shortfalls in:

- Global imagery coverage with high precision
- Assured daily coverage
- Precise time of collection
- Data through-put for immediate operational use
- Security and survivability

The system was successful and DMSP [illegible] fully integrated into the [illegible] force structure.

- Military weather reconnaissance aircraft have been cut back.
- Most theater commands and aircraft carriers have or are programmed for direct readout terminals and a contingency tactical terminal is on alert.
- The end-to-end system, including personnel, procedures and logistics, has been tailored for assured, responsive support in dynamic military and national strategic situations.
- Weather support to world-wide operations has been restructured with much greater reliance upon the Air Force Global Weather Central and Navy Fleet Numerical Weather Center, which in turn rely heavily upon DMSP.

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The integration of DMSP into the Defense force structure results in vital functions which must be accommodated in any follow-on meteorological satellite program. From end-to-end, the system has to be carefully structured to simultaneously support diverse national and in-theater customers, with training and logistics compatible with enlisted personnel skill levels, and with tasking and operations geared for assured support of daily missions of the highest priority.

DMSP was created only with intensive iterations of meteorological, engineering and user needs to achieve a responsive system within the constraints of practical system design. This System Engineering infrastructure is essential to continued operational military support and cannot be farmed out to another agency. Most of the functions of the DMSP Program Office and the cadre of participants will have to be maintained in any further convergence. Specifications cannot be provided to a civil agency any more easily than to a contractor and the constant interaction with users during the development, acquisition and operational phases will still be required. In this regard, the insertion of a civil agency into these essential functions as merely a middleman complicates rather than streamlines the process. Thus, if a joint program is desired, implementation should be by civil augmentation of the DMSP Program Office.

A single joint program would logically be based upon the DMSP system. Most domestic requirements are satisfied by the separate civil geosynchronous satellite system (GOES), augmented by the civil low-altitude polar satellite system filling in for specific operational needs. By contrast, key Defense needs demand a low-altitude polar system and result in such technical requirements such as pointing accuracy, global coverage, local readout, assured availability and accommodation of special missions which will dominate the development of a further converged system. A system capable of satisfying Defense requirements will lend itself well to the typically less demanding civil needs not satisfied by the geosynchronous system.

For each functional area of the satellite system, which Defense needs and corresponding organizational responsibilities for further convergence are discussed below:

- Requirements can be developed jointly with civil agencies.

- System Engineering and Development must be the responsibility of DoD. The DMSP Program Office can be augmented with civil representatives, including management positions.

- Development and acquisition of spacecraft and sensors required for the primary military mission must be satisfied by DoD. A "core" spacecraft design can be developed which will accept various mixes of military, civil and joint payloads. The civil community can share common hardware or they can procure additional items by (1) adding to Defense contracts, (2) through separate procurement using Program Office specifications, or (3) [illegible] development.

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- Military sensors can be expanded to satisfy some civil needs and vice versa. Responsibility for sensor development would be assigned based upon major requirements or interest, with minimal duplication. Civil payloads can be carried on militarily required spacecraft and vice verse.

- Funding for the converged system will be by a single program line, carried in the Defense budget, with joint justification of the program.

- DoD must maintain selection of launch dates and times, precise orbit parameters, daily coverage, command and control and payload management for at least two satellites continuously on-orbit.

- Launch will be via the standard Space Transportation System division of responsibility.

- Needed security, including COMSEC, will be provided for the two militarily required satellites. Direct readout of selected data to foreign civil sites in support of international agreements can be included subject to interruption in case of compromise of national security in crisis or conflict.

- Survivability is required commensurate with military use in crisis and conflict. All satellites will be configured to deny data to the enemy in time of national emergency.

- Operational priorities, including for contingency conditions, will be established jointly for guidance of day-to-day tasking of the system.

- Shared operating structure, subject to maintaining an essential wartime capability, can be implemented with integrated military and civil tasking and participation in spacecraft command and control.

- Free interchange of most planning and tasking information and data products will continue both ways across the military/civil interface.

- Shared processing with complementary responsibilities can be implemented with individual distribution.

- Cooperative R&D will continue with civil agencies responsible for basic research and performing those efforts they are willing to perform and fund, and DoD conducting only those projects where there is a significant military application.

This degree of convergence would result in extensive common hardware, facilities and procedures, assure the absence of unnecessary duplication, maintain a sound programmatic and budgeting structure for implementing the program, and retain certain existing management structure elements to satisfy the requirements of law, policy and international implications to which both DoD and civil

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THE SECRETARY OF COMMERCE
Washington, D.C. 20230

JUN 28 1979

ANNEX 3

Dear Jim,

I am writing to convey my views on the options identified in the draft report prepared by the Polar Orbiting Operational Meteorological Satellite Coordinating Board (POOMSCOB) for further convergence of the civilian and military polar meteorological satellite programs.

As you know, the principal options are two, a converged system under single agency management and a consolidated system which provides for a form of joint management. After reviewing the draft POOMSCOB report and Secretary Brown's June 4 memorandum to you arguing for convergence of the two programs under military management by the Department of Defense, we strongly believe that the convergence option is neither feasible nor desirable. We also have grave doubts about the viability of the consolidation option, but believe that issue should not be resolved in the context of the budget process.

Secretary Brown's memorandum makes plain the Department of Defense's objection to a converged system under civil management. I strongly believe that a polar meteorological satellite system under Department of Defense management is also unacceptable. As explained more fully in the enclosed memorandum, the Department of Defense's proposal is contrary to Presidential policy developed over the last twenty years and embodied, among other places, in PD/NSC-37; is inconsistent with the Space Act of 1958; and would compromise our ability to meet existing international commitments and to foster increased international collaboration. In addition, it is apparent from the Department of Defense's memorandum -- which admits that "accommodation of special /military/ missions...will dominate the development of a further converged system," -- that a Department of Defense managed system would be defense dominated. Thus, although the Department of Defense's converged system might save money, it would do so at the expense of civilian satellite requirements and national and foreign policy objectives.

It had been our hope that further convergence under some form of joint management would be possible. In view of the Department of Defense's inflexibility, however, we now tend to believe that joint management would not work in practice and should not be adopted. The difficulties of negotiating and implementing acceptable management arrangements and the risks to the civilian program, in our view, appear not to be worth the savings. In any event, we believe this issue should not

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be resolved as part of the fiscal year 1981 budget process, but should be considered in the broader context of the remote sensing studies undertaken in response to PD/NSC-42.

This is not to suggest that further savings cannot be achieved As you know, over the past several years we have made considerable progress toward convergence and have already achieved many of the savings attributable to a fully converged system. Most of the additional savings from further convergen identified by POOMSCOB fall under spacecraft and sensor design and procurement. The management difficulties which concern us arise because the draft POOMSCOB report suggests that the present four satellites (2 civilian and 2 military) be replace by three larger satellites serving both civil and military requirements. We believe that many of the savings identified by POOMSCOB can still be attained, and the management difficul avoided, by retaining the present system of four satellites under separate management and moving to joint procurement of an existing spacecraft design and, to the extent possible, consolidated procurement of sensors. The National Oceanic and Atmospheric Administration (NOAA) will be employing by 198[illegible] an advanced, stretched spacecraft, the Advanced TIROS-N, which is capable of supporting both the Department of Defense and NOAA polar orbiting programs. Use of this design would avoid the significant design costs associated with the POOMSCO proposal and, by establishing joint procurement procedures, would permit capture of many of the POOMSCOB savings. We recommend this proposal as the most satisfactory resolution of the difficult policy issues posed by Secretary Brown's memorandum.

If further consideration will be given to changing the histor U.S. policy of having civil satellites operated by a civilian rather than military agency, I would want to discuss this subject with the President.

Sincerely,

JANITA

Enclosure

Honorable James T. McIntyre, Jr.
Director, Office of Management
and Budget
Washington, D.C. 20503

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COMMENTS OF THE

DEPARTMENT OF COMMERCE

ON CONVERGENCE OF THE MILITARY AND CIVIL POLAR ORBITING

METEOROLOGICAL SATELLITE SYSTEMS UNDER

DEPARTMENT OF DEFENSE MANAGEMENT

In response to the draft report by the Polar Orbiting Operational Meteorological Satellite Coordinating Board (POOMSCOB) on further convergence of the military and civil polar meteorological satellite programs, the Department of Defense (DOD) has argued in favor of convergence of the two systems under DOD management. We oppose the DOD proposal for the following reasons:

1. Military Management of the civil meteorological satellite system is contrary to a consistent national policy legislated by Congress and approved by several Presidents over the last 20 years.

The separation of civil and military satellite functions has been a characteristic of national space policy since at least 1958. Section 102(b) of the Space Act of 1958 provides:

> The Congress further declares that [space activities] shall be the responsibility of, and shall be directed by, a civilian agency exercising control over aeronautical and space activities sponsored by the

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> United States, except that activities peculiar to or primarily associated with the development of weapons systems, military operations, or the defense of the United States shall be the responsibility of, and shall be directed by, the Department of Defense; and that determination as to which such agency has responsibility for and direction of any such activity shall be made by the President...(emphasis added).

Obviously the functions of the civil operational environmental satellite program cannot be construed to be excepted from the general provision of this section.

Consistent with this statutory direction, when the issue of whether to combine the civil and military environmental satellite programs was addressed early in this decade, the White House in 1973 decided to maintain a separate civil system. The reasons for that decision were stated in a December 10, 1973 letter from Henry Kissinger to then-OMB Director Roy Ash:

> To continue the cooperative relationships in the context of future weather satellites, we should (1) sustain our policy of open access to weather data; (2) meet our established commitments to the World Weather Watch and the Global Atmospheric Research Program and be prepared to expand such cooperation in the future; (3) encourage further international participation in our programs; and (4) maintain the civilian character and control of the U. S. weather program as it relates to such international activities.... These conditions can be satisfied by maintaining the civil agencies' functions of defining, supervising, and operating our civil weather satellite program.

More recently, President Carter reaffirmed this basic policy when in PD/NSC-37, which states that "[t]he United States will maintain

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current responsibility and management relationships among the sectors focused on civil, defense, and [other] objectives."

The DOD proposal to vest control of the civil system entirely within DOD thus flies in the face of established Congressional and Presidential policy.

2. DOD management of a converged system would compromise existing international commitments and undercut efforts to foster increased international cooperation.

A second consistent characteristic of national space policy has been the use of satellites to foster international cooperation. Again, the Space Act of 1958 provides in section 102(c):

> "The...space activities of the United States shall be conducted so as to contribute...to...cooperation by the United States with other nations and groups of nations in...the peaceful application of the results thereof."

Similarly, President Carter, through PD/NSC-37 stated that "[the U. S. will conduct international cooperative space-related activities that are benefical to the United States...."

Until now, the civil meteorological satellite program has been one of the cornerstones of this facet of U.S. space policy. Today, 950 stations in 128 countries use the direct readout services of the civil polar orbiting satellites, including imagery, sounding, and space

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environmental data. The present civil system is fully open and encourages international contributions of equipment and services. Operational instruments contributed by France and Great Britain are now aboard NOAA spacecraft, and ground system cooperation is becoming routine. We expect these foreign contributions to grow under a continued open system providing corresponding decreases in U.S. costs for the system.

It is precisely those characteristics of the civil system which are responsible for its success in promoting international cooperation — openness and accessibility — which would be compromised under DOD management. This danger was a primary reason for the 1973 White House decision to maintain a separate civil system and led the National Security Council Under Secretaries Committee (NSC-U/DM-117, December 4, 1973) to state:

> Suspicions might be raised that the civil part of the [converged program under DOD direction] was concerned with activities "peculiar to or primarily associated with" military objectives....Perception of a change in U.S. policy regarding the "peaceful uses of outer space" could intensify questions concerning legal aspects...[and] our right to acquire data from space for other activities.

If anything, such risks are of even greater import in 1979 than they were in 1973, given the importance of those "other activities" to the SALT II treaty.

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Secretary Brown's memorandum does not amplify the DOD position on international aspects of U.S. space policy. Although the memorandum indicates "[d]irect readout of selected data to foreign civil sites in support of inter- national agreements can be included," no mention is made of foreign contributions to the civil system. Nevertheless, we believe the DOD decision in August 1978 not to provide the current Defense Meteorological Satellite as a host platform for the international satellite-aided search and rescue experiment (to be flown on the last three of the current NOAA polar satellites), largely because of the "...problems associated with foreign system users," provides a clear signal as to how international programs would fare under DOD management.

3. A DOD managed system will not be responsive to civil requirements.

Irrespective of other national policy considerations, a DOD managed system would not be responsive to the priorities of the civil program.

Defense priorities lean heavily toward high-resolution imagery. In contrast, the needs of the civil sector are oriented toward environmental monitoring through the use of quantitative remote sensing from space. The DOD position paper quite candidly admits that under DOD management defense needs "will dominate the development of a further converged system." Its apparent justification for this conclusion is that "most domestic requirements" are satisfied by NOAA's geostationary

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satellites and that NOAA's polar satellites are used only for "filling in for specific operational needs." Neither of these statements, however, is accurate. NOAA's polar orbiting satellites are primary observing tools, providing those specific physical measurements needed to generate extended range forecasts, to assess climatic changes, to provide direct broadcast, and to collect data from and locate remote platforms. These essential functions cannot be satisfied by geostationary satellites, the prime function of which is to improve our ability to detect severe and hazardous events.

Equally incorrect is the DOD position paper's assertion that "a system capable of satisfying defense requirements will lend itself well to the typically less demanding civil needs not satisfied by the geosynchronous system." Defense system sounding data consistently fall outside civil requirements for timeliness and accuracy and its imagery data coverage lacks the breadth of wavelength coverage and calibration needed for NOAA's more demanding quantitative applications. While several of these "shortfalls" could be corrected by the addition of specific instruments, the critical requirements of timeliness and responsiveness cannot be assured in a system dominated by "special mission" requirements. The NOAA polar system is optimized for these purposes; a defense-managed system will not be.

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