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# WITHDRAWAL SHEET

## Ronald Reagan Library

DOCUMENT NO. AND TYPE	SUBJECT/TITLE	DATE	RESTRICTION
1. letter	from George Keyworth to George Shultz re: UNESCO (1p, partial)	11/9/84	<del>P-5</del>
2. letter	from Kenneth Dam to George Keyworth re: UNESCO (1p, partial)	11/24/84	<del>P-5</del> <i>10/21/00</i>
COLLECTION: <p style="text-align: center;">KEYWORTH, GEORGE A., II: Files</p>			kb
FILE FOLDER: <p style="text-align: center;">"U" &amp; "V" Miscellaneous [2 of 2] Box 5 of 27</p>			10/6/94

### RESTRICTION CODES

**Presidential Records Act - [44 U.S.C. 2204(a)]**

- P-1 National security classified information [(a)(1) of the PRA].
- P-2 Relating to appointment to Federal office [(a)(2) of the PRA].
- P-3 Release would violate a Federal statute [(a)(3) of the PRA].
- P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA].
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- P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA].

**Freedom of Information Act - [5 U.S.C. 552(b)]**

- F-2 Release could disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA].
- F-7 Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA].
- F-8 Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA].
- F-9 Release would disclose geological or geophysical information concerning wells [(b)(9) of the FOIA].
- C. Closed in accordance with restrictions contained in donor's deed of gift.

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# United Nations Association of the United States of America



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TO: Friends of UNA  
 FROM: Robert M. Ratner, President  
 RE: UNESCO

1 February 1984

The attached UNA paper, "The United States and UNESCO: A Year of Decision," attempts to provide a balanced analysis of the current relationship between the United States Government and UNESCO and makes a series of recommendations for both to follow in the hope of avoiding a US pullout from the agency at the end of 1984.

The paper does not deny many of the charges leveled against UNESCO by the U.S.; in fact, it says that "the arguments for the need for change within UNESCO are persuasive." It therefore directs the following recommendations to UNESCO:

--UNESCO staff should actively seek to divorce divisive political issues from the agency's useful and important work in science, education and culture.

--The UNESCO leadership should at a minimum show the same degree of budget restraint as is being exercised by other agencies in the UN family as well as by the UN itself.

--Director-General Amadou-Mahtar M'Bow should redress the geographical imbalance in top leadership posts to counter any regional or ideological bias.

But the paper also implicitly questions an underlying assumption of the U.S. position, namely that UNESCO cannot be reformed from within. "Strong and inspired leadership by the United States is essential," it says, "if multilateral institutions are to live up to their potential." And it argues that success in bringing about positive change in UNESCO would suggest that an active brand of US multilateral diplomacy could work to the benefit of the entire UN system. It therefore recommends the following steps to the US Government.

--In light of the positive results achieved at the last General Conference, the US should redouble its efforts in UNESCO activities throughout this year to see if a reform trend can be established.

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## United Nations Association of the United States of America

300 East 42nd Street, New York, NY 10017 212 697 3232

### THE UNITED STATES AND UNESCO: A YEAR OF DECISION

The United States has informed the United Nations Educational, Scientific and Cultural Organization (UNESCO) of its intention to withdraw from the agency at the end of 1984. If the decision is implemented, this would be only the second time in the history of the United Nations that the United States has pulled out of an organ of the world body.<sup>1</sup>

#### The U.S. Decision

The U.S. decision, announced on December 28, 1983, is due to take effect on December 31, 1984. The move was recommended by Assistant Secretary of State for International Organization Affairs Gregory J. Newell with the support of U.S. Permanent Representative to the United Nations Jeane J. Kirkpatrick and U.S. Ambassador to UNESCO Jean Gerard. It was preceded by a six-month interagency review in which federal agencies, U.S. overseas missions, and private professional organizations were asked to evaluate UNESCO programs.

In a press conference on December 29, a State Department spokesman said that UNESCO has "extraneously politicized virtually every subject it deals with," is hostile to the institutions of a free society, especially a free market and a free press, and has "demonstrated unrestrained budgetary expansion." Significantly, in this case, the Administration argues that UNESCO's problems cannot be remedied by U.S. action from within the organization and that the United States might find other channels for international cooperation in pursuit of UNESCO's original goals.

The U.S. decision was not supported in all quarters, however. On December 16, the United States National Commission for UNESCO, a quasi-governmental body of private citizens and professional organizations that advises the

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<sup>1</sup>The first was in 1977, when the Carter Administration took the United States out of the International Labor Organization (ILO) in protest over "politicization." The U.S. rejoined the ILO in 1980.

State Department, opposed the pullout by a vote of 41 to 8. The Commission surveyed more than a dozen U.S. organizations that participate in UNESCO's scientific, educational, and cultural work and reported unanimous support for working for reform from within. These included the American Library Association, the National Education Association, the American Association for the Advancement of Science, the American Newspaper Publishers Association, the International Reading Association, the National Wildlife Federation, and the American Theater Association. Early in December, one such organization, Freedom House, which has been a consistent critic of attempts within UNESCO to limit press freedom worldwide, openly called on the U.S. Government "to remain an active member" of UNESCO and to "monitor the organization carefully and persistently in the future."

### The Complaints Against UNESCO

The problems identified by the State Department appear to be widely acknowledged even among the agency's supporters, although there is clear disagreement on how best to respond to them. The major areas of complaint are:

1. Politicization. By taking up issues like disarmament, human rights, and the Middle East, the United States argues, the UNESCO membership has injected divisive debate into many of the normal areas of its technical competence. Consideration of the importance of archeological digs in Jerusalem, for example, has become an extension of the bitter Arab-Israeli feud rather than an exercise in impartial scientific inquiry. And a legitimate concern over cultural bias in the international flow of news often degenerates into a press freedom debate that pits the Western democracies against authoritarian governments in Eastern Europe and the third world.

Government delegations wage these battles at the biennial UNESCO General Conference, primarily, but U.S. charges are also aimed at the professional staff, who carry out the programs in between these governmental meetings. The administrative staff of Amadou-Mahtar M'bow of Senegal, now in his second six-year term as Director-General of UNESCO, is said to be geographically imbalanced by U.N. standards, weighted in favor of Africans and East Europeans, many of whom are unsympathetic to Western values.

2. Mismanagement and budgetary excess. At a time when most U.N. agencies and the United Nations itself were exercising budgetary restraint in the face of strong pressure to do so by the United States and other major contributors, the UNESCO Secretariat asked for a significant increase in the

agency's 1984-85 budget. (The increase was cut substantially by the most recent General Conference, which then approved the budget with the United States casting the only "no" vote.) In addition, there are accusations of mismanagement and, more specifically, of favoritism and nepotism in the handling of personnel. For example, in March 1983, the UNESCO Staff Association conducted a poll of all UNESCO employees, in which 85 percent of the respondents indicated that they believed that promotions were not based on merit. The United States also charges that UNESCO has an excessively large bureaucracy and a tendency to place too many officials in its Paris headquarters and too few in the field.

#### UNESCO's Response

Director-General M'Bow wrote to Secretary of State George P. Shultz on January 18, 1984 expressing his regret over the U.S. decision and saying that he hoped that the United States would decide to remain in the organization.

In the letter, M'Bow specifically addressed some of the U.S. charges. On the question of politicization, he argued that "a distinction should...be drawn between the viewpoints expressed by UNESCO's individual Member States...and the activities of the Organization itself." This distinction, he said, is "too often neglected by UNESCO's critics." He also pointed out that since 1976, "the vast majority of the decisions taken by the General Conference...have been reached by consensus." By avoiding a vote on all but the most intractable issues, minority views have largely been accommodated, he said.

As for the conduct of the UNESCO staff, M'Bow stated that he believed that it would be impossible to "cite a single case" in which the activities of the Director-General or any UNESCO program activity were "contrary to the ideals enunciated in the Constitution...."

On budgetary and management questions, M'Bow cited a September 1979 study by the U.S. General Accounting Office (GAO) that called UNESCO's management procedures "unique and forward-looking compared to other UN agencies examined" and said that planning and budgeting processes were "conceptually sound."

UNESCO officials in the United States have emphasized this seeming inconsistency between recent statements by U.S. officials and the decision to withdraw. A month before that decision was announced, Ambassador Gerard had given a favorable review of the just-concluded 22nd General Conference by saying, "We can take pride in the work and in many of the accomplishments of this General Conference."

And Congress was assured in a State Department report issued the previous February that there was nothing in UNESCO's work that would require a cutback in U.S. contributions.

### A Year To Decide

With the formal announcement by the United States of its intention to withdraw, there remain the questions of what it will do during the one-year interval and how UNESCO and other member states will respond.

The United States has the choice of either treating the decision as irrevocable or using the now-real threat of a pullout as leverage to bring about change. The assumption held by some observers that UNESCO cannot be reformed from within might usefully be put to the test during this period. One reason for doing so is the relative success the United States achieved at the most recent General Conference. The United States placed a high priority on that meeting, entered it with clearly stated objectives, and effectively coordinated with its allies. As a result, there was no mention of Israel, and only cursory treatment of Grenada--remarkable given the timing. An unusually large number of decisions were reached by consensus. The language adopted on the controversial communications issue contained no mention of international codes that might impinge on press freedom. The United States and its allies won approval for more Western-oriented UNESCO studies, such as the contribution of a free press to cultural development, the watchdog role of the press, measures to ensure the plurality of media forms and channels, and so on. Finally, U.S. pressure had much to do with the Conference's decision to slash budget growth.<sup>2</sup>

If a consistent U.S. effort can produce similar results as UNESCO goes about its routine work in 1984, these observers argue, the Administration might well consider rescinding its withdrawal notice and maintaining a vigilant, high-priority approach to its participation in UNESCO. Indeed, they say, continued success in UNESCO in 1984 would suggest that a more active and aggressive form of multilateral diplomacy by the United States, aimed at reinforcing the basic principles of the United Nations,

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<sup>2</sup>The actual numbers are interpreted differently by different sides in the dispute: the United States says the originally proposed budget represented a 9.7 percent increase, while the approved budget can be seen as either a 5.5 or a 3.8 percent increase. UNESCO, supported by a number of its European members, says the original proposal represented a 6.1 percent increase and the final compromise a 2.5 percent increase.



could result in reduced politicization, greater efficiency and effectiveness, and more budgetary restraint throughout the U.N. system.

#### What Might Be Done In 1984

If the U.S.-UNESCO separation is not to become a divorce by the end of 1984, substantial efforts will be required: the arguments for the need for change within UNESCO are persuasive; at the same time, strong and inspired leadership by the United States is essential if multilateral institutions are to live up to their potential. Because UNESCO is in many ways a test case for the entire U.N. system, the following steps should be considered for this decisive year:

1. The outcome of the last General Conference was widely viewed as favorable. The United States should analyze its experience there to identify how it contributed to that result. This approach should then be rigorously followed and refined at UNESCO meetings throughout the year to see if a trend toward reform can be firmly established.
2. UNESCO staff should look for ways to reduce the chance of divisive political issues that sidetrack its deliberative sessions and its useful and important work in science, education, and culture.
3. Consistent with the similar efforts at budget control being made elsewhere in the U.N. community, the UNESCO Secretariat should informally give early assurance to the United States and other major contributors of its intent to exercise budgetary restraint in the planning of the 1986-87 biennium.
4. The UNESCO Secretariat should take every opportunity to redress geographical imbalance at the senior management levels within the organization with an eye to neutralizing any national, regional, or ideological bias.
5. The United States, recognizing that a temporary withdrawal would be a severe blow to UNESCO and that permanent withdrawal could be fatal to the agency, should hold open the option of rescinding its notice of withdrawal while it studies developments this year. Substantial evidence of a trend toward reform should constitute grounds for a reversal of the pullout decision.
6. A bipartisan commission of prominent private individuals who are familiar with UNESCO's work and its structure should be established. The panel should weigh any evidence of wrongdoing by or within

UNESCO in light of its Charter as well as basic U.S. values. In the process, it should evaluate the assumption that the United States can achieve through other channels the same ends it once sought in UNESCO, taking into account the views of other member states, especially Israel and other U.S. allies. It should also monitor developments within UNESCO during the current year to gauge responsiveness to U.S. concerns as well as the quality of the U.S. performance. Finally, it should report its findings to the Secretary of State before the end of the year with a recommendation either to make good on the notice of withdrawal or to rescind it.

This briefing paper was prepared by the staff of The Multilateral Project, an ongoing study of international issues and institutions carried out by the United Nations Association of the United States of America (UNA-USA). The viewpoints expressed here do not necessarily represent those of UNA-USA as a whole.

Frederic Eckhard  
Executive Director

Peter Fromuth  
Editorial Director

The United Nations Association of the United States of America (UNA-USA) is an independent, non-partisan, nationwide membership organization. Through its programs of research and education it seeks to strengthen public knowledge about the United Nations, to increase the effectiveness of international organizations, and to promote constructive US policies on matters of global concern.

U.S. Military Academy  
(U Misc)



OFFICE OF THE SUPERINTENDENT  
UNITED STATES MILITARY ACADEMY  
WEST POINT, NEW YORK 10996

March 26, 1984

Dr. George A. Keyworth, II  
Director, Office of Science and  
Technology Policy  
Old Executive Office Building  
17th Street and Pennsylvania Avenue  
Washington, D.C. 20500

Dear Dr. Keyworth:

I would like to extend to you an invitation to participate in the 1984 United States Military Academy (USMA) Senior Conference. This is an annual meeting of about fifty distinguished scholars, businessmen, and government and military officials to discuss a major national security issue. This year's topic is "Defense Technology." As you can see from the enclosed agenda (Enclosure 1), we intend to concentrate on the implications of technology for U.S. military forces and for defense management.

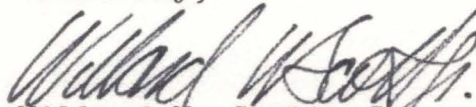
The conference will begin on Thursday evening, May 31, and end early on Saturday afternoon, June 2. It will be highlighted with three addresses by major public figures. The central feature of the conference, however, will be the off-the-record discussion sessions in which you will participate. Each session is initiated with the presentation of original papers prepared for this conference. You will receive by mail a copy of these papers in a Background Pamphlet before your arrival for the conference. The discussions which will follow the papers promise to be informative and exciting exchanges of ideas on this timely conference topic. A tentative schedule of conference events is at Enclosure 2.

We have a limited budget from which to cover conference expenses. We ask, therefore, that participants seek to defray expenses using sponsoring agency funds where feasible. If this is not possible in your case, the Military Academy will reimburse you for your travel and lodging expenses.

We are looking forward to having you join us at Senior Conference XXII. Please complete and return Enclosure 3 to the Conference Executive Secretary, Major John Lilley, Department of Social Sciences, USMA. Because of planning requirements, we would appreciate your reply by April 20. If you will be able to accept our invitation, please include a brief biographical sketch which we can make available to the other conferees. If you have any questions please feel free to contact Major Lilley or the Assistant Executive Secretary, Captain Douglas Lute, by calling 914-938-3782/4110.

With best wishes from West Point,

Sincerely,



Willard W. Scott, Jr.  
Lieutenant General, U.S. Army  
Superintendent

Enclosures

Encl 1

UNITED STATES MILITARY ACADEMY  
SENIOR CONFERENCE XXII  
31 May 1984-2 June 1984

Defense Technology

Thursday, 31 May 1984

Banquet Address:(B1) "Technology and National Defense"  
DR. WILLIAM PERRY

- Which should and which does play the leading role in national security planning: strategy, doctrine, war plans, existing forces, technology, budgets?
- How are these explained by the dynamic roles among the "military goods consumers," the "military goods producers," the "military goods managers," and "military goods constituents"?
- Historically, has the US proven to most effectively exploit evolutionary or revolutionary technology in military goods? Why? How?
- What directions are suggested for the future: technologies? doctrinal vectors?

Friday, 1 June 1984

Plenary I: Implications of Technology for Conventional Forces.

- (Pla) Paper presentation: Conventional ground forces  
GENERAL WILLIAM DEPUY, USA, Retired
- (Plb) Paper presentation: Conventional air forces  
COLONEL FRED FROSTIC, USAF
- (Plc) Paper presentation: Conventional sea forces  
DR. HARLAN ULLMAN
- (Pld) Paper presentation: Implications for Joint Conventional Strategy  
DR. SEYMOUR DEITCHMAN

- What lessons about technology-force structure-doctrine interaction are evident from recent conflicts for conventional forces (naval, air, ground)?
- What are the lessons of these conflicts for joint operations?
- What future directions for conventional forces technology, doctrine, and force structure are suggested?
- How does technology affect choice between strategies of "global presence" (forward-based forces) and "global reserve" (US-based forces)?
- How has technology affected the tension between offense and defense? Which (if either) has or will have an advantage due to technological advances?
- How does technology affect the quality vs. quantity issues?
- What effect will technology have on mobilization and reinforcement plans?
- What are the costs in dollars of technological advances? What are the opportunity costs?

Plenary II: Implications of Technology for Strategic Forces

- (P2a) Paper presentation: Technology and strategic offensive systems  
HONORABLE R. JAMES WOOLSEY
- (P2b) Paper presentation: Technology and strategic defensive systems  
DR. ALBERT CARNESALE
- (P2c) Paper presentation: Technology and strategic stability  
DR. WARNER SCHILLING

How does technology affect the development of pure deterrence vs. warfighting deterrence forces?

How does technology affect quality vs. quantity issues?

How does technology influence arms control possibilities and strategies?

What are the costs of technological developments in strategic forces?

How do technological developments in space and C3I influence strategic forces?

How does technology affect strategic stability?

Banquet Address (B2): American Techno-Culture  
PROFESSOR JOHN KEEGAN

What problems are created for defense policy by American predisposition toward high-technology solutions to problems?

How might technological imperatives lead policy and strategy astray?

Saturday, 2 June 1984

Plenary III: Managing Defense Technology

- (P3a) Paper presentation: Defense Management in the Reagan Administration
- (P3b) Paper presentation: Centralization and public sector approaches to defense technology  
DR. GREGORY CANAVAN
- (P3c) Paper Presentation: Decentralization and private sector approaches to defense technology  
DR. EUGENE FUBINI
- (P3d) Paper Presentation: Collaborative alliance approaches to defense technology  
SIR RONALD MASON

How does the management of defense technology in the US compare to that of other countries (e.g. France, Israel, Soviet Union)?

Can present problems of PPBS be resolved by moving toward greater centralization (i.e. more public sector) of management? toward greater decentralization (i.e. more private sector)?

What form of management can best control evolutionary technological developments? revolutionary developments?

How can technology, strategy, and policy best be integrated to achieve national defense objectives?

Concluding Address (B3): Defense Management in the Reagan Administration

How has the current administration sought to resolve the problems of defense management?

Has technology led policy-makers in the current administration or do policy-makers use and control technology to further strategy and policy?

Incl 2

UNITED STATES MILITARY ACADEMY  
SENIOR CONFERENCE XXII  
31 May 1984 - 2 June 1984

Defense Technology

Schedule of Events

Thursday, 31 May 1984

Registration	Prior to 6:00 p.m.
Reception	6:30 - 7:30 p.m.
Banquet	7:30 - 8:30 p.m.
Banquet Address	8:30 -10:00 p.m.

Friday, 1 June 1984

Plenary Session I -- Implications of Technology for Conventional Forces	
Paper Presentations	8:15 - 9:00 a.m.
Discussion	9:00 -11:15 a.m.
Luncheon - River Cruise	11:30 a.m. - 12:45 p.m.
Plenary Session II -- Implications of Technology for Strategic Forces	
Paper Presentations	1:00 - 1:45 p.m.
Discussion	1:45 - 4:00 p.m.
Reception	6:30 - 7:30 p.m.
Banquet	7:30 - 8:30 p.m.
Banquet Address	8:30 -10:00 p.m.

Saturday, 2 June 1984

Plenary Session III -- Managing Defense Technology	
Paper Presentations	8:15 - 9:15 a.m.
Discussion	9:15 -11:30 a.m.
Luncheon	11:45 a.m. - 12:15 p.m.
Luncheon Address	12:15 - 12:45 p.m.



## Air Force Association

1501 Lee Highway, Arlington, Virginia 22209-1198 (703) 247-5800  
An Independent Non Profit Aerospace Organization

August 29, 1984

Dr. George Keyworth  
Science Advisor to the President  
The White House  
Washington, DC 20500

Dear Jay:

As I mentioned some time ago, the Air Force Association, in concert with the Air Force Space Command, will hold a major national symposium, "The Military Imperatives in Space", on November 1-2, 1984 at the Broadmoor Hotel in Colorado Springs, Colo.

The purpose of the event is to focus national attention on the changing, growing role that space systems play in both strategic and general purpose warfare scenarios. Special emphasis will be placed on the Strategic Defense Initiative (SDI) program as well as on the requirement for ASAT.

We expect an audience of about 500, consisting mainly of civic leaders from the area as well as industry executives from across the country. Media representation, both from the US and the NATO nations, probably will be strong.

Russ Dougherty and I ask that you deal with the topic of the program, especially SDI and national space policy, from the perspective of your office in remarks about 20 minutes in length. Following your speech, Russ, the moderator of the event, will present you with written audience questions in a Q&A period of roughly equal duration.

The symposium will run from about 2:00 p.m. to 6:00 p.m. on November 1 and from 9:00 a.m. to 12:00 noon on November 2. There will be a "working" dinner on November 1 following the first session of the symposium. The key-noter of the event will be the Commander of Space Command, Gen. Bob Herres. Among the participants will be Air Force Under Secretary Pete Aldridge, AFSC Commander Gen. Larry Skantze, SDI Director Lt. Gen. Jim Abrahamson, National Security Agency Director Lt. Gen. Lincoln Faurer, and DARPA Director Dr. Bob Cooper. Still tentative are Army Vice Chief of Staff Gen. Maxwell Thurman, Under Secretary of Defense for Policy Fred Ikle and NASA Associate Administrator for Aeronautics & Space Technology Dr. John Martin.

All of us in AFA look forward to having you with us.

Cordially,

Edgar E. Ulsamer  
Assistant Executive Director/  
Policy and Communications

*William, F.  
Dr. Keyworth already  
committed, cannot do*



THE WHITE HOUSE

WASHINGTON

November 9, 1984

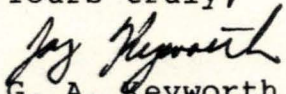
Dear George:

As the end of the year draws closer, so too does our decision about whether our withdrawal from UNESCO is final, or whether we choose instead to renew our membership. As a scientist, I would like to offer my assessment of the implications of formalizing our withdrawal from UNESCO.

Frankly, I think that it would be in the long-term interest of international science for the U.S. to leave UNESCO. The corruption, bureaucracy and politicization of UNESCO that has plagued other UNESCO programs also plagues the science programs. Only a small portion of UNESCO science programs are involved in what we consider real science. A large portion are short-term, quasi-development programs that train Third World technicians instead of scientists. I believe that the original intent of UNESCO--the free exchange of knowledge and talent as a means of accelerating industrial development and improving the quality of life in the Third World--was correct and worthwhile. That intent, sadly, has been lost.

It will take some effort, but in the long run I think we can strengthen other existing mechanisms for the conduct of international science and the propagation of the fruits of science and technology to the developing world. As part of that mechanism, I would suggest that the U.S. contributions to international science be administered through the science agencies of the U.S. government, with oversight by State, as appropriate. This would help restore and maintain the emphasis on substance that UNESCO was originally intended to engender.

The various science bureaucracies in the U.S. have a stake in continued U.S. participation in UNESCO, and thus advocate that we remain active participants. Perhaps, had the many reform efforts of the last 11 months led to results, I might have agreed. However, since significant reform does not seem to have occurred, and considering the important relationship between science and international progress, clearly it is best for the U.S. to proceed with the President's decision to withdraw from UNESCO.

Yours truly,  
  
G. A. Keyworth

Science Advisor to the President

The Honorable George Schultz  
Secretary of State  
Washington, D.C. 20520

File UNESCO



UNIVERSITY OF SOUTH CAROLINA

COLUMBIA, S. C. 29208

PRESIDENT

November 19, 1984

TO SECOND-TERM MEMBERS OF THE  
U.S. NATIONAL COMMISSION FOR UNESCO

Dear Commissioner:

The 48th Meeting of the U.S. National Commission for UNESCO will take place on Thursday, December 13, 1984, beginning at 9 A.M. in the State Department, C Street, N.W., Washington, D.C. You are cordially invited to take part.

We are sorry for the late notification of this meeting. First term Commissioners were notified of the meeting on October 15. The State Department has now made a determination, conveyed in a letter to me today, that Commissioners whose first terms expired in 1983 remain on the Commission. We are therefore notifying you of the meeting immediately in the hope that you will be able to take part.

A further explanation of the membership question, together with more information on our forthcoming meeting, is in my separate letter to all Commissioners, enclosed herewith.

I look forward to seeing you on December 13.

Sincerely,

*James B. Holderman*  
James B. Holderman  
Chairman



UNIVERSITY OF SOUTH CAROLINA

COLUMBIA, S. C. 29208

PRESIDENT

November 19, 1984

TO ALL MEMBERS OF THE U.S. NATIONAL COMMISSION FOR UNESCO

Dear Commissioner:

You have already been notified that the next meeting of the National Commission for UNESCO will be on December 13 in Washington. The meeting will begin in the State Department at 9 A.M. in the Loy Henderson Room. You should use the C Street entrance to the State Department, and staff will be there to assist with your entry to the building and registration.

A subcommittee of the Commission chaired by Nancy Risser has drawn up a provisional agenda, which is enclosed. In view of the importance of the items on this agenda, we hope that those of you representing organizations will be able to speak authoritatively on behalf of your organizations wherever possible.

For reasons which are familiar to you, the National Commission has again been able to conduct only a limited program of activities this year. Attention has been focussed to a large extent on the Administration's decision to withdraw from the Organization at the end of this year unless major reforms are made, and a great deal of attention has also been focussed on the activities within UNESCO, to see if the Organization responds to the U.S. proposals for change.

My own role as Chairman of the National Commission has been affected by my appointment as Chairman of the Monitoring Panel on UNESCO. This panel was appointed by the Secretary of State to advise on UNESCO activities during 1984. It has been essential for the panel to maintain an objective attitude and public reticence in order to fulfill its task. In these circumstances, much of the work of the National Commission has necessarily devolved upon the Vice Chairs and other members of the Executive Committee, and I should like to take this opportunity to thank all the Vice Chairs, Nancy Risser, Leonard Sussman, and David Wiley, for their extremely dedicated efforts

in difficult circumstances, and also all the other members of the Executive Committee and, indeed the members of the Commission as a whole for the activities they have undertaken to try to keep the work of the Commission going during this year. We shall look forward to a full report at the National Commission meeting on these various activities.

As regards the Commission's own future, this is clearly a matter that we shall need to discuss again at the forthcoming meeting. The Commission is authorized under Public Law 565 as amended, and that authorization will remain in effect unless amended, regardless of the decision that the Administration takes on UNESCO. It will be up to the Commission to discuss and make recommendations on whether it should continue in being, if the U.S. leaves UNESCO, and, if so, what its role should be and how it should be funded.

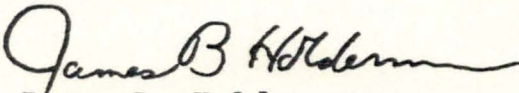
A word of explanation is necessary concerning the current membership of the Commission. You will recall that a plan for the future of the Commission was discussed at last year's meeting, and this remains on the table. One aspect of that plan was a reduction in the size of the Commission from 100 members to 40 members at some point in the future. In February, this year, the Executive Committee discussed the question of the Commission's membership in the interim period, before the newly constituted Commission comes into effect. The Committee decided that it would be sensible not to reappoint any member of the Commission whose term expires during this transitional phase. This decision was conveyed to the State Department in February with a request that the necessary actions be implemented. We have been pressing the State Department since then for a determination on this question of the current membership of the Commission. We have today received the State Department's reply, a copy of which is enclosed. As you will see, the State Department has determined that all members whose first terms have expired remain on the Commission, and they will therefore all be invited and, indeed welcomed to take part in the 48th meeting next month. Apologies are due to those members of the Commission who are receiving late notice of the meeting. We are sure you will understand that this is due to circumstances beyond our control.

As you know, the National Commission no longer formally has a staff or a headquarters office but the University staff, in conjunction with the State Department will do their best to make the arrangements for next month's meeting and will be in touch with you individually about this. Please see the separate note we have enclosed on administrative arrangements. I know we

can count on your forbearance and full understanding, and we shall certainly do our best to make this a productive and useful meeting.

I very much look forward to your participation on December 13.

Sincerely,

  
James B. Holderman  
Chairman

DEPARTMENT OF STATE  
WASHINGTON

November 24, 1984

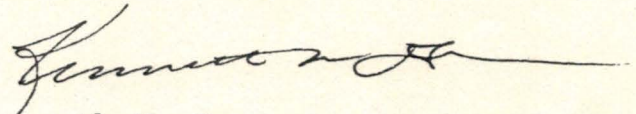
Dear Dr. Keyworth:

Thank you for taking the time to share with us your views on UNESCO. As you know, the President's withdrawal decision last December was a decision regretfully taken in response to UNESCO's chronic mismanagement, politicization, and antagonism toward Western values. Your assessment of the Organization's science activities further confirms the wisdom of the President's decision and will be taken into account in the process of interagency review, now underway.

As you know, we have been working for some time to develop alternative ways to pursue the goals the U.S. has sought to achieve through UNESCO. Following extensive consultations with both government and private sector experts, we are confident that the alternative strategy being planned will protect and further both U.S. and developing countries' interests in science, as well as in education, culture, and communications.

You may be assured that your suggestion concerning the utilization of science agencies in the implementation of the science alternatives has already been taken into account fully. Your interest and support in this matter are greatly appreciated.

Sincerely yours,

Kenneth W. Dam  
Acting Secretary

The Honorable  
Dr. G. A. Keyworth,  
Director,  
Office of Science and Technology Policy,  
The White House.

UNESCO

EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY

FROM: Consortium of Social Science Associations

DATED:

SUBJECT:  
  
Statement of the Consortium of Social Science Associations and the American Psychological Association concerning the U.S. Withdrawal from UNESCO and Alternative Interim Arrangements for U.S. Participation in Multilateral Science Activities, March 25, 1985.

RECEIVED:  
  
April 1, 1985

ACTION BY:  
  
Executive Director/alb

ACTION COPY TO:  
  
NAN

INFORMATION COPIES TO:  
  
Lynch  
  
Kornack



SUSPENSE DATE:

REMARKS: FOR APPROPRIATE ACTION  
  
Please indicate action taken below and include date of action.  
If written correspondence was sent, please attach a copy.  
  
( ) Written correspondence.  
( ) Telecon.  
( ) Action transferred to \_\_\_\_\_.  
( ) No action necessary.  
( ) Other.

Filed UNESCO

American  
Psychological  
Association  
*please see p. 4*

**Steven B. Kennedy**  
Administrative Associate  
International Affairs  
(202) 955-7685

1200 Seventeenth St., N.W.  
Washington, D.C. 20036



# CONSORTIUM OF SOCIAL SCIENCE ASSOCIATIONS

1200 SEVENTEENTH STREET, N.W., SUITE 520, WASHINGTON, D.C. 20036 • [202] 887-6166

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Statement of the CONSORTIUM OF SOCIAL SCIENCE ASSOCIATIONS  
and the AMERICAN PSYCHOLOGICAL ASSOCIATION  
Concerning the U.S. Withdrawal from UNESCO  
and Alternative Interim Arrangements  
for U.S. Participation in Multilateral Science Activities  
March 25, 1985

Hearings on Department of State Authorization Bill, FY 1986  
before the Subcommittee on International Operations,  
Committee on Foreign Affairs

The Consortium of Social Science Associations groups ten scientific and professional associations with a total membership of 185,000 social scientists in such fields as law, economics, history, political science, and psychology. In addition, the Consortium has 27 organizational affiliates with many more thousands of members.

The American Psychological Association is the nation's leading association of professional and academic psychologists. Its membership totals over 68,000. APA is a member of COSSA and of the U.S. National Commission for UNESCO.

COSSA and its members are concerned with the future of U.S. involvement in international scientific cooperation. It is in the context of this broad concern that we view the questions of the U.S. withdrawal from UNESCO and the administration's plans for establishing alternatives to U.S. participation in UNESCO.

1. Living up to repeated promises of support for international science.

In late 1984, in preparation for the imminent U.S. withdrawal from UNESCO, the State Department elaborated a program of alternative activities in education, science, culture, and communications. The program was based on recommendations from the National Research Council (1). It totalled \$47 million, and included \$14 million for science activities. The details of this program have not been made public, although the Assistant Secretary of State for International Organization Affairs, Mr. Gregory Newell, stated before this subcommittee on December 6, 1984, that 85% of the resources would go "into other agencies such as UNDP, AID, USIA" (2, p. 121) as "funds in trust" (ibid, p. 126). The goal of these funds was "to forward development in the Third World" (ibid, p. 121). The Department of State would act as a "check writer" and no new personnel would be added to coordinate the activities supported with this \$47 million.

The OMB rejected State's proposed program in January. Soon after, Department of State personnel, in consultation with staff at the NRC, arrived at a revised budget figure of \$2.75 million that would be used in FY 86 "to continue support for U.S. participation in and to meet U.S. commitments to international conventions and scientific organizations engaged in work considered essential and important to U.S. interests" (3, p. 32). The activities supported by the \$2.75 million, which forms part of the

International Organizations and Programs account of the Foreign Aid Bill, are indeed important (3, pp. 32-34). However, the administration has yet to respond to a number of pressing questions, among which are the following.

(a) How will the U.S. commitments referred to be met for the year 1985, given that the United States has ceased to contribute to UNESCO effective December 31, 1984?

(b) How was the \$2.75 million figure arrived at? Mr. Newell has stated that 85% of State's \$47 million proposal was intended for Third World development. Even if this 85% must all now be considered nonessential to U.S. interests (as defined by some unspecified criterion), by what criteria was the remaining \$7 million pared down to \$2.75?

(c) Will the Department allow the recent negative decision of OMB to neutralize its commitment, so often stated in the months prior to the announcement of the U.S. withdrawal on December 19, and indeed in Secretary Shultz's letter of that date to Director General M'Bow, to "continue to make a significant and concrete contribution to international cooperation in education, science, culture, and communications?" Put more optimistically, how will that commitment be pursued in the wake of the OMB action?

## 2. Planning for future U.S. participation in international scientific cooperation

The Department of State apparently plans to circulate a letter among other federal agencies in an attempt to locate funds for "UNESCO-like" activities. Reportedly, State intends seek out and to identify loci of "excess" funds and expertise within various agencies (NSF, AID ...) which the Department could then coordinate and guide in accordance with some as yet unstated view of priorities in international scientific cooperation. Again, questions arise.

(a) How realistic is it to expect that in the present budget climate the agencies will volunteer funds? At what level of funding? \$47 million?

(b) If funds and in-kind contributions are indeed collected, who will coordinate and oversee their administration? Can the State Department now go beyond the role of "check writer" for which it is already set up and fill in for the UNESCO bureaucracy? Instead, should not the responsibility for international science (or education, culture, etc.) be clearly identified as a normal part of the operation of the relevant federal departments and agencies, or else effectively concentrated within some entity created for this purpose? Most would agree that State is not set up for this purpose, that if anything it has moved further away from this role in recent years (e.g., in abolishing the secretariat for the U.S. National Commission for UNESCO in 1981).

(c) What set of priorities will be used to determine how any collected funds are to be used? Has the administration been able to rank science activities in priority order? Has it been able to determine whether a given science program benefits the United States in equal or greater proportion to its costs? If so, have the policies underlying such calculations been spelled out clearly so that they can be debated?

(d) This project is reportedly being carried out in the office of the Deputy Assistant Secretary for Private Sector Initiatives. Will the views and contributions of the private sector (e.g., the U.S. National Commission for UNESCO) be sought?

(e) In a report commissioned by the Department last year (1), the National Research Council suggested that "the time may have come to begin discussions of new models for facilitating international cooperation both for the advancement of scientific knowledge and for strengthening infrastructure in developing countries" (p. 19). The report also cited an unfortunate lack of overall coordination of U.S. involvement in multilateral science cooperation and suggested the development of "a complementary working relationship between a governmental entity, such as the NSF, and a nongovernmental one, such as the National Research Council" (p. 19). We urge that a decision be made to fund a more in-depth study of the U.S. role in multilateral scientific cooperation, as the NRC has recommended (p. 17).

### 3. The fate of the U.S. National Commission for UNESCO

The U.S. National Commission for UNESCO was not asked to participate as a body in the 1984 Monitoring Panel on UNESCO (although some members of the Commission, including Chairman James Holderman, served on it). Similarly, the USNC was not assigned the role of monitoring the UNESCO reform process. This task has been turned over to a newly appointed Reform Observation Panel that includes one eminent scientist (Dr. Fred Seitz), several members of the 1984 panel, and several new members (including Ursula Meese). The Commission appears to have been bypassed, even though it was founded by Congress in 1946 precisely to advise the U.S. government on matters relating to UNESCO. It is composed of 100 members representing organizations predominantly in the private sector. In 1982, the Commission produced a "Critical Assessment of U.S. Participation in UNESCO" (4) that was unanimous in recommending "that the United States not only continue to remain a member of UNESCO, but that the effectiveness of U.S. participation in the work of the Organization be increased" (1). In December 1983, the Commission again expressed this view, voting 41-8 in favor of the United States remaining a member of UNESCO.

It appears that these positions have made the administration reluctant to call upon the Commission to fulfill its statutory function with regard to monitoring reform within UNESCO. We do not believe that this failure can be justified, particularly in view of the fact that in recent years the Commission's critical analyses of UNESCO's shortcomings, and of the shortcomings of the Commission itself, have been honest and forthright. On every occasion the Commission has shown itself to be willing to cooperate with the Department of State. It is difficult to guess at what role the administration might see for the Commission in the years 1985, 1986, and beyond.

### 4. The administration's overall goals in multilateral affairs

Mr. Newell has frequently expressed a set of five goals that guide the administration's relations with all multilateral organizations (5). The first of these goals is to "reassert American leadership in multilateral affairs." We believe that it will be difficult to pursue this goal successfully without

a sufficiently strong concomitant commitment to the agonizingly slow process of international cooperation. Progress in reorienting a U.N. agency in which so many of the world's nations enjoy their ability to play the sort of active role they see as being closed to them elsewhere, and in which the multinational bureaucracy has become so entrenched, is bound to be difficult.

### Summary

We currently detect an unfortunate trend toward a protectionist and neoisolationist attitude toward international scientific exchange. An overly narrow pursuit of "science in the national interest," or worse, "science for national security," is capable of doing great violence to science and its longstanding tradition of internationalism by positing cooperation in science as a threat to U.S. competitiveness. This is a false opposition. Participation in multilateral organizations creates access for U.S. scientists. Limiting that participation limits our access, isolating our scientists. As the record of protectionism has shown, isolation is hardly conducive to long-term competitiveness.

We endorse the recommendation of the National Research Council that the prorated portion of the U.S. contribution to UNESCO previously devoted to biological, behavioral, and social science continue to be made available through the National Science Foundation and the NRC to support international cooperative research and training (1).

While it appears true, as the NRC points out, that "U.S. social scientists have had limited involvement in UNESCO projects" (1, p. 22) and that "the NSF has not been especially active in the area of multilateral scientific cooperation" (1, p. 18, emphasis ours), we believe that our country's withdrawal presents us with an excellent opportunity to strengthen our national performance on both counts. Upon reentry into UNESCO, such increased involvement by U.S. social scientists might well help temper some of the excesses of politicization to which UNESCO has been subject.

For these reasons, we believe with the NRC that "it is extremely important to ensure continuity of funding" (1, p. 17). We urge the relevant committees of Congress, in cooperation with the Director of the National Science Foundation, the President of the National Academy of Sciences, and the Director of the Office of Science and Technology Policy to achieve this goal.

We trust that the Department of State will continue to make known to the Congress its commitment to international cooperation in education, science, culture, and communications.

#### CONSORTIUM OF SOCIAL SCIENCE ASSOCIATIONS

By: David Jenness, Ph.D., Executive Director

#### AMERICAN PSYCHOLOGICAL ASSOCIATION

By: Michael S. Pallak, Ph.D., Executive Officer,  
John J. Conger, Ph.D., APA Representative to the U.S. National Commission  
for UNESCO, and  
Wayne H. Holtzman, Ph.D., Chairman (1984), APA Committee  
on International Relations in Psychology and  
President, International Union of Psychological Science

CITATIONS

1. UNESCO Science Programs: Impacts of U.S. Withdrawal and Suggestions for Alternative Interim Arrangements. A Preliminary Assessment, Office of International Affairs, National Research Council (Washington: National Academy Press, 1984).

2. United States, House of Representatives, Hearings Before the Subcommittees on Human Rights and International Organizations and on International Operations of the Committee on Foreign Affairs, 98th Cong., 2nd Sess., July 26, September 13, December 6, 1984 (Washington: Government Printing Office, 1985). Statement of Honorable Gregory J. Newell, December 6, 1984.

3. United States International Development Cooperation Agency (AID), International Organizations and Programs: Congressional Presentation, Fiscal Year 1986, pp. 32-34 (attached).

4. A Critical Assessment of U.S. Participation in UNESCO. Special Meeting of the U.S. National Commission for UNESCO (June 1-3, 1982), Department of State Publication no. 9297, International Organizations and Conference Series 158, Bureau of International Organization Affairs, October 1982.

5. Letter from Gregory J. Newell, Assistant Secretary of State for International Organization Affairs, to Charles H. Percy, Chairman, Committee on Foreign Relations, U.S. Senate, dated February 29, 1984 (transmitting U.S./UNESCO policy review).


EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY

FROM: Ms. Maryann Urban  
The White House - Presidential Personnel

DATED: August 12, 1985

SUBJECT:

Ms. Urban is leaving the White House and wanted to express her enjoyment in working with Dr. Keyworth and the OSTP staff.



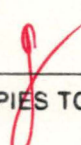
RECEIVED:

August 14, 1985

ACTION BY:

Executive Director/ljsj

ACTION COPY TO:

NAN 

INFORMATION COPIES TO:

Lynch

SUSPENSE DATE:

REMARKS: FOR APPROPRIATE ACTION

Please indicate action taken below and include date of action.  
If written correspondence was sent, please attach a copy.

- ( ) Written correspondence.
- ( ) Telecon.
- ( ) Action transferred to \_\_\_\_\_.
- ( ) No action necessary.
- ( ) Other

"U" Folder

THE WHITE HOUSE

WASHINGTON

August 12, 1985

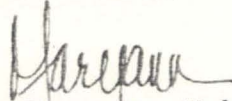
Dear Mr. Keyworth:

I wanted to let you know that, for personal and family reasons, I am leaving Presidential Personnel and the White House. I have truly enjoyed the opportunity to work with you and the others at the Office of Science and Technology Policy.

It has been a great privilege to have been able to serve President Reagan for the last five years, both here in the White House and during the 1980 campaign; and, in addition, for several years during his term as Governor of California. Fortunately, I will be remaining as a member of the Administration in Philadelphia, where I will be the Regional Director, ACTION.

I sincerely hope that if there is anything I can do to be of assistance to you in the future, please do not hesitate to call on me in Philadelphia. I do hope we can keep in touch. Best regards to you.

Sincerely,



(Ms.) Maryann Urban  
Associate Director  
Presidential Personnel

Honorable George A. Keyworth, II  
Director  
Office of Science and Technology Policy  
New Executive Office Building  
Washington, D.C. 20500

EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY

FROM: Frederick L. Scarf, TRW Space & Technology  
DATED: March 28, 1986

SUBJECT: Encl. tapes of Uranus, Jupiter, & Saturn; info memos about tapes also encl.

RECEIVED: April 1, 1986  
ACTION BY: Executive Director/mg

ACTION COPY TO: NAN

INFORMATION COPIES TO: McTague *Johnson 4-7-86*

SUSPENSE DATE:

REMARKS: FOR APPROPRIATE ACTION  
Please indicate action taken below and include date of action.  
If written correspondence was sent, please attach a copy.  
  
( ) Written correspondence.  
( ) Telecon.  
(X) Action transferred to *Dick Johnson 4/4/86 per MAR.*  
( ) No action necessary.  
( ) Other

FILE: "URANUS"





TRW Space & Technology  
Group

One Space Park  
Redondo Beach, CA 90278  
213.535.4321

March 28, 1986

Dr. John McTeague  
Office of Science and Technology Policy  
Old Executive Office Building  
17th and Pennsylvania Avenue  
Washington, D.C. 20500

Dear John:

It was a great pleasure to meet you and to be able to participate in the White House luncheon this week. I was sorry that on Wednesday I did not have with me a second copy of my Uranus tape, but a copy for you is enclosed. In order to help with your next public talks on Jupiter and Saturn, I also enclose audio tapes with plasma wave sounds from these earlier Voyager encounters. The memos give some information about these tapes.

Best regards,

Frederick L. Scarf  
Chief Scientist  
Space Research and Technology

FLS:sr  
Enclosure

23498-6035-RU-00

PICTURES AND TRAJECTORY  
INFORMATION FOR VOYAGER 1,2 TAPE V.003

by

Frederick L. Scarf

Space Sciences Department  
TRW Defense & Space Systems Group  
One Space Park  
Redondo Beach, California 90278

and

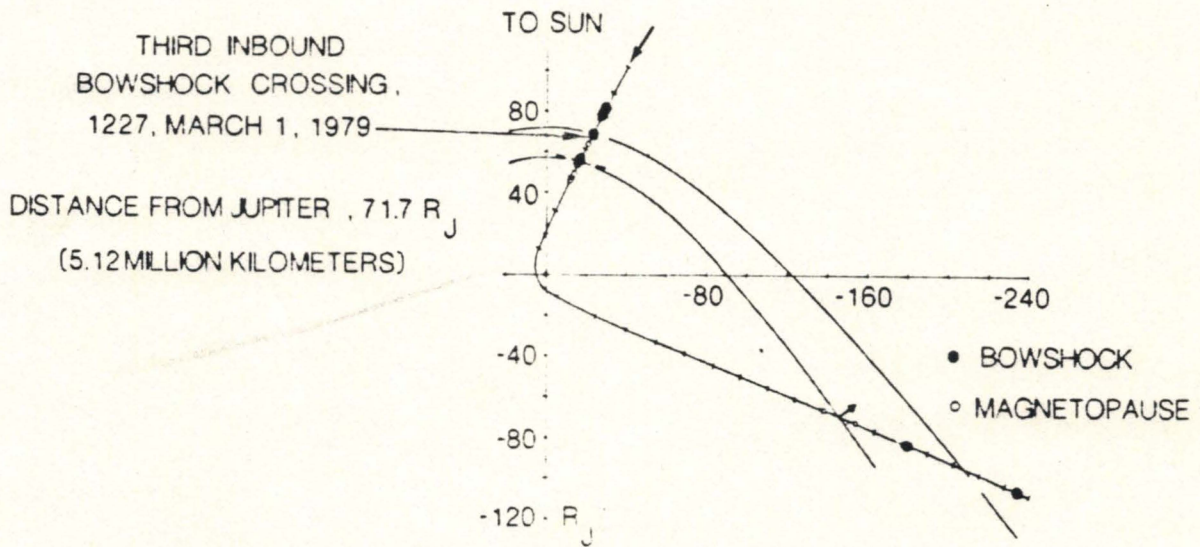
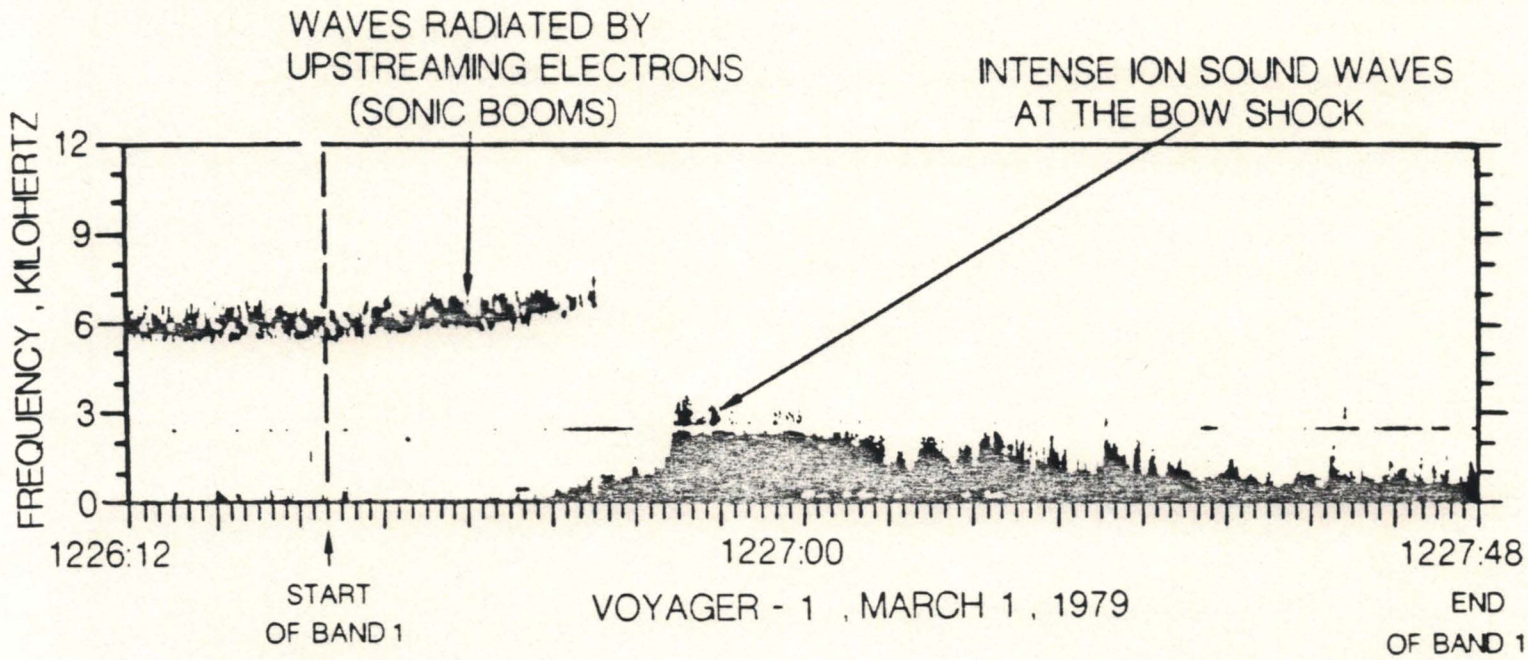
Donald A. Gurnett and William S. Kurth  
Department of Physics & Astronomy  
University of Iowa  
Iowa City, Iowa 52242

October 1979

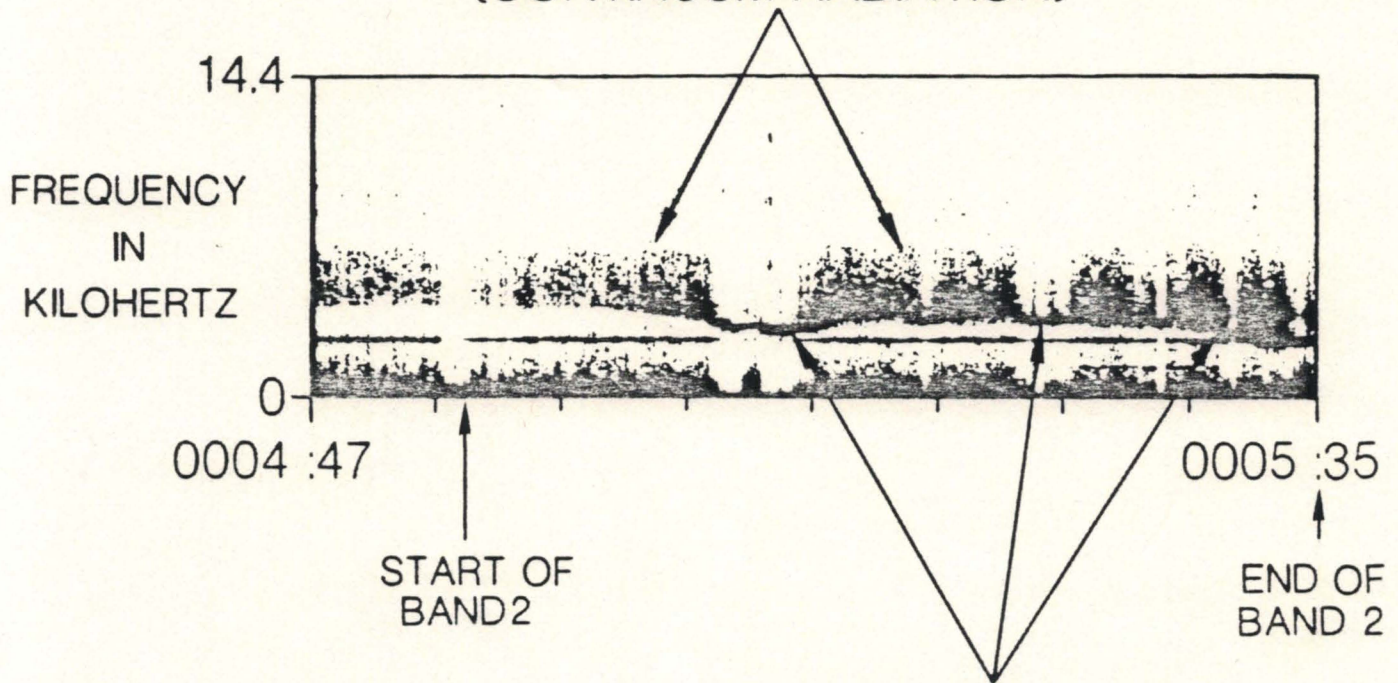
Space Sciences Department  
TRW Defense & Space Systems Group  
One Space Park  
Redondo Beach, California 90278

## CONTENTS

- BAND 1. Voyager 1 Bow Shock.
- BAND 2. Voyager 2 Trapped Radio Waves and Upper Hybrid Resonance Sounds.  
(It is believed that the upper hybrid resonance signals generate the trapped radio waves).
- BAND 3. Voyager 1 Lightning Whistlers and Hiss. (The lightning whistlers are difficult to hear in the presence of the hiss, and this band has a pair of whistlers repeated three times. The hiss signals are important. These waves are spontaneously-generated, and they cause precipitation of energetic electrons into Jupiter's atmosphere.
- BAND 4. Voyager 1 Chorus (played at one-quarter speed). These "chorus" emissions, which sound like birds chirping, are also locally-generated. They cause precipitation of low energy electrons into the atmosphere. The hiss and the chorus together are largely responsible for the very intense aurora detected at Jupiter.



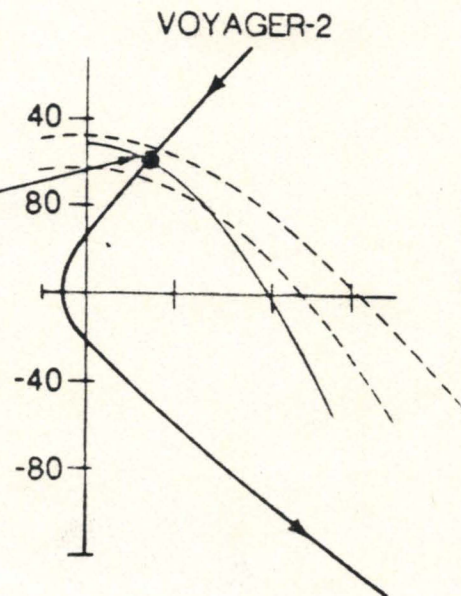
RADIO WAVES TRAPPED  
JUST WITHIN THE MAGNETOPAUSE  
(CONTINUUM RADIATION)

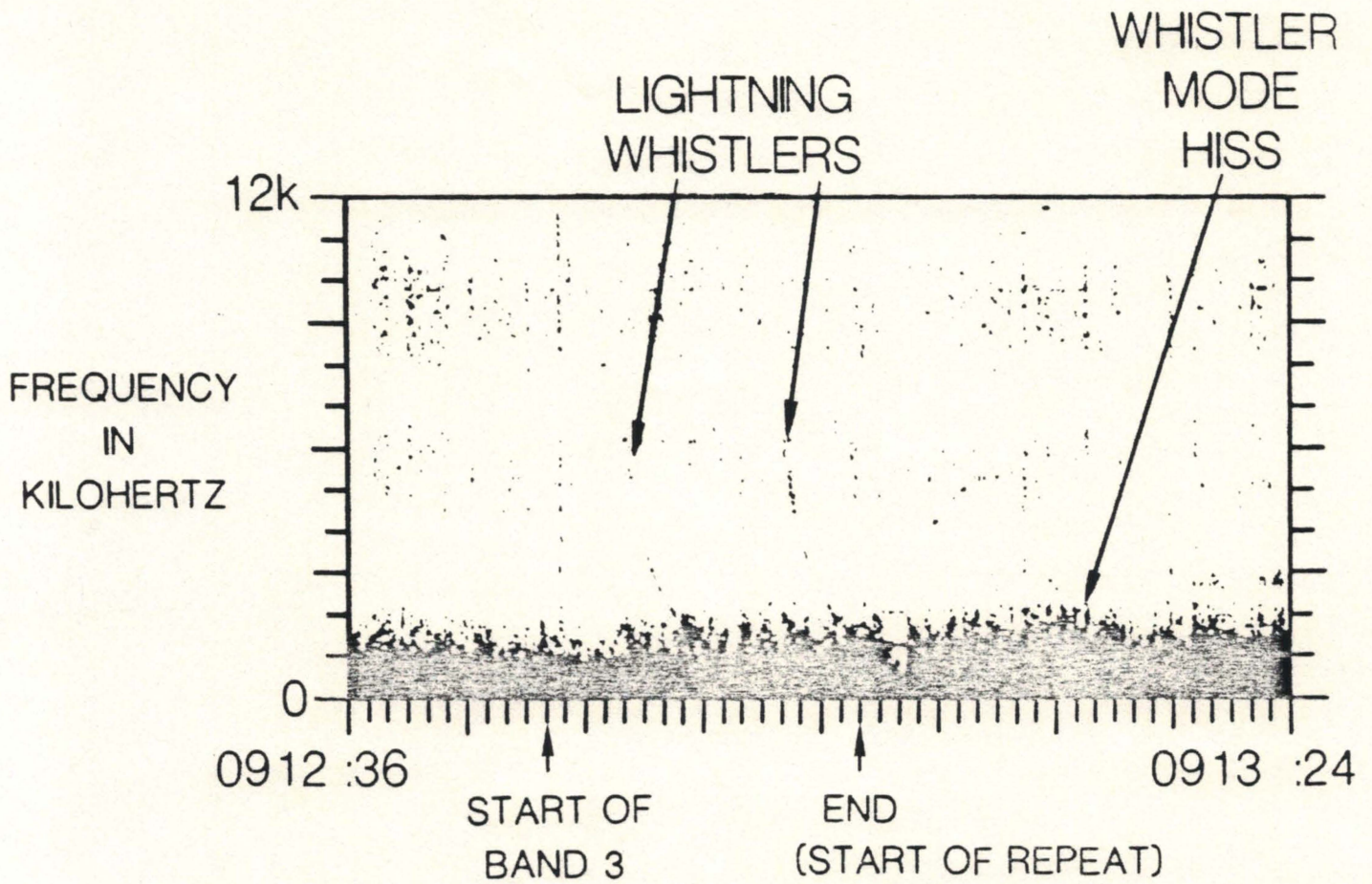


UPPER HYBRID RESONANCE SIGNALS  
(SOURCE OF CONTINUUM RADIATION)

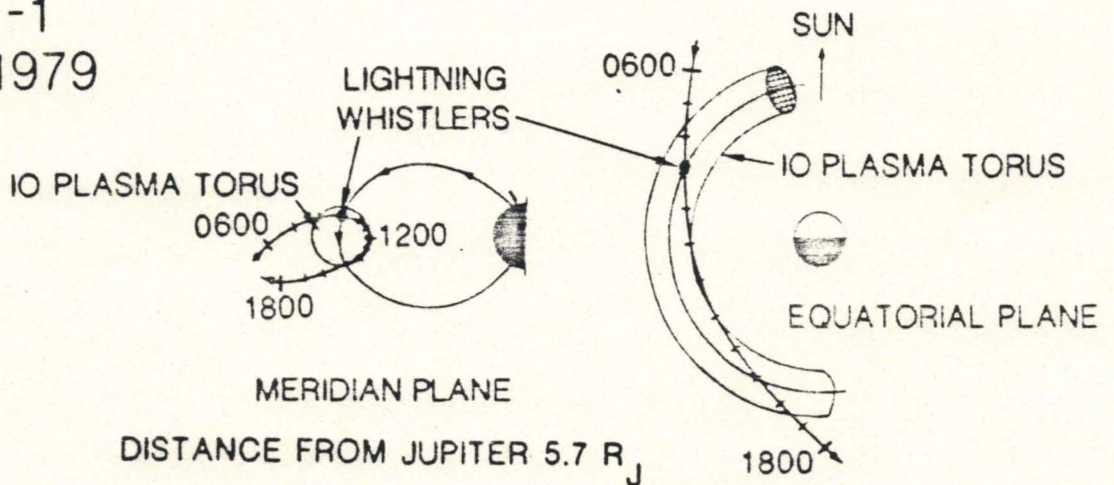
VOYAGER - 2  
JULY 5, 1979

FIRST INBOUND  
MAGNETOPAUSE CROSSING,  
0004, JULY 5, 1979  
DISTANCE FROM JUPITER  
71.0 R<sub>J</sub>

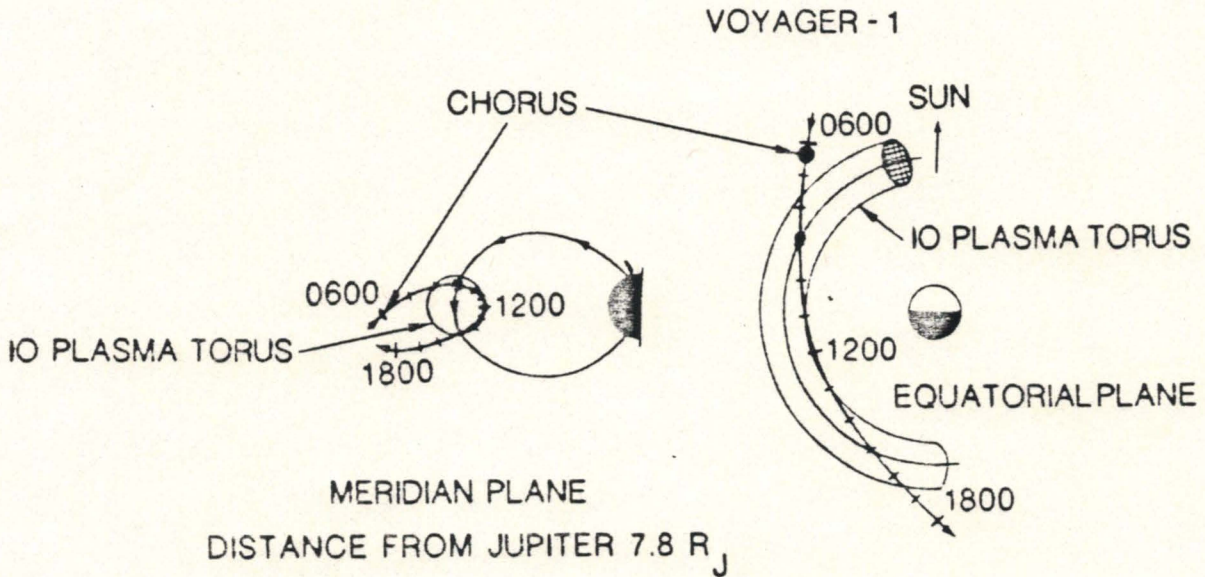
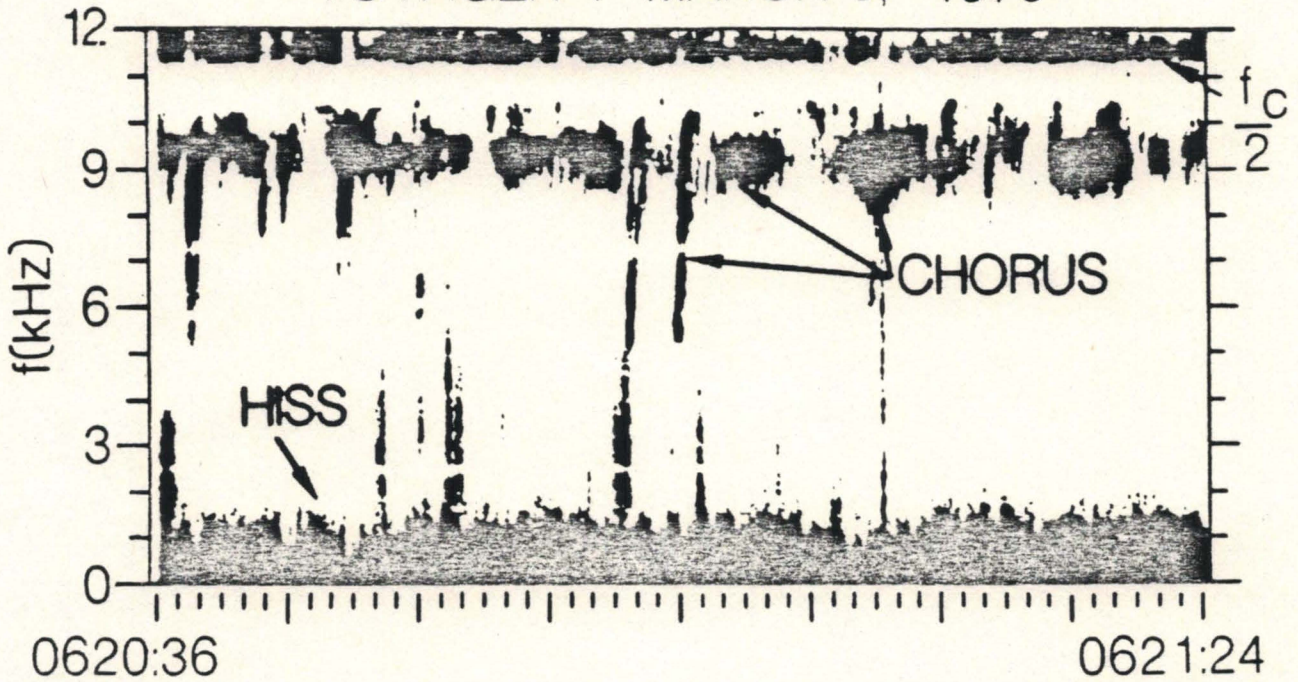




VOYAGER -1  
MARCH 5, 1979



VOYAGER-1 MARCH 5, 1979



A Description of the Signals  
on Voyager Plasma Wave Tape S-1,  
"Voyager 1 at Saturn"

by

F. L. Scarf<sup>1</sup>, D. A. Gurnett<sup>2</sup>, and W. S. Kurth<sup>2</sup>

<sup>1</sup>Space Sciences Department  
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January 26, 1981

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## Tape S-1: Voyager 1 at Saturn

The Voyager 1 remote sensing instruments, such as the television camera, the radio astronomy receiver, and the ultra-violet spectrometer, acquired important new information on the Saturn system for a period of many weeks and even months before and after closest approach (2340, November 12, 1980). However, the primary planetary measurements for those Voyager instruments especially concerned with local field and charged particle phenomena (the magnetometer, the plasma probe, the plasma wave system, the energetic charged particle and cosmic ray systems) were obtained in the relatively short interval between the inbound crossing of the bow shock (at 2327 on November 11) and the last part of the outbound shock crossing (at 0615 on November 16). During these 4.3 days in which Voyager 1 traversed the magnetosphere and magnetosheath of Saturn, the instruments made continuous measurements of the planetary magnetic field, the distribution of plasma, the trapped radiation belts, and the plasma wave spectrum using the low-rate general science telemetry link that runs in parallel with the high-rate transmissions devoted to imaging. In addition, there were 34 distinct intervals during this 4.3-day encounter period when the plasma wave investigators were allowed to use the high-rate telemetry to measure briefly the complete broadband wave spectrum. Each one of these 48-second long frames with high-rate wave measurements allows us to listen to sounds in Saturn's magnetosphere using the 10-meter wave antennas as if they were electric microphones. Basically, in this mode, the plasma wave instrument operates just as if we had carried a portable tape recorder to Saturn and connected a long car radio antenna directly into the microphone input.

The total amount of audio data from Saturn is extremely limited in comparison with that available from earth or Jupiter, but these Voyager 1 broadband measurements are scientifically important, and they are also highly unusual. Some types of waves (chorus, electron plasma oscillations, ion acoustic waves) were detected as anticipated, but several of these have novel sounds or were found in unexpected locations. We also detected Saturn sounds that have no clear counterparts at earth

or Jupiter. These include Saturn static, multiple narrowband tones, and strong impulsive noise bursts.

Audio Tape S-1 contains six brief segments taken from five of the 34 magnetospheric frames discussed above, and a seventh audio segment taken from one post-encounter frame recorded on November 18, 1980. Figure 1 contains a drawing of the Voyager 1 flyby trajectory, and the large dots show the spacecraft positions for these seven audio segments. Segments 2, 4, 6, 7 are played as recorded at Saturn; segments 3, 5 are played at half the original speed; and segment 1 is played at one-eighth speed. An overview of the plasma wave observations at Saturn is contained in the Science report, "Plasma Waves Near Saturn: Initial Results from Voyager 1," by D. A. Gurnett, W. S. Kurth, and F. L. Scarf. Some brief comments on these seven specific audio segments are tabulated below:

Segment 1: Electron Plasma Oscillations (34 seconds, 1/8 speed).

These structured chirps were detected at 1002 on November 12, 1980, when Voyager was inbound within the magnetosphere at a distance of  $15.6 R_S = 936,000$  km. Emissions such as these are generally associated with passage of a beam of electrons, and similar waves are frequently detected upstream from the planetary bow shock (see notes on segment 7, below). We did not expect to detect this kind of electron plasma oscillation within Saturn's magnetosphere.

Segment 2: Saturn Static (13 seconds, original tape speed).

This sound segment with highly impulsive noise bursts was recorded at 1257 on November 12, when Voyager was inbound at  $12.5 R_S$ . We detected very similar static on other November 12 broadband frames recorded at 0143 ( $R = 24 R_S$ ) and 1830 ( $R = 6.9 R_S$ ), and on November 13 frames recorded at 0108 ( $R = 3.6 R_S$ ) and 0326 ( $R = 5.4 R_S$ ; see segments 4, 5, below). Intense impulsive sounds of this nature have not been found on audio recordings from the magnetospheres of earth or Jupiter.

Segment 3: Saturn Emission Tones (16 seconds, 1/2 speed).

These puzzling waves were detected at 2252 on November 12 when Voyager was inbound at  $3.26 R_S$  and  $40^\circ$  south latitude (48 minutes before closest approach). Although it may sound as if there is a single tone

here, spectral analysis shows that there are more than two dozen distinct audio tones in the frequency range 50 Hz to 14.4 kHz. The strongest of these signals have center frequencies near 1 kHz, 6.3 kHz, 8.7 kHz, and 9.6 kHz. Gurnett, Kurth, and Scarf (1981) pointed out that some of the lines have characteristic frequency spacings suggestive of source mechanisms involving Saturn's magnetic field at the orbits of Rhea, Dione, and Tethys. Weak narrowband tones within the 4-6 kHz frequency range were sporadically detected in other parts of the magnetosphere.

Segment 4: Saturn Chorus (16 seconds, original tape speed).

These electromagnetic chorus emissions and the accompanying "static" were detected at 0326 on November 13 during the outbound pass. Here, Voyager was at  $R = 5.4 R_S$ ,  $\theta = -4.6^\circ$ , and soon afterward the spacecraft crossed the ring plane, the magnetic equator, and the orbit of Dione. This chorus wave emission interacts strongly with electrons having energies in the range 1-5 kilovolts and causes them to precipitate into the atmosphere.

Segment 5: Saturn Chorus and Impulses (24 seconds, 1/2 speed).

This contains another part of the frame from 0326, November 13, played at half speed. These strong impulses have not been identified. We are considering (a) lightning from the atmosphere, (b) discharges from the spacecraft, dust, and/or ring material, (c) impacts on the spacecraft, (d) Doppler-shifted ion acoustic waves. Other sources are possible.

Segment 6: The Outbound Bow Shock (13 seconds, original tape speed).

Voyager crossed a thick pulsation-type bow shock between 0550 and 0615 on November 16, 1980, at a distance of  $78 R_S = 4.68$  million kilometers. A wideband frame was recorded between 0553:23 and 0554:11, and the ultra low-frequency ion acoustic waves in this segment were detected between 0553:34 and 0553:47.

Segment 7: Upstream Plasma Oscillations (14 seconds, original tape speed).

These chirps represent electron plasma oscillations generated by electrons heated at the bow shock. At this time (0123, November 18), Voyager was at a distance of  $118 R_S$ .

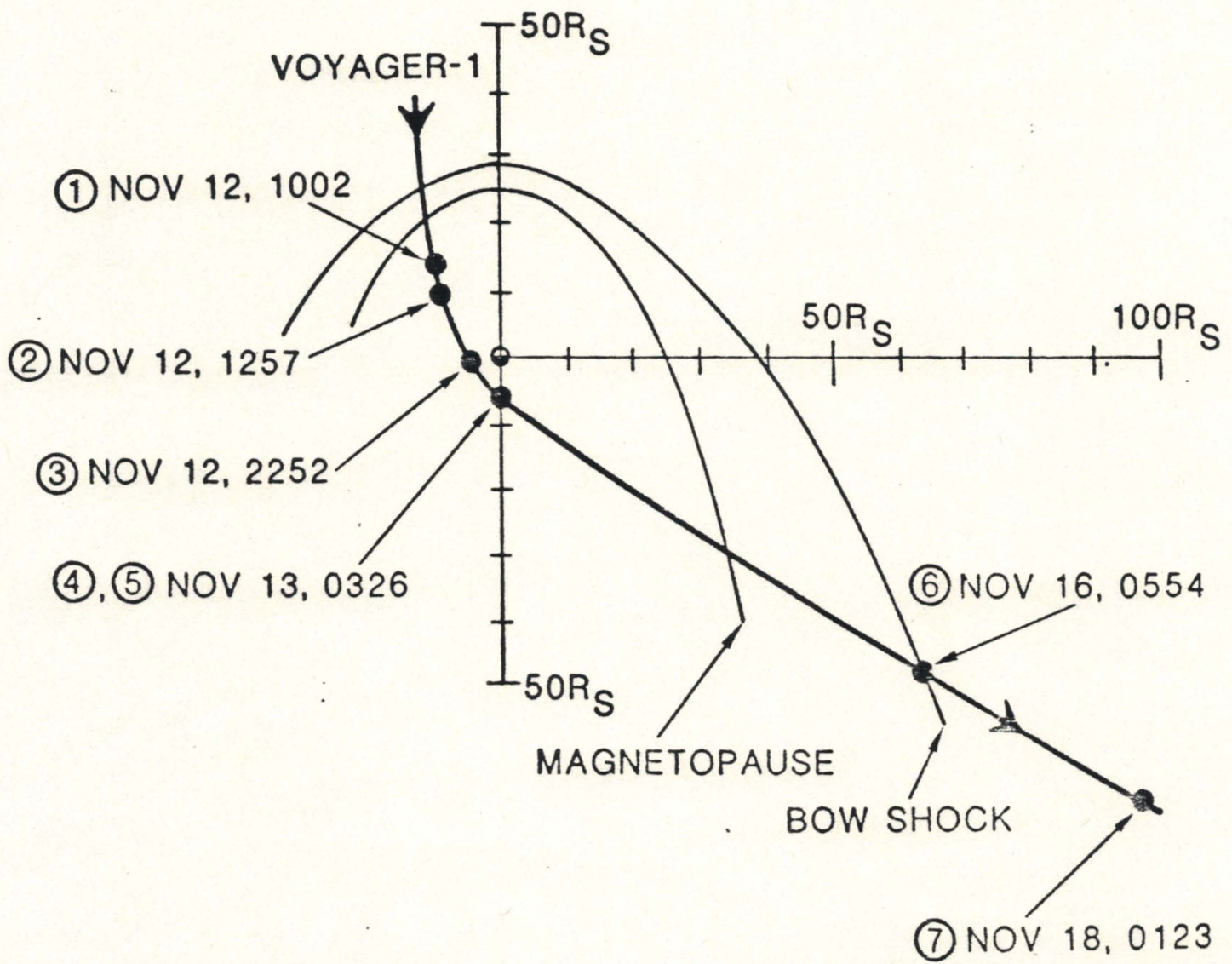


Figure 1.

EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY

FROM: Eagle Council  
Jill Ullerich

DATED: September 28, 1985

SUBJECT:

Thanking Dr. Keyworth for the work he has done and is doing towards SDI.

RECEIVED: October 3, 1985

ACTION BY: Executive Director /dlw

ACTION COPY TO:

NAN

INFORMATION COPIES TO:

Lynch

SUSPENSE DATE:

REMARKS: FOR APPROPRIATE ACTION

Please indicate action taken below and include date of action.  
If written correspondence was sent, please attach a copy.

( ) Written correspondence.  
( ) Telecon.  
( ) Action transferred to \_\_\_\_\_.  
( ) No action necessary.  
( ) Other.

File "U" Folder

126 W Dixon Ave.  
Wayton, Ohio 45419  
September 28, 1985

Dear Mr Keyworth,

You did a good job explain-  
ing SDI. Thank you for the  
work you are doing. We of Eagle  
Council appreciate you!

Sincerely,  
(Mrs) Jill Ulrich

*Thank You*



MAIL ROOM

85 OCT 3 A 9: 53

RECEIVED

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EXECUTIVE OFFICE OF THE PRESIDENT  
OFFICE OF SCIENCE AND TECHNOLOGY POLICY

FROM: Edgar Ulsamer Air Force Association	DATED: July 3, 1985
SUBJECT: FYI: Enclosure, Air Force Magazine story titled, "C3I Keeps Climbing" (pgs. 102-109), that resulted from Dr. Keyworth's participation in the Electronics Symposium in Boston.	
RECEIVED: July 5, 1985	ACTION BY: Executive Director/l sj
ACTION COPY TO: NAN	
INFORMATION COPIES TO: Lynch Abell Roesch	
SUSPENSE DATE:	
REMARKS: FOR APPROPRIATE ACTION  Please indicate action taken below and include date of action. If written correspondence was sent, please attach a copy.  ( ) Written correspondence. ( ) Telecon. ( ) Action transferred to _____. ( ) No action necessary. ( ) Other	

*Filed U\* Felder*





**AFA**  
Air Force Association

1501 Lee Highway, Arlington, Virginia 22209-1198  
An Independent Non Profit Aerospace Organization  
Phone: (703) 247-5817

**MEMO**

From: EDGAR ULSAMER  
Assistant Executive Director/  
Policy and Communications

July 3, 1985

Dear Jay:

Thought you might want to see the AIR FORCE Magazine story titled, "C3I Keeps Climbing" (pgs. 102-109), that resulted from your participation in our Electronics Symposium in Boston.

Thanks again for joining us.

Respectfully,

**Electronic capabilities are increasing rapidly—but so are requirements and cost, and that's a real problem.**

# C<sup>3</sup>I Keeps Climbing

BY EDGAR ULSAMER  
SENIOR EDITOR (POLICY & TECHNOLOGY)

**C**OMMAND control communications and intelligence (C<sup>3</sup>I), a vast and diverse array of electronic systems, subsystems, and components without which the signals of war would retrograde to bugles and semaphores, is in its heyday. Over the past five years, defense spending on C<sup>3</sup> has shot up by 150 percent in *real*, inflation-adjusted dollars, according to Assistant Secretary of Defense for C<sup>3</sup>I Donald C. Latham. The publicly disclosed portion of the C<sup>3</sup>I funding request tallies \$22.1 billion in FY '86, compared with \$9.9 billion in FY '81, Secretary Latham told the AFA national military electronics symposium held on April 25-26 in the Greater Boston area.

The "dark" portion of the investments in C<sup>3</sup>I, mainly in the intelligence area, has undergone similar rates of growth, with spending on tactical intelligence systems, for instance, scoring a nineteen percent gain over last year's level, he said. AFSC Commander Gen. Lawrence A. Skantze told the AFA meeting that the Air Force's share of the Pentagon's FY '86 C<sup>3</sup> spending is pegged at about \$10 billion—or forty-six percent of the total Department of Defense request—up from slightly less than \$9 billion in FY '85.

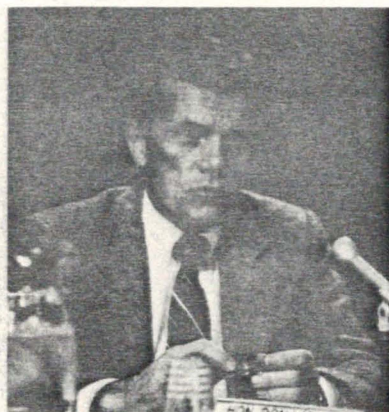
The "stars" of the current cast of C<sup>3</sup>I products are what Secretary Latham termed the "incredible sensors" that are now coming out of the pipeline. Key here are the advanced synthetic aperture radar (SAR) of the TR-1 (a derivative of the high-flying U-2) and the SAR I version of the SR-71—eventually to be followed by a growth version, the SAR II—that "allows you to take pictures of the battlefield at night and in any weather from a hundred miles away and to present [such pictorial informa-

tion] to [our] commanders." The upshot is that "we can fight continuous combat [by dint] of seeing in the dark with C<sup>3</sup>I."

Another hallmark of the Defense Department's C<sup>3</sup>I program is the emphasis on integrating C<sup>3</sup>I with the weapon systems themselves. Great strides are being taken in this area in the tactical area, but some "disconnects remain on the strategic side," according to the Pentagon's top C<sup>3</sup>I executive.

## Soviet Progress in C<sup>3</sup>I

While the US C<sup>3</sup>I business clearly is on a roll, Secretary Latham pointed out that Soviet progress in C<sup>3</sup>I systems is more comprehensive and hence alarming. The Soviets, he suggested, deliberately propagate the canard that, in the context of C<sup>3</sup>I, they are technological inferior in such areas as the strategic, tactical, and SDI (this country's strategic defense initiative, or "Star



Donald C. Latham is Assistant Secretary of Defense for Command Control Communications and Intelligence (C<sup>3</sup>I).

Wars") missions. "They are not," he stressed. "They may have less capacity in their computers and, maybe, less speed, but they are very good in applying technology to their systems—much sooner and better than we are in both lethal and nonlethal systems."

By way of an example, he pointed out that they "are ahead in the application of digital technology. [Also], they are ahead in applying IR [infrared sensor] systems to their fighters." At least three of the last Soviet fighters are equipped with IR systems, compared to "zero" on the US side, even though "the F-106 had an IR search track years ago."

In the area of air-to-air missiles, the Soviets are clearly in the lead, he added, saying: "We are trying to field AMRAAM [the advanced medium-range air-to-air missile] at an incredible cost while they already have a missile on [some of their] aircraft that is even better than AMRAAM."

Another area where the Soviets best US capabilities by a wide margin is in the largely classified "design for war" field, according to Secretary Latham. Stressing that he could only touch on this security-sensitive area in general terms, he disclosed that the Soviets build "a lot of wartime surprises into their equipment." This ability to deceive and conceal stems from the Soviet tendency to design "wartime reserve modes" into their systems—not just in terms of electronics but across the board.

Juxtaposing central features of the F-15 and the MiG-31, he pointed out that the F-15's gross takeoff weight (GTOW), when carrying maximum fuel, is about

68,000 pounds; the comparable figure for the MiG-31 is 85,000 pounds. The MiG-31's GTOW exceeds that of a B-17 World War II strategic bomber, he added. Even the new two-seat F-15E, with a GTOW of 81,000 pounds, lags behind the MiG-31. He assessed this Soviet fighter as superior to any existing US aircraft because the MiG-31 "has better avionics, a better C<sup>3</sup> system to work into, a better air-to-air missile, is faster, has greater combat range, and [the Soviets] are producing it like gangbusters."

### Concern Over the Acquisition Process

The Defense Department's fundamental concerns about the state of the research, development, and acquisition process involve military systems in general but C<sup>3</sup>I technology in particular, Secretary Latham told the AFA symposium. The four principal areas, he said, are that "we are not keeping up with the threat; that the cost



Commander of Air Force Systems Command, headquartered at Andrews AFB, Md., is Gen. Lawrence A. Skantze.

of doing business is staggering; that [there are deficiencies] in how we specify equipment; and that [there is cause for concern] about contractor performance."

Under the rubric of staggering costs, he cited the fact that the R&D costs associated with the airborne terminals of the Defense Department's new jam-resistant, global Milstar satellite communications system have escalated to about a half a billion dollars. "That's R&D only, without recurring costs," he complained. Assuming optimistically that the weight of the B-1's Milstar terminal can be held to 500 pounds or less, he predicted that the total installed cost of such a terminal will "come to several million dollars per aircraft." On an installed basis, each pound of avionics aboard the B-1 costs about \$4,000, while the comparable cost per pound of Milstar avionics—allowing for launch costs—has reached a staggering level of between \$35,000 and \$40,000, according to Secretary Latham.

He warned presciently that the costs of the Joint Surveillance and Target Attack Radar System (JSTARS)—a moving-target-indicating SAR installed on a modified Boeing 707 designated the C-18—might cause Congress to balk. (The House Armed Services Committee subsequently zeroed the FY '86 JSTARS funding request of \$260 million on grounds that the "committee believes there are less costly alternatives for this mission." The committee further claimed that the Defense Department "failed to comply with congressional guidance to develop a plan for a more survivable JSTARS platform than the Boeing 707," reflecting presumably a preference for the much smaller TR-1. Some or all of this HASC cut is

likely to be restored in conference with the Senate, but the warning about growing costs is real and clear.)

Stressing the "great and versatile capability" that ensues from JSTARS's ability to locate, track, and target moving targets from the forward line of troops (FLOT) to deep into the enemy's rear echelon, Secretary Latham nevertheless expressed concern that "it's going to cost \$1.4 billion for the first four aircraft." He asked rhetorically and with obvious resignation, "How much more of this can we stand?"

Several other speakers stressed the fundamental importance of JSTARS, including General Skantze, who termed it a "fall-on-your-sword" priority. Lt. Gen. Clarence E. McKnight, Jr., USA, the Joint Staff's Director for C<sup>3</sup>I, and Maj. Gen. Jacob W. Moore, USMC, the US Central Command's Chief of Staff, both underscored the essentiality of this system in operational terms. Lt. Gen. Melvin F. Chubb, Jr., Commander of AFSC's Electronic



Lt. Gen. Melvin F. Chubb, Jr., is Commander of AFSC's Electronic Systems Division, Hanscom AFB, Mass.

Systems Division and keynote speaker of the meeting, termed JSTARS pivotal to second echelon interdiction and standoff capabilities required in Europe and elsewhere. He strongly defended the Air Force's choice of the C-18 as the JSTARS platform, but acknowledged that the C-17, USAF's new airlift aircraft, might also be suitable for the JSTARS mission.

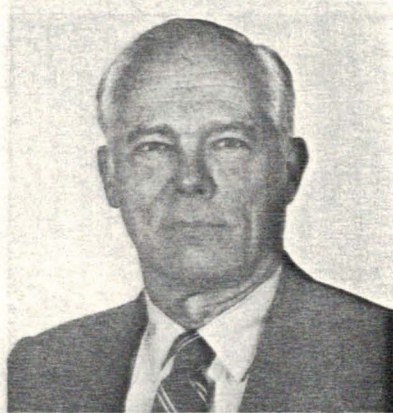
### Problems With JTIDS

Another C<sup>3</sup>I program that Secretary Latham warned was becoming vulnerable to congressional budget slashing because of cost is the Joint Tactical Information Distribution System, or JTIDS. (The House Armed Services Committee did precisely that when it zeroed key elements of this program.) The R&D costs of JTIDS, Secretary Latham predicted, "ultimately will reach about \$2.3 billion." The system will allow large numbers of users to share essential data securely and in the face of sophisticated jamming. Although he acknowledged the operational requirement for JTIDS, Secretary Latham expressed dismay over its high cost, driven in part by the fact that "it is an eleven-year-old program, with some relevant work dating back even further. The system won't get into production before 1987 or 1988. Why should it take so long for a fancy radio?"

A fundamental reason why JTIDS's research and development costs keep rising is that the individual needs of the various users seemingly can't be accommodated in one common design. This leads to major, special modifications. Deputy Assistant Secretary of the Navy for C<sup>3</sup>I Harold Kitson explained that his service "has a

unique requirement to have multiple, simultaneous nets to provide command and control capability for the anti-air warfare, antisubmarine warfare, antisurface ship warfare, electronic warfare, and battle force commanders." Stressing that the Navy's requirements differ from those of the Air Force, he added that the Navy has historically emphasized data over voice in its communications. The Navy, he said, encountered schedule problems during full-scale engineering development of its JTIDS system—especially in terms of the F-18—but is now at the point "where we are integrating software with our brassboard system. By the end of this calendar year, we will have our first full-scale engineering development terminal delivered."

He told the AFA meeting that the Navy plans to procure approximately 2,000 JTIDS terminals. Although the Navy uses an approach to JTIDS that differs basically from that of the Air Force—distributed time



*Harold Kitson is Deputy Assistant Secretary of the Navy for Command Control Communications and Intelligence.*

division multiple access (DTDMA) vs. time division multiple access (TDMA)—the Navy's terminals will be "backward compatible" with those of the Air Force. This means that Navy terminals that need to talk to Air Force terminals can be equipped to do so, according to Secretary Kitson.

Another factor affecting the JTIDS program is the Air Force's requirement over the long term to replace its Have Quick I and II voice communications systems, which provide electronic counter-countermeasures for primary air-to-air and air-to-ground radio links, with a more robust capability known as the enhanced JTIDS, or EJS. Although the need for EJS is not immediate, General Chubb said this upgraded system is imperative in order to keep the Soviets from getting "a jump on us."

General Skantze cited EJS as an example of how adding new requirements in the design stage can entail delays and cost increases: "Since the program started—under the name Seek Talk—EJS has grown from a jam-resistant voice radio in the UHF band to include interoperability with JTIDS in the L-band, addition of a TACAN capability, operation in an alternate band, and the capability to pass a limited quantity of data in both the L-band and alternate band." As a result, the initial operating capability for this secure communications radio has slipped seven years, the AFSC Commander told the AFA symposium.

Secretary Latham, while acknowledging that successful enemy jamming can "shut down the Air Force," warned that EJS will probably cost well over thirteen times more than Have Quick II. As a result, he ex-

pressed doubts about the affordability of EJS. General Skantze suggested that the experience with EJS and with other instances of "requirements creep" cement the case for declaring a "moratorium on new requirements early in the development process." He cautioned that no moratorium should be absolute, but stressed that "when a program manager declares the need for a moratorium, having the entire defense community support him would do more to improve the C<sup>3</sup>I acquisition process, contain cost, and get delivery dates met than would any other management initiative." He added that the short life-cycle of emerging technologies in the electronics realm strengthens the case for imposing moratoria.

### **Fixed-Price Mania?**

Over the past year, several significant Pentagon programs experienced schedule slippage that, in turn, caused the government to "cap" some of them, according to Secretary Latham. "We in effect told the contractor, 'This is the final money we are going to give you, and you will have to complete [the program at this funding level] or you will have to pay the overage.'" He said JTIDS and the Airborne Self-Protection Jammer (ASPJ) are in this category.

The result on the part of the Pentagon has been over-emphasis on fixed-price contracts: "You are seeing fixed price becoming the norm in programs that carry a fair amount of risk." Expressing skepticism about categorical application of fixed-price contracting to R&D in the C<sup>3</sup>I field, Secretary Latham pointed out that software, rather than hardware, is often the Achilles' heel of such programs. On average, about eighty percent of the cost of C<sup>3</sup>I programs is in the software, "yet often we can't get the software to work." At least three NATO-related programs managed by the US are bogged down in software problems and, as a result, are between three and four years late, he said.

General Skantze agreed that fixed-price contracting should not be applied in a procrustean manner: "From a contracting point of view, we are in the risk-management business. The higher the risk, the more the government should share that risk; the lower the risk, the more industry should share that risk." Stressing that the Air Force will not resort to fixed fee plus (FFP) contracting "just because it's popular," the AFSC Commander averred that "if we want industry to build something that isn't invented yet, then we are clearly in the 'cost-plus' area." He told the audience of industry executives from around the country that, "in general," the Air Force will continue to "link the R&D contractor to building the first pieces of equipment" in the case of programs involving competitive procurement. "If we want to bring in a second manufacturer, we will make allowance for the first contractor's investment in the program." The government as well as industry find themselves in a "hardball defense procurement arena" and need to recognize that "Congress is in no mood to tolerate cost growth of significant amounts for defense programs," General Skantze warned.

"This year, for the first time in recent history, a major Air Force program, a munitions system, was canceled due to a breach of the Nunn-McCurdy Act [covering cost overruns in excess of fifteen percent]," General

Skantze pointed out. Rejecting the contention that the Air Force has been excessively harsh in dealing with contractors, he noted that "we have put people who failed to meet the required standards on due notice. We didn't run to the media to [tell them about] these difficulties, but these sorts of things do get out. I agree in a broader sense there has been too much criticism [in the media], but that is pretty well out of our control, if not completely so." Recent sanctions by the Defense Department against top executives of a major aerospace company do not represent a deliberate attempt by the Pentagon to revamp the management of that company. But General Skantze speculated that enough pressure has been applied on that company so that "I would be very surprised if the corporate board [of that organization] had not been thinking along those same lines."

Secretary Latham made clear that not all cost growth is the fault of industry. By way of an example, he cited the case of the Roland air defense weapon system that is deployed with the New Mexico National Guard: "This is a disaster story. We took a perfectly good European system . . . and redid the whole design to Americanize the system from the metric [standard]. It turns out that we want to send [these weapons] here and there and thus need to re-Europeanize them again. The Germans [who co-designed Roland originally] came over and said it's going to cost \$10 million to do that. This is ridiculous."

#### **Divergent Views on JRMB**

With about sixty-five percent of all C<sup>3</sup>I programs predicated on cross-service or multinational use, the importance of a joint oversight mechanism is obvious. The service Vice Chiefs and the Director of the Joint Staff are now meeting on a regular basis as the Joint Requirements and Management Board, or JRMB, which was formed last year, to examine potential joint military requirements; to identify, evaluate, and select systems for joint development and acquisition; to provide oversight of cross-service requirements and management issues; and to resolve service issues that arise after a joint program has been initiated.

Proponents of the JRMB claim that its actions in its first year of existence have led to potential life-cycle savings of about \$3 billion. Major issues currently being examined by the Board include remotely piloted vehicles (RPVs), electronic warfare commonality, worldwide military command and control systems, and wide-area surveillance, including space-based radars. The uniformed side of the Pentagon in general sees the JRMB as proof that the services can and will work together at the highest levels to achieve maximum combat capability by the most economical means. In addition, the meetings of this body of "four-stars" helps to establish closer working relationships and promotes consideration of the impact of individual service decisions on the other elements of the Defense Department.

Secretary Latham told the AFA meeting that he "opposed" formation of this Board when it was first proposed by the Defense Science Board. He alleged that "these 'four-stars' . . . meet all the time; [they] meet without staff and without understanding these complex issues. We need to come up with a better mechanism."

General Skantze countered that he was "not at all surprised that [Secretary Latham] is concerned about

the JRMB, because [its views] might not coincide with what he sees as needed." This structure was created because the Secretary of Defense and the Defense Science Board agreed that "the responsibility for setting military requirements for meeting military threats belongs to the military services. The four Vice Chiefs and the Director of the Joint Staff make up the JRMB and are the means for getting the joint view into the requirements process. They look at the issues and don't just let them gestate in the civilian community in OSD," according to General Skantze.

#### **Further Delays for Space-Based Radar?**

As requested by OSD, the Defense Science Board last summer completed a study of the space-based radar requirement and, according to Secretary Kitson, "ended up with a recommendation that a 'Block Zero' approach, with relatively low cost and limited operational capability, should proceed immediately." The Department of the Navy, he claimed, came up with a concept that dovetails with the DSB's recommendation. OSD, at the same time, "is supporting an effort to get critical technology efforts for the space-based radar initiated in FY '85. Once again, however, the Navy and Air Force have not resolved their differences in management, and until they do, the program will really not get started," according to Secretary Kitson. He suggested that the high costs of space-based radar rule out the possibility of either individual service funding the project independently. The current impasse, General McKnight told the AFA meeting, prompted the JRMB to review the program in an attempt to resurrect it.

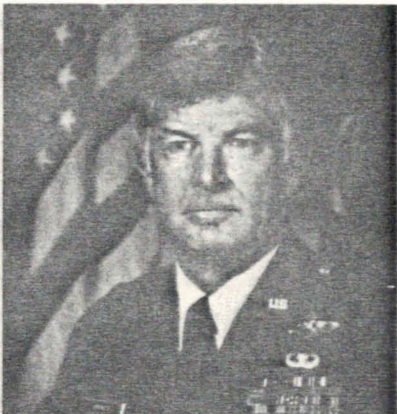
A space-based radar is of vital importance to the Navy, according to Secretary Kitson. Such an all-seeing, global sensor would enhance the survivability of the battle groups by its ability "to pick up Bears and Backfires in time for our fighters to go after them, in the right direction." Pointing out that the exchange ratio in a local combat area boils down to a function of the square of the force ratio, he suggested that a space-based radar would "allow us to put twice as many fighter aircraft in a local area to confront an incoming Backfire raid on a battle group." This would improve the exchange ratio fourfold and thus would sharply reduce the probability of the Soviet bombers getting through.

Another incipient space program of major long-term importance to the Navy is the blue-green laser communications system, which shows great potential for maintaining reliable command links with the ballistic-missile-launching submarines (SSBNs). This type of laser energy can penetrate clouds and seawater to reach submerged submarines operating at full speed. Tests of major components of this submarine laser communications research program off the coast of California by the Defense Advanced Research Projects Agency (DARPA) and the Navy have shown highly promising results, according to Secretary Kitson.

A space-qualifiable prototype transmitter is to be fabricated and readied for test in FY '86. At the same time, a submarine-qualified atomic resonance filter receiver is being built. Testing of these pivotal components will set the stage for formulation of a specific configuration and full-scale engineering development. The laser communications system—in addition to its primary strategic mis-

sion—is expected to enable battle group commanders to maintain communications with submerged attack submarines that support them.

A third space-based system that was singled out for special emphasis at the AFA symposium is the Boost Surveillance and Tracking System (BSTS), a follow-on to the Defense Support Program's early warning satellites. Now a part of the SDI program, the BSTS not only detects the launch of ICBMs and SLBMs on a global basis but calculates their trajectory within tens of seconds to permit intercepts before the missiles can release their individual warheads. The new defense budget request seeks \$130 million in the coming year for development of this system. BSTS is to achieve operational status in the early 1990s, according to Secretary Latham. The system's contract definition, including selection of a prime contractor, is about "to start in earnest," he added.



*Maj. Gen. Thomas S. Swalm is Commander of TAC's Tactical Air Warfare Center at Eglin AFB, Fla.*

### **Electronic Warfare Issues**

Congressional experts have expressed concern about the Air Force's decision to cancel the Pave Tiger RPV program. Maj. Gen. Thomas S. Swalm, Commander of the Tactical Air Warfare Center, said the primary reason behind this decision was that Pave Tiger—envisioned originally as a low-cost RPV—had become a "very expensive program. The costs just went up and up." As a result, it lost out to some other programs the Air Staff "felt stronger about." General Swalm said that Pave Tiger, designed to shut down or kill enemy radar defenses and jammers, "would have been very useful against Soviet UHF jammers, especially in cases where we don't have Have Quick" available.

General Swalm underscored the importance of upgrading—or replacing with follow-on systems—the EF-111A Raven, or "Electronic Fox" as pilots call it, and F-4G Wild Weasel. Predicting a pronounced requirement for standoff and penetration jammer platforms in years to come, he suggested that the forty-two EF-111As will eventually have to be replaced. In the case of the F-4G, he said, the Air Force is looking at electronics upgrades and reengining because "the engines simply are getting too old."

While he was sanguine about the Air Force's ability to cope with Soviet "Radio Electronic Combat," General Swalm expressed some concern about Soviet radio-frequency weapons. This new technology appears capable of disabling both avionics and personnel on a broad basis. While he declined to give specific details because of tight security classification, he acknowledged that

"we watch Radio Frequency [technology] very closely and are working this in both a tactical and a technical sense. This is a hot and heavy issue, and we certainly don't have it on the backburner."

In discussing another hush-hush element of electronic warfare, command and control countermeasures (C<sup>2</sup>CM), General Chubb acknowledged that "we are working the devil out of" this area and have a number of "black programs" in progress. A key reason behind the intensity of the Air Force effort in C<sup>2</sup>CM is that the Soviets "are so potent" in that area.

### **DoE's Nuclear Weapons Programs**

The US doesn't know "a great deal [about] what really goes on" in the design of Soviet nuclear weapons, the Department of Energy's Assistant Secretary for Defense Programs, William W. Hoover, told the AFA symposium. When both the US and the USSR began in the early 1960s to test nuclear devices underground because of their agreement not to detonate nuclear devices in the atmosphere, "we lost most of our intelligence [on] what the internal design of their weapons is actually about," he disclosed. On the other hand, "we can see the magnitude of their effort" in terms of such yardsticks as laboratory floor space and size and quality of work force. The Soviet level of effort in nuclear warhead programs tops that of the US by "between fifty and a hundred percent." Secretary Hoover warned that "while we don't know what they are doing in weapons [design], there is legitimate concern about the magnitude of their effort." On balance, he said, "they certainly seem to be as good as we are" in nuclear warhead and nucleonics technology.

DoE's defense programs are being carried out by three national laboratories—Lawrence Livermore, Los Alamos, and Sandia—and seven production plants managed by commercial contractors. DoE's weapons design complex, Secretary Hoover said, "is probably the world's leading user of supercomputers. The evolution of nuclear weapons is directly tied to the power of supercomputers. That is why we are anxiously awaiting the next generation" of supercomputers that will make possible advanced computer-designed warheads. In the D-5 program, which is also known as the Trident II SLBM warhead program, DoE expects to be "converted to full use of computer-aided design and computer-aided manufacturing and production," he told the AFA symposium.

While SDI "is meant to put nuclear weapons on the endangered species list," he pointed out that a comprehensive ballistic missile defense system is out in the future, and "until then, we will need strong deterrent capabilities." Nuclear weapons and their warheads are the underpinning of this country's deterrence strategy. As long as that remains the case, "we need to test to make sure that [our nuclear weapons] remain viable." As a result, "it would not be useful to proceed with a Comprehensive Nuclear Test Ban [CTB]." He added that if arms-control considerations were to drive the US to a point "where we are unsure whether our [nuclear] weapons remain viable, this would be quite destabilizing."

In spite of the increasing complexity of nuclear weapons, this country's nuclear materials stockpile is down

RE,

by about twenty percent from what it was a few years ago, according to Secretary Hoover. The largest percentage of special nuclear materials (SNM)—the key component of nuclear weapons—“comes from dismantling old weapons.” Secretary Hoover added that “we retire almost the same number of weapons as we produce in any one year.” DoE plans to continue this policy, but “we don’t want this to get out of balance so that, in fact, we can’t meet requirements.” Over the past few years that balance has been “right at the margin.” Needed are various improvements, such as having “our reactors produce at a higher rate” and eventually replacing reactors as they wear out: “By the turn of the century, these reactors will be fifty years old—so there is cause for phasing in newer reactors as we phase out older ones.”

DoE is also exploring such technologies as “special isotope separation that will allow us to process some



*William W. Hoover is the Department of Energy's Assistant Secretary for Defense Programs.*

material that is currently in an unusable form.” He added that, at present, “there is virtually no redundancy in the system.” Also, the system is vulnerable not just in terms of terrorism but also with regard to natural disasters and strikes by a laser force. He stressed that it is essential to develop a backup capability for the production of tritium, a nuclear material of central importance. At the moment, he said, the only place where “we load tritium is at the Savannah River facility.” The Department of Energy has produced excess quantities of some critical components to build up a reserve that, in case of a shutdown, can sustain the production process “for about one year,” Secretary Hoover explained.

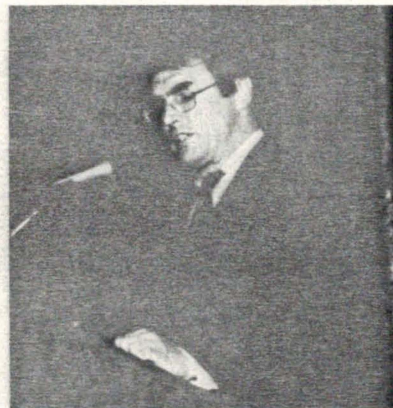
Over the past few years, DoE has quadrupled the number of security systems at its nuclear facilities. Still, the prevention of terrorism remains a tough job: “We use things like perimeter intrusion and detection systems [and] sensors that detect nuclear material that is being taken out of our facilities,” according to the DoE official. Lastly, there is a “sort of volunteer nuclear fire department—the Nuclear Materials Search Team—[whose top-flight experts] search for, diagnose, and know how to disarm” nuclear weapons that might have fallen into the wrong hands. “We have deployed this team several times, but only under hoax conditions,” he disclosed.

An area of major concern, according to Secretary Hoover, is the hardening of warheads—especially their electronic arming and fuzing devices—against the nuclear effects of other weapons, hostile or friendly, such as X-rays and gamma rays. “We are putting a lot of effort

into hardening our weapons, primarily at the Sandia [facility]. We are confident that [the warheads] can survive to [a] degree so that there is no fratricide, [wherein detonation by one weapon disables another].”

### **Status of the SDI Program**

Dr. George A. Keyworth II, the White House Science Advisor, told the AFA meeting that the first—and central—goal of the Strategic Defense Initiative (SDI) is the elimination of “the ICBM, the most destabilizing element of the nuclear arsenal, as an effective military weapon.” If SDI were eventually to succeed in convincing the Soviets of the “loss of utility of their ICBMs as a preemptive force, they will have to admit that the age of the ICBM as the dominant weapon is passing. They, and we, will no doubt begin to replace ICBMs with other weapons, but in so doing we’ll be phasing out the most feared and most destabilizing of the nuclear weapons.”



*White House Science Advisor in the Reagan Administration is Dr. George A. Keyworth II.*

SDI’s basic leverage against ICBMs stands or falls with the ability to intercept those weapons in the boost phase, before the individual warheads and penetration aids can be offloaded by the “bus.” Recent major advances in directed-energy weapons technology, he suggested, point the way toward successful boost-phase intercept capability. By the way of an example, he cited “high-power, pulsed lasers—with as much as a hundred megajoules packed into a 100-microsecond shock—[that] could cycle so fast that we might only need a handful of them to defend against the whole Soviet ICBM fleet launched simultaneously.”

He added that recent advances in basic research in astronomy “have shown us how we can use adaptive optics for atmospheric compensation. That means we [could put] large lasers on the ground, where they can be easily maintained and protected, [and] relatively simple mirrors in space to reflect the rapid laser pulses and direct them to their targets far away.” He predicted that such a weapon would be both survivable and “almost impossible to overwhelm by proliferation. A single laser could send out more than 500, maybe up to 1,200, missile-destroying pulses per minute.” He added it appears likely that “we can develop a technology in which pulses are going to be far cheaper than missiles—though I hasten to add that it’s up to us to show that we can do that.” ■

*(AFA's next symposium on military electronics is scheduled for June 26–27, 1986, again in the Greater Boston area.)*

Dr. Agni Vlavianos - Arvanitis

# BIOPOLITICS

DIMENSIONS OF BIOLOGY

1985



Dr. Agni Vlavianos - Arvanitis  
To Dr. George Keyworth Jr.,  
with esteem  
Agni Vlavianos Arvanitis

BIOPOLITICS

DIMENSIONS OF BIOLOGY

1985

# BIOPOLITICS

DIMENSIONS OF BIOLOGY

by

Dr. Agni Vlavianos-Arvanitis

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Greece, June 24-28, 1985.

ABSTRACT

BIOPOLITICS\* - DIMENSIONS OF BIOLOGY

"Biopolitics" proposes international cooperation for the better understanding of "bios". A global educational campaign through communication satellites may be used to implement such a project.

Biotechnology is presently inducing the expansion of human potential. Values need to be re-examined in order to allow for the challenge of new dimensions.

Our improved understanding of life processes arises the need of revision of basic societal frameworks.

This paper will discuss possible reassessment of current views relating to politics, communications and the arts. The impact of biotechnology on society is providing the framework of new philosophical horizons for man of the 21st century.

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\*The terms "biopolitics", "biolegislators", "biolawyers" are introduced here for the first time in international literature.

## BIOPOLITICS - DIMENSIONS OF BIOLOGY

Beneath the shadow of the sacred rock of Acropolis, participants of this conference are gathered to celebrate Athens as the cultural capital of Europe in 1985. The shared admiration for Doric and Ionian styles and the love for symmetry create the common bond. Man feels fortunate to belong to the 20th Century, since his appreciation for symmetry takes new dimensions due to technological progress. Technology expands the horizons of understanding and widens the spectrum of thought to include not only the cosmos but also to reveal the infinite beauty of the microcosmos and the macrocosmos. Present estimates suggest that our galaxy contains 100 billion stars and there exist billions of other galaxies. This has challenged the uniqueness of our planet. An increasing number of biologists are preoccupied with inquiries such as: has life come from outer space or will life be sent to other planets?

The continuous development of his potential, and the tremendous flow of new information, provide a need to reassess man's predicament in space. The pathway of technology unravels nature's secrets and improves the perception of the universe.

"Galaxy or galaxies  
are small dimensions  
not infinity  
Neutrons are small  
very small  
not infinity  
And what am I  
A neutron to the galaxy  
Or a galaxy to the neutron"

(Dr. Agni Vlavianos-Arvanitis  
Oscillations, 1983)

As more of nature's laws are discovered, Einstein's view of Creation seems so full of wisdom: "Everything in nature is governed by laws, and all I can think is that the legislator is wiser than the laws."

At the brink of the 21st Century, technological achievements seem almost unreal, as though rapid progress images mythology. The biologist deciphers the code of life, the chemist produces artificial elements, the physicist challenges the galaxies with  $E=mc^2$ , the mathematician travels beyond the realms of abstraction, by the Uncertainty Principle, and the philosopher realizes the impact of technology.

"Transcending thoughts passing boundaries  
of limiting space potentials  
Crossing bridges of transparent solids  
Energy waves of eternal messages  
leading to communication  
Faster than flashes of the soul  
Brighter than the laser beam  
Piercing everything  
Spreading everywhere"

(Dr. Agni Vlavianos-Arvanitis  
Oscillations, 1983)

Mythology has returned. Technology, today's Prometheus, with sensitivity and prophecy provides light and fire, crusades for revelation of the seeds of truth, and makes possible the advent of a new era. In the drama of history, present technology closes the curtains on the scenes of the ancient world and introduces a panoramic view of the march of knowledge. However, with accelerated progress and high degree of specialization, with escalating

technology, scientists expedite discoveries but also entropy increases through rapid exploitation of resources. The pollution of the planet gears the future to the proximity of disorder. In order to harness this trend, biology can provide a model for the improvement of the quality of life. A study of "bios" leads towards a better grasp of the meaning of life. Dimensions of biology seem to reach a new perspective that may be christened here as "biopolitics".

Human history can be traced back to a few thousand years only. During this period, several political models have been developed. Tyranny, and democracy are among the older ones; and now new terms like socialism, communism, capitalism, are added as alternative models of human society. The history of life, however, extends into several hundred million years. Life has been tested in unlimited varieties and the most viable species have survived through the powerful selection of evolution. It is for this reason that "bios" can become the model for attaining the desired dimensions and expanding strategies for future society.

Social systems undergo continuous changes through the process of dynamic equilibrium. It is impossible to estimate correctly all the factors contributing to the success of the entity. The borders of society, organizational systems, code values, distribution of labor, specialization, and overall conditions of harmonic functioning may be considered in the future within the framework of comparing "bios" with society.

A multidimensional model will be required for developing the potential vectors of "biopolitics". Presently an effort is made to describe some implications

of this model. Future dimensions of biology are mentioned in relation to genetic engineering, the arts, defense, communication, energy production, legislation. The philosophical and social impact remains to mature parallel to technological progress.

It may be impossible to forecast the impact of genetic engineering on the future of sciences. Alternative futures are offered to man. Following proper decisions by creating better livestock, cereals and grains, genetic engineering will play a key role in the balance of powers and economic growth. Health sciences too will be greatly affected. Is genetic engineering opening Pandora's box by leading to unforeseen difficulties or with the guidance of educated "biolegislators", it will prove to be a major discovery in the 21st century?

The mapping of human genes, and the identification of genetic diseases, will completely revolutionize medicine. Presently over 200 genetic disorders are identified, and insight is provided in more than 1000 diseases. Tests like amniocentesis or chorion villus biopsy are becoming common practice for prenatal diagnosis. Already new scientific discoveries cast the light of dawn upon these directions. Cloning experiments, human insulin production by bacteria, and recent work on oncogenes, provide a pathway towards the unlocking of hereditary secrets. Hope exists for curing diseases by DNA "probes" and gene therapy. Prolonging of life could be achieved by understanding the switching "on" and "off" of genes. Today's science fiction may become tomorrow's reality: ATP tablets produced by industrialized mitochondria, or the incorporation of chloroplasts into animal cells are just two of such future possibilities.

Since opposition may arise, enlightened "bio-legislators" will be required to set the ethical boundaries within which morally justified scientific research can be carried out. With increased understanding of brain wave patterns, and more comprehensive analysis of the genetic aspects of behavior, "bio-lawyers" will be required to evaluate legal and ethical issues. Only those possessing better knowledge and deeper comprehension of biology will be able to acknowledge the delicate implications involved.

In the Olympics, athletes reach high levels of performance. It seems as though the full potential of the human body has been reached. However, with more information derived from brain research, great improvements have been obtained. Biofeedback can also be used for attention control and focusing power. Computers provide model performance by simultaneous analysis of brain waves and muscular coordination. Improved understanding in sport science can be used not only by Olympic athletes, but also by the general public. Recent research in athletic science has led to overall health improvements.

For future, biology can serve as a model for computer memory storage and processing of information. By searching for the true function of brain cells, it may become possible to discover the mechanism by which memory cells store data in the form of abstract thoughts. Once this has been achieved, the same system of chemical storage of thought may be introduced into computers, widening the scope of analysis. Another resource of thought could be provided by creating a "Bank of Ideas" where scientists, academicians, and philosophers may

bequeath their achievements before the arrival of their final day.

Like most other creators, artists seek a source of inspiration. Biology, with its many stunning features and hidden mysteries can surely serve that purpose. Throughout the centuries, art has reflected the study of nature. In this respect, "bio-art" is not an innovation. Already painters have peered down the microscope to discover a completely new world of existence. The recent opening of the microcosmos provides unlimited sources of inspiration for artistic expressions in the future. Artists with better understanding in biomolecular structures may provide new dimensions of artistic expression.

In fields such as architecture, the beehive, termite nests, cell membrane, or other organelles could be structural models for the future. Bio-materials have been tested and have survived the selection of several hundred million years. For civil engineers biomaterials such as collagen, and cellulose could be useful in construction. Aeronautical engineers may design planes with mobile wings or hollow bone structure, and marine engineers boats and anti-rust skin protection.

Photography and music are constantly drawing inspiration from nature, but up to the present, artistic expressions have been based mainly on visual and acoustical effects. The sense of smell has not been used as extensively. How would it be if one would admire the painting of a battle field and simultaneously hear battle cries, or smell gunpowder?

The sense of smell could be further investigated in relation to defense. Radars or radios transmit information based on sight and sound. However, insects, by using their sense of smell, identify their mates or their enemies from miles away. This "individualized" recognition system based on the sense of smell remains still unexploited.

Cells also have this capability. In man at least one million different anti bodies exist so as to distinguish the specific enemy and utilize individualized defense. This does not eliminate the parallel existence of generalized response provided by lysosomes or white blood cells.

One of the most perfect examples of community survival is provided by the cell, as evidenced by the compartmentalization and cooperation among the organelles. Under the cryptographic code control of the nucleus, many organelles and complex metabolites function in order to maintain a stable environment. Ribosomes, provide interpretation of the code and synthesis of proteins; mitochondria, the monetary system, by burning of sugar as fuel energy production; Chloroplasts, the solar battery system, converting sunlight into food and energy; endoplasmic reticulum, the transportation system; and cell membrane, the selective guard control of the gates, allowing traffic inside or outside the cell.

Biotechnology is presently inducing the expansion of human potential. Values need to be re-examined in order to allow for the challenge of new dimensions.

The increased role of bioethics has contributed to better reflection on problems raised by modern technology. To cite only a few, such as reproductive technologies, abortion, definition of death, organ transplant, birth control. It is not enough to raise questions on such ethical issues. "Biopolitics" proposes international cooperation for the better understanding of "bios". Since education is the pathway leading to understanding, communication satellites may be used to implement such a project. A global educational campaign could increase public awareness on the crisis of the ecosystem or population explosion. Man can become more aware of the ramifications of modern biology in domains such as health, agriculture, economy. The transition from abstract to practicality will thus become more evident. Man as part of the total "bios" system may develop more respect for the values of the natural world. With improved understanding of life processes, "biopolitics" arises the need of revision of basic societal frameworks.

In conclusion, one realizes that man possesses the option for alternative futures. The rapid rate of technological improvement provides the ascending ladder of knowledge, and the linking bridge between the present and the future. In the following decades, "biopolitics" may play an important role as an exemplar of peace and messenger of harmony:

"With wings of the soul  
I touch the golden waves of infinity  
Around, heavenly beauty like light  
Sparkles rays with colors of flowers  
Whispers the soil, awakens the earth  
Not like a mother, just like a daughter  
Of the cycle of wear  
and the infinite of the eternal  
The melody of the universe  
Is surrounded by the rhythm of harmony"

(Dr. Agni Vlavianos-Arvanitis, 1984)



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