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PROCEEDINGS
OF THE
DoD INFORMATION
ANALYSIS CENTER CONFERENCE

8-9 DECEMBER 1981

DEPUTY UNDER SECRETARY OF DEFENSE

FOR

RESEARCH AND ENGINEERING

(RESEARCH AND ADVANCED TECHNOLOGY)

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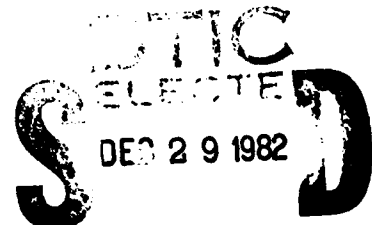| REPORT DOCUMENTATION PAGE	READ INSTRUCTIONS BEFORE COMPLETING FORM

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The conference was sponsored by the Defense Logistics Agency, Defense Technical Information Center, in accordance with prior agreement with the Office of the Deputy Under Secretary of Defense for Research and Engineering (Research and Advanced Technology.) The purpose of the conference was to improve the effectiveness of DoD Information Analysis Centers (IACs) in supporting Defense programs. The conference brought together (cont)

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managers from the Office of the Under Secretary of Defense for Research and Engineering; Services and other DoD R&D Program Managers; DoD in-house and contractor engineers and researchers; and technical information managers and specialists involved in DoD scientific and engineering programs, to determine needs and priorities. A forum was provided through which those responsible for policy and program management of the DoD IAC Program discussed a varied set of problems with a cross section of users and managers. The objective of the conference was to generate mutual efforts aimed at meeting deficiencies, and to explore new ways of improving IAC services to the Defense community. By any measure the conference was a success and the stated objectives were accomplished.

DEFENSE LOGISTICS AGENCY
DEFENSE TECHNICAL INFORMATION CENTER
CAMERON STATION
ALEXANDRIA, VIRGINIA 22314

PREFACE

The DoD Information Analysis Centers (IACs) are responsible for the collection, storage, review, evaluation, synthesis, repackaging, and dissemination of authoritative scientific and technical information in a format most useful to the scientists and engineers in well-defined areas of technology in which they specialize. The Centers are highly selective in the information gathering function and once the literature is acquired, are no less selective in extracting and evaluating information assuring always that the latest most authoritative information is available to their users. The aim of the IAC services is to improve weapon system reliability, engineering decisions and development lead time and to provide a means of increasing the productivity of Defense Scientists and Engineers through reduction of duplicative test and evaluation programs.

The conference was sponsored by the Defense Logistics Agency, Defense Technical Information Center, in accordance with prior agreement with the Office of the Deputy Under Secretary of Defense for Research and Engineering (Research and Advanced Technology). The purpose of the conference was to improve the effectiveness of DoD Information Analysis Centers (IACs) in supporting Defense programs. The conference brought together managers from the Office of the Under Secretary of Defense for Research and Engineering; Services and other DoD R&D Program Managers; DoD in-house and contractor engineers and researchers; and technical information managers and specialists involved in DoD scientific and engineering programs, to determine needs and priorities. A forum was provided through which those responsible for policy and program management of the DoD IAC Program can discuss a varied set of problems with a cross section of users and managers. The objective of the conference was to generate mutual efforts aimed at meeting deficiencies, and to explore new ways of improving IAC services to the Defense community. By any measure the conference was a success and the stated objectives were accomplished.
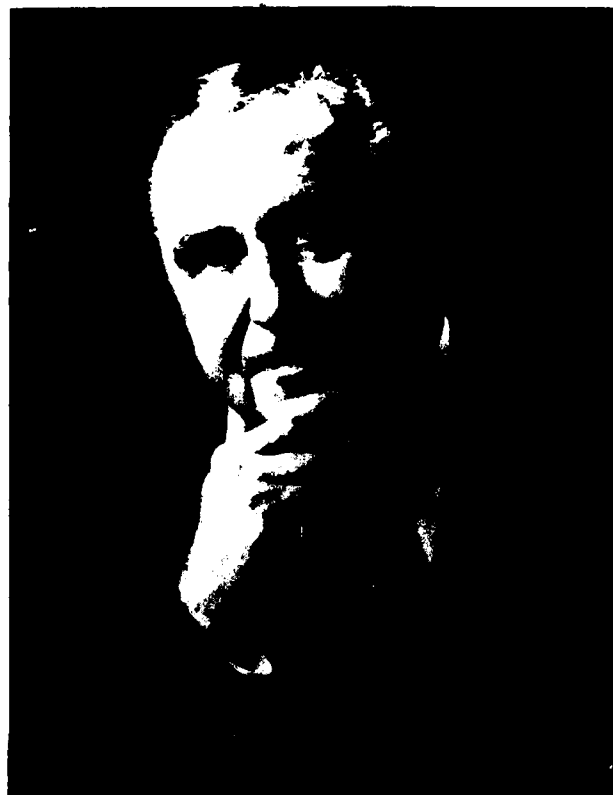
HUBERT E. SAUTER
Administrator

THESE CONFERENCE PROCEEDINGS ARE DEDICATED TO THE MEMORY OF
DR. YERAM S. TOULOUKIAN

Dr. Yeram S. Touloukian, (1920-1981)

The field of scientific and technical information in general and the information analysis centers in particular has lost a great pioneer, advocator and friend: Dr. Yeram S. Touloukian, who died suddenly on 12 Jun 1981 in Bethesda, Maryland, two hours after suffering a massive heart attack during a meeting on thermophysical properties data and information.

Dr. Touloukian was the Director of the Department of Defense's Thermophysical and Electronic Properties Information Analysis Center (TEPIAC) and Purdue University's Center for Information and Numerical Data Analysis and Synthesis (CINDAS), which operates TEPIAC for the DoD. CINDAS was known as the Thermophysical Properties Research Center (TPRC) before 1974.

Dr. Touloukian was a pioneer in the field of scientific and technical information. He singlehandedly founded TPRC/CINDAS in 1957 at Purdue University. Under his outstanding technical and administrative leadership, TPRC had attained national and international recognition as a unique

institution of its kind in a relatively short period of time. In a White House press release as early as 7 December 1958, the report of President Eisenhower's Science Advisory Committee, then under the chairmanship of Dr. James R. Killian, Jr., cited TPRC as an example of Centers which offer the solution to the acute problem of scientific and technical information needs of the Nation. Dr. Alvin M. Weinberg, author of the famous Weinberg Report (a Report of the U.S. President's Science Advisory Committee, 1963) has cited TPRC on a number of occasions as an example of a model Data Analysis Center.

Dr. Touloukian's outstanding pioneering achievements caused TPRC at Purdue University to become a nationally recognized Center for the research, analysis, and synthesis of world knowledge on the thermophysical properties of materials of vital importance to science, engineering, and technology. The Department of Defense established the Thermophysical Properties Information Center (TPIC) at TPRC in 1960, and the National Bureau of Standards selected TPRC in 1964 to be a component of the National Standard Reference Data System (NSRDS). Subsequently, the National Science Foundation established the Underground Excavation and Rock Properties Information Center (UERPIC) at TPRC in 1972, and the Defense Logistics Agency (DLA) moved the Electronic Properties Information Center (EPIC) from Hughes Aircraft Company to Purdue University to merge with TPIC in 1973, which resulted in the present DoD Thermophysical and Electronic Properties Information Analysis Center (TEPIAC).

Dr. Touloukian was a lifelong advocator of the importance of generating correct information through critical evaluation, analysis, and synthesis of polluted information referred to as "original data" and of the need effective transfer of correct information to the ultimate end-user. To this end he made most outstanding contributions. Under his leadership TEPIAC/CINDAS produced more evaluated numerical data on material properties than any other organizations in the world and published 59 volumes of authoritative major reference works on material properties data and information with a total of 44,565 pages.

In addition to being the Director of TEPIAC and CINDAS, Dr. Touloukian was Distinguished Atkins Professor of Engineering and Professor of Mechanical Engineering at Purdue University. He was also appointed to numerous national and international scientific and technical committees, boards of societies, editorial boards of journals, and government panels. He received numerous awards and honors from both national and international organizations. The passing away of Dr. Touloukian is a great loss to the information analysis centers as well as to his family, colleagues, and friends.

DR. C.Y. HO
Director, TEPIAC

PROCEEDINGS OF THE THIRD DoD
INFORMATION ANALYSIS CENTER CONFERENCE

Held at
Naval Surface Weapons Center
White Oak, Silver Spring, Maryland
8 - 9 December 1981

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Office of the Deputy Under Secretary of Defense for Research and Engineering
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Mr. Hubert E. Sauter, Administrator
Defense Technical Information Center

CO-CHAIRMAN

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Defense Technical Information Center

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SESSION II - Dr. Jimmie Suttle, OUSDR&E

SESSION III - Mr. Henry Pusey, Naval Research Laboratory Shock and Vibration
Information Center

SESSION IV - Mr. Hubert E. Sauter

SPEAKERS

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Dr. Stephen D. Bryen, Deputy Assistant Secretary (International) Economic
Trade and Security Policy

Dr. Grace Ostenso, Professional Staff, Committee on Science and Technology,
U.S. House of Representatives

Dr. Joseph E. Clark, Office of Science and Technology Policy, Executive Office
of the President

SESSION II

Mr. Jerome Persh, Staff Specialist for Materials and Structures, OUSDR&E

Mr. Charles Miller, Program Director for Federal Laboratories. National Science Foundation

Ms. Ruth S. Smith, Chief, Office of Customer Services, National Technical Information Service

SESSION III

CAPT K.M. Duff, Assistant Chief of Naval Research, Office of Naval Research

Col. Ralph L. Kuster, Jr., Chief Structures and Dynamics Division, Air Force Flight Dynamics Laboratory

Mr. James Daniel, Test and Evaluation Directorate, Army Missle Command

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Mr. Charles W. Cardiff, Director, Information Control Division, Office of Assistant Secretary of Defense Management Systems

Mr. Jerome Pearson, Air Force Flight Dynamics Laboratory

Mr. Harry Pebly, Army, Plastics Technical Evaluation Center

Mr. Harold Mindlin, Metals and Ceramics Information Center

Mr. Charles E. Fridinger, Naval Surface Weapons Center. White Oak

Mr. George Darcy, Army Materials and Mechanics Research Center

Mr. Henry Pusey, NRL, Shock and Vibration Center

Executive Summary

The DoD Information Analysis Center Conference was held on 8-9 December 1981 at the Naval Surface Weapons Center (NSWC) White Oak. The Conference was sponsored by the Defense Logistics Agency (DLA) Defense Technical Information Center (DTIC), in accordance with prior agreement with the Office of the Deputy Under Secretary of Defense for Research and Engineering (Research and Advanced Technology.)

The purpose of the Conference was to improve the effectiveness of DoD Information Analysis Centers (IACs) in supporting Defense Programs. The Conference brought together managers from the Office of the Under Secretary of Defense for Research and Engineering; Service and other DoD R&D Program managers; DoD in-house and contractor engineers and researchers; and technical information managers and specialist involved in DoD scientific and engineering programs, to determine needs and priorities. A forum was provided through which those responsible for policy and program management of the DoD IAC Program could discuss a varied set of problems with a cross section of users and managers. The objective of the conference was to generate mutual efforts aimed at meeting deficiencies, and to explore new ways of improving IAC services to the Defense community.

The following issues were explored during the Conference:

The funding policy currently being used to support IACs is potentially in conflict with other DoD and U.S. Government policies concerning the release of information to unfriendly foreign governments and foreign competitors of U.S. industry. The pressure to recover costs via the sale of products and services does not fit with the idea of controlling sales to prevent indiscriminte dissemination.

The procedures to be followed by Technical Monitors in the public release of products originated by IACs needs to be formalized.

There is a need for a review of each IAC by a Technical Advisory Group at least biennially. The review should audit the technical activity of the Center in relation to its stated objectives and determine the continuing need for and effectiveness of the Center.

There is a requirement to include criteria to evaluate the continuing need for an IAC in DoDI 5100.45 Centers for Analysis of Scientific and Technical Information.

Basic operations of all DoD Information Analysis Centers should be supported by sponsoring Military Departments/Agencies.

There is a need to create an awareness of the technological activities and the availability of IAC competence, create visibility and encourage maximum usage and support for the Center to authorized users and subscribers.

Acknowledgements

individuals who helped organize and who served as Chairman of the sessions and panels. These contributors are identified in the Conference Agenda.

Finally, a yeoman effort was received from Leslie Richie and Lisa D'Orazio of the DTIC staff who provided the necessary peerless typing.

RECOMMENDATIONS

The following recommendations for DoD IACs resulted from the conference:

Establish criteria to evaluate the continuing need for an IAC. Is the center still functioning in a major DoD technology thrust area? Is the center demonstrably useful to the DoD? Is the center fulfilling a DoD need that is not duplicated by other public, private or government organizations? What is the value of products and/or services to users with respect to current DoD programs? Are funds available?

Have each IAC reviewed at least every two years by an advisory group appointed by the Director, Research and Technical Information, OUSDRE(R&AT), to audit the technical activity of the center in relation to it's stated objectives and to determine continuing need for the center.

Basic IAC operations shall be supported by DoD funds.

Centers shall observe export control limitations and data categories specified in munitions control and critical technology lists issued by DoD, DoE and the Departments of State and Commerce.

IACs may serve the private sector to the extent practicable without impairment to DoD within guidelines provided by the Technical Monitor.

DoD Information Analysis Center Conference
Naval Surface Weapons Center
White Oak, 8 - 10 December 1981

SESSION I
Opening Remarks
Dr. Leo Young

Tuesday, 8 Dec 81

Good morning. I would like to welcome you to the DoD Information Analysis
Center Conference. My name is Leo Young and I am the newly appointed Director
of Research and Technical Information in the Office of the Under Secretary of
Defense for Research and Engineering (known as OUSDR&E for short).

The last time I spoke in this auditorium was almost two years ago as president
of IEEE during Engineers Week. So it is a real pleasure to be back again,
this time on a different subject - the Information Analysis Centers. I will
be acting as the chairman this morning and so I will be introducing the
various speakers as we go along. I would like to thank the organizers of the
Conference, Hu Sauter and Jim Pendergast for doing a great job.

Let me just tell you very briefly what my position in OUSDR&E is. The title
is a double barrelled one - Research and Technical Information and under the
research there are two subheadings as it were. One is the 6.1, the basic
research that DoD itself supports and the other part is the IR&D, the
Independent R&D in industry. Finally, there is the technical information
which means that I get involved with people like Hu Sauter and the Defense
Technical Information Center, and the IACs, which is my reason for my being
here.

One of my primary objectives is to provide the DoD Research and Engineering
community with a strong revitalized information program which is consistent
with the recognition that information is a valuable resource that must not be
wasted and must be used properly. It is my intention in my new office to
utilize as much as possible the fine work done by people like yourself and
others who have preceded me. In doing so I will need your support and I
solicit your assistance.

The selection of subjects for the Conference is an excellent one; we are all
going to learn a lot here. The Information Analysis Center (IACs) are an
important part of the DoD Technical Information Program. The purpose of the
Conference is to improve the effectiveness of the IACs in supporting Defense
programs. With your input we can develop recommendations for program
improvements. On Thursday morning we will have an executive session for DoD
only, where we will analyze what we learned during the conference.

I now want to introduce the officer in charge here at the Naval Surface
Weapons Center to say a few welcoming remarks. Commander Paul Amesse.

Thank you Dr. Young. Good morning. On behalf of Captain Jim Fernandes the
Commander of the Naval Surface Weapons Center and Mr. Ronald Vaughn our
technical director, I would like to welcome the DoD Information Analysis

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Center Conference to the NSWC White Oak Laboratory. As one of the major R&D facilities under the command of the Chief of Naval Material, we at the Naval Surface Weapons Center understand and appreciate fully the extreme importance of getting the right technical information to the right hands at the right time. We hope that the next three days will be a fruitful exchange for all of you and that the management of technical information will be improved as a result. Once again I would like to welcome you to the Naval Surface Weapons Center and I hope you enjoy our facilities here.

Thank you Paul. It is now my pleasure to introduce Dr. George P. Millburn who is the Acting Deputy Under Secretary of Defense for Research and Engineering, responsible for Research and Advanced Technology. I have had the pleasure of working for George for all of about seven working days and so far we are doing very well.

Let me just give you a brief introduction of George. He received his Bachelor of Sciences degree in mathematics and physics from the Case Institute of Technology in 1950 and his Doctor of Philosophy degree in nuclear physics from the University of California in 1956. Prior to coming to the Defense Department he worked for the Aerospace Corporation in El Segundo, California, where he was general manager of advanced programs. Previous to that he was associated with the Ford Aeronautronics in ICBM Penetration Aids and also with the University of California Lawrence Radiation Laboratory in design and testing of nuclear weapons in basic research in high energy particle physics. He came to the Defense Department in August 1978 originally as assistant to the Deputy Under Secretary of Defense for Research and Advanced Technology and he is now the acting Deputy Under Secretary. As such, he is responsible for the 6.1 (basic research) and 6.2 (exploratory development) and the 6.3a (part of the advanced development that is undertaken by the Defense Department). Please welcome Dr. Millburn.

INTRODUCTION
Dr George P Millburn Deputy
Under Secretary Research and Advanced Technology (Acting)

Thank you Leo and good morning ladies and gentlemen. It is a distinct pleasure for me to welcome all of you this morning to the Department of Defense Information Anlaysis Center Conference. As most of you probably know, responsibility for the Defense Technical Information Program is in my office specifically with Dr. Leo Young who has just recently assumed the post of Director of Research and Technical Information, which previously I think most of you know, had been filled by Dr. George Gamota. We have set as a goal the enhancement of the Department of Defense Technical Information Program, and improved support of research and development effort. Whether or not we are successful in our efforts to achieve this goal depends in a large fraction upon the cooperation and dedication of everyone who is here today. We have taken several initiatives in the last year to improve the management of information. We sponsored a DoD Technical Information Conference for R&D managers in March 1981. The primary objective of the conference was to bring together a large cross section of Defense in-house and contractor scientists, engineers and technical managers to assist in the planning of the Defense Scientific and Technical Information program. A second objective was to develop recommendations for program improvement in broad areas that define major scientific and technical information issues. I was pleased with the output of that conference and I believe we achieved the planned objectives.

This Conference has similar objectives and concerns with respect to the DoD Information Analysis Center program. My interest in an enhanced technical information program stems in part from my concern for the Defense technology program and the state of U.S. productivity. The United States is the technological leader today but we can't afford to be complacent. I believe that if the United States means to increase its productivity, it must establish systems and programs which create needed high quality information, comprehensibly document the information, monitor its effectiveness and share it with those who can use it to achieve our common goals. This, of course, is a role of an Information Analysis Center.

Information Analysis Centers have served as a focal point for authoritative expertise in the field of science and technology within which the particular Center operates. They have an excellent reputation and have been tapped by the Department of Defense and its contractors for solutions to technological problems and for the planning of advanced defense systems. I firmly support the role that the Information Analysis Centers play.

There are of course many important and complex issues in DoD Technology Transfer Program that must be addressed. The Information Analysis Centers are an important part of the DoD Technical Information program and I am confident that the output from this Conference will help develop recommendations for their improvement. You can depend upon my support and good luck in your deliberations over the next few days.

I now want to introduce the keynote speaker. We are very fortunate to have Dr. Stephen D. Bryen, Deputy Assistant Secretary, International Economic Trade and Security Policy. Dr. Bryen received his bachelors degree from

Rutgers University and his Masters and Doctorate from Tulane University where he specialized in international politics. He served on the staff of Senator Clifford P. Case, as senior foreign policy assistant and on the staff of the Senate Foreign Relations Committee where he also directed the Near East and South Asian Affairs Subcommittee. Completing post-doctoral work at the Virginia Polytechnical University, Dr. Bryen conducted several study projects for the U.S. Senate on the Middle East, Europe, Africa, and Southeast Asia. Presently, Dr. Bryen is serving as Deputy Assistant Secretary of Defense for International Economic Trade and Security Policy. The subject of his address (our keynote talk) is very important to all of us and is the DoD Viewpoint on Technology Transfer. The subject has received much attention and we are looking forward to hear what you have to say.

Good morning everyone. Thank you Mr. Chairman. I appreciate the opportunity
to be here this morning. I do want to speak to you about the Department of
Defense Viewpoint on Technology Transfer and what drives it. And in that
connection I want to discuss with you a subject of considerable importance to
our national security. This is what we believe today as a large scale effort
undertaken by the Soviet Union to improve the technological quality of what is
its hugh war fighting apparatus. It is our assessment, and I think it is the
assessment of the Reagan Administration, that this Soviet effort is highly
coordinated and that it's being carried out largely by the expense of the free
world by a raid on our technology base. Soviet leaders have learned that they
have access to Western technology, both through legal and illegal channels,
under the guise of purchases for benign and civilian objectives. The Soviets
have obtained, and continue to obtain, a wide range of equipment critical to
their military programs. Where they have failed to get what they want openly
they have resorted to a well coordinated illegal acquisition program. They use
agents; they co-op citizens; they take advantage of unsuspecting business men
and women; they move goods through neutral and third world countries, through
diplomatic pouches; they exploit the weakness in our control system and
thereby gain access to Western technology on an unprecented scale.

Until now the West has failed to respond to this challenge. Our export
requirements were too loose and they still are too loose. Our enforcement
program in the past was too lax. There were too many loopholes in our
international control system. Clearcut violation of our export laws and the
export laws of our allies often were forgiven and forgotten. Violators when
they were caught, either were not punished or got off only with modest fines.
The result of all this was the Soviet raid on our technology base not only
continued, it increased in scope. Let me describe for you how this occurred,
how the Soviets profit as a result, and some of what we are trying to do about
it.

We would do well to recall, only a decade ago, it was fashionable to believe
that the Soviet Union would shift its emphasis from military pursuits to
improving the material well being of its citizens. Many felt that Soviets with
the right encouragement would manufacture fewer guns and instead produce
consumer goods greatly desired by their people. And accordingly a decade ago,
national and international controls were restructured to give the Soviet Union
more access to Western technology and products. And sophicated goods indeed
did flow that way. It is a sad fact that it was the United States itself that
actually requested and received more exceptions to the International Control
Lists for exports to the Soviet Union than any other participating Western
power. It is even more grim to note in retrospect that many of the exceptions
granted to the United States under the International Control Program
contributed directly to Soviet military modernization. And today we can see
the result of the laissez faire attitude of the last decade in the size and in
the technological capabilities of the Soviet military forces. They have
introduced new generations of smart weapons. They have dramatically improved

their air lift capability. They have made their nuclear delivery systems more accurate and they have enhanced computers to drive it, and better communication switching apparatus.

Today the Soviets field some 50,000 main battle tanks of modern design and 20,000 artillery pieces, all of which are protected by sophisticated antiaircraft net of comparable quality of capability. There are more than 5,000 helicopters supporting the armed forces of the Soviet Union including helicoper gun ships, some of which are presently in service in Afghanistan. In Eastern Europe alone there are 3,500 advanced tactical bombers, intercepters, and fighter aircraft. In the last eight years, Soviet military industry has turned out over 1,000 fighter aircraft in each year. The operational supersonic backfire bomber can support Soviet land and naval forces in critical areas such as the Middle East and Persian Gulf. In addition, the Soviets are expanding their nuclear arsenal. Western Europe, Japan, and China are under the shadow of a new family of SS-20 intermediate range ballistic missiles, each equipped with three independently targeted nuclear warheads.

Despite the evidence that the Soviet Union continued its military buildup and modernization program, the liberalized system of international export controls was allowed to persist unchanged. As a result, the Soviets continued to use western technology to support their burgeoning military industrial system. Today there are over 135 military industrial plants operating in the Soviet Union spanning some 40 million square meters of factory floor space turning out more than 150 major weapons systems. In addition, there are hundreds of factories producing both civilian and military goods, with the first priority in these factories on military. And you probably know there is a standby system in the Soviet Union so that purely civilian factories can pick up military production in war time. Since 1970 despite detente, the USSR has increased it's military manufacturing base by some 40 percent. That is the official military manufacturing bases, not the secondary or tertiary systems. In the comparable period our military industry shrank as our defense investment declined. And while we struggled over what weapons system to produce and sometimes didn't produce any at all, and cancelled some programs, the Soviets pushed ahead dramatically.

Their effort didn't stop with just adding additional manufacturing capability. They have been enlarging their research and development structure to support the growing military industry. In aerospace alone, in the past decade, they have expanded their research and development capacity by over 30 percent. The manpower pool of scientists and engineers for research and development also is expanding. In 1980, this base of professionals consisted of 900,000 engineers and scientists; that is the world's largest single group. It is sobering that in 1980 the Soviet Union graduated an additional 300,000 engineers, most of whom will work in military and military related production and design. Even with her massive domestic effort and the additional help the Soviet's can get from Warsaw Pack countries, such as East Germany and Czechoslovakia, the Soviets cannot nor are they trying to go alone. They rely more and more heavily on the products of Western technology and science for their industrial modernization and for new military products.

From the Soviet point of view there are some rather significant benefits that can be derived by exploiting the West's advanced technology base. The benefits include some of the following on the proceeding page:

They can save and do save billions of dollars by acquiring proven Western technology. They can save years of research time. More importantly, they can avoid costly mistakes and errors. And finally, they can know in advance that new systems will work properly, or alternatively, they can know in advance where they have to go if a problem arises, a luxury we don't always have.

The list of technology they have acquired for their military is a long one. It includes high speed computers that are being used for designing modern weapons, for signal processing, for command and control, for intelligence gathering. It includes semiconductor manufacturing know-how that is now used to make Soviet weapons more reliable, more precise and more capable. This technology is also used to assist with commercial navigation equipment and guidance for aircraft, ships, submarines and missiles. They have acquired as well, significant amounts of equipment including machinery that is being employed to support the production capability of the military industrial base itself. This ranges from precision machine tools, two and three axis type - sometimes more, to process know-how technology.

Much of this has happened because our international control system is not working. That control system is centered around a voluntary organization called the Coordinating Committee. You have probably heard about it by the acronym COCOM. Under COCOM critical goods are supposed to be controlled for export to the Soviet Union or to other prescribed countries. But it is precisely these critical goods in the past decade that have been exported legally in this system. Let me give you just some examples of what I mean:

> A good bit of Western ship building know-how and equipment was exported to the Soviet Union, including items like floating drydocks, which not only expand the Soviet ability to repair civilian surface ships but actually helps them to repair submarines at sea. We have seen examples of Western floating drydocks with Soviet military missile submarines.

> It includes heavy vehicle construction plants and plant support facilities, giving the Soviets the quantum jump in low durability and reliability and far better mobilization position. Of course I am talking about the Cama River facility first and foremost. We believe that before the Cama River plant was built the Soviets would have to reach into their civilian economy for trucks in order to mobilize their forces. They do not have to do that any longer. Anyone who watches what is going on in Afghanistan will see many hundreds of Cama River build trucks on duty there.

> Legal exports include Western semiconductor and microelectronic know-how, which has given the Warsaw Pack and the electronics manufacturing base that is operating mostly in the support of the military. In addition, modern printed circuit facilities were exported and continued to be exported to the Soviet Union because we do not at present have any international controls over that technology.

> Now these are the legal acquisitions. They have been supported, where necessary, by even more far reaching illegal acquisitions by the Soviets. Only this past summer, for example, millions of dollars worth of high grade electronic polysilicone and monosilicone, the basic building block material for microelectronics circuits, was diverted to the Soviet Union. Some of it came from here and some of it came from Western Europe.

It does not only apply to small items. Big items too have been illegally acquired by the Soviets. An example, the IBM 360/370 Main Frame Computer. The Soviets wanted that computer at the time for very specific reasons. They were in the business of designing their own large computer and they wanted to model it on the IBM system. They did a good job of that. The copy is nearly exact and it is interesting to note that the repair manuals that the Soviets used for fixing their Readd series computer happens to be the IBM repair manual. Another aspect, it is entirely compatible with all IBM products and IBM peripherals, and IBM software. So the computer that is now manufactured in the Soviet Union and eastern Europe can be augmented from time to time and as necessary by additional Western products with no interface problems.

There are many ways the Soviets acquire embargoed equipment. One way, and it works sometimes, is simply to have goods purchased here and shipped to a neutral or nonaligned country. Then, of course, diverted on to the Soviet Union. Neutral countries do not generally maintain any embargo laws and some of them actually have developed their own rather sophisticated capabilities. Switzerland today, for example, and Austria produce some very sophisticated electronic manufacturing equipment, important to the semiconductor field. Another way you can get hold of Western technology, and the Soviets use this method, is simply to set up front companies. We have just had a case on the west coast. A front corporation, duly charted under some state laws, is a good means to buy equipment that would otherwise be denied. Finally, you can always co-op individual businessmen and women, factory workers, whoever is needed at the time. If all those methods fail, you can always use a trained agent, and there are plenty of those, and they are being used.

Now the Soviets maintain an intelligence system that is keyed strongly on the emerging technologies of high military value in the West. They keep a close watch on the latest developments in the computer industry, in advanced large scale intergrated circuit design and manufacturing know-how, including our VHSIC (Very High Speed Integrated Circuit) program. They watch the developments in magnetic bubble and memory technology, genetic engineering, fracture mechanics, super plasticity, just to name some. They exploit, and they work at this very hard, western technical literature, including the public materials produced by the Department of Defense. I want you to know today that we are about to take steps this week to significantly cut down the availability of that kind of material. they are also participating in commercial and scientific data exchange programs. And through such means they have access to a wide range of information about western business, industry and science. We are going to take some steps to limit their access to some of these programs.

In summary, the Soviets are managing an exploitation network essential to improving the quality of their military and the military industrial base that builds those weapons. They are taking advantage of the gaps of our export control system and the vunerability of the West to easy exploitation. Of course, they are using our free institutions and our open society against us. And because our own national defense programs, and our own war fighting materials have not been modernized fast enough, it is important to note the Soviets are exploiting many civilian technology breakthroughs that we in our own defense programs have yet to fully make use of. It is in a sense at this point that we face the greatest danger. For while we have committed outselves to rebuilding our

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national defense, it is going to take us some time to do it and do it right. It is essential that while we improve our own defenses we close down Soviet access to new technologies that they want very much for their military buildup.

Ultimately, what is at stake is our ability to maintain the quality edge on which our whole defense system is pinned. We have never tried to compete with the Soviets with numbers and we are not going to try to compete with the Soviets with numbers; we can't do it. We don't have the manpower for it; we don't have the industrial base to produce such high quantities of equipment, and we can't move it to where it is needed very easily. We can only maintain the balance of power and maintain the peace I believe, and I think it is widely believed by the Department of Defense today, by fielding better quality, and I don't like to use this term because it is not a popular one, more sophisticated weapons systems then the other side.

So we have before us, I think, the need to maintain that quality edge and one way we can do that is by shutting down the Soviet access to our technology. We are taking a number of steps to see to it that happens. First we are, and we have already done this, we are tightened up significantly, Soviet access to American technologies through legal channels. This is largely an administrative effort and it is working. Secondly, we are going to our allies in a full court press to tighten up the international control system. In January we will have the first high level meeting of the coordinating commmittee (COCOM), by the way, the first high level meeting in 30 years, and we expect to get some results. We have also asked NATO to conduct a major study of technology transfer and to make recommendations to the alliance for cutting back on Soviet access to sensitive technologies important to NATO missions. That study was launched last May by Secretary Weinberger, it is now in full swing and today in fact it is being discussed in Brussels by the Secretary with his counter parts at the NATO ministerial meeting. We expect concrete results from that. We have asked in addition that ministries of defense in Europe and Japan participate in the export control process. It may come as a surprise to you to know that it is only the United States where the Defense Department actually participates and has legal responsibility for export control. In other European countries, despite the fact that the COCOM system is designed to inhibit, if not stop, Soviet access to Western technology for its military buildup, despite that fact, defense ministries in Europe play absolutly no role in the export control process. They are not consulted, they are not advised, they do not give advice. We are seeking very hard to change that and we believe that we have an opportunity to do so through the NATO mechanism and through the high level COCOM meeting where we have advised our allies that we expect the military ministry of defense representation on their side.

Now these are just some of the steps that we are taking through Department of Defense channels. There are other steps being taken through the Justice Department FBI and, Commerce and State, to also add to a rounded program of export control and to stop the illegal acquisition program. We are going to toughen-up customs control and we are going to toughen-up enforcement here at home, and we are urging our allies to do the same. There is a lot at stake in this effort; all of us are working very hard to make it succeed. We have to reverse years of practice that ran the cther way. We have to do it at a time when the economy is not as strong as we would like; when some industries are suffering. Also, when there is tremendous pressure here and abroad to sell

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almost anything to keep economies moving. We would have to do it at a time when, the economy being what it is, we would have to fight like hell just to keep the Defense budget where we think it needs to be over the next five year period in order to rebuild our national defenses. The odds are tough, but we think the effort is worth it, we think the benefits are clear, and in the long term we think that our best interest and our security will be well served.

Thank you very much.

DoD Information Analysis Center Conference
Tuesday Morning, 8 Dec 82
Session I – Technical Information as a National Resource
Dr. Grace Ostenso: Professional Staff, Committee on Science
and Technology, U.S. House of Representatives

Congressman Brown sends both his greetings and his regrets. The Farm Bill
conferees, of which Mr. Brown is one, are in session today. Thus, Mr. Brown was
not able to be here. He has given numerous speeches on this subject and this is
the very first one that he has not personally presented. Information science and
technology is a subject dear to his heart and his interest. He would truly like
to have been here.

There is no doubt, as the title of your session for today indicates, that STI is
a National Resource. Congress is beginning to recognize this fact, although
slowly perhaps, and is becoming increasingly concerned with the multi-dimensional
facets of the efficacy and utility of this national resource. They are
discovering that both producers and users of STI share a number of cross cutting
national goals such as: increasing economic productivity, maintaining national
security; enhancing the U.S. posture aboard, advancing the frontiers of science;
and improving the quality of life. Congressman Brown and several other members
of various committees believe that a careful review of existing public laws and
relating executive directives is needed to address the management, the utility
and the coordination of STI services available in both the public and private
sector.

STI Trends and Opportunities

Let me begin by giving you a few of the trends and opportunities in terms of STI.
These may not necessarily be new. Some of them have been around for a long time,
but perhaps they are more prominent at this point in time since we are beginning
to see rapid advances in the technology itself and thus greater potential.
First, STI is one part of a larger "information world." For many years STI
policies and practices were generally considered to comprise a separate realm of
their own. With the advent of expanding information requirements and services,
supported by advanced information and telecommunications technologies, STI must
now be considered an integral part of the "world" of information and of
comprehensive national information policy.

The second trend is a changing role and changing definition of STI. A need
exists to develop more explicit government policies to define and integrate both
public and private sector areas of STI responsibility. This can only be
accomplished by orientating policy members to the multiple roles of STI and its
potential to solve many of the nations civil sector problems.

A third trend is a need for quality information system. There has been a need
for quality information for a long time and unfortunately that need still exists.
Although many excellent STI information services, particularly bibliographic
systems, are operational, a critical need still exists for products and services
that can provide key factual information specially formated and packaged to be
responsive to user requirements for selected material. Present day information
resources often are not organized to meet problem-oriented needs.

A fourth trend is a need for effective user access and dissemination. Management concern is rising over user accessibility to certain data resources including cost, awareness of existing files, limitations on distribution, government regulation and intervention, protection of data confidentiality, and duplication of data services by government and the private sector.

Five, STI is a critical factor in international relations. Present collection and monitoring systems involving foreign STI material are not adequate. A parallel concern is the expressed need to know more about the STI policies of other nations. Some groups, in fact, believe that consideration should be given to developing "codes of conduct" between nations to facilitate orderly and productive guidelines for the exchange of STI.

Six, Federal agency support for information management is of concern. The importance attached by senior officials in Federal agencies to good information management practices varies widely. Likewise, the importance attached to STI offices appears to be diminishing as they compete for scarce budgetary resources. There appears to be a need to assign a proper value to information resources within the larger context of government operations. Full utilization of STI resources may require a new approach to accounting for expenditures and evaluating productivity in this area.

Last, a need still exists for a focal point to ensure effective STI systems and broad strategic information policy and planning. The need for a dynamic mechanism at the highest levels of authority is needed to insure necessary cross disciplinary STI systems. While the U.S. posesses the most advanced STI systems in the world, its competitive advantage is decreasing because it lacks the policies and mechanisms for coordinating public and private sector STI exchange, and for developing a comprehensive national information policy.

STI Activities in the Executive Branch

Let me next review some of the STI activities in the executive branch and those of particular concern to the Committee on Science and Technology and to Congressman Brown. The current round of budgetary and organizational actions by the Administration related to STI activities also appear to have been done without an anlysis of the impact on the total federal STI activities. For example, the Smithsonian Science Information Exchange (SSIE), for thirty years the only source of information on all federally funded research-in-progress was closed on October 30. I understand their functions are to be transferred to the National Technical Information Service (NTIS), but without additional funds or manpower for implementing the former SSIE functions.

NTIS, on the other hand, now an independent unit which distributes STI for numerous agencies may be moved to the Bureau of Standards or elsewhere, where it will no doubt be in competition with other entities for a piece of the reduced budget. Or, if the Washington Post article of November 20 is correct, Secretary Baldridge is planning to transfer the bulk of NTIS business to private firms. This action would give to the private sector the right to publish and sell government studies and statistics on a profit making basis. Ironically, some of the firms which purchase the government reports were reported to be concerned that prices might go up and service might go down if government withdraws from the information business.

The Institute for Computer Sciences and Technology, created in the National Bureau of Standards in 1965 to promote the effective management and use of information technology within the Federal government and address Federal needs for standards not being met voluntarily, is apparently also a problem to the Department of Commerce. The future of the institute appears to fluctuate from day to day, either being phased out entirely by FY 83 or being given new status by reporting directly to the Secretary of Commerce.

Likewise, the National Telecommunication and Information Administration (NTIA), primarily involved in telecommunications and policy analysis for the Executive Branch, already hindered by a lack of adequate resources, is also expected to receive additional reductions. In fact, at a hearing before Congressman English's Government Information Subcommittee last week, the administrator of NTIA indicated that all domestic and information policy could now be handled by 20 staff members rather than the 70 staff currently working in this area. All of these functions are in the Department of Commerce and yet it does not appear that a comprehensive analysis has been conducted to determine the total impact of these activities on STI or the total information area.

Also of concern is the implementation of the Paperwork Reduction Act of 1980, which has, as its major objective, the management of government information. One of its features is the creation of a Federal Information Locator System to locate existing information and identify duplication in agency reporting and record keeping requirements. Many Federal Information Managers are concerned that OMB is interpreting this directive as a license for managing and controlling the acquisition and dissemination of STI. In my opinion, and in Congressman Brown's opinion, this is not the intent of the Brook's Act. If this concern is real, it could have a serious effect on future research and development activities, not to mention productivity and innovation.

These STI activities are but a few examples of the total information policy issues which the congress must be prepared to address. Other complex issues include: the role of government in research and development; the role of government in the application of information technology; regulatory reform in the information and communications industries, including the challenge to encourage diversity and competition without inhibiting technological innovation and jeopardizing our national leadership in telecommunication R&D; the role of U.S information policy in international relations; and the role of government in information availability, accessability and management.

Information policy issues must be coordinated through a Federal focus for government-industry cooperative efforts. The Office of Science and Technology Policy has statutory responsibility for research, planning and coordination of scientific information activities. In the past this responsibility received little attention in OSTP. The Reagan Administration's Science Advisor, Dr. Keyworth, has indicated information is a priority issue and we trust his definition will also include STI. Perhaps the OSTP representative who follows me on the program today will provide additional insight into their priorities and plans in this area.

Information is an important national resource, but only if it is organized into a system which is both accessible and meaningful to the ultimate user. The management of data from collection to retrieval is significant because of its centrality to decision making and problem solving, and because of its

considerable economic cost. In the Federal Government alone, estimated expenditures for data processing in FY 81 were 6 billion dollars.

There is an obvious need within the federal government to address the issue of how to structure the collection, storage, and processing of data, especially scientific and technical data, in a more rational way. There is also a related need to examine the effectiveness of significant statutes which address these problems. For example, approaches to the management of scientific and technical information have been ad hoc and piecemeal. Agencies have not considered in a systematic way the impact of their actions on government-wide information problems. New initiatives are needed to address the storage, access, packaging and dissemination of scientific and technical information purchased by taxpayers through federally funded research.

Federal agencies have a responsibility to ensure that their information resources are efficiently and effectively managed. The GAO and others have identified instances where the Federal Government is providing information services, free or at less than full cost, which are also available in the private sector. The questions are: Who in government should be responsible for processing and disseminating STI? What level of STI should be administered by government? Is the government assuming a legitimate function of the private sector? Under what circumstances should the government create information and information networks? Is the user fee concept, which is being implemented by this Administration, a viable and appropriate mechanism when the taxpayer has already supported the acquisition of the data? What effect will the user fee concept have on the dissemination and the use of scientific and technical data?

STI issues aside, there is little question the United States is doing an inadequate job of strategic policy planning for the information future. The decision we make about this future will have profound implications, not only for our economic well-being, but for the size and structure of the work force; for the evaluation of our educational institutions, for personal privacy; civil liberties; and for many other concerns central to our personal and societal values.

At the present time, the responsibility for Federal research, development and policy activities concerned with information is uncoordinated and fragmented throughout numerous agencies, and there is no effective forum where government and private interests may cooperate in consideration of policy issues. An integrated approach would require that information technology and its development be considered together with the potential economic and social impacts of this technology, and with policy issues regarding information access and information delivery. It would not require that all these activities be performed under the same roof or even by the same agency; but it would require coordination of activities and high level planning and direction. The lack of a mechanism for connecting concerns for the development of this powerful information technology (primarily scientific and technological questions) with the consideration of policy issues which the employment of this technology inevitably raises (primarily economic, political and social questions) motivated Congressman Brown to introduce H.R. 3137, the Information Science and Technology Act of 1981.

The Science and Technology Act of 1981
I will spend a few minutes on the background of the Information Science and Technology Act. One of the assumptions underlying the Act is that in many areas

we do not yet know enough to make wise policy choices. We need to pull together what is known, separate the true "facts", from the false "facts", fill some of the gaps in our knowledge, and analyze the consequences of the different courses of action open to us.

The mechanism proposed in the Bill for doing this is an independent structure in the Executive Branch, called the Institute for Information Policy and Research. The Institute would not itself be a policy making body. It would, (as the Nora and Mine report, "The Information Society", describes (the role of a similar institute proposed in France)) analyze, warn, alert, propose and persuade. The Bill gives the Institute a lifetime of 10 years, unless extended by the Congress. It is viewed as a transitional mechanism to facilitate our Nation's evolution into an information society. The Institute is not intended to conduct basic research in information science and technology or to develop hardware. It would not itself determine policy nor would it have any regulatory authority.

It is important that the Institute have strong links with the information community and with the body that will ultimately formulate information policy, the Executive Office of The President. To help build those links, the Institute would be under the general direction of a National Information Science and Technology Board consisting of 15 members appointed by The President and drawn from government, industry and commercial interests, as well as science and educational institutions. The institute would have a procedure by which organizations and institutions with a serious interest in information issues could become affiliates. Along with the diversity of viewpoints expressed by the Board, this provision is designed to promote cooperative interaction among government, industry and commercial interests, and scientific and educational institutions. In developing the programs of the Institute, the Director is instructed to consider the concerns of the affiliates, as well as to consult with the Board.

In addition to the initial 3-year appropriation for the Institute, the Board would set a fee schedule for afiliates. The Institute would evolve toward a joint public/private funding arrangement somewhat analogous to that of Japan's Research Institute for Telecommunications and Economics, or England's National Computing Center. The Institute's emphasis is on policy and research which are of overall national importance and which transcend particular agency missions. Not surprisingly, these are precisely the kinds of issues which everyone assumes that someone else is looking after.

The Subcommittee on Science, Research and Technology held hearings on the Bill in late May. The hearings used the bill as a focal point to review the issues raised for the private sector and all levels of government by the transition of the U.S. to a society based increasingly on information products and services.

The contrasting views of the Information Industry Association (IIA) presented by their Vice President Robert Willard, and the views of the Executive Branch expressed by National Telecommunications and Information Administration (NTIA), illustrate the range of opinions which the Subcommittee received on H.R. 3137. The Information Industry Association commented, "Our review of the legislation convinces us that it will provide a mechanism for addressing a large range of information policy issues. We also feel that the capabilities it will provide are limited and that such limitations are perfectly appropriate. As we read the legislation, neither the Institute or the Special Assistant have the power to set information policy and we endorse that

approach." IIA also stated that, "NTIA's Office of Policy Analysis and Development should remain a separate entity to provide the President with policy support on positions he has chosen." They foresee NTIA as the advocate of the Administration's position once the Institute has made available to The President the range of considerations and alternatives necessary to come to a decision.

NTIA, on the other hand, stated "virtually all of the desirable objectives and shared goals of this proposed legislation can be achieved, and indeed are being pursued within the framework of existing laws and organizations. The Administration accordingly does not support this proposal. We do not believe, moreover, that this proposal would substantially advance the goal of providing good policy research and analysis in support of policy decisions. Indeed, in separating the policy research from the policy making, the proposal could adversely effect forward progress in this area."

In general, the witnesses agreed that: information policy was an issue of high priority; current responsibility was fragmented; the proposed Institute/ Board/Affiliate structure had merit, but the present political climate was not conductive to new structures; and information concerns should have high priority in the federal government.

The testimony is now being analyzed and the Subcommittee recommendations for future actions will be prepared based on that analysis. The Subcommittee intends to continue its work in this area and solicit a wide-range of viewpoints on information policy needs, how those needs can be met, the barriers to unmet needs, and appropriate action to accommodate the goals of H.R. 3137, if the Bill as presently formulated is not the answer.

Thus, I leave you with some of the questions I raised earlier: what should the role of the federal government be in facilitating the transition to an information society? Does H.R. 3137 adequately address the information policy needs of the U.S.? If so, can the goals expressed in this Bill be achieved through the Institute/Board Affiliate framework proposed, or are there more effective mechanisms or institutional arrangements, either voluntary or legislative? Our Subcommittee staff, as well as Congressman Brown, would be interested in your comments and proposals for other ways to achieve what appeared to be the correct goals to approach comprehensive national information policy. We would appreciate any assistance you can provide toward finding an effective way to accomplish those goals.

QUESTIONS AND ANSWERS
Dr. Grace Ostenso

Question:
Doctor, I am Harry Pebly, I manage one of the information centers. Now there is a long standing problem that has been brought into focus again this morning by the previous speaker who was talking about the philosophy of restricting the flow of information, in my opinion. Another point of view, which I think perhaps your office would represent, is that the information centers have always been guided to disseminate information as widely as possible. As a matter of fact, the information center's have a mandate to recover as much of their cost as possible by trying to sell and use NTIS. Do you have any comment on that seeming contradiction?

Ostenso's response:
We are aware that this kind of dichotomy is in existence and I think the thing we are searching for at the moment is coordinated information policy to balance national security considerations with the perceived need to restrict transborder data flow. Congressman Brown frequently makes the comment that the UNESCO debates on the New World Information Order exemplify our lack of foresight. Mr. Brown has proposed for many years that we make our information and communication technologies more readily available to developing countries to assist their development efforts and to achieve a partnership with them. If we had used the area of information technology to dissiminate information that would be helpful to them in meeting their own needs, we would not have had to debate, at recent UNESCO meetings, issues concerning freedom of speech and the exchange of STI. We would be interested in any thoughts you may have on how to remove the barriers to the free flow of information.

A response by Dr. Young:
It is under active consideration in DoD and elsewhere and a lot of people are very much aware of the fact how do you, if possible, actually slow down the flow of information to undesirable countries and at the same time facilitate the flow of information in this country. Clearly these are incompatibles and you can't stop the flow completely; all you can do is slow it down in the other direction. You can only do so much in facilitating in this country and that balance is hard to find. There are extensive discussions taking place. We could use all your help and I don't know how it is going to come out in the end.

Question:
I am Jerome Pearson of the Air Force Wright Aeronautical Laboratories. How would this 10 year Institute be funded and what kind of levels were you thinking of?

Ostenso's response:
It would be funded through appropriations directly to the Institute itself. The funding levels authorized to be appropriated by the bill were 6 million for FY 83, 8 million for FY 84, and = 10 million for FY 85.

Question:
Does that bill have support in Congress now as to being passed possibly in this coming session?

Ostenso's response:
It is unlikely that it will be passed in this coming session. The Subcommittee
is currently putting together its recommendations concerning the Bill. We have
had hearings. The next step would be to develop revisions based on the
hearings and other suggestions received. It is unlikely that the Bill would be
passed in this Congress, but I can promise you that the work on getting the
goals of the Bill, whether through legislation or other means, will be carried
out by the Subcommittee.

Question:
Are there any comparable institutes in the Executive Office from which you can
draw this experience?

Ostenso's response:
There are other institutes proposed in other bills such as the Technology
Foundation. Actually, the National Science Foundation began as a separate
institute within the federal government to address research and development
activities. NSF has grown into a longstanding federal agency. The Institute
proposed in H.R. 3137 has a sunset clause and one of the functions of the
Institute would be to give some recommendations as to where this responsibility
for high level coordination and policy direction ought to be placed within the
existing structure. Thus, it is not the intent that the Institute would become
a longstanding independent agency such as NSF.

Question:
I see the dichotomy but my thoughts are not clear. I would like to relate to
my perceptions and have you play back with some corrections where I missed the
boat. I perceive that Congress does not consider its own role to be that of
establishing policy. It perceives policy to be a function of the Executive
Branch, however, Congress does perceive it has a legitimate role to legislate a
mechanism by which the Executive Branch establishes policy, and proposes a
mechanism for doing that with a ten year body that has no policy or procedural
authority. Do I perceive that correctly?

Ostenso's response:
That is essentially correct. The purpose of the mechanism proposed in H.R.
3137 is to develop a basis for policy determination.

Question:
How can a body that doesn't perceive that it has a policy function go one step
further and legislate the mechanism by which policy is devised?

Ostenso's response:
Congress, in one sense, has policy setting responsibility, but the final
development of policy is usually the role of the Executive Branch. Congress's
role is to shape and direct policy and to determine where and what types of
policy are needed to meet societal goals. Congress also has comprehensive and
appropriate policy being formed. The intent of H.R. 3137 is not to alleviate
the Congress from its policy making responsibility in this area. The intent is
for the Institute to develop recommendations on what directions policy ought to
take and how policy can best be implemented within the Executive Branch, and to
provide Congress and the Administration with the necessary knowledge on which
to base wise policy options and conduct the oversight that is necessary to
achieve appropriate policy action through legislation or other means.

Question:
Has there been any thoughts as to how to assign a value to STI resources?

Ostenso's response:
I think there has been some thought given to that in the past; at least that was not a totally new idea of mine. The Science and Technology Committee about 5 years ago held a workshop in conjunction with the Library of Congress on STI issues. One of the recommendations of the workshop groups at that conference was that a value ought to be assigned. There were some thoughts given as to how it might be done, but I don't think any specific options were proposed. The Subcommittee would certainly be interested in any proposals related to the value of STI and how those values might be developed. Some indication of the value of STI products and services is necessary to relate it to productivity and economics, and to the need for and effectiveness of STI activities.

Question:
I'm Janet Brooks, the Defense Communications Agency. I assume we agree that STI and all the information resources have proven to have cost effectiveness far beyond the cost approach. However, the trustee organizations which fund the information services frequently do not see the cost effectiveness because they do not use the correct tools to measure them. The Audit Service, the GAO and other activities which have in the past measured productivity of information resources, in my opinion, don't use the proper tools. I would like to see Congress take some interest in what variety of tools are available, what alternative tools are available for measuring the cost effectiveness of information resources or have been given. I believe that it can be demonstrated that most of the DoD information facilities more than pay for themselves.

Ostenso's response:
Indeed we do need some way to evaluate the effectiveness and the worth of STI activities. Because the value of STI is not measured at the present time, STI may not be fully appreciated by those who are providing the funds for that kind of operation. Some of the tools that have been used in the past to measure these values may not have been appropriate and we do need some better ones. I expect that the reason that the tools used in the past were inappropriate may be the lack of the development of measurement methodology. If anybody can suggest the best ways or even options, we certainly would be interested in knowing about them. I might tell you in that context that the Subcommittee does plan, early in the next session, to look at in a general way, perhaps not in a hearing format, the impact of the organizational and budgetary actions and STI activities. The evaluation of the effectiveness and the value of STI could be one of these issues under discussion.

Question:
I'm Earl Kirkbride from the Naval Research Lab. You mentioned that there were some activities by the Administration to move information dissemination activities from one place to another. I seem to detect that you believe at least that this was an attempt to, in the guise of reducing cost, reduce the flow of information. I intreprete it that way. It appears to me as a citizen that there are many other attempts to reduce the flow of information from the government to the people, i.e., headline hunting things and making fun of publication. My question really is this: Is there any intention of the Congress to conduct any kind of hearings on the effects of these various administration activies to reduce the flow of information?

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Ostenso's response:

I don't know of anything at the present time that is scheduled, however, there has been some activity in that area. The hearings that I referred to which were held by Congressman English's Subcommittee on Government Information and Individual Rights indeed focused on that issue and included witnesses from the State Department and the U.S. office of the U.S. Trade Representative. Our own Subcommittee will conduct some activities in this area. We plan to request briefings from several Departments concerning current considerations and actions regarding the free flow of information. If specific concerns are identified, no doubt they will precipitate hearings.

Question:

What is the machinery on the Hill to coordinate how the House and Senate are looking at information?

Ostenso's response:

I don't like to say this, but I must confess that the concerns about fragmented and uncoordinated activities within the Executive Branch are not too dissimilar from those of the two Houses of Congress. However, we have held joint hearings and we have held joint workshops on numerous subjects. Another mechanism is the personal interest in a subject by one member of the House which may be shared by a member of the Senate regardless of their special committee responsibilities. This mechanism may be one of the strongest ways in which coalitions are developed to address specific issues. House and Senate taskforces have also been put together on specific subjects which give members an opportunity to express their views and plan for joint activities. Obviously, if a bill is introduced on the House side, it is not going to go anywhere until a counterpart bill is introduced on the Senate side, so communication and coordination between the two sides is promoted through this mechanism also.

Question:

I'm Ed Richards of the GIDEP program. You mentioned something suggesting that NTIS may be given to the private sector to run instead of the government. Has there been pressure on the congressional members to get some legislation so that the government will get out of the information business and give it to private industry.

Ostenso's resonse:

From my personal experience as Subcommittee staff, I have not seen an organized expression of interest to encourage the Congress to reduce Executive Branch involvement in information activities or allocate those activities to the private sector. I have heard concerns expressed by individuals about actions to reduce the Federal role. But I have heard from Federal role. I have heard from organized interest groups on either side of the issue.

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DoD Information Analysis Center Conference
Tuesday Morning, 8 Dec 82
Session I - Technical Information as a National Resource
Dr. Joseph E. Clark: Office of Science and
Technology Policy Views on STI

It is true, as others in the administration said earlier, that use of scientific and technical information is a major concern of the Reagan administration. In this time of re-examination, institutional change and evolution of innovative policies many of us are re-examining the premises and assumptions under which we have operated in recent years.

As a professional working now in the Federal Government, it is a very exciting and very challenging time. Perhaps it is not a way that many of us would like to be challenged, but I think it is a very good and timely thing for us to re-examine basic science and technology policy issues, including those related to collecting, analyzing and disseminating scientific information.

Specifically, in the case of scientific and technical information, current issues include the role of the federal government, the appropriate interface with the private sector, our national versus international interests, as well as, the potential conflict between maintaining a healthy scientific enterprise and meeting national objectives in defense. This is a very vital, very important time to have the best brain-power and the best people working on these issues. So, it is a very exciting time and it is necessary to get past budgetary questions and get to the heart of the policy questions which underlie budgetary implementation of policy decisions.

In this administration, it was the closing of the Smithsonian Science Information Exchange, Incorported, that brought OSTP to focus on this area of science policy.

It was very difficult to find many people who strongly supported continuation of SSIE. The question that we were asking was whether OSTP should agree or disagree with the policy decision to close SSIE, which had been taken by the management of the Smithsonian Institution.

There were fundamental questions about the role of the private sector (SSIE, Inc.) versus the role of government in scientific and technical information that were at the heart of the SSIE difficulties. We spent considerable time talking to the management of SSIE, the Smithsonian Institution, NTIS, and numerous agencies, in trying to help with the transition of the core functions of SSIE into NTIS on a 100 percent cost-recovery basis. These are really a microcosm of the issues mentioned earlier. We are working hard to try to see that those SSIE functions that have developed over the last 30 years, those which really need to be maintained and perhaps strengthened, are appropriately addressed. We are considering views of the interested parties, including the information industry, federal information managers, and private researchers.

We also need to examine where user charges fit within the context of scientific and technical information systems: who pays, how much do they pay, how do we appropriately allocate the cost? Should cost be recovered by a free market

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pricing system or should scientific information be considered as a public good which is paid for by the tax system? Those are basic and difficult issues, and we are really just beginning to understand the questions.

My analysis of issues concerning scientific and technical information indicates that we do need to have an appropriate federal presence in scientific and technical information.

There has recently been a good study of the general issues by a task force of the National Commission on Library and Information Systems. They issued a report on the relative roles of the public and private sectors, identified many of the critical issues and made some recommendations which are worth your review and analysis. Such studies are critical to making those wise and difficult policy choices that will face us during the next year.

I would next like to make a few specific remarks about two areas of legislative activity: the Stevenson-Wydler Technology Innovation Act that passed the last congress and patent legislation.

There is a problem with respect to this Act that we all need to be clear about.

The Stevenson-Wydler legislation is generally regarded as "interventionist" by this Administration. Specifically, grants for generic technology centers are considered to constitute an overly interventionist federal role. However, Section II of the Stevenson-Wydler Act is in fact not so interventionist. Moreover, the general policies and goals of the Stevenson-Wydler Act can be supported by this Administration. So, it is necessary to be careful when discussing the Stevenson-Wydler Act, to differentiate between its goals, objectives and general policy and how those are implemented in Section II of that Act, versus most of the other sections of that Act.

Section 11 calls for the establishment of Offices of Research and Technical Applications. I am pleased to see that many agencies including DoD are giving this serious attention. I am also pleased to see that changes are being made in Federal laboratories to ease appropriate access to their technology. Offices of Research and Technical Applications are good locations for those "gatekeepers", those technology transfer agents who can assist the technology transfer and technical innovation process.

Secondly, in terms of Patent legislation, I call your attention to the 28,000 patents which are owned by the Federal government. This patent portfolio is a result of the historic federal predisposition to keep title to invention of R&D contractors and Federal employees. The very low utilization rate of these patents (less than 5 percent of those federally owned patents are commercialized) is a matter of grave concern to us. The last Congress granted the first right to title of such patents to small businesses, nonprofit institutions and universities through Public Law 96-517. This policy change was made so that R&D performers who have historically been those most likely to commercialize those patents, would in the future put those patents into commerical use. We are working in this administration with both House and Senate committees to have that policy extended to the entire private sector. The notion then is that R&D contract performers, basically outside of government, would get the rights to the title of those patents which are based on the intellectual property that they produced, thus should capitalize on the historic fact that the probability of

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commercialization is greatly enhanced when R&D performers have patent title rights, particularly if they have a commercial position in the market where that technological innovation is needed.

I want to thank you for giving me the opportunity to be with you.

I would be pleased to address your question.

QUESTIONS AND ANSWERS
Mr. Joseph E. Clark

Question:
Mr. Clark, one of the comments that is heard quite often relates to the lack of an appropriate forum mechanism for your office, for example, to properly hear the views and opinions of the people who are involved in scientific and technical information. The COSATI, the Committee on Scientific and Technical Information, certainly had a lot of drawbacks, but it did provide such a forum. The question is, is there any thought in recreating perhaps not a new COSTI, but some mechanism to create a forum, a platform from which people can be heard?

Clark's response:
The question relates to OSTP mechanisms for getting input, I believe particularly from federal information managers, but also I think necessarily from private information managers. The answer is yes; we are giving serious consideration to what kinds of mechanisms we need to reach out to those who have varying perceptions of the use of intellectual property, whether in the patent field or in the scientific and technical information field . . . whether we activate something under the FCCSET mechanism, the Federal Coordinating Council for Science, Engineering and Technology; whether it should have public and private sector membership, what the level of activity should be, how many people need to be involved in order to get all the necessary and appropriate inputs. Those are matters of active discussion now and we would welcome any thought that you might have on this subject. This is really a part of our overall assessment of how OSTP should deal with a broad range of issues which is ongoing.

Question:
I am John Gilman, Institute for Scientific Information. Could you put aside the matter of scientific information as such and address the matter of science and technology as perceived by the Reagan Administration and by your organization.

Clark's response:
Yes, perhaps I am remiss in not having said some things about OSTP in general, and where it fits within the Reagan administration. I would refer you, by the way, to an article in last week's Chemical and Engineering News which quoted and editorialized on a presentation that Dr. Keyworth made to the Council of Scientific Society presidents. It is an excellent one page article on that subject.

The Reagan Administration considers that federal support for basic research is essential. The Administration also considers that the private sector needs to be strengthened, particularly in performing demonstration or development. Basic research is considered that long-term exploratory activity supported, for example, by the National Science Foundation, National Institutes for Health, and the 6.1 programs of the Department of Defense. That is what the Reagan Administration considers to be the essential federal role in research and development support.

I have recently been looking at the question of what may or may not fall in the crack when the federal government supports basic research and the private sector supports those various applied activities. There is a question on how one

engages those with one another which is done very nicely through a sophisticated research management system in DoD but which is not matched in most other Federal research agencies. We are much concerned about technological innovation in general, its relationship to patent policy, and its relationship to scientific and technical information systems.

Question:
Joe, you were talking about the things that may be coming up; I assume you were talking about the Schmitt bill and Ertel bill. Could you also give us your assessment of the administration viewpoint of the essense of these bills.

Clark's response:
The question relates to current patent legislation in the House and Senate and the Administration view of Senator Schmitt's bill and Congressman Ertle's bill. The Administration is very supportive of those bills. There are some difficulties with how they are currently drafted, but we are in the process of working out minor differences. We are in contact with House and Senate staff in discussion of modification of those bills that would strengthen them and would better meet the objectives that we are all agreed upon. The general purpose is to extend the legislative policy of Public Law 96-517, which is to provide first right to patent title to the R&D contractor. There is now an Administrative markup of the Schmitt bill which represents the Administration position which was hammered out over many months. We think it is good legislation which really will give a boost to technological innovation.

Question:
Would you care to comment on some of the potential or current conflicts between the Department of State and the Department of Defense with respect to the policy of dealing with our national technological base as a national resource, especially regarding export, perhaps in particular to neutrals and to the difficulties we recently had in Sweden.

Clark's response:
The question relates to some of the current controversy involving the State Department, Defense Department and other interests in International Technology Transfer. I am not familiar with the particular Swedish case that you referred to but I would like to learn something about that. My involvement with such issues has been relatively limited. Generally, these issues concern the balancing of the national interest, our international interests and the interests of the global scientific enterprise.

One problem is how to assure appropriate dissemination of technical information to ensure domestic use without jeopardizing our national security. In the case of the Fish amendment to the Ertel bill, one question concerns how to ensure the appropriate dissemination of patent information and the patentability of U.S. inventions in foreign countries. There is particular concern in those areas that we may not have bilateral agreements for scientific and technical information exchange. These questions are not settled at the current time, but we have worked closely with the Office of Management and Budget as well as, those in the State and Defense Departments. I have not yet talked to research managers in the Department of Defense about this issue, or for that matter the technical information managers about it. I know this answer is not very satisfying, but it is an accurate reflection of the unsettled current state of these matters.

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Question:
Toward the end of your answer to the direction of the Administration you
mentioned three areas of basic research; you said NSF, NIH, 6.1. Can you
elaborate on that area at all. Can you give any more specifics on the
direction of the present administrations support in the areas of science and
technology.

Clark's response:
Do you mean elaborate beyond those specific examples or within those specific
examples?

Question:
At your will, either.

Clark's response:
Let me tell you a story that may help to answer the question. In the last
administration one of the jobs I had was to try to match up a list of state and
local government needs for technical information with federal research and
development activities. We went through a major exercise in asking some 40
federal agencies who conduct research and development what research they did
compared to what state and local government needed. We spent about a year
trying to match up an enormous pile of information that we got from all these
agencies with this list of needs for technical information. One of the basic
messages that came back from the agencies in response to the White House
Memorandum that asked them to provide information to make this match, was that
basic research isn't related to any of those problems in a way that we can
define. They also said research related to intelligence and international
activities is not closely related to those domestic needs. That left us with
having chopped off two tiny ends of a very broad spectrum of $40-billion-worth
of research and development activity which is conducted in the federal
government.

One thing that I learned from that exercise, which is relevant to your
question, is that what would be considered basic research in one agency is
very different from what is considered basic research in another agency. For
example, the National Science Board not too long ago decided that there was no
objectively discernible difference between basic and applied research. They
underwent an internal reorganization which was based in part on the premise
that they could not differentiate within the National Science Foundation
between basic and applied research. If you can't differentiate between those
in the National Science Foundation, I'm not sure how you can differentiate
between basic and applied research activities in other agencies. It is really
very difficult. There are however, some general OMB definitions of basic
research, applied research, development, demonstration and technology transfer.
Use of these definitions to circumscribe the policy of the Reagan
Administration to support basic research is going to be subject to a modest
amount of case-by-case interpretation.

Ladies and Gentlemen I would like to get the afternoon session started. This afternoon session is entitled Future Directions for IACs. My name is Jim Suttle and I am in the Office of the Under Secretary of Defense for Research and Engineering temporarily, working with Dr. Leo Young. I have been here since July. My regular job is with the Army Research Office in North Carolina where I am the Director of the Electronics Division. I came to DoD around the first of July to help out in this office, and just before I arrived, the director left, the previous rotators left and the secretary quit. I found myself in an awkward situation. And as Leo said we find this office has basically two functions, one having to do with research and the other technical information. The part having to do with research I felt I knew a little something about. The technical information part I didn't feel so confident about. Almost immediately Hu Sauter and other people proceeded to come in and explain how this program needed expanding and that program should be reduced, and I found that, much to my dismay, six or seven of the DoD Directives or Instructions were due to be updated three months ago. So now that Leo is on board, he has these things as well as technical information, which haven't been touched for the most part.

Now, this morning's session dealt with fairly broad issues dealing with technical, managerial and policy issues of concern to those who work in the area of scientific and technical information. This afternoon session on Future Directions for IACs gets closer to the Conference title, I think, and without further ado I would like to introduce the first speaker, Mr. Jerry Persh, who is also in the same office that I am in, or at least the same office under the Deputy Under Secretary for Research and Advance Technology. Jerry is a staff specialist for materials and structures and he will talk to us about the role of IACs in this important area of research.

Now we have to get down to our part of it; here is the real time situation. We heard about the policy deliberations but we are dealing with a immediate situation. Now we are in real time and things have to be done.

This is the title of the session, but as far as the future direction is concerned I would like to break that down into two parts. I don't know what the long range future directions will be and we probably won't know for quite awhile. We have a pretty good idea where we are going in the short term. By this I mean in the next few weeks or few months, so it is sort of a two phased operation and as is usually the case the materials area turns out to be the bell weather. I will be discussing the materials centers as a homogeneous community, recognizing that each one serves a special segment of that community. The remainder of the IACs such as the CPIA, DASIAC and so on, serve other communities and the rules of the game or how they operate may be different for those other centers. I think it will be very, very difficult to have an overall philosophy for all of the IACs because of the different communities they serve, but anyway we would like to take a good look, and I think it has to be a good look, at the material centers.

These five centers deal principally with materials. Each one services a different segment of the community and upon deeper examination, it is more heterogeneous than homogeneous. We have many people looking over our shoulder at what we do with these centers. We have investigators from here and there and the other place. We have also to worry about whether or not these centers are really helping us. Because of this visibility I asked myself a series of questions.

Keyword in all these items is Department of Defense. These centers are funded from the Department of Defense budget and they have to serve the Department of Defense.

First question: Are they demonstrably useful? Now I don't mean counting the number of inquiries or requests for information because for all we know 50 or 100 percent may not be useful for DoD. We have to know from where these inquiries come and what is done with the response when it is provided. When information is necessary to the production of a major weapon system and that can be shown, then it is useful. It has to be demonstrated that it is important to the Department of Defense. Is it information to be put into the back of a report which is to be given to an audience not important to the Department of Defense? That evaluation has got to be made. So we have to look at who is getting this information and what they are doing with it as it is related to the Department of Defense mission. That is what I mean by demonstrable.

As far as the second question is concerned, you find that maybe some of the information that the IACs are putting out is obtainable elsewhere. Elsewhere could be a professional society meeting. You find that some of our major contractors don't believe anything they get from anybody and they have to

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develop the information themselves. That is the only way they will accept it. Maybe they will use the Information Analysis Center to check their information. That is important, but we have to examine whether or not that information can be obtained from somewhere else or whether it is unique in terms of the Department of Defense needs. Whether it be major system development, or research and development, whatever, but in many cases I think we will find that information is otherwise available.

The third one is a pretty important one and here again the actual user community has to be asked "Are you getting this information in the best form?" Whether it be a report or data or a thought about something, we have all sorts of newsletters, we have data sheets, but is that the best form? Maybe we want to have conferences? Maybe that will be the best form. I'm just not so sure that the traditional way of doing things is the best way for these IACs to get the information out to meet the Department of Defense needs.

As everybody knows we are in a fairly substantial defense build-up. There are many production contracts out. We are building airplanes, ships, tanks and so on. Traditionally the IACs have been oriented toward the research and development community, but the general center of gravity of our funding and programs is toward production. Perhaps the IACs are oriented improperly based on the Administration direction, Department of Defense direction and maybe it should be directed toward the acquisition community, production community. We should find out. I know we should find out what those peoples' needs are. Whether or not they have need for information within the IAC complex. That has to be asked because we are spending billions producing equipment.

MATERIALS IACs QUESTIONS

o ARE THEY DEMONSTRABLY USEFUL TO THE DoD?

o ARE THEY FULFILLING A DoD NEED THAT IS OTHERWISE NOT BEING FULFILLED?

o ARE THEIR PRODUCTS/SERVICES IN THE BEST FORM FOR DoD NEEDS?

o SHOULD THEY BE ORIENTED TOWARDS THE R&D AND/OR ACQUISITION/PRODUCTION
   COMMUNITIES?

o ARE THE FUNDING ALLOCATIONS ALIGNED WITH DoD PRIORITIES?

o DO CHANGES HAVE TO BE MADE IN THE DIRECTION, COVERAGE, PRODUCTS, MANAGEMENT,
   FUNDING, ETC. OF THE DoD IAC PROGRAM?

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QUESTIONS AND ANSWERS
Mr. Jerome Persh

Question:
I have an obvious one, you didn't list PLASTEC among your information centers, they are a material. I hope there isn't a message there?

Persh's response.
No message there Harry. I listed only those that are funded out of DLA. I know we have PLASTEC and Col. Kuster will be talking about the composite center.

Question:
Is there any reason why these centers couldn't be centralized into a central information base?

Persh's response:
No, that could be an option. As I say, I don't know the answers.

Question:
Since there is a need for changes in the centers, has there been any consideration given to creating a telecommunications information center? It seems to me that there is a crying need for that.

Persh's response:
That will be factored in.

Question:
Charles Fridinger, Naval Surface Weapons Center. At this time, is there any degree of uniformity in the operations and funding of information centers?

Persh's response:
I think the answer is that I think there is too much uniformity, but the funding is not uniform. I think the communities that are served each require their own special treatment; special way of doing business.

Mr. Suttle's response:
Let me address this. In spite of the fact that I was lighthearted about my knowledge of this subject, I have learned something over the last few months. There are some 20 or 21 of these, I am not sure of the exact number, about 12 or 14 are under contract, funded at different levels. The funding level is dependent upon the requirements placed in the contract for that particular area of interest. There are a number of others that are run in-house. For instance, the Army has some seven of these, I believe, that are in-house operations. Obviously, those are funded differently and managed differently than those that are done under contract.

Of the people who came to see me shortly after I came on board, the people from the Defense Audit Service, were concerned with several issues. One issue was the management scheme for the IACs in general and one of the first things I noted to them was that each one is specific. Each has a different kind of goal. There may be some that have common goals, but there is something different in the makeup of each of these and one has to take that into account.

This would not only affect the funding level, but the management concerning that particular IAC as well. There were questions concerning the overall management from a policy standpoint and that might dictate to the kind of question you are raising. The DoD Instruction (DoDI 5100.45) which governs the operations of IACs is being revised, some revision is needed, the thing is 15 or 16 years old as I recall. But the intent of the IACs is exactly what Jerry has stated. Each one is started on the basis of some specified and demonstrated requirement to fill a DoD need. The level of funding and so forth is different, but that depends on the particular area that we are considering.

Question:
In your studies for determining the usefulness of the data to DoD, the information you are providing to users, have you run any studies as to what the value was, and how do you measure it, or what do you have in the way of techniques to get this evaluation?

Persh's response:
I personally haven't run into any studies. The only technique that I know of right now is hard work. I don't think it is going to come out easy; it is not an easy thing to do.

Question:
Are you presently doing anything that way or are you just planning it?

Persh's response:
Planning it, but I don't think there is an easy way to get that answer, I think it is going to take a lot of hard work.

A response by Dr. Suttle:
Thank you Jerry. This question of a metric for information systems is a very serious one. It is not unlike what one finds in the area of basic research. Basic research frequently comes under the gun at various levels and the question in DoD is frequently what do we get for this. I would be the first to admit, although I've been involved with basic research in the Department of Defense for 20 years that it is probably not the most efficient way to build weapon systems. The basic research question is something you can't do without. If you don't do that work to provide a base of knowledge which is available when someone needs it, you are in real trouble. We can generate samples of accomplishments just as people in the information area do, but I think the answer is basically the same, you have got to have it. The question of how you measure it is a difficult issue. In some areas it may be easy to do; I don't know. Jerry is unclear in his area and I think depending on what the nature of what the subject area is, you get a different answer. In the information area, when I asked how useful is that system, again my experience over the last few months, typically, the answer I get back is we had 1,600 calls for use of that system this month. That is not the answer. I call that information system a lot and ask questions and it is totally useless, but it adds to the numbers. There has got to be something firmer than that in justifying the existence of an information activity. Whether it is an IAC or any other type of activity. If we are going to justify this in context of what Jerry was saying, the usefulness to DoD, we have to find some way that is convincing to those people who ultimately provide the funds for those operations in order to continue them.

Our next speaker, Mr. Charles Miller, is the Program Director for the Federal Laboratories consortium and, like myself, he is here on a temporary stint with the National Science Foundation from Lawrence Livermore Laboratory.

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Those of you who looked at your program will notice that I am to say something
about "current perceptions of technology transfer." I am not going to predict
what is going to be happening in a few months, let alone the fiscal year 1983
budget. I want to talk about what is happening now. I used the term "technology
transfer." One of Carter's economic advisers once used the term "recession" in
Congressional hearings and was critized for talking about a recession. He then
said, "maybe I'll say banana instead of recession." There are times when I talk
about technology transfer when I think we ought to use the term "banana" because
technology transfer in the 10 plus years that I have been working in the area
means different things to different people and sometimes people can get pretty
emotional about precise meanings. At lunch time, Henry Pusey and I were talking
about a meeting we attended, a one week Engineering Foundation-sponsored meeting
in Asilomar, California, on Industry-University-Government Cooperation. We spent
probably the better part of the first couple of days wrestling around what terms
to use; technology utilization, technology transfer, commercialization, banana,
whatever. We finally came to the consensus that we would call it technology
diffusion, which has also been used by many other authors.

Let me just stick with the term technology transfer for the reason that it is
an acceptable term in Washington now; that technology transfer is a good thing
to do.

INTRO SLIDE
We are going to talk about two things very briefly. One is the Stevenson-Wydler
Technology Innovation Act of 1980, Public Law 96-480. Then I want to make a few
comments about an organization called the Federal Laboratory Consortium for
Technology Transfer or the Federal Lab Consortium, the shorthand is FLC.

First, a little background on the Law. A number of years ago several
congressional members became interested in technology transfer in response to
inputs from constituents and from public interest groups. It was pointed out
that the Federal government, at that time, was spending something like 30
billion dollars every year on research and development. The Federal Government
employed directly and indirectly over 200,000 scientists and engineers and they
were involved primarily for the Government's own benefit. Questions were
raised that since the taxpayers have invested a considerable amount of money in
facilities, in the people, and in their annual budgets, shouldn't we get more
wide spread use out of this investment?

Congress began holding hearings. The House Science and Technology Committee's
Subcommittee on Science, Research and Technology, then chaired by Congressman
George Brown, was quite interested in this issue. They held five days of
hearings in 1979, looking at the issues. Experts were drawn from the Federal
Government's technical community, from professional organizations, from public
interest groups, from state and local governments and from industry. The
message delivered was that the taxpayers perhaps were not getting the biggest
bang for their buck out of the investment in R&D. Steps could and should be
taken to speed up the transfer of R&D results to the public and private
sectors, and to make it more efficient and more effective.

Both Senator Mathias and Congressman George Brown were in the process of drafting a legislation in the 96th Congress to address this need when the Stevenson-Wydler Act was reported out of the Senate to the House where it was referred to the Subcommittee on Science, Research and Technology. The bill that originally came down from the Senate addressed innovation and productivity and called for the establishment of certain new initiatives to help improve the state of productivity in the private sector. The subcommittee saw this as complimentary with the work that they were doing regarding federal technology transfer. They then authored Section 11 "Utilization of Federal Technology", and amended the act to include this section. The House and Senate passed the Act as amended. It was sent to The President and he signed it October 21, 1980.

The Act states that it is the responsibility of the Federal Government to ensure full use of our nations research and development investment. A popular phrase is that "we have a vast storehouse of technologies" available.

SLIDE 1
The law establishes a new mission for the federal government. The intent of congress with this law is to "provide the basis for the inclusion of technology transfer programs in the mission requirements of every federal agency engaged in R&D activities."

SLIDE 2
In summary, Section II says that every federal laboratory and research and development center in the United States shall make technology transfer a part of the laboratory mission, establish a research and technology applications office, assess projects in the individual laboratories for potential applications, disseminate information on the products, processes and services in each of these federal laboratories, cooperate with the center for the utilization for federal technology, (also created as part of this act) and other technology transfer organizations and to provide technical assistance upon request.

SLIDE 3
Every federal laboratory must, according to this law, establish an ORTA (Office of Research and Technology Applications.) However, if you have an existing organization that fulfills many of these functions, you don't have to reorganize or rename it. Such an example is the NASA Research Center's Technology Utilization Offices. They also state that we have to let everybody know that it is available through an active outreach program. The law also states that if the annual R&D budget of your installation is over 20 million dollars per year that you should staff this office with at least one full time professional. To allow flexibility, specific funding and staffing arrangements within each laboratory are between the laboratory and the host agency.

SLIDE 4
The law also requires the preparation of applications assessments. The ORTA office should assess every R&D project within that laboratory that might have potential for application to the public and the private sectors. It is up to the individual ORTA to determine when and how and to what extent these assessments are made.

SLIDE 5
The law requires active dissemination of this information and directs the laboratories to "provide and disseminate information on federally owned and

originated products, processes and services having potential application to state and local governments and to private Industry." We must have an active outreach program and the intent is to do more than merely make information available. As one of the Congressman said in one of the hearings "what we don't want to do is have another organization which shoves reports through knotholes."

SLIDE 6
The law created the Center for the Utilization of Federal Technology (CUFT). CUFT is to be the clearinghouse for all federally originated research and technology and is to be the point of contact for initial users of the system. Additionally, ORTAs should cooperate with the existing programs within the National Science Foundation, with the Federal Laboratory Consortium and other like organizations. CUFT has been established within NTIS, but separate funds have not been appropriate as called for in the law. The Department of Commerce has stated that it intends to fulfill the requirements regarding CUFT and its clearinghouse function.

SLIDE 7
Another requirement is to provide technical assistance. It has been stated that institutions don't transfer technology. People transfer technologies. When the Mayor of Rockville for example, is facing a problem which he thinks may have a technical solution, it is not enough for an ORTA to refer him to NTIS for technical reports. When appropriate, the Federal Laboratory is to provide direct assistance through visitations, demonstrations, workshops, or the like. In these activities, we are not to compete with the private sector. Where appropriate, the Laboratory may recommend that the problem should be addressed by commercial firms.

SLIDE 8
Now, what are the implications of this law for the Federal Agencies? The law states that every agency should make available one half of one percent of their R&D budget for use in carrying out this law. A provision was added so that each agency can waive the requirements for the one half of one percent set aside and for the one full time professional at their laboratories by explaining to Congress why they are doing this and how they intend to otherwise fulfill the mandates. Last fiscal year all agencies waived the requirements. They waived the requirements on the one half of one percent set aside on the basis that ongoing activities far exceed this dollar amount. Many of them waived part of the requirements for full time professionals at each of the laboratories where required.

The Department of Energy, for instance, identified a few single program laboratories, such as Stanford Linear Accelerator, which have an annual budget of over twenty million dollars. They said they wouldn't have a full time professional, they would have, however, the equivalent of one full time equivalent, with one office being responsible for this function. The Defense Department also waived part of this requirement because of the large numbers of DoD laboratories whose annual budget is over 20 million dollars.

When the law was passed, Congress expressed the intent of holding oversight hearings in the near future, and the House Subcommittee on Science, Research and Technology held three days of hearings this past summer. Senators Mathias and Schmitt intend to hold joint oversight hearings in the near future. In preparation for oversight hearings, they have requested the GAO to study progress on implementation by Federal Agencies and their Laboratories.

SLIDE 9

Let me shift gears a little bit now and talk about the Federal Laboratory Consortium. It turned out that the chartered goal of the FLC dovetailed with the intent of Congress in some of these areas on utilization of federal technology. The overall mission of the Federal Lab Consortium is to facilitate the fullest possible utilization of federally sponsored R&D and that together we attempt to mobilize the necessary resources in order to do this. The FLC was organized to help provide an environment, an organization and the mechanisms, to transfer technology.

SLIDE 10

The Consortium had it genesis in 1971 when DDR&E asked several of the laboratories to get together to see if there were ways that they could apply military technologies to civilian problems. Eleven laboratories met at Navy Weapons Center, China Lake, California, and decided to form a DoD consortium for technology transfer. This grew in DoD until by 1974 it had 34 members. In 1974 the NSF had become interested in this process and requested the DoD to open up it's membership to other agencies. We now have some two hundred of the laboratories and R&D centers represented from 11 different federal agencies.

SLIDE 11

The organization chart indicates our structure. We have helping us an advisory committee composed of representatives from industry, university, state government and local government. The members elect an executive committee, a chairman and vice-chairman. The Executive Committee appoints an executive director. We also have, as a subset of the executive committee, a small group that serves as a planning committee. This is a membership driven organization. We meet semi-annually, once in the spring and once in the fall. We try to have meetings on the East Coast, the West Coast and in the Midwest, on an alternating basis so that everyone has a chance to get to at least one meeting every year.

SLIDE 12

For ease in communications, we have organized into six Regions. Each Region is represented by a Regional Coordinator.

SLIDE 13

We also have another Officer: The technical specialty coordinator. His job is to identify individuals within the FLC who are specialists with an awareness of who is doing what in certain technological areas within the FLC and within the FLC community. Current technical specialist areas are listed.

I will be happy now to answer any questions.
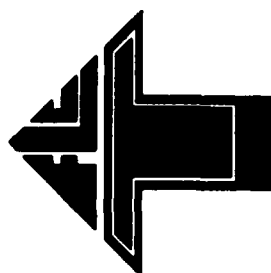
THE STEVENSON–WYDLER TECHNOLOGY INNOVATION ACT OF 1980

PUBLIC LAW 96–480

THE FEDERAL LABORATORIES

AND THE

FEDERAL LABORATORY CONSORTIUM for TECHNOLOGY TRANSFER

INTRO SLIDE

MISSION STATEMENT

PL 96-480

It is the intent of Congress that this law "provide the basis for the inclusion of technology transfer programs in the mission requirements of every Federal agency engaged in R & D activities."

Source: House Report No. 90-1199, Page 32

SLIDE 1

SUMMARY REQUIREMENTS

PL 96-480

EACH FEDERAL LABORATORY WILL:

- MAKE TECHNOLOGY TRANSFER PART OF THE LABORATORY MISSION.

- ESTABLISH A RESEARCH & TECHNOLOGY APPLICATIONS OFFICE.

- ASSESS LABORATORY RESEARCH AND DEVELOPMENT PROJECTS.

- DISSEMINATE INFORMATION ON PRODUCTS, PROCESSES AND SERVICES.

- COOPERATE WITH CUFT AND OTHER T^2 ORGANIZATIONS.

- PROVIDE TECHNICAL ASSISTANCE UPON REQUEST.

SLIDE 2

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RESEARCH & TECHNOLOGY APPLICATIONS OFFICE

PL 96-480

- Each Federal Laboratory must have one;

- An existing organization may be designated;

- An active outreach program is required to make potential users aware of the office;

- At least one full-time professional staff (if Lab R&D budget over $20M);

- Specific funding and staffing is the joint responsibility of the agency and the individual laboratories.

SLIDE 3

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APPLICATION ASSESSMENTS

PL 96-480

- "APPLICATIONS ASSESSMENT" REQUIRED FOR EVERY R&D PROJECT DETERMINED TO HAVE POTENTIAL FOR SUCCESSFUL APPLICATION.

- RESEARCH AND TECHNOLOGY APPLICATIONS OFFICE DETERMINES WHEN, HOW AND FOR WHICH PROJECT ASSESSMENTS ARE NEEDED.

SLIDE 4

45

DISSEMINATION

PL 96-480

- LABORATORY IS "TO PROVIDE AND DISSEMINATE INFORMATION ON FEDERALLY OWNED AND ORIGINATED PRODUCTS, PROCESSES, AND SERVICES HAVING POTENTIAL APPLICATION TO STATE AND LOCAL GOVERNMENTS AND TO PRIVATE INDUSTRY."

- AN ACTIVE OUTREACH PROGRAM IS REQUIRED.

- INTENT IS TO DO MORE THAN MAKE INFORMATION AVAILABLE.

SLIDE 5

46

COOPERATE WITH OTHER AGENCIES

PL 96-480

- EACH LAB DIRECTED TO COOPERATE WITH AND ASSIST THE NEW CENTER FOR UTILIZATION OF FEDERAL TECHNOLOGY (CUFT) ESTABLISHED BY DOC, AND WITH NSF AND FLC.

- INTENT IS TO USE ESTABLISHED NETWORKS (SUCH AS THE FLC) TO FACILITATE TRANSFER.

SLIDE 6

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TECHNICAL ASSISTANCE

PL 96-480

- ASSISTANCE IS FOR STATE AND LOCAL GOVERNMENTS AND THE PRIVATE SECTOR WHEN APPROPRIATE.

- RECOGNITION THAT MORE THAN INFORMATION DISSEMINATION IS REQUIRED.

- LABORATORIES HAVE FLEXIBILITY IN PROCESSING REQUESTS.

SLIDE 7

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IMPLICATIONS OF THE LAW FOR FEDERAL AGENCIES

PL 96-480

- MAKE AVAILABLE NOT LESS THAN ONE HALF OF ONE PERCENT (.5%) OF R&D FUNDS FOR THE TECHNOLOGY TRANSFER FUNCTIONS REQUIRED BY SECTION 11.

- OR -

WAIVE THE FUNDING AND THE STAFFING REQUIREMENTS AND REPORT TO CONGRESS ON ALTERNATIVE PLAN. (FUNCTIONS REQUIRED BY LAW CAN NOT BE WAIVED.)

- OVERSIGHT HEARINGS ARE SCHEDULED ON IMPLEMENTATION.

SLIDE 8

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EXISTING POLICY of the

FEDERAL LABORATORY CONSORTIUM

PL 96-480

- TO IDENTIFY AND MOBILIZE NECESSARY RESOURCES

  TO PROVIDE: Environment

  Organization

  Transfer Mechanisms

- TO FACILITATE THE FULLEST POSSIBLE UTILIZATION OF

  FEDERALLY SPONSORED RESEARCH & DEVELOPMENT

  INVESTMENT

SLIDE 9

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BACKGROUND 1971-1974

PL 96-480

DEPARTMENT OF DEFENSE
TECHNOLOGY TRANSFER
LABORATORY CONSORTIUM

- ESTABLISHED BY 11 DOD LABORATORIES

- GREW TO 34 MEMBERS BY 1974

SLIDE 10

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FEDERAL LABORATORY CONSORTIUM

Organizational Chart

SLIDE 11

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FEDERAL LABORATORY CONSORTIUM

NORTHEAST REGION

MID-ATLANTIC REGION

MIDWEST REGION

MID-CONTINENT REGION

FAR WEST REGION

SOUTHEAST REGION

SLIDE 12

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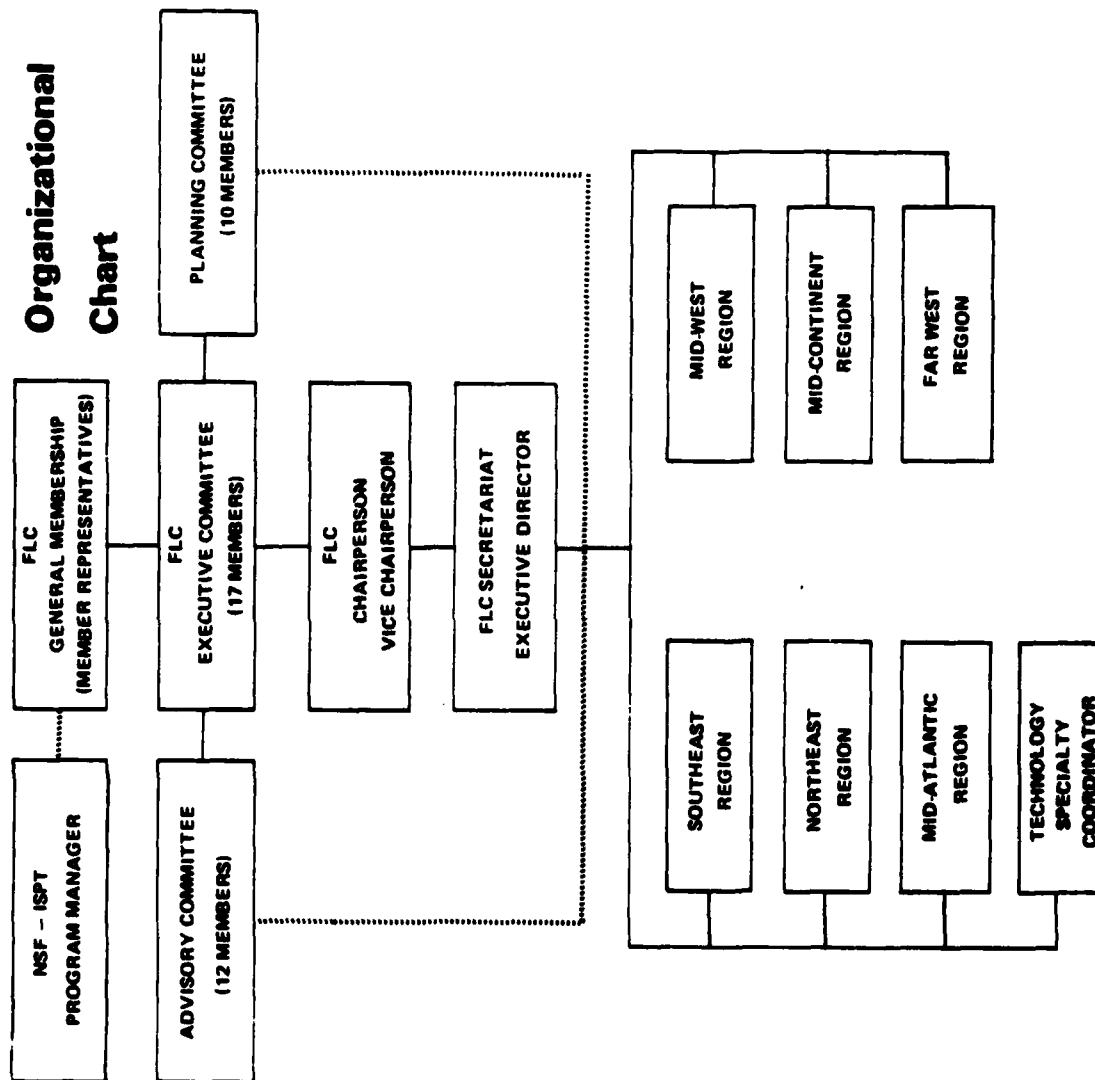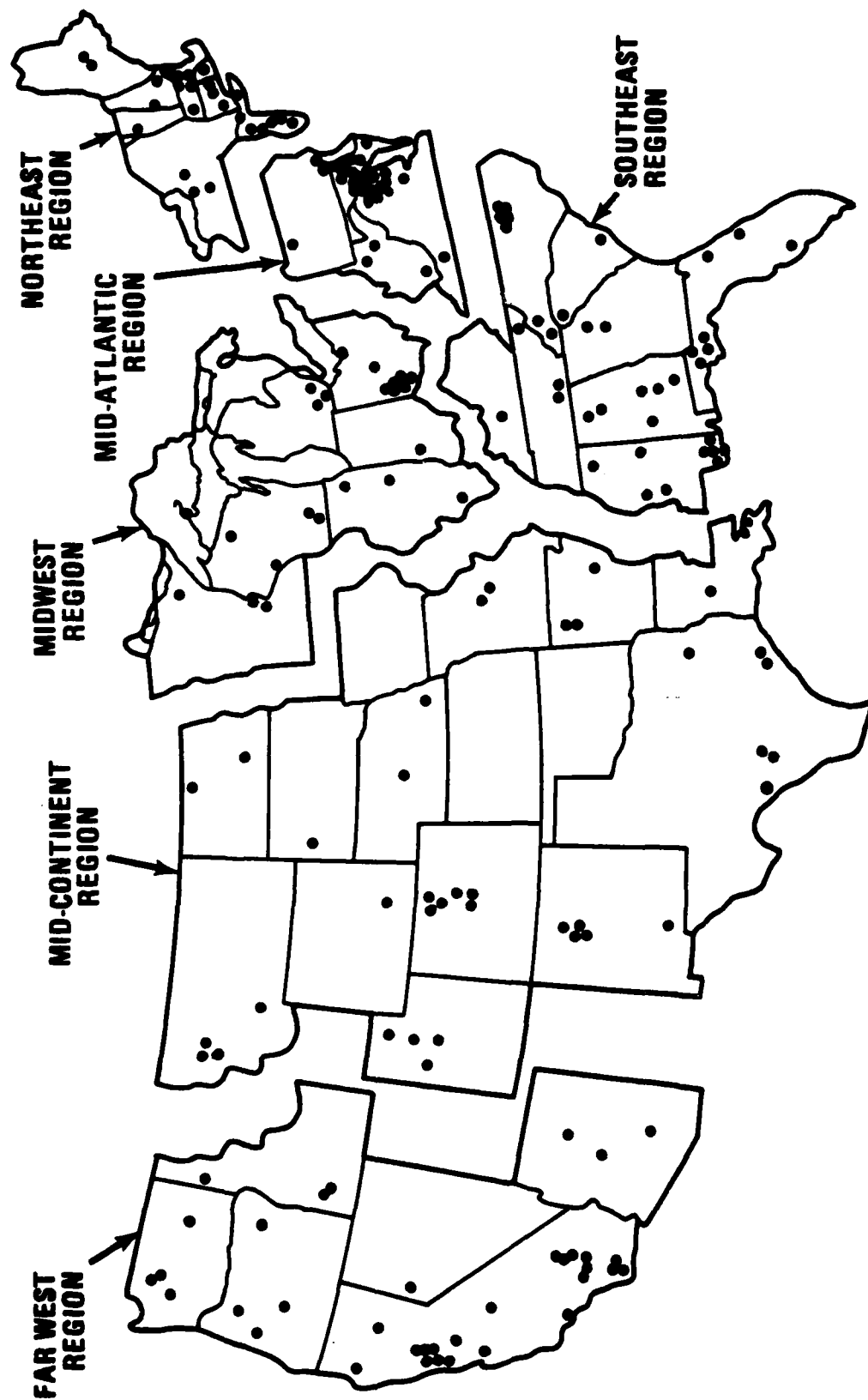
THE MATRIX APPROACH

Technical Specialty Coordinator

- BIOMEDICAL

- ENERGY

- ENVIRONMENT

- INFORMATION
  & COMMUNICATION

- HUMAN RESOURCES &
  MANAGEMENT SCIENCES

- PUBLIC SAFETY

- EARTH SCIENCES

- REMOTE SENSING GUIDANCE
  & CONTROL

- CONSTRUCTION & SEVERE
  ENVIRONMENT

- PHYSICAL SCIENCES

SLIDE 13

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QUESTIONS AND ANSWERS
Mr. Charles Miller

Question:
I just learned this week that science foundations support for the data bank is waiting or perhaps discontinued and therefore you are soliciting support from all of the participating organizations. Does it look like that is going to be a productive resource?

Miller's response:
Yes, the budget cuts that we began experiencing within the last year caught us by surprise. We had planned to be independent of the National Science Foundation in 3 years. We are now in the second year of a three year continuing grant from the National Science Foundation. At the end of this period we were to be independent of NSF money on a sustaining basis. Let me point out that the National Science Foundation to date has put something on the order of $700,000 into all of these activities of the Federal Lab Consortium. We have made some intelligent guesses that the member laboratories in terms of in-kind support, travel, and laboratory sponsored research workshops have been committing something on the order of 1 to 1.5 million dollars for each of these years. We were expecting $300,000 this year for operations of the consortium. Worst case now from NSF is that instead of $300,000 we may be looking at $50,000. So, sooner than we had anticipated, we are asking member laboratories and our parent agencies to help us provide operating support. Operating support goes to such things that we don't ordinarily do within the mission of an individual laboratory, such as pay travel expenses for advisory committee members, publications, funding of demonstration projects (which may include adaptive engineering,) third party travel expenses, and things of this nature. The response to date from the Laboratories has been quite good. They are digging down and coming up with the money to help keep this going.

Question:
Could you elaborate a little bit on how national needs are sort of translated into action by the group. In other words take the auto industry in real trouble, is there specific effort aimed at helping the auto industry?

Miller's response:
Did everyone hear that question. That is a good question. There are several answers and all of them related. Let me answer that first in terms of the local and state governments. Local and state governments, through a variety of other networking organizations, articulate the members' needs to us so that we can readily address those. We have been working actively for a year to see what we can do to create a comparable method to work with industry. At a meeting sponsored by Wright-Patterson AFB last May we had representatives from industry on a panel to talk to us about their needs. What this did was to establish a dialog. Individually and collectively we may have difficulty working with General Motors where we wouldn't have that difficulty working with the automotive industry, due to concerns such as preferential treatment issues. We are exploring other ways to work with industry. For instance, the National Science Foundation has an industrial science and technology and innovation program where they sponsor university/industry cooperative research centers and small business innovation research. We are exploring with them ways to link the expertise of the federal laboratory community with the needs of industry through these and other mechanisms. It is not an easy thing to do.

Individual laboratories do things separate from all of this. For example, the
Air Force has funded my host laboratory, Lawrence Livermore Laboratory, to do
some work in commercializing precision machining technology. They have now
transferred this technology with Air Force funding to a dozen different large
organizations and perhaps two dozen smaller organizations, all of whom are
actual or potential vendors to the Air Force. We are in the process of looking
for further additional support to spread this through industry. Parenthetically,
this isn't as Joe termed it, government intervention, we have industries standing
in line asking us to do this.

Question:
As an information specialists in private industry, is there a central number
that I could call with say, an industrial problem? Why don't you utilize one
of your laboratories and direct me to that laboratory?

Miller's response:
I failed to mention that there are several places you can buy into the system.
One of the reasons we have the regional organization is that it would be easier
for the user to contact one individual in his Region, rather than to try to
locate the appropriate Laboratory. That is also my function.

Mr. Suttle's response:
It is time to hear the last speaker of the afternoon. We have with us
Mrs. Ruth Smith who presently is Chief of the Office of Customer Services with
NTIS. She formerly was Manager of Technical Information Services at IDA (the
Institute for Defense Analysis) and she has been known at DTIC as a friend for
some time having served as chairman of the special committee on information
problems. This is a committee that apparently looks at difficulty experienced
within the community that provides information services in the Washington Area,
within the government I should say. Ruth has also been very active in the special
library association and is a national director. Her subject is interaction of
IACs with other information activities.

I am pleased to be here this afternoon. I did try to talk Jim Pendergast out of
having me on the program after I found I would be leaving the Institute for
Defense Analysis (IDA) to take a position at the National Technical Information
Service (NTIS), but Jim would have none of it. He said I could still express my
views based on more than twenty years in a Defense-oriented library/information
environment and working with the Committee on Information Hang-ups for more than
twelve. So, here I am. My topic is "Interaction of IACs With Other Information
Activities." So this will be an overview from the perspective of those 'other'
information activities.

Information Analysis Centers

Let's begin with the Information Analysis Centers -- the IACs. What makes them
special? In searching for the answer, I found that there are quite a number of
them. In 1979, the Library of Congress National Referral Center listed over 100
in a Directory of Federally Sponsored Information Analysis Centers (AD-A082470).
Only about 20% are funded by the Department of Defense. The DoD IACs are
described in a little booklet Information Analysis Center Profiles for
Specialized Information, put out by the Defense Technical Information Center
(DTIC). They also are described in How To Get It; a Guide to Defense-Related
Information Resources compiled by IDA for DTIC. An updated version of this guide
is due for release in January 1982, (AD-A110000). The National Technical
Information Service also describes them, and others, in their catalog of Special
Technology Groups. From these sources I learned that the IACS:

> Gather, analyze, and produce packages of information for a targeted user
> community.
>
> Produce state of the art reports, critical reviews and technology
> assessments,
>
> Provide current awareness information,
>
> Update scientific and engineering reference works,
>
> Provide authoritative advice in response to technical inquiries, and
>
> Prepare bibliographies.

In general, the IACs are most apt to work directly with users -- and with a
select set of users -- rather than with libraries and information centers. This,
however, is changing. They are beginning to reach out and interact more with
'other activities'. This is good. We need to work more closely together.

Information Partners

the users (who also are the producers of new information) and the processors and
distributors are information partners. All need to work together -- to
undergird the R&D process and, at the same time, avoid unnecessary duplication
and cost.

The scientists, engineers, R&D managers and other such users gather information on a problem, analyze it, perhaps add to it and, usually, produce a report. They use and feed the system. They are information users and information producers.

Processors and distributors, on the other hand, exist solely to support the efforts of users/producers. This includes all information analysis centers, libraries/information centers, as well as other sources of similar services. They develop products and services for the users/producers.

Mutual Information Activities

It is easy to see that all these various partners engage in similar information activities, to accomplish their missions. These include:

Searching (looking for facts or bibliographic citations).

Acquiring and collecting (some materials are discarded and some saved),

Processing (creating, indexing, abstracting, analyzing, re-packaging),

Storing and retrieving again, and

Disseminating or distributing information and materials.

User/Producer Search - First Level

In his search for information, a bench scientist goes first to his collegues -- those who are working in the same subject field. And, why not? Colleagues are trusted to have authoritative answers. Often they quickly identify the important papers. This saves the searcher time and he gets quality results. They have no problem communicating with peers.

Typically, one colleague of a group can be relied upon to have a considerable collection of carefully selected and indexed documents. He is the information gatekeeper. He is certain to have a collection in depth and willing to share it.

Information gathered from colleagues by telephone, person to person, at conferences, or by mail (electronic or otherwise) is screened, selected, and used for the project at hand. Some of it is kept in personal files for future reference.

Processors/Distributors Search

Similarly, when the processors/distributers search for information not in their own files, they tend to go to other IACs, other libraries and information services, and other outside sources. As a last resort, they might consult individuals who are experts in a field. Their search is to be able to supply an information service to the user, such as:

Specific data (facts),

On-line searches,

Bibliographies,

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Information summaries,

Announcements,

Indexes/catalogs/data banks,

Document delivery,

Collection maintenance.

User/Producer Search - Second Level

When communication with colleagues does not produce the needed information, the scientist, the engineer or R&D manager -- if he really needs the information -- will begin to look elsewhere.

He might go to an IAC -- if there is one that covers his subject and he knows that it exists. Or, he might go to his local library/information center -- if there is one and he knows that it exists. Since he prefers to find material himself, typically he will go to the card catalog and search through the stacks before he will ask for staff assistance. As a result, he does not always take advantage of services and resources that are available to him.

He really does not trust the analyses of the IACS or the screening of information by librarians. (After all, he is the expert.) He wants quality information and he wants it now.

Changing Information Needs

The need for greater interaction is highlighted by the changing needs of the information partners.

Experts these days are becoming more specialized. At the same time, the problems they must tackle are more multidisciplinary. So, it is increasingly impossible for the expert to know everyone working in all the areas of his investigation. With the overload of available information, it also is increasingly difficult for him to sort out the quality information. Once it has been sorted out, there must be some way to flag it in the system.

Another complication is the growing use of computers to store, manipulate and create data without ever transcribing it to paper. We must find ways to share this information.

Those of us who provide products and services need to let the information user know that we exist and how best to avoid unnecessary duplication of effort among ourselves, in order to control costs. For these reasons, it is becoming increasingly imperative that we take part in networks, the sharing of resources, and the development of cooperative programs.

Goals for the Future

As partners in a mutal venture, we need to have common goals that will help us to coordinate our activities and channel our efforts toward a better system. For example:

Develop a cost effective interactive R&D information system.

Build trust and reliability into the system.

Speed up announcement and retrieval of data and documents.

Increase visibility of available services.

Action Plans
Based on our common goals, we can draw up the action plans. For example:

Increase visibility. DTIC is the centralized source of DoD R&D information, yet only six of the IACs store bibliographic records in DTIC's master file. More of them should do this.

Meetings and seminars, such as this one, help to explain and advertise the services of the IACs. Perhaps there should be more of them. Letters or brochures might be distributed to a wider audience. For example, the IDA Technical Information Services recently received a letter from one of the IACs which said in effect: Look. Here we are. This is what we can do for you. Give us a call or write. That's good. Librarians and information specialists really are a part of the marketing effort. They are agents who reach many users who might not otherwise hear about the IAC services.

Share resources. I already have indicated that IACs input information to the DTIC data base. This information now has been made available for searching on-line by registered DTIC users. The computer program that was developed by DTIC to accept the IAC input subsequently enabled DTIC to conduct the Shared Bibliographic Input Experiment (now a program) for direct input of bibliographic records from remote terminal sites at libraries/information centers. This resource sharing program promises benefits which I will describe shortly.

For the future, we need to build on the resource sharing concept. A coorinated system of interaction can be achieved through a star network that can be enhanced and expanded. Before I get to that, I would like to outline the long range goals of the Shared Bibliographic Input program.

Shared Bibliographic Input (SBI) Program
Long range goals were established at the beginning of the experiment. They still are the goals of the program:

Take advantage of source cataloging.

Reduce duplicate effort of recataloging same reports.

Speed up announcement of publications.

Create a clearinghouse of acquisition information.

Be able to search local holdings on-line.

Be able to phase out maintenance of card catalogs.

Develop a DTIC-compatible system for handling local files.

Be able to printout combined lists for local use.

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Add to these, that this program enables DTIC to better serve the Defense community and provides cost effective processing as well as, a richer store of information.

DTIC Star Network

In this resource sharing program, the IACs as well as, library/information remote sites input bibliographic information on-line to DTIC. DTIC provides the centralized computer capability and shares with the remote sites the task centralized of input information -- to create an on-line Defense catalog and referral service. DTIC is exploring the feasibility of providing space for private files at DTIC for the cooperating libraries/information centers already in the program. It also is considering the developent of an operating prototype for automating private files at the local sites.

Enhanced Star Network

The DTIC star network can be expanded to meet the needs of the end users -- the scientist, the engineer or the R&D manager at the local site. From his own personal terminal, he can tie into the system through his own library or information center. From his own office, he will be able to search, select and store information in his own private file.

With a little imagination, this concept could be expanded further to make it an interactive communication network, including communication between colleagues as well as, between information centers, to improve access to information.

Galaxy of Star Networks

Extend this concept outward and the system can connect the major R&D information facilities. they already have interagency agreements and cooperative programs to share information, such as documents and tapes of bibliographic information, to support their differing but overlapping missions.

Amoung the benefits are cost effective processing and an interactive information exchange. These are goals worth pursuing.

The Future

In the words of our friend Andy Aines, "We need to anticipate the future and plan for it." Our future needs an integrated information system that will:

    Contribute significantly to the productivity of research and engineeiii.; programs,

    Be sufficiently flexible to accept expected an unexpected change,

    Feature maximum compatability with other information systems,

    Share communication and participation among all partners in the R&D information community, and

    Accomplish these goals at the lowest investment or resources.

Let's get at it.

Thank you.

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INTERACTION OF IACs

WITH

OTHER INFORMATION ACTIVITIES

Ruth S. Smith

DoD Information Analysis Center Conference
Naval Surface Weapons Center
White Oak, Silver Spring, MD
December 8, 9, 10, 1981

INFORMATION PARTNERS IN THE R&D COMMUNITY

USERS/PRODUCERS

SCIENTISTS

ENGINEERS

R&D MANAGERS

OTHERS

PROCESSORS/DISTRIBUTORS

INFORMATION ANALYSIS CENTERS

LIBRARY/INFORMATION CENTERS

AGENCY INFORMATION SERVICES/CENTERS

OTHERS

MUTUAL INFORMATION ACTIVITIES

- SEARCH

- ACQUIRE AND COLLECT
    DISCARD OR SAVE

- PROCESS
    CREATE
    INDEX
    ABSTRACT
    ANALYZE
    RE-PACKAGE

- STORE AND RETRIEVE

- DISSEMINATE/DISTRIBUTE

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USER/PRODUCER SEARCH
FIRST LEVEL: COLLEAGUES

TELEPHONE

PERSON-TO-PERSON

GATE KEEPERS

CONFERENCES

PERSONAL FILES

CORRESPONDENCE
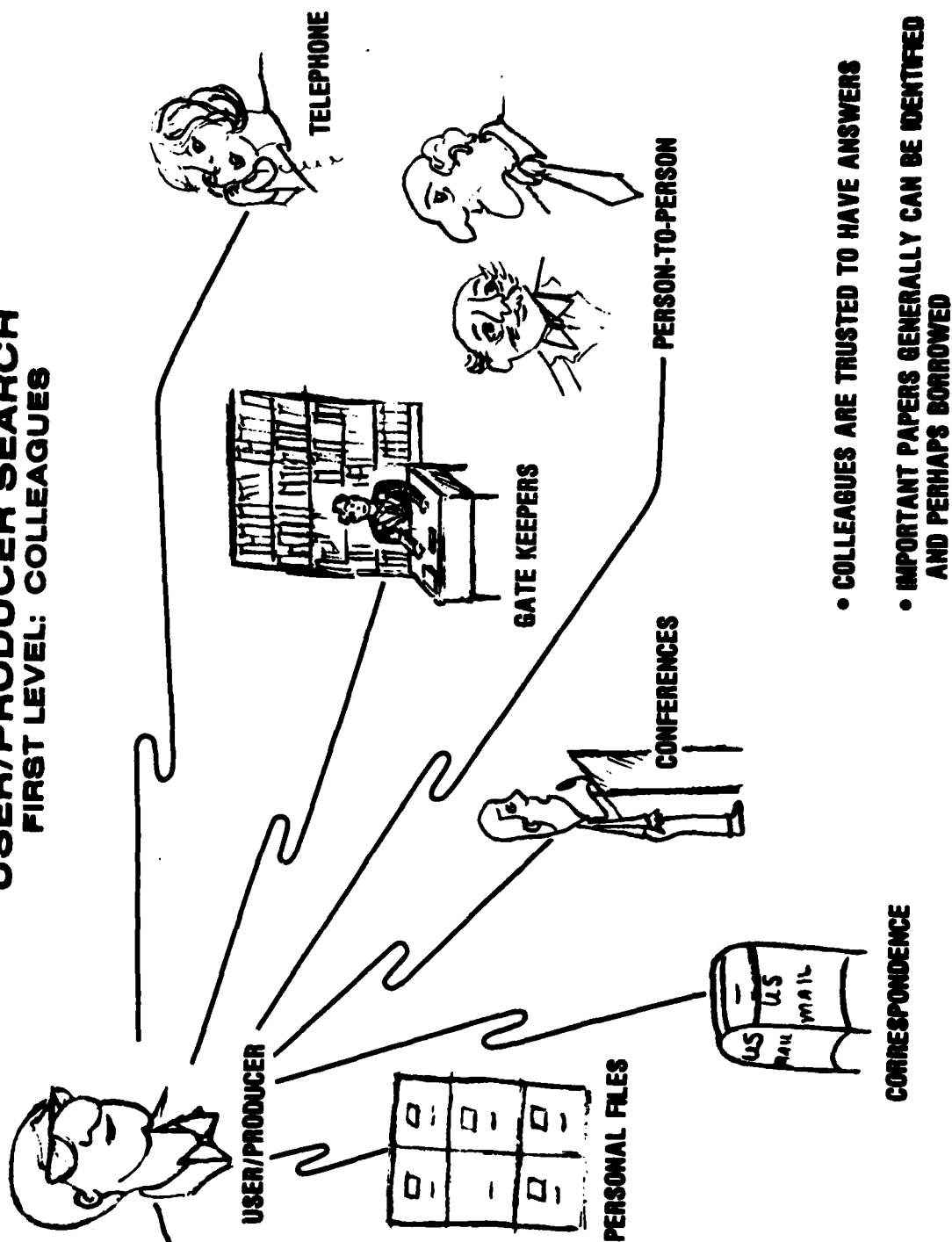
USER/PRODUCER

- COLLEAGUES ARE TRUSTED TO HAVE ANSWERS

- IMPORTANT PAPERS GENERALLY CAN BE IDENTIFIED
  AND PERHAPS BORROWED

PROCESSORS/DISTRIBUTORS SEARCH

INDIVIDUAL EXPERTS IN FIELD

OTHER IACs

OTHER LIBRARIES/INFORMATION CENTERS

- SPECIFIC DATA
- ONLINE SEARCHES
- BIBLIOGRAPHIES
- INFORMATION SUMMARIES
- ANNOUNCEMENTS
- INDEXES/CATALOGS/DATA BANKS
- DOCUMENT DELIVERY
- COLLECTION MAINTENANCE

OTHER AGENCY INFORMATION SERVICES/CENTERS

IACs...

LIBRARIES/INFORMATION CENTERS...
AGENCY INFORMATION SERVICES

THEIR OWN FILES AND COLLECTIONS

OTHER OUTSIDE SOURCES

USER/PRODUCER SEARCH

SECOND LEVEL: LIBRARIES/INFORMATION CENTERS, IACs AND SERVICES

STACKS

CATALOG

HANDS-ON TERMINAL

USER/PRODUCER

STAFF ASSISTANCE
IN PERSON,
BY TELEPHONE, OR
VIA FORM, MEMO OR LETTER

- RELUCTANT TO ASK FOR ASSISTANCE
- PREFER TO FIND MATERIAL THEMSELVES
- OFTEN DO NOT KNOW IACs AND OTHER RESOURCES EXIST
- DO NOT TRUST ANALYSES OF IACs OR SCREENING OF CENTERS (THEY ARE THE EXPERTS)
- WANT ANSWERS/MATERIALS DELIVERED PROMPTLY
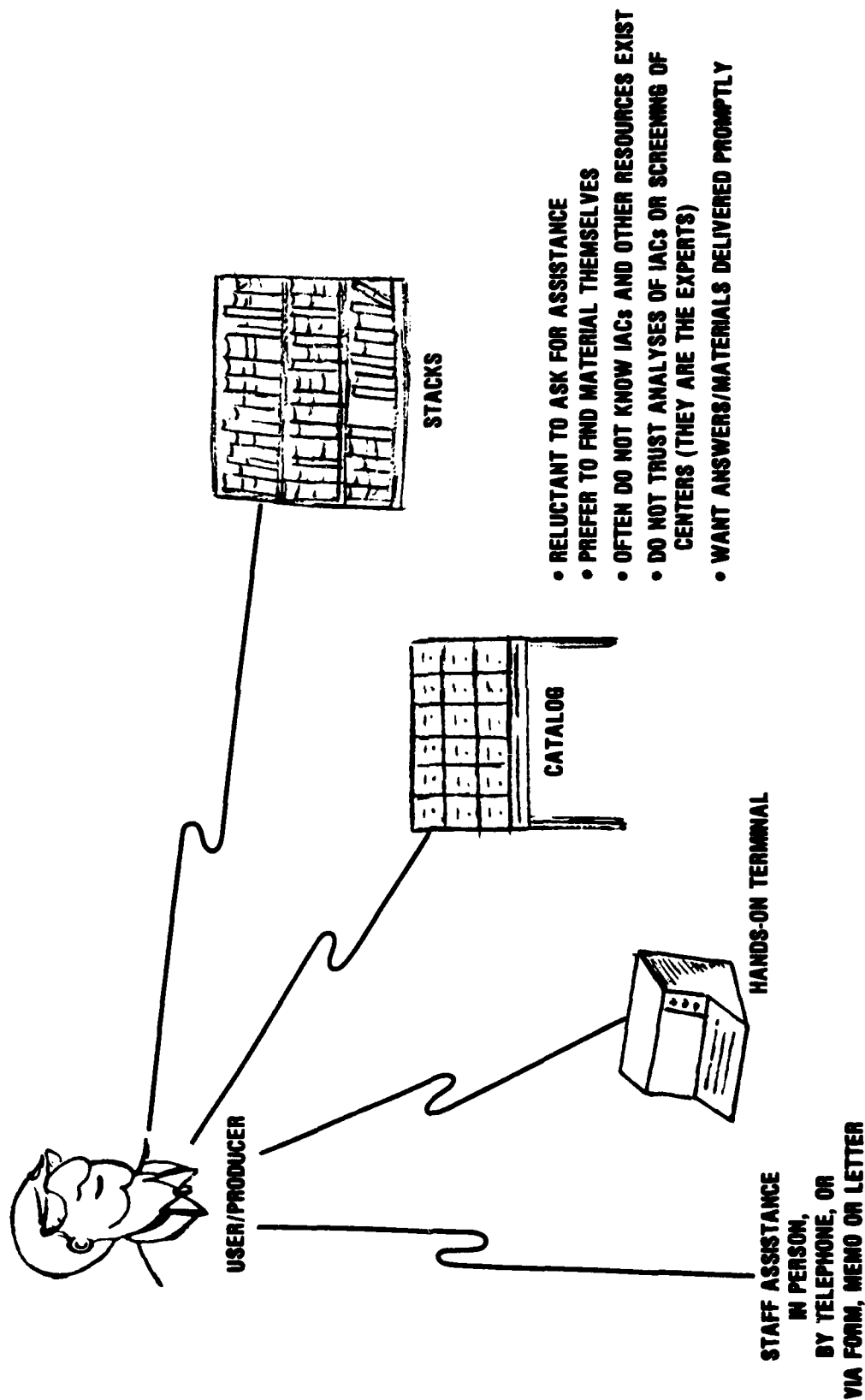
CHANGING INFORMATION NEEDS

<u>USER/PRODUCER</u>

EXPERTS BECOMING MORE AND MORE SPECIALIZED

PROBLEMS BECOMING MORE AND MORE MULTIDISCIPLINARY

IMPOSSIBLE TO KNOW EVERYONE WORKING IN ALL AREAS

USERS NEEDED TO HELP SCREEN QUALITY OF INPUT

COMPUTER USE GROWING...TO STORE, MANIPULATE, ADD TO DATA WITHOUT TRANSCRIBING IT TO PAPER

<u>PRODUCER/DISTRIBUTOR</u>

NEED TO EDUCATE USERS REGARDING AVAILABILITY, ACCESS AND USE OF PRODUCTS AND SERVICES

NETWORKING, SHARING OF RESOURCES, DEVELOPMENT OF COOPERATIVE PROGRAMS BECOMING MANDATORY

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GOALS FOR THE FUTURE

- DEVELOP A COST EFFECTIVE INTERACTIVE R&D INFORMATION SYSTEM

- BUILD TRUST AND RELIABILITY INTO THE SYSTEM

- SPEED UP ANNOUNCEMENT AND RETRIEVAL OF DATA AND DOCUMENTS

- INCREASE VISIBILITY OF AVAILABLE SERVICES

ACTION PLANS

INCREASE VISIBILITY
DTIC TR DATA BASE SEARCHES

MEETINGS AND SEMINARS

LETTERS AND BROCHURES

SHARE RESOURCES
IACs AND DTIC

SBI PROGRAM

DEVELOP R&D INFORMATION NETWORK
STAR NETWORK

ENHANCED STAR

GALAXY OF STAR NETWORKS

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SHARED BIBLIOGRAPHIC INPUT (SBI) PROGRAM
LONG RANGE GOALS

- TAKE ADVANTAGE OF SOURCE CATALOGING

- REDUCE DUPLICATE EFFORT OF RECATALOGING SAME REPORTS

- SPEED UP ANNOUNCEMENT OF PUBLICATIONS

- CREATE A CLEARINGHOUSE OF ACQUISITION INFORMATION

- BE ABLE TO SEARCH LOCAL HOLDINGS ONLINE

- BE ABLE TO PHASE OUT MAINTENANCE OF LOCAL CARD CATALOG

- DEVELOP A DTIC-COMPATIBLE MODEL FOR LOCAL FILES

- BE ABLE TO PRINTOUT COMBINED LISTS FOR LOCAL USE

DTIC STAR NETWORK
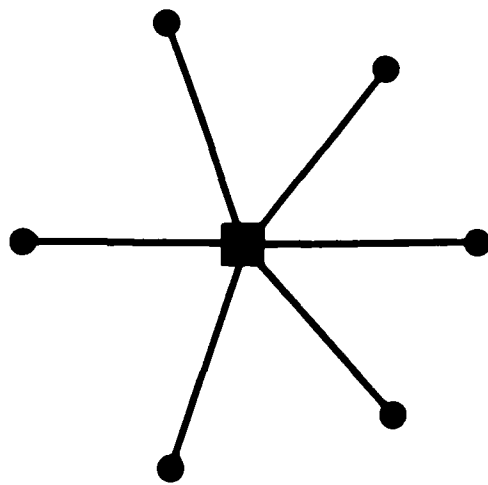
■ DTIC COMPUTER

● IAC AND LIBRARY/INFORMATION CENTER TERMINALS

FEATURES:

SHARED BIBLIOGRAPHIC INPUT TO DTIC CENTRALIZED COMPUTER

PRIVATE FILES AT DTIC

REMOTE FILES AT LOCAL SITES

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ENHANCED STAR NETWORK
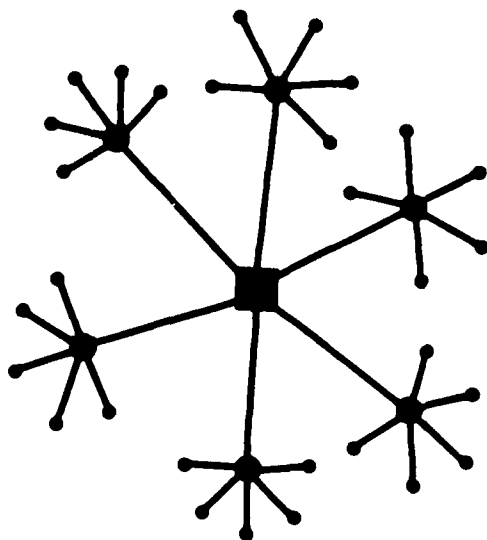
- ■ DTIC COMPUTER
- ● IAC AND LIBRARY/INFORMATION CENTER TERMINALS
- · USER TERMINALS

FEATURES:

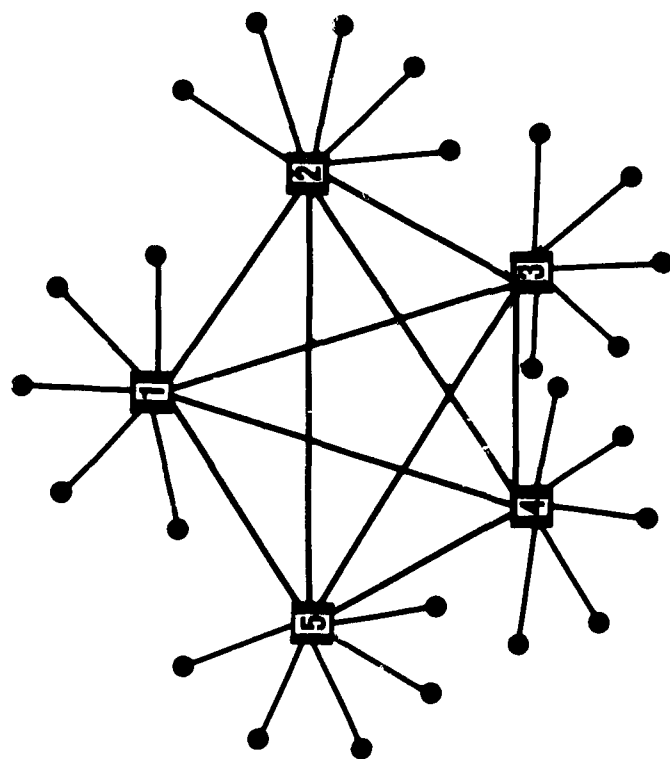**USERS' PRIVATE FILES STORED IN DTIC-COMPATIBLE COMPUTER AT LOCAL SITES**

GALAXY OF STAR NETWORKS

1 - DTIC
2 - NTIS
3 - NASA STI FACILITY
4 - DOE/TIC
5 - OTHER

FEATURES:

INTERACTIVE INFORMATION EXCHANGE

COST/EFFECTIVE PROCESSING

THE FUTURE

FUTURE INFORMATION SYSTEMS MUST:

- CONTRIBUTE SIGNIFICANTLY TO THE PRODUCTIVITY OF RESEARCH AND ENGINEERING PROGRAMS

- BE SUFFICIENTLY FLEXIBLE TO ACCEPT EXPECTED AND UNEXPECTED CHANGE

- FEATURE MAXIMUM COMPATIBILITY WITH OTHER INFORMATION SYSTEMS

- SHARE COMMUNICATION AND PARTICIPATION AMONG ALL PARTNERS IN THE R&D INFORMATION COMMUNITY

- ACCOMPLISH THESE GOALS AT THE LOWEST INVESTMENT OF RESOURCES

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DoD Information Analysis Center Conference
Wednesday Afternoon, 9 Dec 81
Session III - Role of IACs in High Priority Programs
Mr. Henry Pusey: Chairman

In Session I we heard some interesting general discussions about policy and
related matters. In Session II we began looking in new directions for the
Information Analysis Centers, still in a general way. In Session III we will
take a closer look at Information Analysis Centers with a view to making them
more effective. Our principle mission is to serve the Department of Defense, so
we will be looking primarily at how we can improve our services to DoD. This
afternoon we will get into the rather complex and nebulus problem of how to
measure the effectiveness of IAC operations.

Before I introduce the first speaker, I would like to place this session in
perspective. We chose as the session topic, "The Role of IACs in High Priority
Programs." This doesn't mean very much unless you define a high priority
program. As I reflect on it, a more appropriate title probably could have been
chosen, but let me tell you what we had in mind. The first slide (Figure 1)
came directly out of the Navy's Guide for RDT&E.* This Guide is well done and
is currently under revision. In the slide you will notice the breakdown in the
types of RDT&E funding from 6.1, 6.3a and b, right on up to 6.4 and 6.6. Please
note that the 6.1 and 6.2 programs product our technology base. It is basic
research; it is exploratory development. The kind of information that is
generated should be used by the system development people further along in the
process. You will notice that the information is supposed to flow from our
technology base into feasibility demonstration and, finally, system development.
Although it may work for economics, I think the supply side theory for
technology just does not work unless we do something about providing an
effective coupling. In the RDT&E Guide, such things are discussed under the
subject of technology utilization (Figure 2). Things like technology push and
requirements pull are described. These two phenomona are supposed to bring the
user of the technology together with the generator of the technology, so that
technological advances can be used more effectively to develop better systems.
The push end of it depends on how feasible it is, from a technical standpoint
and how eager the people in the R&D community are to get their technology in use
in the fleet, the aircraft, or the tank. The requirements pull, on the other
hand, must come from the people in the systems development arena. Part of their
responsibility should be to look for any available new technology that could be
used to make the best possible system. Whether they do so or not depends
greatly on whether they think it is worth doing. It depends on their drive or
motivation to solve the problem.

I submit that what is needed is an effective coupling between the research and
development peopl. and the systems development people so that the right user
and supplier are put in contact with one another. No matter what this coupling
mechanism is called, it is clear that its function is not simply a matter of

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* Department of the Navy RDT&E Management Guide, NAVSO P-2457
(Rev. 12/79), 15 December 1979.

forwarding documentation; it must provide one-on-one "on line" communication. In the third slide (Figure 3), I am going to suggest that this coupling can and should be the Information Analysis Center. Although I may not have picked the best point to wire the IAC into the system, I think this is a function an IAC should perform.

With that as a kickoff, it is my pleasure to introduce our first speaker. Captain Karl Duff, who is Deputy Chief of Naval Technology and Deputy Chief of Naval Research, will tell you how he views IACs with respect to his program.
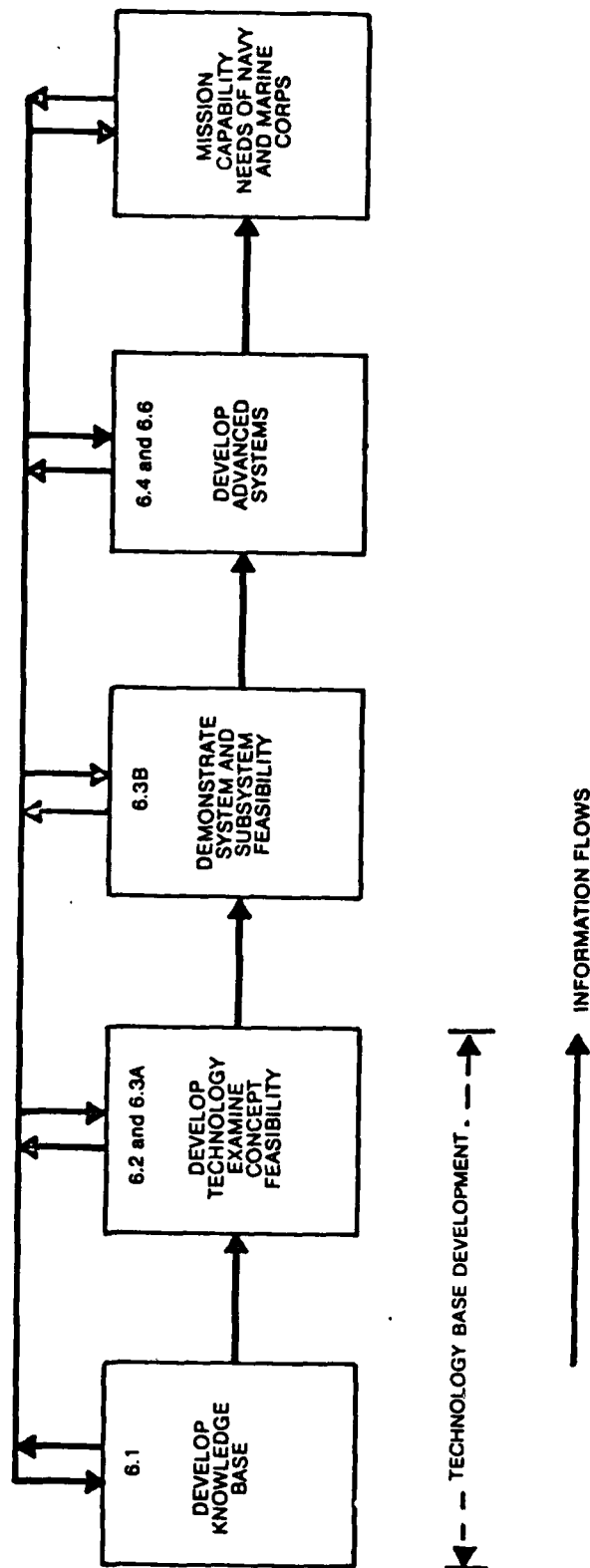
Functional View of the Defense RDT&E Process

FIGURE 1

TECHNOLOGY UTILIZATION

TECHNOLOGY "PUSH" DEPENDS ON

- TECHNOLOGICAL FEASIBILITY

- EAGERNESS OF R & D COMMUNITY
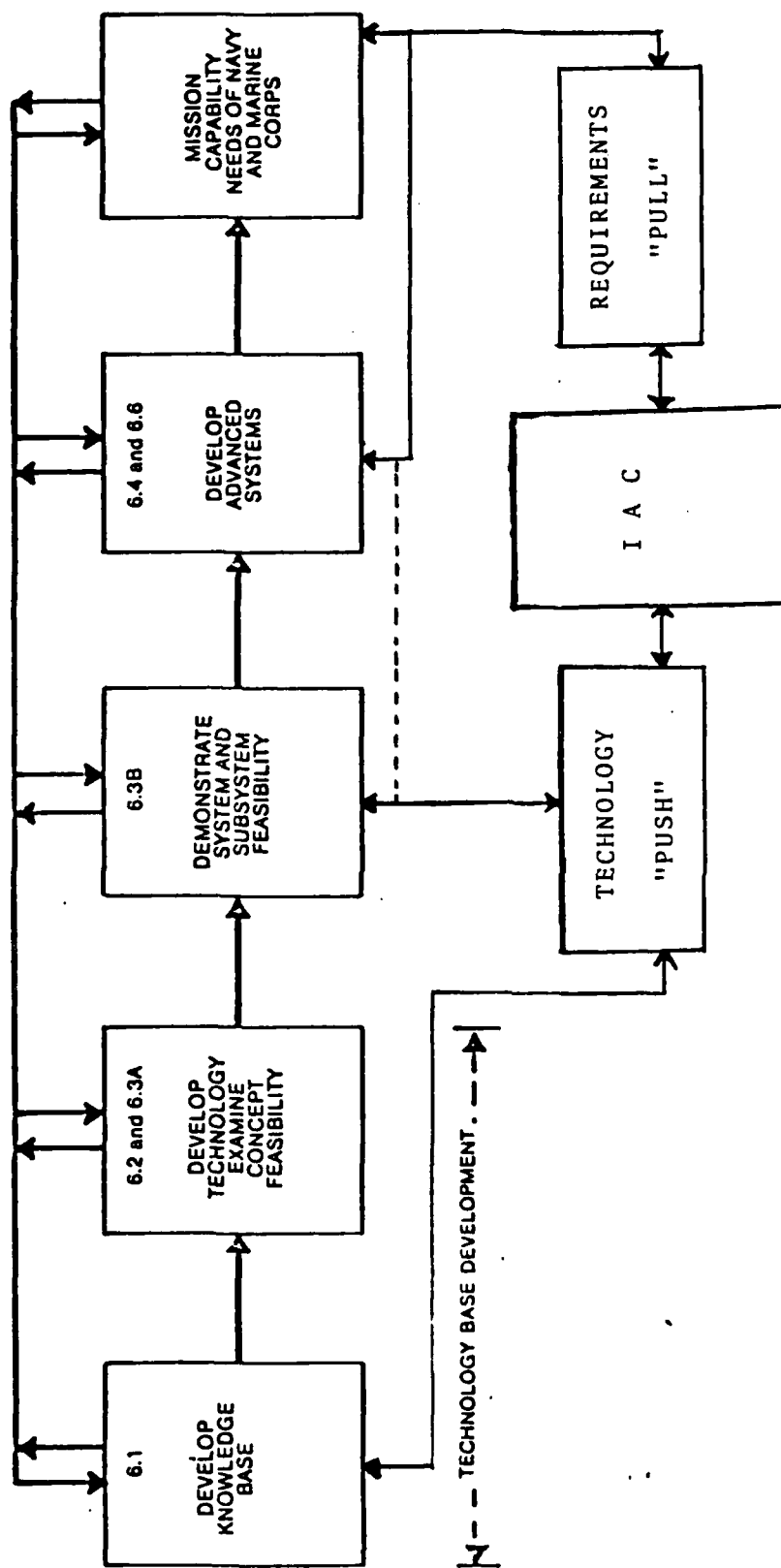
REQUIREMENTS "PULL" DEPENDS ON

- WHAT IS WORTH DOING

- DRIVE TO SOLVE PROBLEMS IMPEDING SYSTEMS DEVELOPMENT

AN EFFECTIVE COUPLING IS NECESSARY!

- THE RIGHT USER AND SUPPLIER MUST BE PUT IN CONTACT WITH EACH OTHER

- THE EFFECTIVE TRANSFER OF PROVEN TECHNOLOGY INVOLVES MUCH MORE THAN FORWARDING OF DOCUMENTS

FIGURE 2

80

THE IAC LINK IN THE DEFENSE RDT&E PROCESS

FIGURE 3

My background is almost entirely in research and development, with emphasis on
acquisition development. I have spent all of the last 15 years of my Navy
career in RDT&E, including a tour in Vietnam. Most of this, however, has been
6.3 and 6.4 development within the Naval Material Command and the Naval Sea
Systems Command. I am now on my first tour in the so-called Tech Base (6.1 and
6.2 RDT&E) hence a lot of my orientation with respect to high priority use of
technical information is based on experience at the systems acquisition end of
development; I know how project managers think and how problems tend to get
solved when technical "holes" develop.

In order to set the stage for some of the views and information that I am going
to present, I will first provide some background on management of the Tech Base
within the Navy. Part of the purpose behind this is to introduce to you the
"players" in the organizational chain who administer the money, i.e., the
claimants. Then I am going to present some information that Henry Pusey of the
Naval Research Laboratory helped me assemble as to how well those individuals
are utilizing the Information Analysis center (IAC) system. Finally, I am
going to present some views on the directions in which we need to proceed in
order to improve IACs utilization.

The Chief of Naval Research (CNR), Rear Admiral Leland S. Kollmorgen, USN,
wears three hats; that is, he holds three jobs simultaneously. A second hat
is that of Chief of Naval Development (CND) reporting to the Secretary of the
Navy, as does the CNR. He is also the Deputy Chief of Naval Material for
Technology, reporting to the Chief of Naval Material. Now, I am presenting
the latter organization first because it is simpler (Fig.1.). The CND is
delegated by the Assistant Secretary of the Navy for Research Engineering and
Systems (ASN(RE&S)) all the functions of administering, programming, planning
and appraisal for all Navy 6.2 RDT&E effort. After Congress passes an
appropriation bill, he is also responsible for budget execution of the 6.2
RDT&E effort. He does not actually spend a dime of the 6.2 funding himself.
None of these functions I've mentioned involve the obligation of money or the
administration of contracts in exploratory development. These functions are
performed by the claimant organizations and program managers who receive
funding. We have a total manning in this office now of 31 people. The
functions again are to (1) administer the programming, planning and budget
cycle, (2) perform program appraisal on an annual basis, and (3) execute the
budget when the appropriation bill comes out.

Now as Chief of Naval Research, he performs the same functions for 6.1 RDT&E
but there are several additional functions as well (Fig.2.) First, execution
and management of a good percentage of the program effort in basic research is
performed by the Office of Naval Research and the Naval Research Laboratory
(NRL) under his command. His people are actually claimants to a major portion
of the 6.1 Navy research program. We have scientific officers who as program
managers plan their programs, compete for funding according to the merit of

the programs, write up the procurement requests for contracts, and monitor contract performance. ONR carries its own contract acquisition directorate, handles its own financial accounting and, by the way, administers the whole RDT&E account (from 6.1 to 6.6) for the entire Navy. The Patent Office performs functions for the entire Navy Patent program and the Contracts Directorate administers all contracts with universities for the Navy, Army, Air Force and DoD. Hence, the Office of Naval Research is quite a bit more complex organization, having not only people that administer the same delegated 6.1 RDT&E management functions for the Secretary of the Navy that was mentioned before for the 6.2 programs, but also claiming a good portion of that money and spending it. About 380 people work at ONR and 3100 at NRL.

Now, it also helps to provide some perspective on the need for better management of our Tech Base money. Figures 3, 4 and 5 provide historical perspective on the trends in Navy 6.1 and 6.2 investment and you see that for about the past 15 years it has trended downward considerably (Fig. 3). Starting about the middle of the 1960's the Navy experienced a severe down trend and planned budgets illustrate that things are not going to get significantly better regarding the amount of 6.1 and 6.2 available to invest (Fig. 4). The same conclusion is supported in a number of ways; i.e., Tech Base percentage of Navy RDT&E has gone down, and also the Tech Base percentage of the Navy's total obligational authority (Fig. 5).

Hence, we have to efficiently manage the limited Tech Base funding that is available. On the earlier figure illustrating the Office of Navy Technology (Fig. 1) you will observe a new Industrial Research and Development (IR&D) function which has been transferred from the Office of Naval Research. This change reflects recent Navy decisions to exercise a policy of improved guidance to industry and monitoring the IR&D funding on government contracts. We are pursuing two major objectives, and we are being driven in part by the shortage of our Tech Base funding. That is, we want to increase the relevance between industry investment in IR&D (which we partially fund through overhead, as you know) and Navy/DoD investment, according to our perceived needs in research and development. The second thing that we want to do, which applies particularly to the present IACs conference participants is to provide for increased effectiveness in the transfer of that information back and forth between the DoD Tech Base and industry. The findings that I will be presenting shortly regarding the low level at which IACs are being utilized within the Navy might indicate that significantly broader efforts are needed if IACs are to play an additional role in increasing IR&D relevance.

Now let me speak for a moment on the method by which the CNR/CND has recently, over the past three years, brought Tech Base budget development into much closer accord with the Navy's budget development process. Based on CNO guidance, the CNR/CND establishes priorities and fiscal controls projecting the amount of funding estimated to be available in the coming years and allocates those funds to potential claimants in general accord with the prior year's approved five year plan (Fig.6). He receives proposals from claimants in competition for a certain portion of the budget year funding beyond that already committed to ongoing programs. He evaluates those proposals for technical worth, quality, past performance by the people involved, risk, potential, pay-off, etc., and also the priorities of the work as it relates both to the technical work and the naval needs. The support staff analyzes and and prioritizes the programs and the final package is submitted to ONR and ONT

Corporate Boards, respectively, to make a final determination on what new programs will be approved. This is incorporated into the current Tech Base program and becomes the Navy Tech Base POM for the forthcoming years budget.

There are two classes of people who work in this area. The first is the group of project managers, who execute the contracts and supervise the performance of the contractors, be they universities, industries or Navy laboratories. The other group is the program element managers who perform the functions of corporate overview programming, planning and budgeting and program appraisal (Fig. 7). Mr. Pusey and I conducted a survey of each of these two groups working in 6.2 RDT&E to try to find out how effectively the IACs system is being employed (Fig. 8). On the left hand side of Fig. 8 is listed all of the Navy's 6.2 RDT&E program element managers that work in the Office of Naval Technology. We inquired regarding (1) how many program managers are using at least one IAC and (2) of those IACs which are considered relevant by the program and program managers, how many of them are actually being utilized. The Xs represent those IACs that are actually being utilized. By simply scanning across the table one can see that only a few of the program element managers are utilizing one or more IACS. The asterisks represent affirmative answers to the following question, "Now that you are aware of the IACs system and the information available from it, would you consider it relevant to your work and would you use it?"

Subsequent to canvassing this group, the survey was taken to the program managers in the claimant organizations and asked the same question. Shown in Fig. 9 is the Office of Naval Research, which has program managers (scientific officers) who are claimants to a portion of both the 6.1 and 6.2 tech base. You see that with the exception of the IR center, none of the IACs are being used by the Office of Naval Research program managers. Figure 10 is the result for the Naval Sea Systems Command (NAVSEA) showing that, although there is a large potential use of the IACs in the minds of the program managers in NAVSEA, only a small portion are currently being utilized. The Naval Air Systems Command (NAVAIR) results show slightly higher utilization rate than NAVSEA, although the potential utilization is lower (Fig. 11). Figure 12 shows Naval Electronic Systems Command (NAVELEX) and its complete non-utilization of IACs by any of the program managers in NAVELEX. This may suggest lack of relevant sources of information for some of the high stress electronics technology that is now being pushed in the Tech Base in NAVELEX or classification levels that preclude an IACs type of information access. Also shown in Figure 12 are two programs within the Naval Supply Systems Command (NAVSUP), and two program elements, only one of which is being used. Finally, in the Naval Facilities Command (NAVFAC) we have all of the program managers using some portion, approximately fifty percent, of the IACs. Now, an overall summary of the statistics shows 8 of the 21 program element managers in ONT using IACs and, considering the asterisks, they envisage about three times this level of utilization as being potentially helpful to their technical program efforts. Within the Systems Commands also, about one third (approximately 22 out of 65) of the program managers are using IACs (Fig. 13). These managers also judge that a potential increase in IAC's utilization levels is possible by at least a factor of three.

I'd like now to relate IACs to high priority programs. There are at least three major areas of users (Fig 14). There are, first, the program managers that work in 6.3 RDT&E, that is full scale (i.e. advanced) development, and 6.4

RDT&E or engineering development. Engineering development essentially deals
with systems that have already been committed to production subject to lead
unit operations testing and 6.4 funds the pilot line or engineering prototype
programs. Second, there are program managers for the various procurement
(non-RDT&E) programs where multiple production has already been authorized.
Finally, there are program managers for fleet modernization and maintenance.
Situations frequently occur where these program managers, especially those
working in 6.3 and 6.4 RDT&E, are confronted with a significant technical
deficiency (Fig. 15). That is, they are confronted during the design process
(or perhaps later during the test program) with some kind of a problem for
which there is no immediate satisfactory solution because the technical risk
associated with each candidate alternative is unacceptable for various
reasons.

As a specific example (certainly not the only example) in my experience on the
NATO PHM program I recall that at the time of material selection for the
hydrofoil struts and foils there existed no fully satisfactory alternative.
Of the two leading alternatives, one was a high-strength non-corrosion
resistant steel, for which the Navy had great fabrication and material
properties knowledge, but which was totally unsatisfactory for a sea water
environment application involving internal water ducts. All things
considered, it wouldn't stand up in the corrosion environment. The other
alternative was a high-strength corrosion-resistant steel with outstanding sea
water properties, but which had only limited material fabrication and fatigue
property documentation. The fabrication knowledge of this material was
severely deficient from a Tech Base viewpoint. I had never heard of IACs at
that time. If I had, perhaps another more satisfactory alternative could have
been provided. It is important to understand that when a program manager
confronts a problem like this he proceeds immediately to his onboard technical
resources for assistance (Fig. 16). Both within his contractors and within
his own immediate in-house government support he does have a certain level of
technical expertise. (In the Navy, in-house expertise is usually within the
Navy laboratories.) The project manager will therefore first identify his
problem to these groups. Unfortunately, these prople have, usually helped
staff the unsatisfactory design solutions in the first place. If then given
special tasking to help resolve the now well-defined problem, they may very
well provide no further insight into the technical alternatives unless IACs
are perceived as a responsive, expert technology information resource. If
these technical groups are unaware of the existent IACs, where the whole
national Tech Base can be accessed for the purpose of shedding some light on a
particular problem, then the program manager is left to his own devices and
has, expecially in a high priority program, no alternatives at this stage but
to plung ahead. Termination is not a viable alternative. Hence, at his own
expense and usually with severe schedule constraints, he can easily arrive at a
non-optimum solution (Fig. 17). A secondary effect of this process will likely
be that the technical deficiency remains unidentified in the Tech Base at least
for some time, because those responsible for developing the Tech Base
requirements and for managing the IACs' efforts are not directly informed of
the program's technical deficiencies. Hence, there is a two way breakdown;
requirements "pull" upon the Tech Base program is lost and technical solutions
potentially available through IACs are lost to the acquisition program
manager.

Based on these considerations, I have some suggestions (Fig. 18). First, the IACs need to be linked with the 6.3 and 6.4 program managers on a face-to-face basis. This audiance heard a lot yesterday about how important the documentation is, but I believe documentation is overstressed. I am not advocating that we only carry technical information only around in our head, of course, but to make IACs work more effectively we must have IACs coordinate with high priority programs and thereby supporting the people that are generating the most short term, urgent technology needs. This is not effectively accomplished through a formal documentation process. Repeating again, there are two purposes that are served by a face-to-face linking of IACs and high priority programs: (1) the people that are in a position to establish Tech Base requirements and have much to do with identifying the priorities in the Tech Base discover and understand the most relevant requirements being generated in acquisition programs, (2) managers with urgent technology need are least likely to overlook available solutions to technical problems.

Specifically, it is my recommendation that IAC managers incorporate some type of a personal technique for accessing the high priority programs most likely to be associated with their technology area - i.e., such as by attending program reviews (which are run at least quarterly) and hearing first hand of the technical problems being confronted. Being open and supportive of acquisition project managers will help a great deal - program managers love to learn of new resources! Furthermore, one does not have to work with the program manager himself; most of these programs have technical directors who can at anytime provide a summary of their technical problems.

In terms of public relations, I think it is important that the title of IACs be, in fact, most descriptive of the mission and most likely to create the mind of the hearer a correct perception of what IACs are about (Fig. 19). I don't think in the title "Center for Naval Analyses," one knows that "analyses" is their only product. One would erroneously conclude that IACs also produce only a "soft" product. But IACs sell a "hard" product-technology. They transfer solutions and technology-based information from one point to another; that is a "hard" product, in my mind. Furthermore, IACs are in the support business; not merely trying to provide a "stand-along" end product. They are trying to support other programs, the high priority programs. Hence, I believe the function is assist and support, not just analysis. Therefore, I propose a revised title, "Technology Assistance Support Center," to replace the current title and more properly convey the IAC mission. The acronym "TASC" is also a good descriptor to help sell these wares a little more effectively. That concludes my comments. Are there any questions?

OFFICE OF NAVAL TECHNOLOGY (MAT 07)

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┌─────────────────┐
│  DCNM(T)/CND    │
│    MAT 07       │
├─────────────────┤
│   DCNM(T)       │
│   MAT 07B       │
├─────────────────┤
│TECHNICAL DIRECTOR│
│   MAT 07C       │
└────────┬────────┘
         │                          ┌──────────────────┐
         │                          │   PLANNING &     │
         ├──────────────────────────│   ASSESSMENT     │
         │                          │    MAT 07P       │
         │                          └────────┬─────────┘
    ┌────┴────┬────────────┬────────────┬────┴──────┐
┌───┴────┐ ┌──┴──────┐ ┌───┴──────┐ ┌───┴────┐
│WEAPON &│ │SUPPORT  │ │ELECTRONICS│ │ IR&D   │
│PLATFORM│ │TECHNOLOGY│ │TECHNOLOGY │ │(OCT 81)│
│TECHNOLOGY│ │MAT 072 │ │ MAT 073  │ │        │
│MAT 071 │ │         │ │          │ │        │
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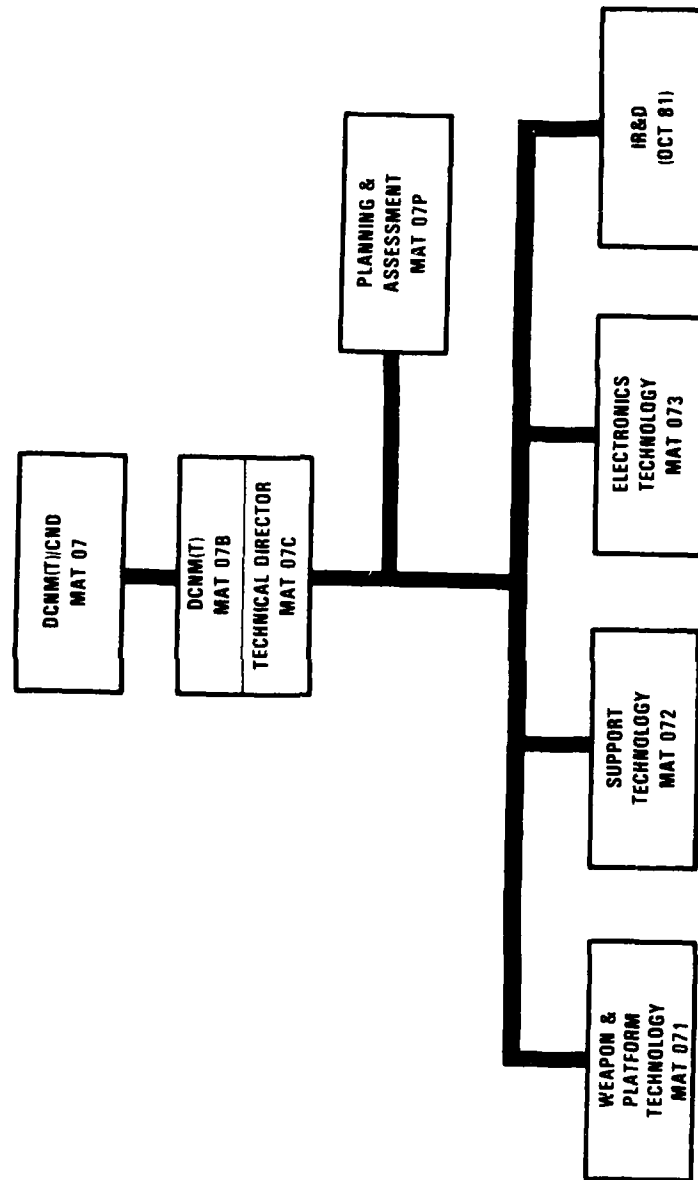
FIGURE 1

OFFICE OF NAVAL RESEARCH ORGANIZATION CHART


```
┌─────────────────────┐
│ CHIEF OF NAVAL       │
│ RESEARCH             │
├─────────────────────┤
│ ASSISTANT CHIEF      │
│ OF NAVAL RESEARCH    │
├─────────────────────┤
│ TECHNICAL            │
│ DIRECTOR             │
└─────────────────────┘
```

- DIRECTOR TECHNOLOGY PROGRAMS
- DIRECTOR NAVY PATENT PROGRAMS
- DIRECTOR RESEARCH PROGRAMS
- DIRECTOR FINANCIAL MGMT/ COMPTROLLER
- DIRECTOR ACQUISITION
- DIRECTOR ADMIN. & MGMT/ CHIEF STAFF OFFICER
- NAVAL RESEARCH LABORATORY
- NAVAL OCEAN RESEARCH & DEVELOPMENT ACTIVITY
- NAVAL BIOSCIENCES LABORATORY
- REGIONAL/BRANCH OFFICES

FY 81 ONR HQ CEILING
TOTAL MILITARY: 32
TOTAL CIVILIAN: 390

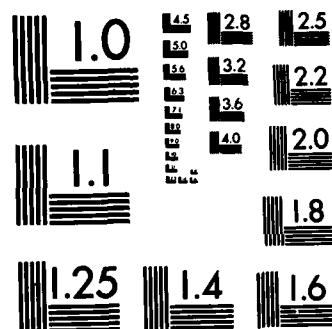FIGURE 2

89
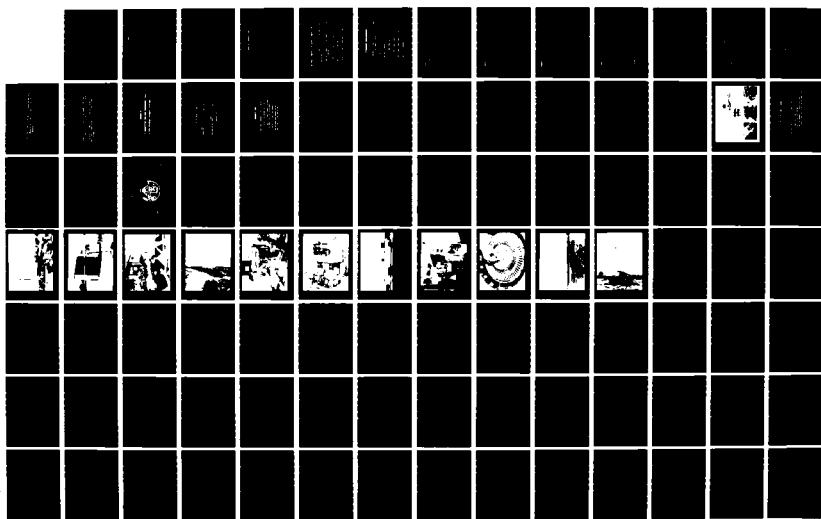
MICROCOPY RESOLUTION TEST CHART

NATIONAL BUREAU OF STANDARDS-1963-A

CATEGORY 6.1 FUNDING HISTORY

FIGURE 3

90
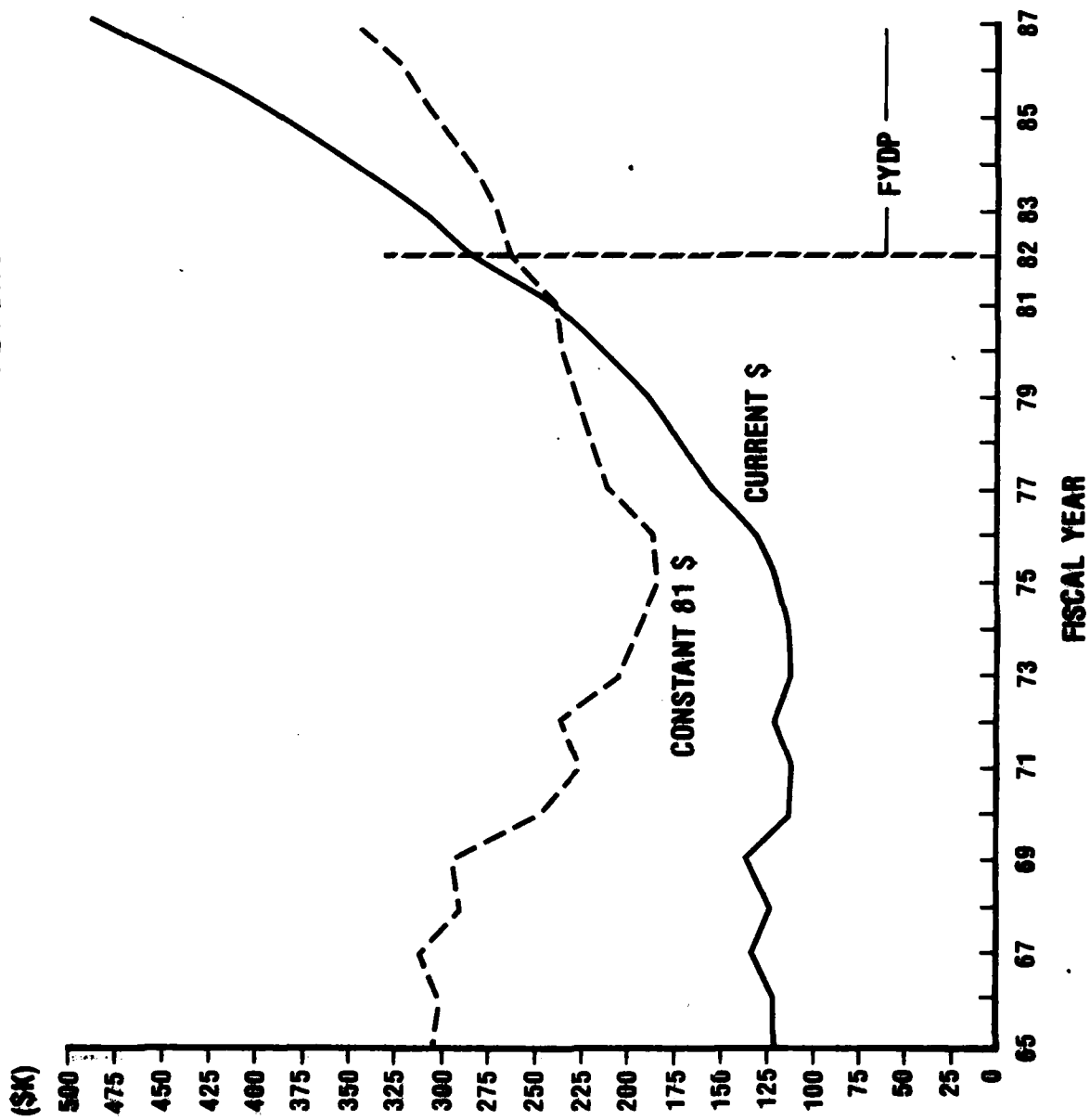
EXPLORATORY DEVELOPMENT FUNDING HISTORY

FIGURE 4

TRENDS IN TECHNOLOGY BASE

% OF NAVY RDT&EN

% OF TOTAL NAVY WEAPON PROCUREMENT

% OF TOTAL NAVY OA

PERCENT
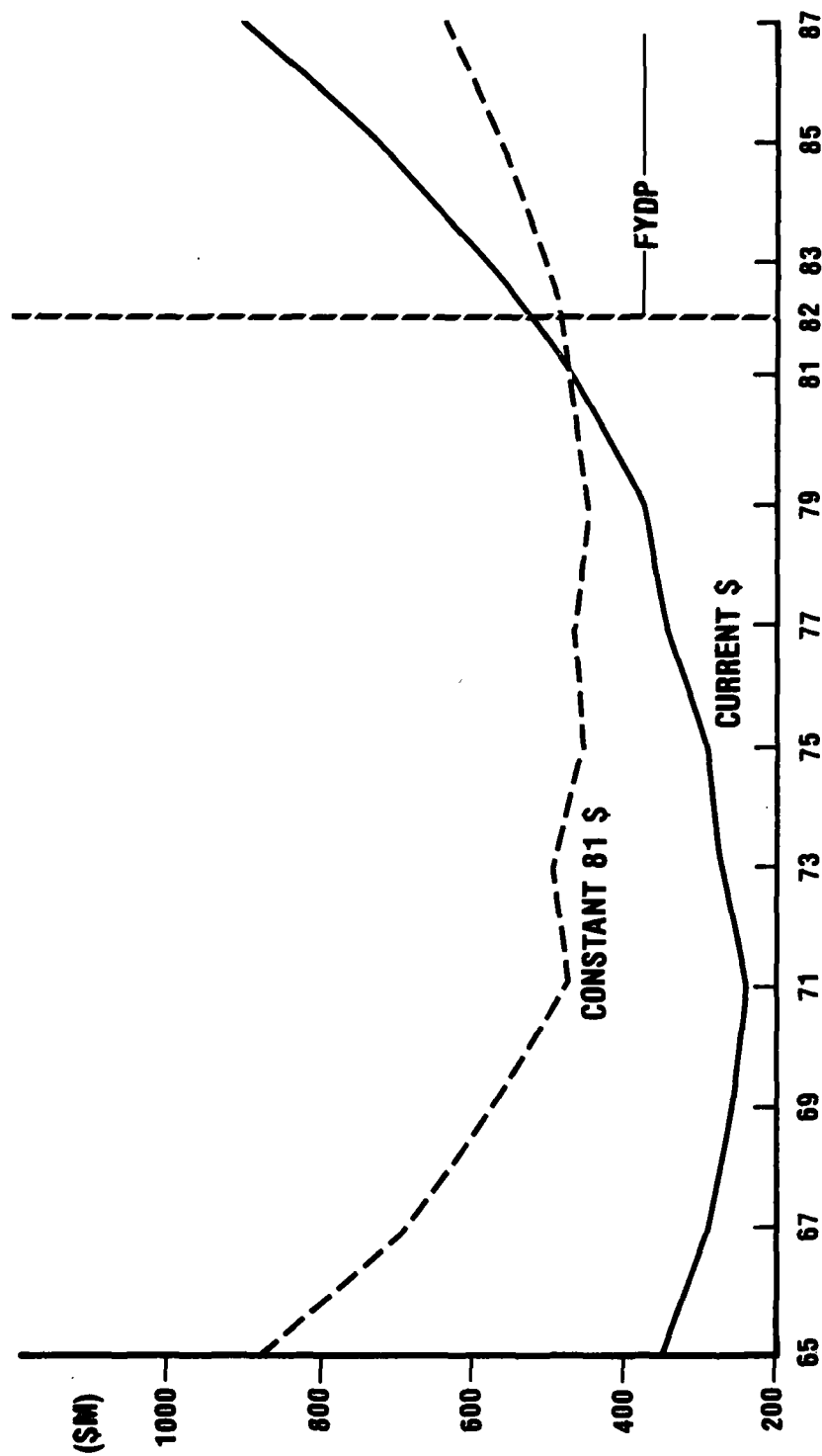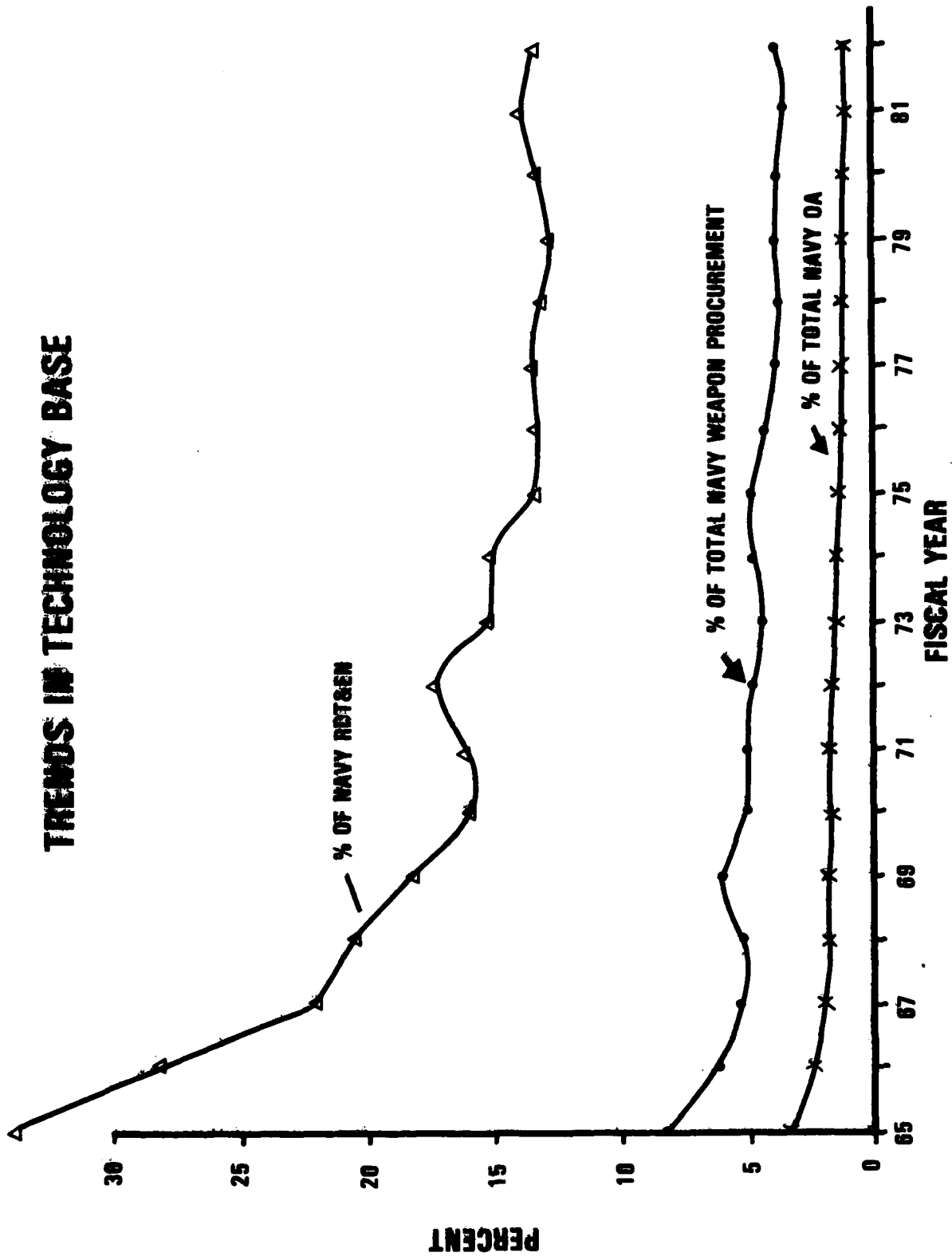
FISCAL YEAR

FIGURE 5

92

MAJOR ELEMENTS OF MANAGEMENT PROCESS

- **DEVELOP TECHNOLOGY BASE OPPORTUNITIES AND NAVAL NEEDS**

- **CNR/CND TECHNOLOGY BASE PRIORITY AREAS AND FISCAL CONTROLS**

- **CLAIMANT PROPOSALS FOR NEW INITIATIVES**

- **ANALYSIS OF OPTIONS AND CAPABILITIES**

- **CORPORATE BOARD REVIEW AND DECISION**

FIGURE 6

93

PROGRAM MANAGEMENT

- **CORPORATE BOARD OF DIRECTORS (PROGRAM POLICY, DECISION, OVERSIGHT)**

  - **INVOLVE RESPONSIBILE MANAGERS**

- **MAJOR CLAIMANTS**

  - **SYSCOMS, ONR, MARCOR, OTHER**

- **PROGRAM ELEMENT MANAGERS**

- **R&D LABORATORIES AND CENTERS**

- **INDUSTRY/ACADEMIA**

FIGURE 7

94

FIGURE 8

INFORMATION ANALYSIS CENTER — CMD PEMs	CEIAC	CPIA	CRSTIAC	CTIAC	DACS	DASIAC	GACIAC	NEIAC	IRIA	TMCIC	MMCIAC	MPDC	NTIAC	PLASTEC	PSTIAC	RAC	SMIAC	SVIC	TACTEC	TEPIAC
AIRCRAFT 022410		*						X	*		X	X	X			*		*	*	
MISSILE PROPULSION 022310		X								X	X		X							
STRIKE WARFARE 023320		*	*		*	*	*		*	*	*	*		*				*	*	*
NUCLEAR PROPULSION 025420																				
SHIPS, SUBS & BOATS 025430							*			*	*									
MATERIALS 027610																				
UNDERSEA WAR. WEAP. 026330	*	*				*	*													
COUNTERMEASURES 027340			*		*		*	X	*				X		*	*	X		*	*
LOGISTICS 027600												*								
UNDERSEA TARG, SUR. 027110			*	X	X			X							X		X	X	*	
HUMAN FACTORS & SSM 027570			*																	
PERSONNEL & TRAIN. 027630																				
BIOMEDICAL 027580					*															
CHEMICAL/BIOLOGICAL 027040					*															
OCEAN & ATMOS. SUR. 027590					*														*	
ENERGY & ENERGETIC MAT. 027050					*														*	
SURF/AERO TARG. SUR 027120					*														*	
COMMAND & CONTROL 027210																			*	
HIGH ENERGY LASERS 027350									X											
DIRECTED ENERGY 027090									X											
ELECTRONIC DEVICES 027020																				

Legend: X IACs USED * POTENTIAL USE

FIGURE 9

INFORMATION ANALYSIS CENTER / ONR PEMS	CEIAC	CPIA	CRSTIAC	CTIAC	DACS	DASIAC	GACIAC	HEIAC	IRIA	MCIC	MMCIAC	MPDC	NTIAC	PLASTEC	PSTIAC	RAC	SMIAC	SVIC	TACTEC	TEPIAC
62241 N							*		X										*	
62232 N							*		X										*	
62721 N							*		X										*	
62712 N							*		X										*	
62760 N							*		X										*	
62633 N					*															
62634 N										*										
62711 N	*				*													*		
62759 N																			*	
62721 N																				
62762 N																				*
62761 N							*		*	*	*	*	*	*						*
62760 N							*													
62732 N	*				*		*									*			*	*
62757 N	*																			
62763 N																				
62758 N																				

Legend: X = IACs USED   * = POTENTIAL USE

96

FIGURE 10

INFORMATION ANALYSIS CENTER / NAVSEA PEMS	CEIAC	CPIA	CRSTIAC	CTIAC	DACS	DASIAC	GACIAC	HEIAC	IRIA	MCIC	MMCIAC	MPDC	NTIAC	PLASTEC	PSTIAC	RAC	SMIAC	SVIC	TACTEC	TEPIAC
62331 N		X					X X		X		X	X	*					X		X
62332 N		X				X	X				X									
62542 N																				
62543 N								*		*										
62633 N		*	*		*		*			*	*	*						*	*	*
62711 N			*		*					*						*		*		*
62712 N									*									*		
62721 N					*		X													
62734 N	*	*	*		*		*		*			*				*		*	*	*
62735 N					*		*		*							*				
62757 N					*		*		*											
62759 N					*														*	
62760 N					*											*			*	
62761 N		X	*		*					X	*	*	X	*		*		*		*
62762 N																				
62764 N*																				
62765 N	*									*		*						*		

* – No Response Obtained

X – IACs USED

* – POTENTIAL USE

97

FIGURE 11

Legend:
** NO ANSWER OBTAINED
* NO CURRENT FUNDING
[X] IACs USED
[*] POTENTIAL USE

FIGURE 12

INFORMATION ANALYSIS CENTER / NAVELEX PEMS	CEIAC	CPIA	CRSTIAC	CTIAC	DACS	DASIAC	GACIAC	HEIAC	IRIA	MCIC	MMCIAC	MPDC	NTIAC	PLASTEC	PSTIAC	RAC	SMIAC	SVIC	TACTEC	TEPIAC
62711 N	*		*		*									*		*		*		
62759 N	*		*		*									*		*		*		
62734 N					*				*							*				
62712 N					*				*							*				
62721 N					*		*		*							*			*	*
62702 N									*							*				
62543 N									*							*				
NAVSUP																				
62700 N					*											X				
62758 N																				
NAVFAC																				
62759 N	X	*	X	X				X		X		*	*		*	*	X			*
62760 N	X	*	X	X				X		X		*	*		*	*	X			*
62761 N	X	*	X	X				X		X		*	*		*	*	X			*
62765 N	X	*	X	X				X		X		*	*		*	*	X			*

X - IAC USED
* - POTENTIAL USE

99

CMD PGM's	MANAGER USE/NON-USE	IAC's USED/APPLICABLE IAC's
	8/21	23/69
COMPONENTS PGM's		
ONR	5/17	5/36
NAVAIR	7/18	17/37
NAVSEA	5/17	15/73
NAVELEX	0/7	0/28
NAVSUP	1/2	1/2
NAVFAC	4/4	24/48
TOTALS	22/65	62/224

FIGURE 13

100

RELEVANCE OF IAC'S TO PRODUCT DEVELOPMENT

- **6.3/6.4 RDT&E ACCOUNTS**

- **PROCUREMENT ACCOUNTS**

- **MODERNIZATION AND MAINTENANCE ACCOUNTS**

FIGURE 14

101

QUESTION: WHAT DOES A SYSTEM DEVELOPMENT MANAGER <u>DO</u> WHEN HE DISCOVERS A TECHNICAL "HOLE" IN HIS PROGRAM?

FIGURE 15

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ANSWER: YOU GO TO YOUR BEST GOVERNMENT AND CONTRACTOR RESOURCES ALREADY INVOLVED IN THE PROGRAM.

IF THEIR BEST TECHNICAL EXPERTS ARE NOT AWARE OF HOW TO SOLVE PROBLEM OR UTILIZE IACs, THEN YOU ARE ON YOUR OWN.

FIGURE 16

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RESULTS

- **UNIDENTIFIED TECH BASE REQUIREMENTS INPUT.**

- **NON-OPTIMIZED TECHNICAL SOLUTIONS.**

FIGURE 17

FURTHER SUGGESTIONS

1. CENTERS UNDERTAKE REGULAR PERSONAL CONTACT WITH DOD LABORATORIES WORKING IN RELATED TECHNICAL AREAS

   ● FACE-TO-FACE

   ● 6.3 AND 6.4 RDT&E SUPPORT AREAS

2. CENTERS UNDERTAKE OCCASIONAL CONTACT WITH PROGRAM OFFICES USING MORE MATURE VERSIONS OF RELATED TECHNOLOGY

   ● LISTEN/AUDIT PROGRAM REVIEWS

   ● OBTAIN PROBLEM SUMMARIES FROM TECHNICAL DIRECTORS

FIGURE 18

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SUGGESTION

CHANGE NAME OF INFORMATION ANALYSIS CENTERS TO REFLECT:

- THE NATURE OF THE INFORMATION AVAILABLE.

- AVAILABILITY OF "HARD" TECHNOLOGY INFORMATION VICE MERELY "SOFT" IDEA DEVELOPMENT.

- SUPPORT VICE STAND—ALONE MISSION.

TECHNOLOGY ASSISTANCE SUPPORT CENTERS, OR
TECHNOLOGY ANALYSIS AND SUPPORT CENTERS

FIGURE 19

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QUESTIONS AND ANSWERS
CAPT K. M Duff

Question:
I had a couple of things that I wanted to suggest that tracks with what you say.
First of all I think it was a very enlightening presentation and it gives us a
perspective that I don't think many of us have ever had in quite this way
before. First, We did a little looking like this in the Army in the past year.
There are 52 similar Program Managers (PM) in the Army; I assume they have a
similar function to yours. We spoke to the PM managers about this very concept
and they effectively told us that PMs are not concerned with the technology.
Theirs is the management of the specific function and the technology is more the
concern of the lab level people. Therefore, I was concerned that one of your
slides indicated that we should look in the labs and on another to look at the
management.

A second comment I wanted to make was I spoke with the research director of the
Army a couple of years ago, Dr. Lasser, about the question of how do we arrive
at the tech base objectives in terms of an overall perspective of technology
where we place the emphasis where we place the money. It turned out that there
were some 28 primary objectives that he had listed. So I said, well if you look
at all of those 28 objectives, does that mean that this is the total technology
that the Army is concerned with this year, and therefore anything that you
specifically mention in the technology, will it fit into one of those 28 slots?
The answer was: gee, I wish that were true but it isn't. Many of them stand
alone. Therefore, what I'm getting at is if you approach this from a 6.1 - 6.5
arena, I think we are perhaps offering a solution to a problem in the wrong
direction because it seems to me that the base of the technology which comes
from these analysis centers is more the concern of the bench level scientists.
For the others to be aware of it certainly it makes sense but I find it a little
puzzling how a tech manager who is interested in dollars, in programming, in
progress, in holes in the system and so on, can take a specific technology and
inject it into what he calls a hole, when this is really the concern of the
bench level scientists. In other words, what I'm saying is that we might try
your matrix in the other direction. Go to the analysis centers and develop a
matrix from their information on who has been using their services. Do you
follow that?

Duff's response:
I followed a portion of it and I think I can kind of sandpaper away at it here
if I put up the next to the last viewgraph (Fig. 18). You brought up a point
which I skipped over which is very correct and I would like to elaborate on that
and see if I've missed part of what you said. I guess I can answer a portion of
it quickly.

Now, the first one says laboratories and I didn't stress it sufficiently. Yes
it is true that there is a lot of distance between a program manager and a
product oriented level even at 6.3 nd 6.4 and the bench level scientists or
first level applied technology that you are referring to and that is
specifically why I was emphasizing the laboratories. Yes, I agree that this is
the first level of engagement. Probably both from the standpoint of language
and from a point where you can get your arms around the whole population of
holes, so to speak, for the purpose of shaping policy in the tech base
management, certainly in the Navy, this is where it is at and when you have

your annual appraisal and you put your proposed tech base initiatives this is where it is done. This is only an input into this, that it would do the IAC managers well to have an orientation. It would do them well to have at least one or two leads on a sampling process at this level, otherwise, I think they are just too isolated. Now within the Navy the tech base initiatives that are put forward annually as part of the budget cycle do include all of the identified areas of effort that are going to be funded. They are prioritized; they are racked up and you can look at them all at once as a part of that budget process and the claimants, or at a minimum the program element managers who dispense money to the claimants, do have a total overview of that. Within the Navy that is true.

Questioner's response:
One other way of expressing this is if you take all of the technical resources for the program managers and you find holes in those resources you identify those holes as technologies we are not covering adequately then you pair that off against an assembly of the analysis centers in terms of the technologies that they really protect. You can't say that those are all the technologies that the DoD is interested in. What we might do is use this logic to help pinpoint future development of centers, in otherwords, centers we don't have that we ought to have and that is one of the logics we use in the Army when we are trying to approve new applications for centers. Usually centers develop as a matter of consequence rather than intention. There are a few that develop by intention but not very many. And frequently when we get an application for a center we look at it and say why does the Army need a center of excellence in that particular discipline. Is it because it is a popular field today such as energy or is it because they have developed an expertise which is currently in the forefront of technical need and may not exist in another five years; what is the reason? I would like us to be able to say these are all the technologies that the DoD is really responsible to protect and therefore, these are the areas where we should have centers of excellence that cover those fields of specialties.

Duff's response:
Yes, I agree. I made that point almost in passing with respect to the fact that the Naval Electronics Systems Command currently has no association with any of the IACs and speculating that might be due to the fact that there are no IACs that are associated with the high technology stress areas that they are working. It also relates to some other points. Perhaps the most valuable technology is not compatible with an IACs type of dissemination of information. It, in fact, might not be sufficiently protected if it is put into an IACs sort of form and that might be the reason that the guardians of that technology do not enter into an IACs type of arrangement. I think that might be the sort of thing the panel might be discussing later on.

Question:
Looking at your suggestions I have a feeling that perhaps they are very very practical for some of the centers, for example, Henry's center where he is located at a Navy center and so on, but for some of the others that are contract operated, geographically dispersed and so on I think there might be some problems. I was wondering if you had any thoughts of how else we might get this type of information available not only to the IAC managers but to other people who would be interested; problems, program reviews and the problem summaries?

<u>Duff's response:</u>
I suggest holding that question until the discussion period.

<u>Mr. Pusey's comment:</u>
I think we are getting into an area now that I think we can cover very nicely in the open discussion and I am glad to see that.

Now it is my privilege to move ahead and present the next speaker, Col. Ralph Kuster, who is chief of the Structures and Dynamics Division at the Wright Aeronautical Laboratory. This is not our first meeting of Col. Kuster. We have had the privilege of him being on the platform at the Shock and Vibration Symposia and it is a great pleasure to see him again.

It is a pleasure to be here today. CAPT Duff provided an overview of the policy
and the upper management level of the Navy. I'll be stepping down several
management levels to the working level of the Air Force Wright Aeronautical
Laboratory, Structures and Dynamics Division. The Structures and Dynamics
Division is a 250-man organization. I am going to discuss the kind of work we
do and how we use the Information and Analysis Centers (IACs). Afterwards,
I will present a marketing film on the Aerospace Structures Information and
Analysis Center (ASIAC), supported and collocated with our Laboratory.
Following that, I will wrap up by showing some products and customers of ASIAC.

STRUCTURES AND DYNAMICS (1st Slide)
We deal in all of the Research and Development levels. We do 6.1 (Exploratory
Research) work with universities, but the bulk of our research work is in the
6.2 area (Basic Research and Development), both on contract and with In-House
talent. We do a large amount of 6.3 work (demonstration of technology) on
contract and have a small number of contract programs at the 6.4 level (system
development). As opposed to an alignment of Navy laboratories with product
organization, the laboratories in the Air Force are independent. While it may
change in the near future, we currently report to a focal point for research and
development activity at Command Headquarters (AFSC), and solicit support for our
programs from the Weapons Systems Development organizations. These system
developers represent aircraft, missiles, electronics and satellites. We also
coordinate our work with NASA, Navy, and Army organizations and with a number of
European and Far East organization.

Here are some examples of our work. The warhead represents work we are doing
with the Ballistic Missile Office using advanced technology non-metallic
material like this carbon-filament, graphite/polymer composite. We are also
working on advanced metals such as metal matrix materials. This viewgraph shows
a combination of advanced technologies, such as super plastic formed, diffusion
bonded titanium with high-strength filaments imbedded in the titanium matrix.
We are developing filament metal matrix composites in both aluminum and titanium
matrix materials. As an example of structural dynamics, I offer this picture of
a flutter suppression test in the NASA Langley wind tunnel. The demonstration
article fluttered so violently that it tore the missile off the edge of the wing
and of course, our job is to develop methodology which will keep that from
happening. The DC-10 wire diagram is an example of finite element analysis
leading to structure design optimization.

To complete the cycle from new material to flight, we are responsible to develop
test methodology which will validate the product of design. The picture shows
an F-4 aircraft in a fatigue test jig.

The main thing I want to point out is that we develop technology and not
systems. We are the experts that CAPT Duff referred to when he noted the
program manager comes to experts in the Laboratories when the system developer
has a problem. We try to keep the program manager from getting into that
problem mode by bringing technology to maturity, transferring it to industry via

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a specification or design handbook and thus get the information out into the manufacturers' hands. The specifications are our way of getting it into the design. The IAC is a major player in the transfer of technical information between Laboratories and Industry.

MISSION OBJECTIVES (2nd Slide)

These are our Structures and Dynamics Division mission statements. We develop lower weight structure that last longer with less maintenance. The weight advantage provides the ability to fly higher and faster.

TECHNICAL ACTIVITIES (3rd Slide)

This viewgraph depicts our organization structure. We are heavily involved in computer aided design and are developing an integration of analysis programs to be used in the design of aircraft, space satellites, or missiles. We have taken the lead in the development of structural life prediction methodology that has been used in the Air Force for a considerable period of time and now is transferring into the civilian sector.

When our sister organization, the Air Force Materials Laboratory develops a new material, the next thing to do is develop new structural design concepts to put the new material into an airplace. If you are using aluminum, you take a sheet of aluminum, bend it 90 degrees, drill a hole in it every 3/4 of an inch, and put a rivet into it. Well, we find that when using titanium many manufacturers are doing exactly the same thing, and that is not efficient. Also, when we developed the graphite filament composite material, the designers wanted to do exactly the same thing with the plastic material and the designs did not work well. So we have to develop new structural concepts for each new material and convince industry to accept it.

At this time, let me regress. We use a couple of IACs on a bread and butter basis. We have an IAC called ASIAC (Aerospace Structures Information Analysis Center (collocated at the Flight Dynamics Laboratory). The three Services and NASA jointly fund ASIAC. ASIAC is important to us for structural technology information. My Division also used another IAC on a regular basis. The Shock and Vibration Information Analysis Center, sponsored by the Navy is also all Service funded. The reason we support and use the Shock and Vibration IAC is because of their focus on dynamic technology. Work in methodology development requires that we stay abreast of the latest development. The Metal Matrix Composite Information Analysis Center located on the West Coast is a new IAC that looks like it will be useful to us. This IAC is important to us because we have recently moved into a metal matrix development thrust and the technology is very new.

TYPICAL IAC INQUIRIES (4th Slide)
Here is a list of the questions to which ASIAC must provide answers.

AEROSPACE STRUCTURES INFORMATION AND ANALYSIS CENTER (5th Slide)
This viewgraph shows some of the organization that use ASIAC. Later, I will show a set of slides with a script that was developed for the Aerospace Structures Information and Analysis Center. We use the slide show to market ASIAC in the Aerospace Industry but the slide show also serves as a local training aide. Our Laboratory has an engineer turnover rate of about 20% per year considering new hires, transfers and promotions. Thus, we have quite a training requirement. We use the ASIAC facility to accomplish part of that training and use the film as an introductory training aide. As an Air Force Laboratory, we also have

agreements with university graduate centers for students to accomplish their dissertation work in conjunction with our programs. The ASIAC is an excellent facility for literature searches and as a library depository for their work.

When we move personnel into a new technology area such as metal matrix, or bring a new individual into an area like graphite composite, the first place to start is with a literature search at ASIAC. A literature search at ASIAC is mandatory prior to accomplishing a statement of work or evaluating a contractor's proposal for a new contract. We also expect industry to accomplish a literature search at the start of a research contract.

When a weapon system development program gets into a problem, and our consultants are called in to solve the problem, the best source of information is ASIAC.

In addition to the Flight Dynamics Laboratory, the following are also users of ASIAC. The Air Force Weapons Laboratory at Kirtland AFB is working with laser beam development and they are interested in dynamic control. The Armament Test Lab at Eglin AFB, FL is a weapons development organization. The Aeronautical Systems Division is the organization that develops Air Force airplanes. The Air Force Logistics Center is responsible for all weapon systems, parts and maintenance on the airplanes. The Materials Lab and the 4950 Test Wing at Wright-Patterson AFB use the ASIAC facility quite a bit.

Everyone is interested in incorporating lessons learned into new designs. ASIAC can help us. If desired, we can file a document as small as a memo in ASIAC and with cataloging that memo will be called out in a literature search. A very important feature of ASIAC is we do not need to access each specific IAC because ASIAC automatically accomplishes that in a literature search. ASIAC is electronically linked via several circuits. Other files which are accessed by ASIAC include DTIC, NASA, CERT 2, PANDEX, and TRASDEX. DTIC also provides an automatic tie into every IAC in the country if that IAC is feeding information into DTIC. So you see that by going to ASIAC, we can tie into every IAC in the country and use them.

SLIDE SHOW
At this time, I will show the slide show that I previously noted. ASIAC is an organization which can transfer technology from Laboratory to industry. Whenever we are faced with routine analytical support on a consulting basis, we attempt to transfer the routine operations to ASIAC on a relief basis to avoid using our Laboratory research engineers on routine work. If a government organization or a contractor who is working on a government contract wants to use ASIAC, that organization can transfer funds to our contract and ASIAC starts work via our contract immediately. If that work is accomplished under the auspices of the Flight Dynamics Lab we review the work and the product. Anybody could go straight to Anamet Laboratories, the ASIAC contractor, and deal directly with them, in which case, the Flight Dynamics Laboratory will not be involved. Now let's review the slide show.

SUMMARY OF ASIAC ACTIVITY (6th, 7th, 8th Slides)
I will use this reproduction of the ASIAC Quarterly Report to review the ASIAC products. Notice the large number of literature searches. The number for corporation literature searches is small because this statistic is reported at the end of the fiscal year. Most literature searches on new government

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contracts would occur toward the beginning of the fiscal year. The number of computer program transfers is dropping because of reduced effort in developing new programs and a recent change in regulations which restrict their release.

You will notice a fairly large number of documents distributed. ASIAC distributes a large number of hard copies to the various organizations shown on this viewgraph. Microfiche is the primary distribution media because, by regulations, we are not allowed to retain an extra stock of technical publications.

IAC PUBLICATION DISTRIBUTION (9th Slide)
This is a breakdown of the Shock and Vibration Information Analysis Center (SVIAC) provided by Mr. Pusey, and you can see the Air Force is not the biggest user of their distributions while the Navy is. SVIAC is located at the Naval Research Laboratory (NRL). This IAC enjoys the same tie with NRL that ASIAC enjoys with the Flight Dynamics Laboratory. The Flight Dynamics Laboratory does use the SVIAC for current information in their area of expertise.

FUNDING SOURCES (10th Slide)
The funding sources shown are for the Shock and Vibration IAC. Again, the Flight Dynamics Laboratory funding for SVIAC is lower because we primarily use ASIAC for our requirements.

Once again, I appreciate the opportunity to present our work and our use of the Information and Analysis Centers. They are a vital source of information to us.

STRUCTURES & DYNAMICS

ADVANCED METALS

ADVANCED COMPOSITES

STRUCTURAL TEST

STRUCTURAL ANALYSIS

FLUTTER PREVENTION

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TP6-1 STRUCTURES AND DYNAMICS

MISSION: DEMONSTRATED STRUCTURAL TECHNOLOGY VIA

- LOWER STRUCTURAL COST
- LIGHTER STRUCTURAL WEIGHT
- HIGH PERFORMANCE PER GIVEN STRUCTURE
- ASSURED DESIGN LIFE CRITERIA FOR MILITARY FLIGHT VEHICLES

STRUCTURES AND DYNAMICS DIVISION

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MR. LUSTIG   5059

STRUCTURAL CONCEPTS BRANCH (FIBC)

MR. KELLY   4030

ANALYSIS AND OPTIMIZATION BRANCH (FIBR)

L/COL PICCHIONI 7191

STRUCTURAL INTEGRITY BRANCH (FIBE)

MR. SMITH   2544

STRUCTURAL VIBRATION BRANCH (FIBG)

MR. THOMAS   6622

ADVANCED DEVELOPMENT BRANCH (FIBA)

MR. GOESCH   5006

ADVANCED COMPOSITES ADP (FIBAC)

D. ROSELIUS   6639

ADVANCED METALLICS ADP (FIBAA)

MR. BOENSCH   5664

MAIL
AFWAL / ( )
WPAFB OH 45433

SOME TYPICAL IAC INQUIRIES

• WHAT ENVIRONMENTAL DATA ARE AVAILABLE FOR VEHICLES/PLATFORMS?

• HOW CAN FIELD LOADS DATA BE CONVERTED TO TEST REQUIREMENTS?

• WHAT METHODS/FACILITIES ARE AVAILABLE FOR TESTING?

• WHAT COMPUTER PROGRAMS/ANALYSIS METHODS ARE AVAILABLE?

• WHAT SPECIFICATIONS ARE APPLICABLE TO VEHICLES/PLATFORMS?

• WHAT IS THE RATIONALE BEHIND SPECIFICATION REQUIREMENTS?

• WHAT METHODS/EQUIPMENT ARE AVAILABLE FOR MEASUREMENT/DATA ANALYSIS?

AEROSPACE STRUCTURES INFORMATION & ANALYSIS CENTER

ASIAC

DATA BASE
(COMPUTER-AIDED SEARCH)
- DTIC
- NASA
- NTIS
- FTD
- PANDEX / TRANSDEX

LIBRARY
(MANUAL SEARCH)
- 8247 DOCUMENTS
- 27000 MICROFICHE

QUICK RESPONSE ANALYSIS
(STRUCTURAL EXPERTISE)
- FDL
- AFWL
- AFATL
- ASD
- AFLC
- ML
- 6585 TG
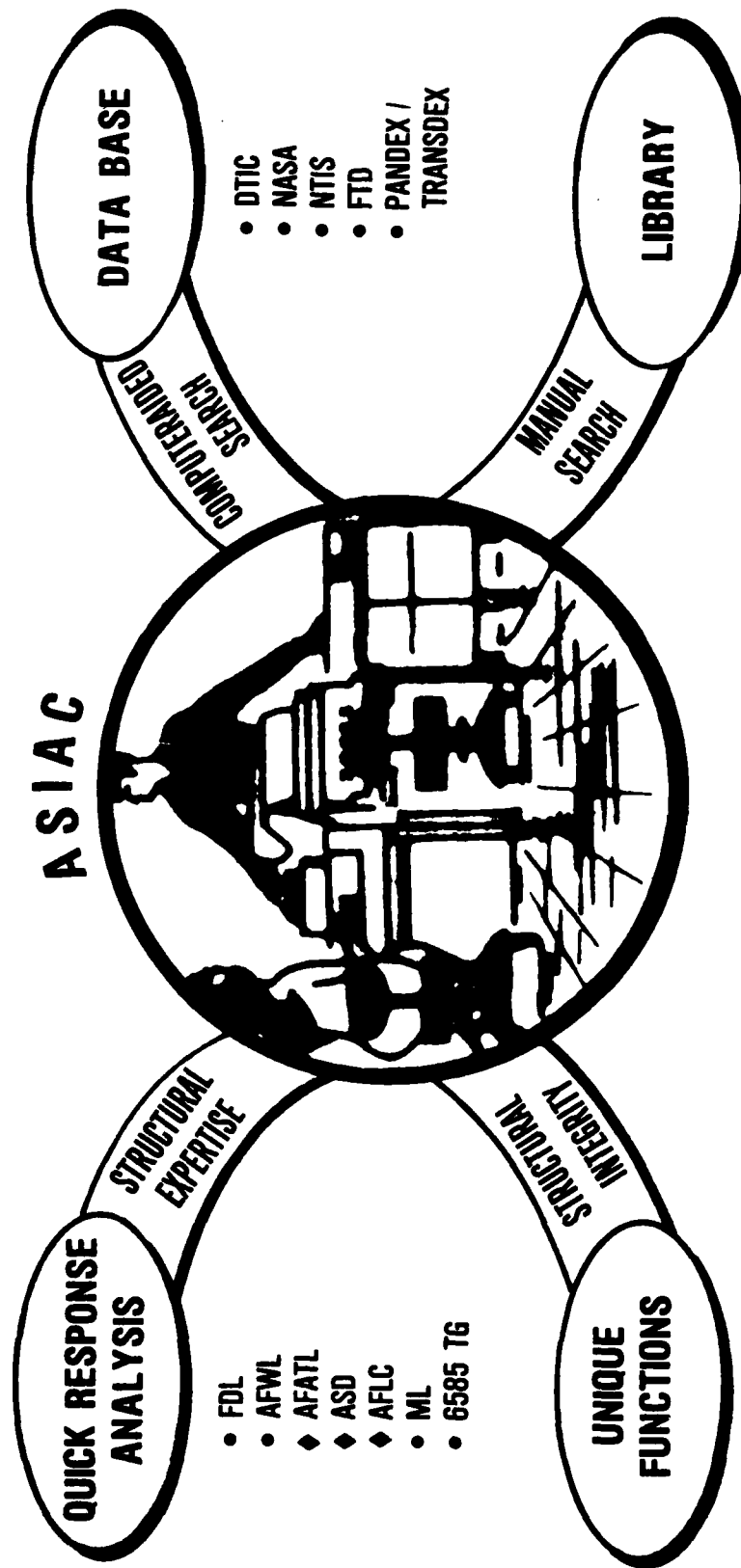
UNIQUE FUNCTIONS
(STRUCTURAL INTEGRITY)
- STRUCTURAL HISTORY
- ASIP TECH RESULTS
- LESSONS LEARNED

- THE ONLY DOD IAC WITH A CORPORATE MEMORY FOR STORAGE AND RETRIEVAL OF SPECIALIZED STRUCTURES INFORMATION

SUMMARY OF ASIAC ACTIVITY

TYPE OF ACTIVITY	1ST YR	2ND YR	3RD YR	4TH YR (PROJECTED)
RETROSPECTIVE LITERATURE SEARCHES				
GOVERNMENT ORGANIZATIONS	941	929	1065	1220
UNIVERSITIES	25	36	0	0
CORPORATIONS	24	17	125	58
COMPUTER PROGRAMS				
COLLECTED	0	14	5	0
DISTRIBUTED:				
GOVERNMENT ORGANIZATIONS	22	36	5	0
UNIVERSITIES	8	20	2	0
CORPORATIONS	63	111	70	0
TECHNICAL CONSULTING				
GOVERNMENT	29	53	32	12
UNIVERSITIES	2	7	3	1
CORPORATIONS	2	2	3	8

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SUMMARY OF ASIAC ACTIVITY

TYPE OF ACTIVITY	1st Yr	2nd Yr	3rd Yr	4th Yr (Projected)
Documents Distributed				
Microfiche:				
Government	914	565	399	492
Universities	83	67	3	0
Corporations	261	311	109	28
Hardcopies Loaned				
Government	127	152	187	191
Universities	4	3	4	0
Corporations	16	35	4	0
Hardcopy Pages				
Government	2766	4509	2109	4285
Universities	28	37	0	7896
Corporations	98	100	1369	810
Documents Collected				
In Microfiche Form	3196	2653	1405	1387
In Hardcopy Form	408	566	784	493

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SUMMARY OF ASIAC ACTIVITY

TYPE OF ACTIVITY	1st Yr	2nd Yr	3rd Yr	4th Yr (Projected)
● PUBLICATIONS				
ASIAC Technical Reports	17	10	8	8
Technical Papers	1	0	1	1
Newsletters	2	0	0	1
ASIAC Accession List	4	3	6	7
Audio-Visual Presentations	2	0	0	0
● PRESENTATIONS				
Technical Presentations	7	10	6	1
Short Courses	1	0	0	1
● PUBLICITY				
Newsletters Distribution	3447	260	108	98
Audio-Visual Presentations	21	16	7	17
ASIAC Accession Lists Distributed	624	468	930	97
ASIAC Flyers	0	0	349	100
● CONFERENCES				
Hosted	2	1	0	0
Attended	3	4	8	7

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JAC PUBLICATION DISTRIBUTION

AIR FORCE 10 %

NASA 8 %

ARMY 14 %

CONTRACTORS 25 %

NAVY 43 %

FUNDING SOURCES

AIR FORCE 4 %
ARMY 8 %
NASA 9 %
OTHER DOD 13 %
NAVY 39 %
NON-FEDERAL 27 %
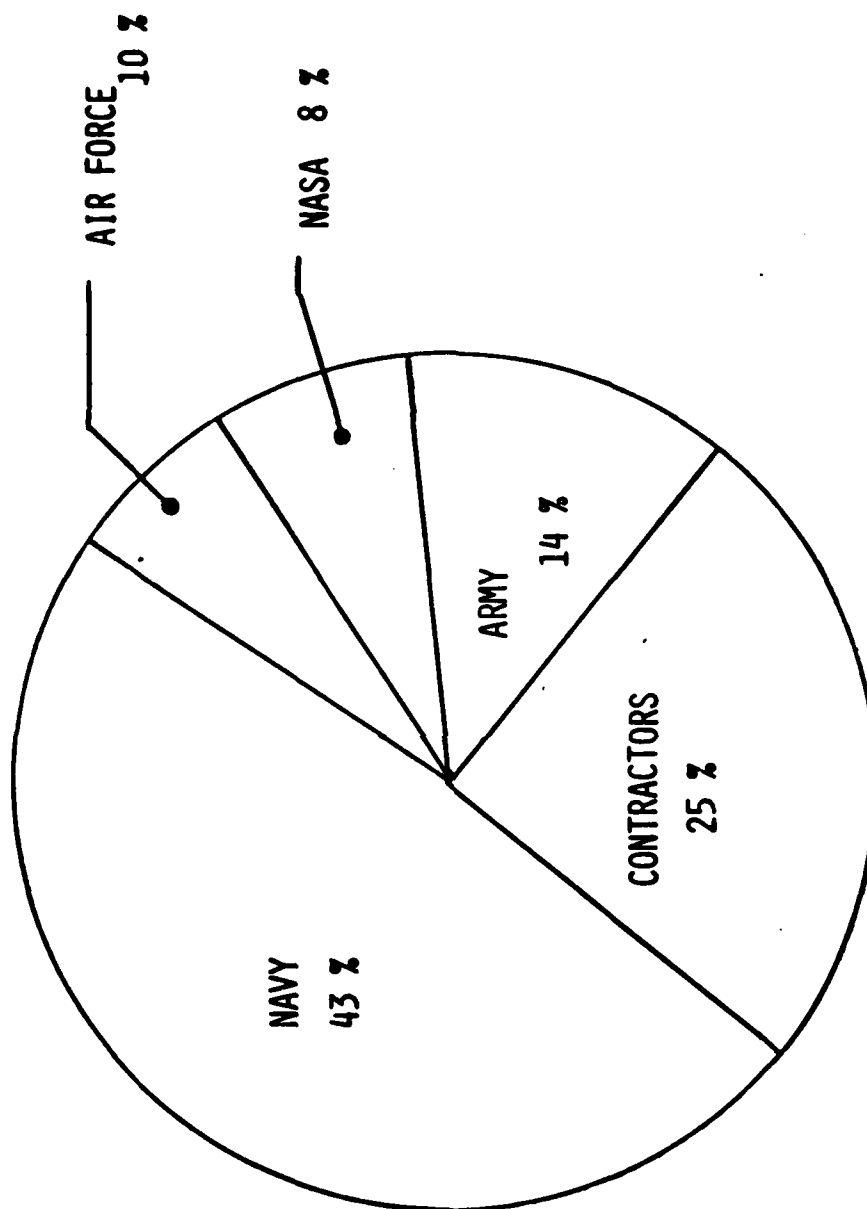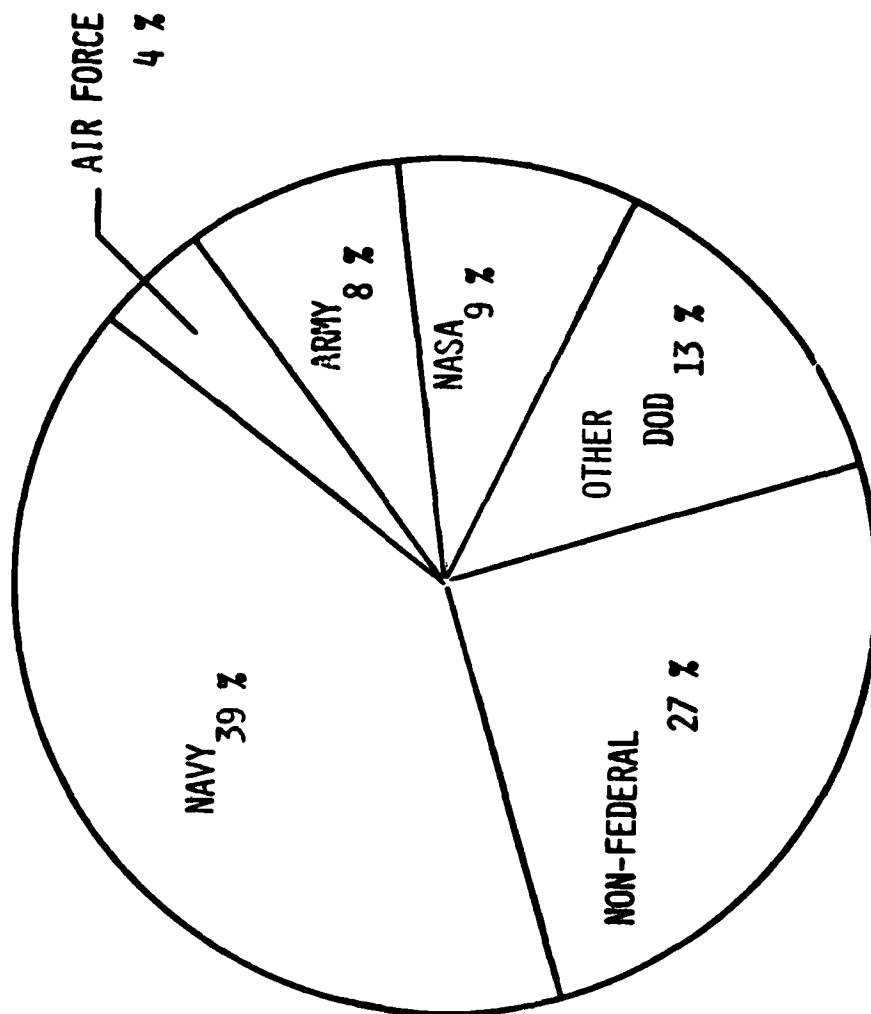
EXAMPLE OF A MULTI-FUNDED IAC

In order to get started here this morning I would like to take just a few
minutes to describe the organization that I'm representing. First off, as
Henry mentioned, I'm from the Army Missile Command at Redstone Arsenal, Alabama,
in the Test and Evaluation Directorate; a part of the Army Missile Laboratory -
the research and development portion of the Command.

This is a separate command from the Test and Evaluation Command although both
are subordinate to the Material Development and Readiness Command with
Headquarters in Alexandria, Virginia.

The comments that I make here this morning are applicable to the Missile
Command and are not addressed to Army Test and Evaluation policy.

The mission of the Test and Evaluation Directorate as I extracted from MICOM
Regulation 10.2, Change 4 is as follows.

TEST AND EVALUATION DIRECTORATE - MISSION:

1. To plan, direct and conduct research studies to advance missile and
laser systems testing technology, test control systems, and analysis
techniques.

2. Initiate test programs ---- conduct and evaluate tests for missile and
laser systems ----.

3. Plan and operate major test facilities and keep facilities and test
methods abreast of the state-of-the-art.

4. Plan, develop, and provide MICOM policy for comprehensive integrated
testing programs.

5. Provide a staff overview of MICOM test programs.

6. Provide technical and test support to Project Manager and other
command elements.

7. Represent the Department of the Army and subordinate commands in
operation of the Eastern Test Range.

One thing that I might point out that is not stated in these mission statements
but of which I'll talk about a little later and which is one of the most
important services that we provide, is maintaining the "Corporate Memory" from
past programs and development efforts.

I don't think there is anything at all exclusive about this mission. I would
expect any organization involved in testing to have a mission similar to this.
The most important idea in going into the mission statements is to mention that

it is imperative that we, as test prople, keep abreast of all advancements
being made in the test and evaluation (T&E) field as evidenced by the mission
statements in items 1 and 3 and we could very well say applicable to our
complete mission.

Design verification or Development is the first real test of the hardware
to determine if any severe problems exist that would prevent continuation with
the concept.

FIGURE 1
Shown here is a FAD, it is a terminal homing accuracy demonstration round
developed at Redstone a number of years ago. It is the forerunner of the
Hellfire missile and it is presently released for production; was released I
believe last month for ASORT.

After the initial hardware anolomies are sorted out and later in the development
cycle, prequalification tests may be conducted to apply test to hardware
representative of production type items in an effort to discover and correct any
design deficiencies prior to full qualification and subsequent production.

FIGURE 2
This next slide shows a reentry vehicle undergoing prequalifications
electromagnetic radiation and interference testing.

Safety tests are conducted in which the items are overstressed or intentionally
destroyed to determine if, and to the degree to which the hazards exist to the
users in the field. These tests may be conducted to obtain clearance for
airborne applications.

FIGURE 3
The first slide here shows a Hellfire missile attached to a helicopter launcher
being subjected to high voltage simulating that which might be experienced in
operation. These missiles must not launch or detonate when subjected to this
test.

FIGURE 4
Sympathetic detonation tests are conducted to determine the degree of hazard
existing to personnel due to premature detonation while stored or handled. They
are usually caused to detonate by bullet impact or fire.

Qualifications are conducted to insure that the equipment will meet those
environments anticipated in worldwide use. Usually, larger samples are tested
than in previous tests in order to gain some statistical confidence that the
representative population is tested.

First Article test may be conducted on complete systems during initial
production, second source vendors, or spare parts. The attempt here is to
subject the hardware to test during missile production to determine if any
production processes have changed any parameter of the hardware from that tested
in qualification.

FIGURE 5.
This slide shows an inspection being made of a first article sample.

When a system is fielded and in the hands of the using troops, continual testing is still required. These tests may be called lot acceptance, quality verification, or with missiles – fly to buy, but in essence, it means that for each production lot, a sample is taken, environmentally treated and operated. If these tests are successful, then the lot is accepted.

FIGURE 6
This next slide shows some anti-tank missiles going through a vibration test to qualify them under simulated field transportation.

Even weapons stored worldwide do not escape this continual process to be sure that they are reliable and ready for quick use. Each year this Directorate travels around the world testing weapons that have been stored for periods up to 10-12 years. This Surveillance or Stockpile Reliability program gives the unit commanders the assurance that they need to know that the weapons are ready on short notice.

FIGURE 7 and 8
This is one of the vans we have at the Missile Command which are sent worldwide to do this testing.

We tie the mission statements in with the previously described test programs involving T&E in these specific, though not all inclusive, areas:

1. Measurement and data analysis

2. Design of test equipment

3. Developing test specification criteria

4. Evaluation and documentation of test results

5. Safety requirements

6. Establishing test requirements, plans, and procedures

7. Estimating costs

8. Reviewing test plans by others

Test and Evaluation personnel like all others involved in the development, production, and fielding of hardware require up-to-date information. The information most frequently sought by test personnel is – what are the new facilities and the latest capabilities in testing? How about the latest techniques or methodology? New measurement techniques both in methods and transducers? Environmental data from the field? Data analysis and presentation?

To answer some of these questions the Directorate has worked with various IACs over the years.

The most extensively used IAC is no doubt the Shock and Vibration Information Center. Test and Evaluation Directorate has had an extremely close relationship with this Center over at least the last 20 years and does in fact have a

representative on the joint DoD-NASA Technical Advisory Group. Shock and Vibration is naturally a big part of the Army's testing mission. A broad spectrum of land combat and air defense, ranging from shoulder fired infantry weapons to long range nuclear missiles is being developed. As a result, there are wide variations in shock and vibration criteria. Since each system fielded by the Army is unique to its environment, each system must be tested differently. The environment for a helicopter mounted missile is different from that experienced by a man carried weapon.

It is imperative then, that we maintain a full awareness of all new developments in this field. As our mission states, we must keep facilities and tests methods abreast of the state-of-the-art. Working with SVIC and the vibration community that they serve has been a major force in maintaining this advanced capability.

Through the services that SVIC offers, the Symposia of which we have been participants for many years, the technical advisory group meetings, and the literature digests and other publications, and research services; there is no question but that this relationship has served to bring our shock and vibration technology second to none.

FIGURE 9

The Reliability Analysis Center located at the Rome Air Development Center is another Information Analysis Center that is used extensively by the Test and Evaluation community. Our directorate at MICOM has been very involved in testing microelectronics for a number of years now. One of the machine set-ups for these tests is shown in this slide. These tests are necessary due to the increased sophistication of guidance systems, fuzing, and tracker electronics and the continual advancements being made in the microelectronics field. For these reasons it is very difficult to select standard parts from the Qualified Parts Lists (QPLs). Therefore, some reliability testing must be conducted. One of the things that we feel may be missing from the data bank on even QPLs is the performance of these items after being in the field for 8-10 years. We now have a program which we are working on with the Reliability Analysis Center to determine if we can get any kind of correlation between long term life and the failure rates of some of these parts.

Some of the services received from the Rome Air Development Center includes software support for T&E's Tektronix S3262 automatic test system and consultation with software development personnel. Since RADC also has responsibility for MIL-HDBK-217, we have on numerous occasions consulted with their personnel concerning reliability requirements and calculations for piece parts used in weapon system tests.

In addition, T&E uses information in reports, reliability handbooks, and other publications from RADC for all parts, or microelectronics programs.

One of the IACs, the Guidance and Control Information Analysis Center (GACIAC), located in Chicago and administerd under contract with the IIT Research Institute is technically monitored by the U.S. Army Missile Command. It is responsible for the dissemination and exchange of technical information related to the guidance and control of tactical weapons. Since this field is primarily a design function as opposed to a test, GACIAC is utilized by directorates other than T&E. I only mention this center to illustrate the importance that MICOM places on this transfer of knowledge.

The Joint Services Guidance and Control Committee established MICOM as the technical monitor for GACIAC due to the fact that it represented the Army's Center of excellence in tactical weapons guidance and control. As we all know, this GACIAC supports the entire DoD community.

The Defense Technical Information Center (DTIC) at Cameron Station also plays a big part in the dissemination of pertinent information on high priority programs. All significant reports that are published at MICOM except for those containing proprietary information are automatically distributed and retained by DTIC. Although the further distribution of these reports remain the responsibility of the originating agency, DTIC is the link between the originating agency and those that have a legitimate request and need to know. Requests around the country are received on a regular basis requesting reports on file at DTIC on test results of major development programs conducted by T&E.

Three additional centers which are also important in the field of test and evaluation are the Nondestructive Testing Information Analysis Center (NTIAC) at Southwest Research Institute, San Antonio, Texas, the DoD Nuclear Information and Analysis Center (DASIAC), in Santa Barbara, CA, and the Infrared Information and Analysis Center (IRIA), in Ann Arbor, Michigan. We have not worked as closely with these centers as others but anticipate an increased relationship with them due to the increased emphasis in infrared/laser and nuclear testing.

FIGURES 10 and 11
The newest capability in the directorate is the nuclear EMP facility shown in these two views.

To sum up the relationship that the Test and Evaluation community has with the IACs I would say that the services that have been most beneficial to the engineers in our organization are these:

1. Current awareness publications and digests;

2. Symposia which I've mentioned earlier;

3. State of the art publications in testing and most importantly,

4. Direct inquiry service from the IAC staff who are, or should be, professionals in the discipline of the community they serve. They understand the problem and provide information in a timely manner or they put you in touch with other test engineers who may have a new approach to a similar problem.

There are other areas though, in which work needs to be done. The Army is now developing many types of weapons which are laser guided. In order to evaluate the performance of these weapons under battlefield conditions measurements must be made of the atmospheric conditions (and laser transi , 'on characteristics). An attempt is currently being made to establish a data t on all data collected which pertains to this area. Dr. Don Snider of the Atmospheric Sciences Laboratory at White Sands Missile Range (WSMR), NM is coordinating this effort. Data, taken in evaluation programs such as this, in some instances, lack the backup primary standards. As a result, data that is provided from various test locations is being collected utilizing different measurement techniques. Not only do errors exist when comparing one method against a second but also errors exist in the traceability of the measurements to a common standard.

The majority of data currently available in obscurant testing exist in the form of digital tapes. There is a problem in establishing a common format of data such that data from one test environment can be compared with that of a second. When this format is established, all tapes will have to be prepared in this format. There is time and cost associated with this tape preparation. In addition, procedures need to be established and a mechanism defined which will allow updating of data. In many instances data has to be refined based on new analysis. If previous data is left uncorrected, false conclusions may be drawn based on erroneous data. The need for such a common data base in this area is apparent.

Another service that is lacking in the test community is a complete up-to-date listing of test personnel and agencies who perform certain tests. For example, a who's who listing could be published, it seems to me, listing personnel, at least in the U.S., who are involved in testing in the various disciplines, i.e., shock and vibration, electromagnetic effects, nondestructive testing, and microelectronic reliability testing. I know of no such publication available today. With contacts with other agencies or services available much time and expense could be saved in researching for new testing methodology and available equipment technology. I believe resources could be saved in this area.

And thirdly, as it was mentioned yesterday and it has been mentioned again today, I believe we need to do a better job of publicizing the IAC's to the potential user. We could put this in the form of mailers, presentations or whatever. Until I received this booklet from the SVIC I was completely unaware of some of the IAC's available to support testing effort. I've mentioned three earlier, the Infrared Information and Analysis Center, the Nondestructive Testing Information Analysis Center, and the DoD Nuclear Information and Analysis Center, which we have only been aware of but have not had the opportunity to work with in the past. I think the main reason for this is a lack of knowledge on the part of some T&E personnel of what an Information Analysis Center is and the services that they offer. This is a problem of communication and should be addressed. Perhaps if an up-to-date who's who in testing were prepared, this would be an ideal channel to disseminate this information and bridge this communication gap.

Modern weapon systems are expensive. You only have to read the newspapers or trade journals to realize that. The cost to the tax payers for modern sophisticated defense systems is increasing at a rate much faster than the defense budget. This alarming rate cannot continue indefinitely. We must in the future not repeat the errors of the past. I spoke of "corporate knowledge" earlier. This is defined as the transfer of knowledge from the past to the future so that the mistakes are not repeated. All of us must be a part of this memory bank. Effective information transfer within the T&E community saves valuable time and money by keeping engineers aware of the newest and most efficient test methodology as it becomes available. To utilize the corporate memory that we all must have, it is important that a communication link be available between test people and designers, between test people and analysts, between test people and project managers, so that overall progress in our RDT&E programs will be enhanced.

The Specialized Information Analysis Center may well be the best candidate to be that link.
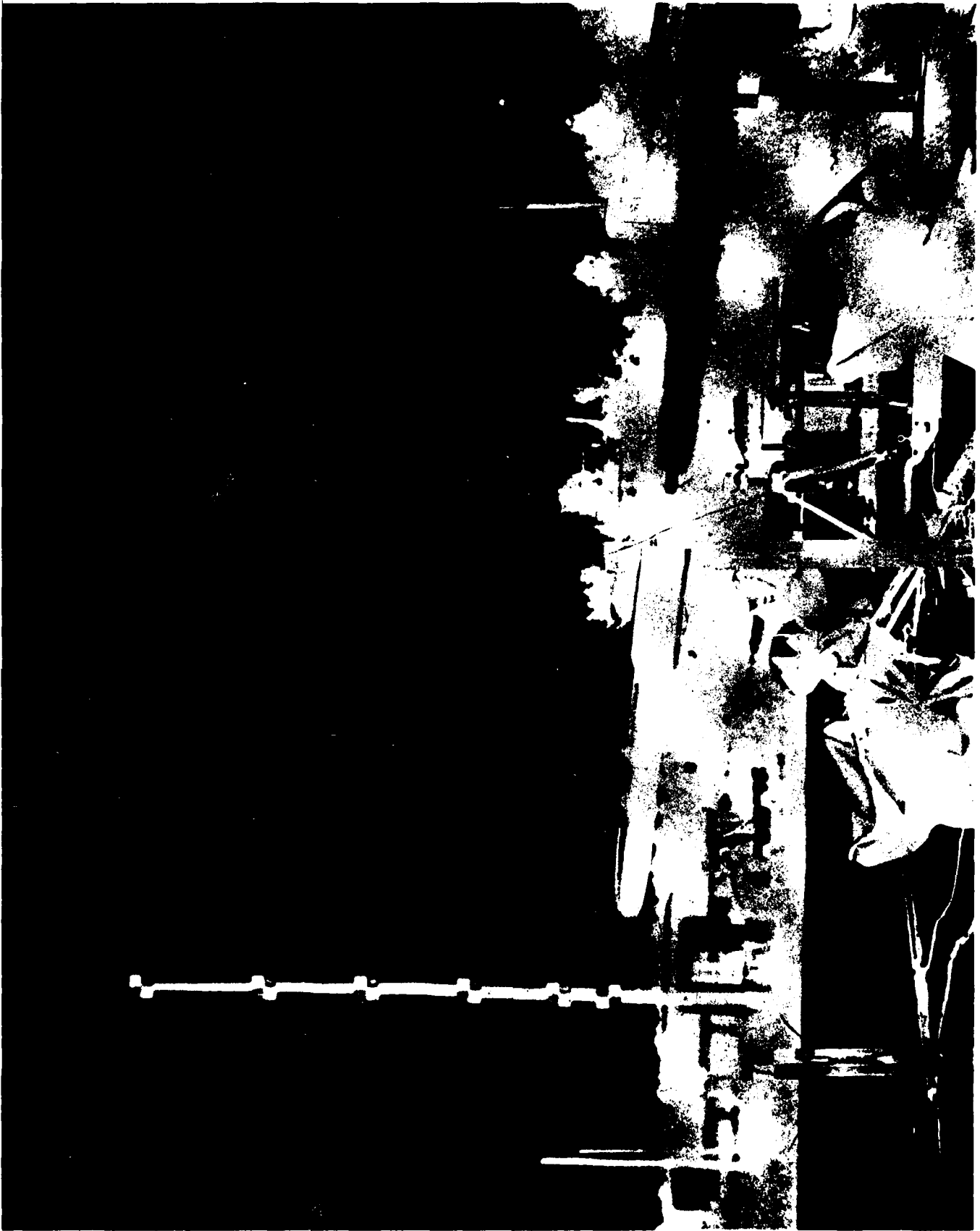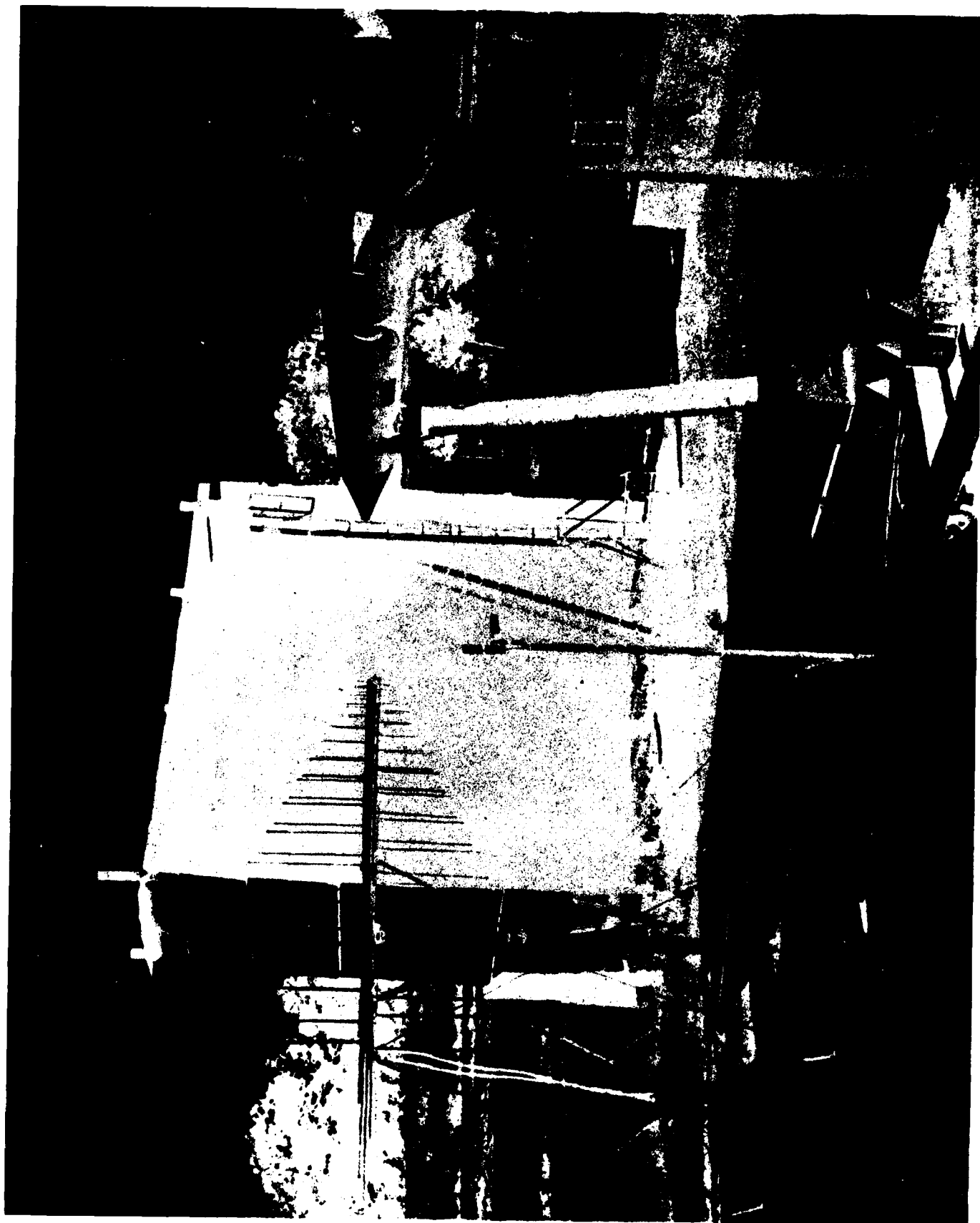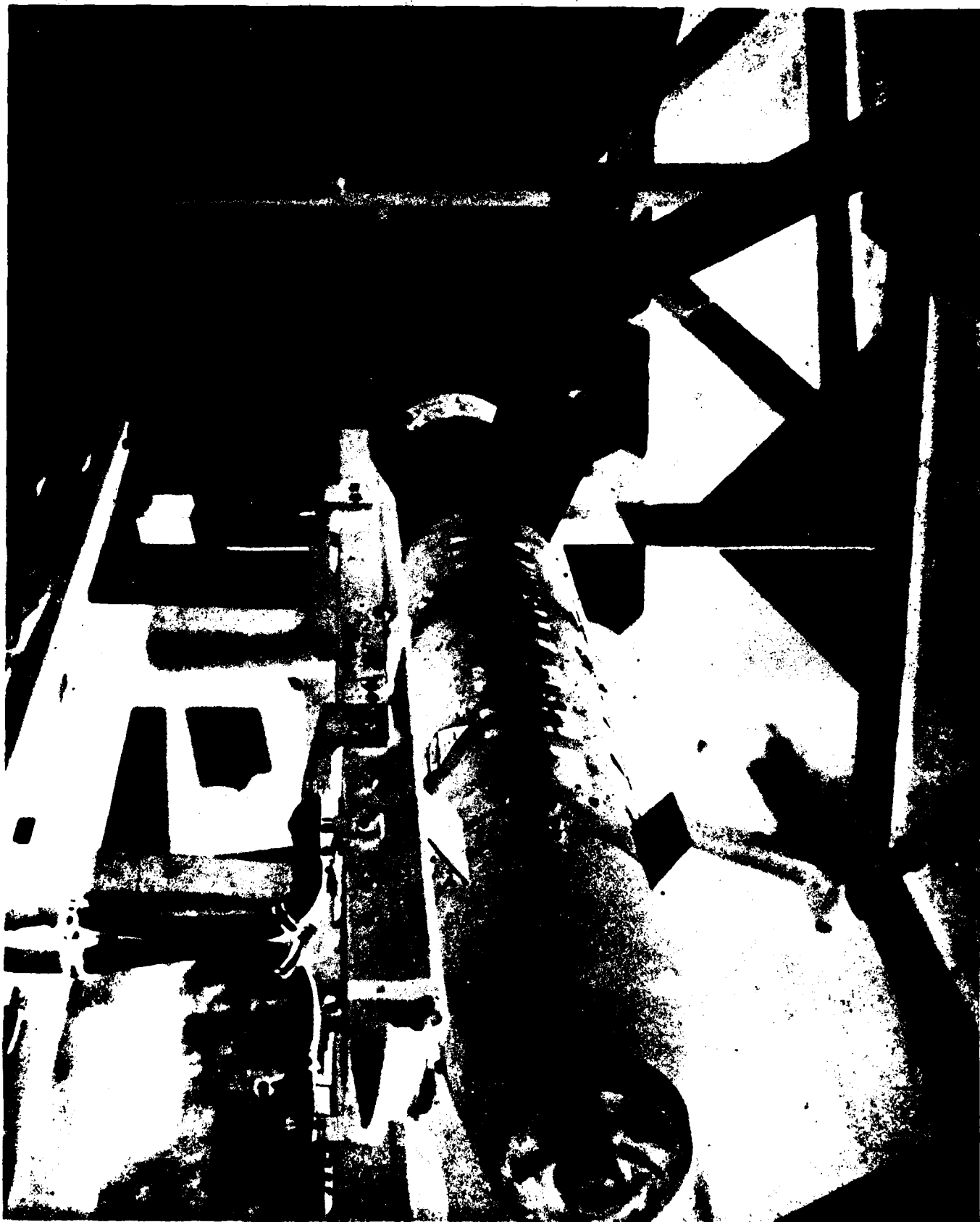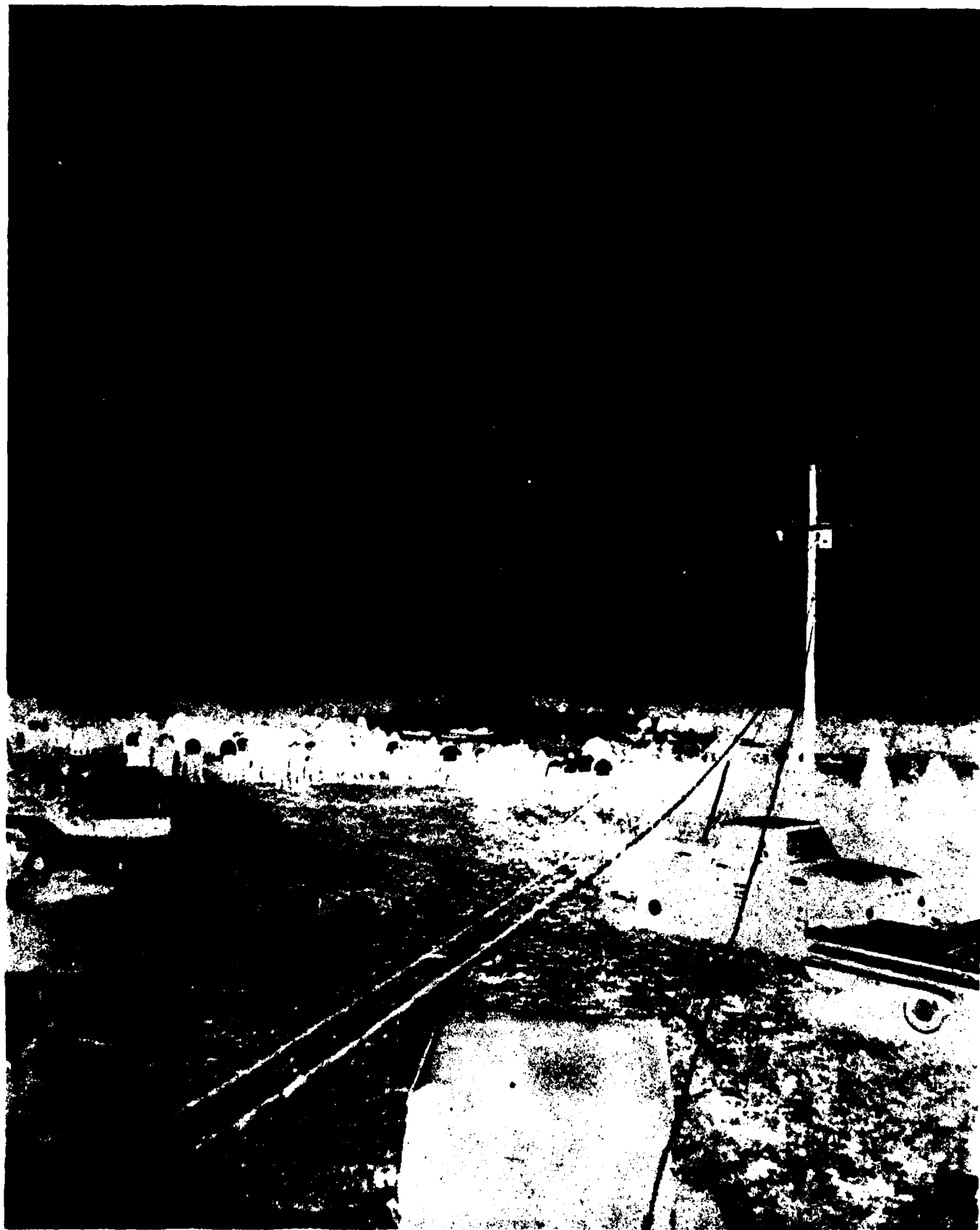
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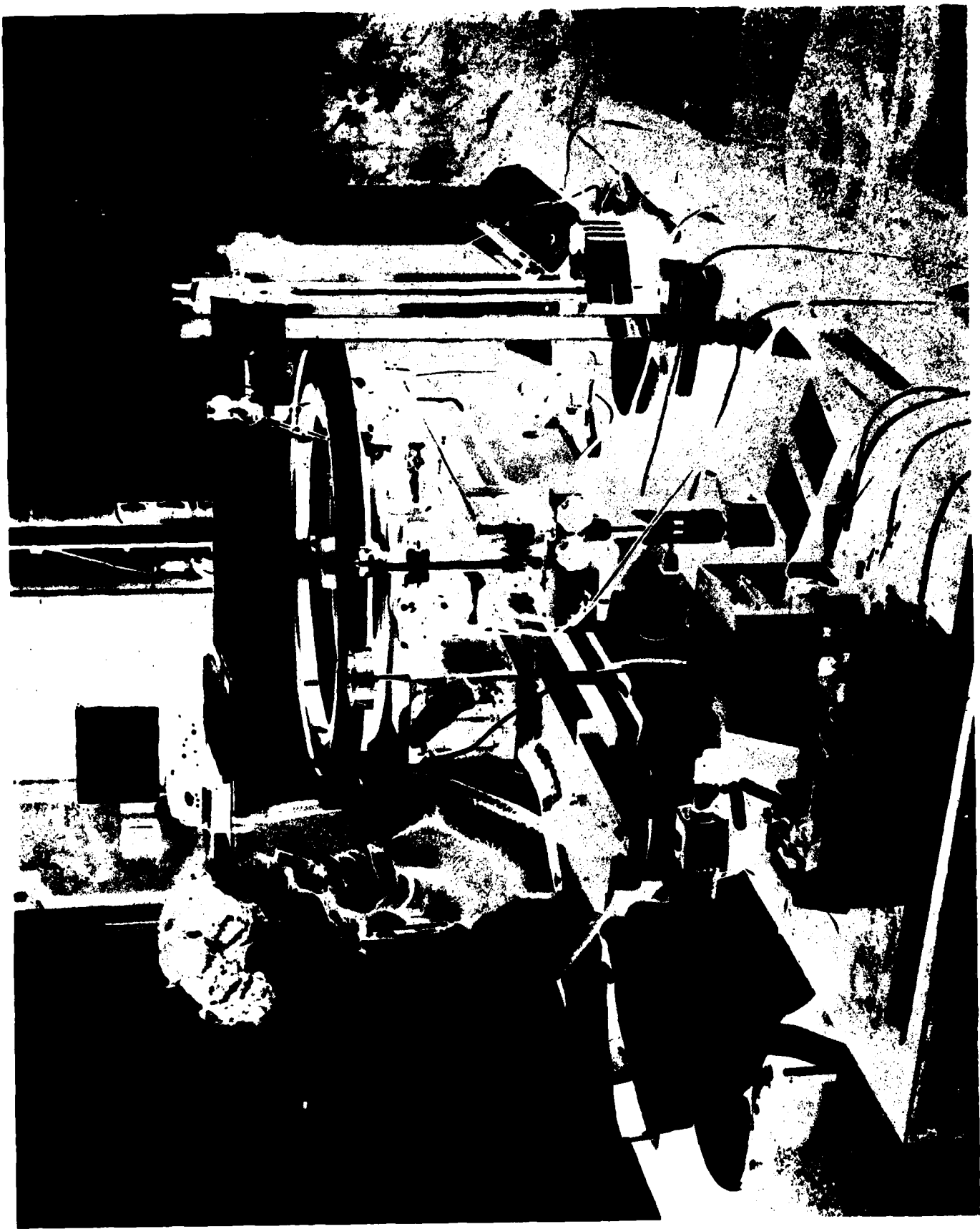
FIGURE 1

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FIGURE 2

FIGURE 3

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FIGURE 4

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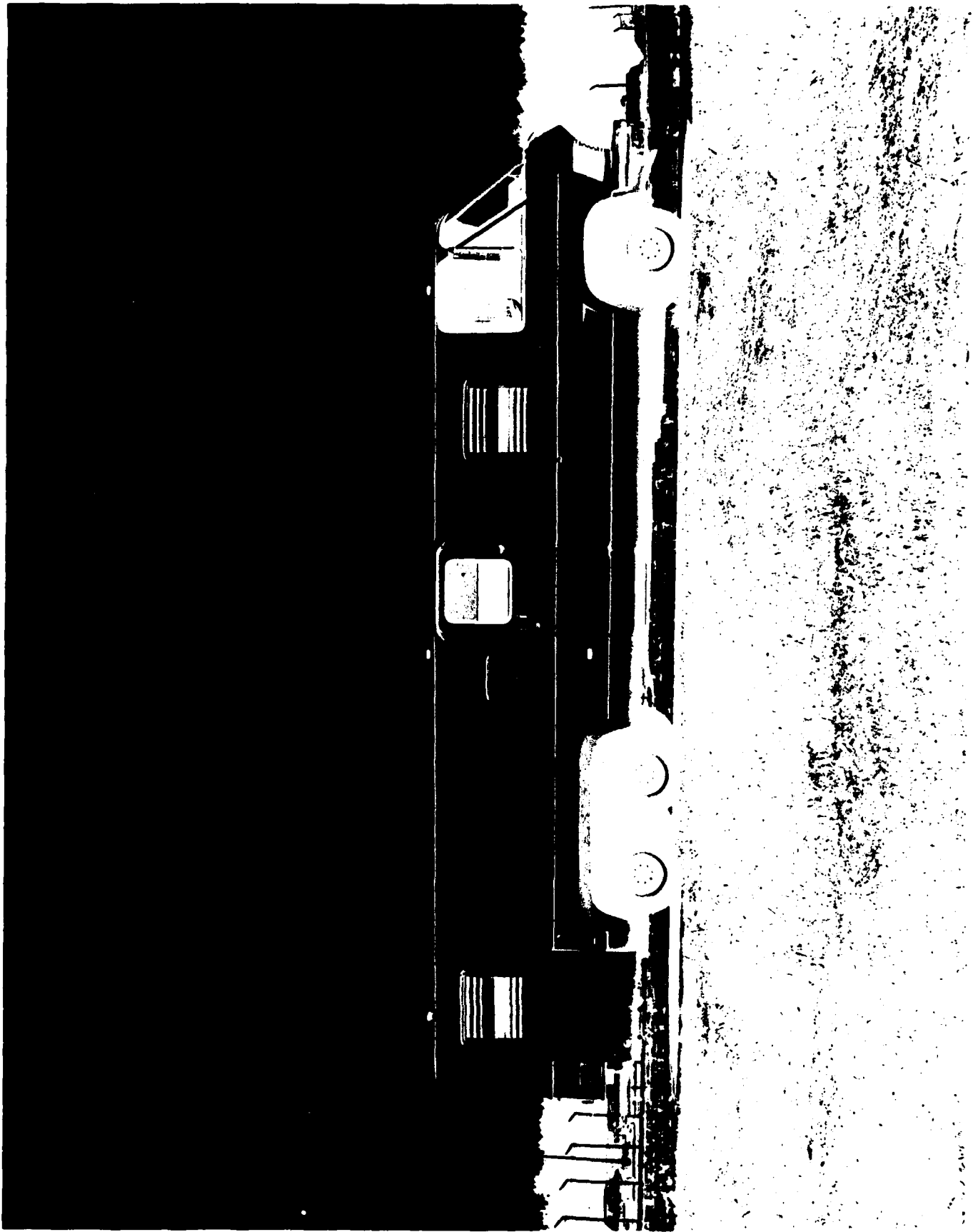FIGURE 5

FIGURE 6

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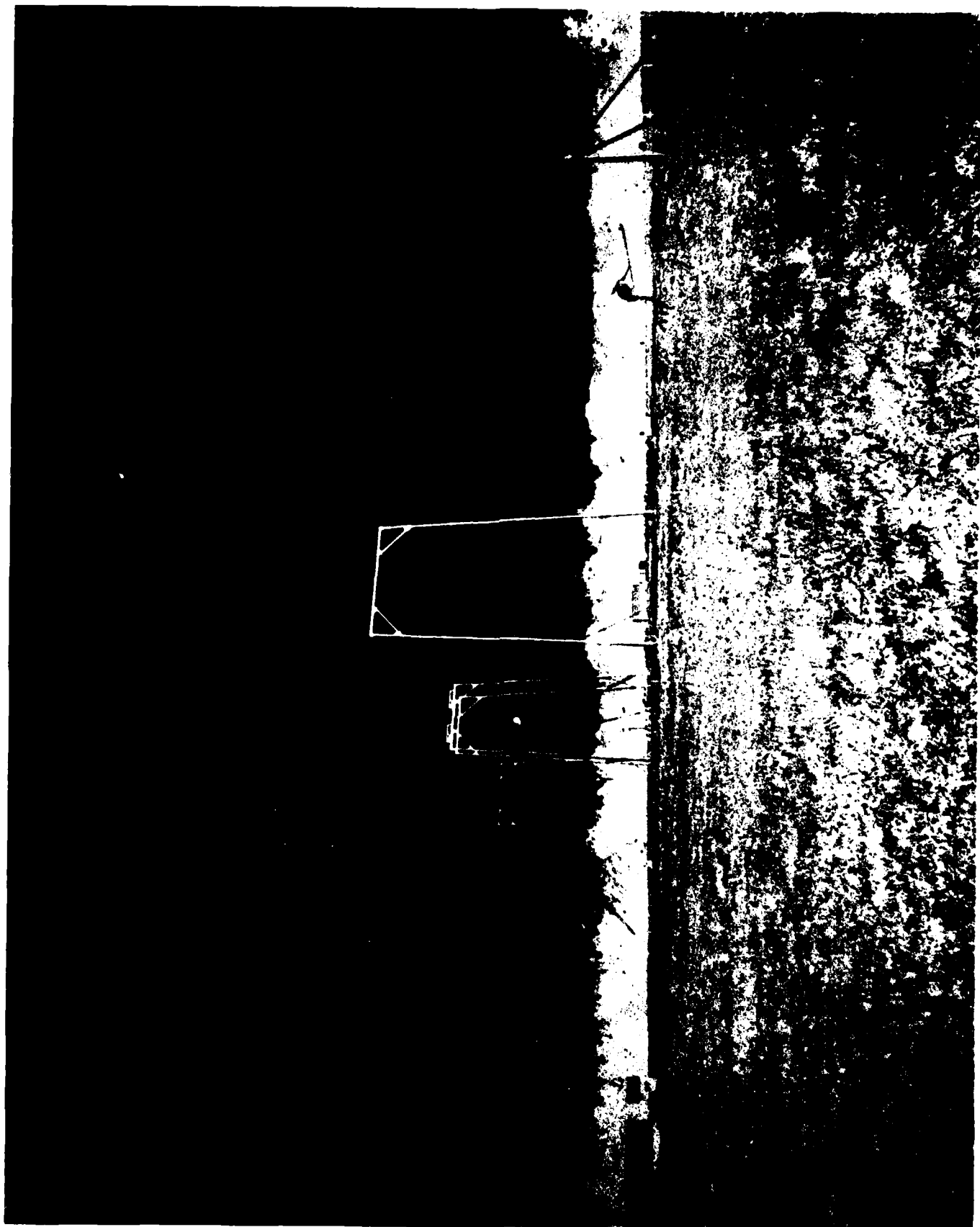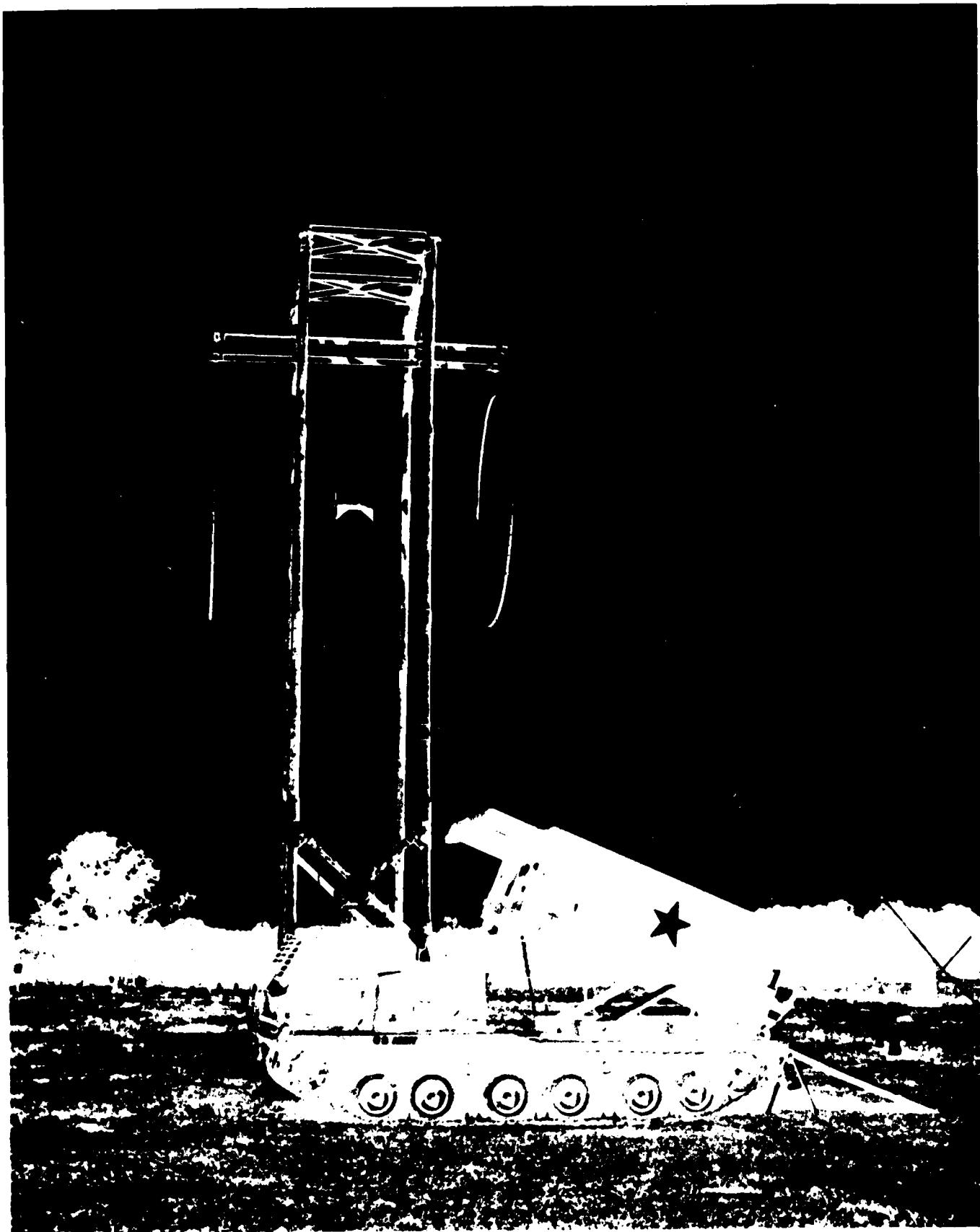FIGURE 7

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FIGURE 8

FIGURE 9

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FIGURE 10

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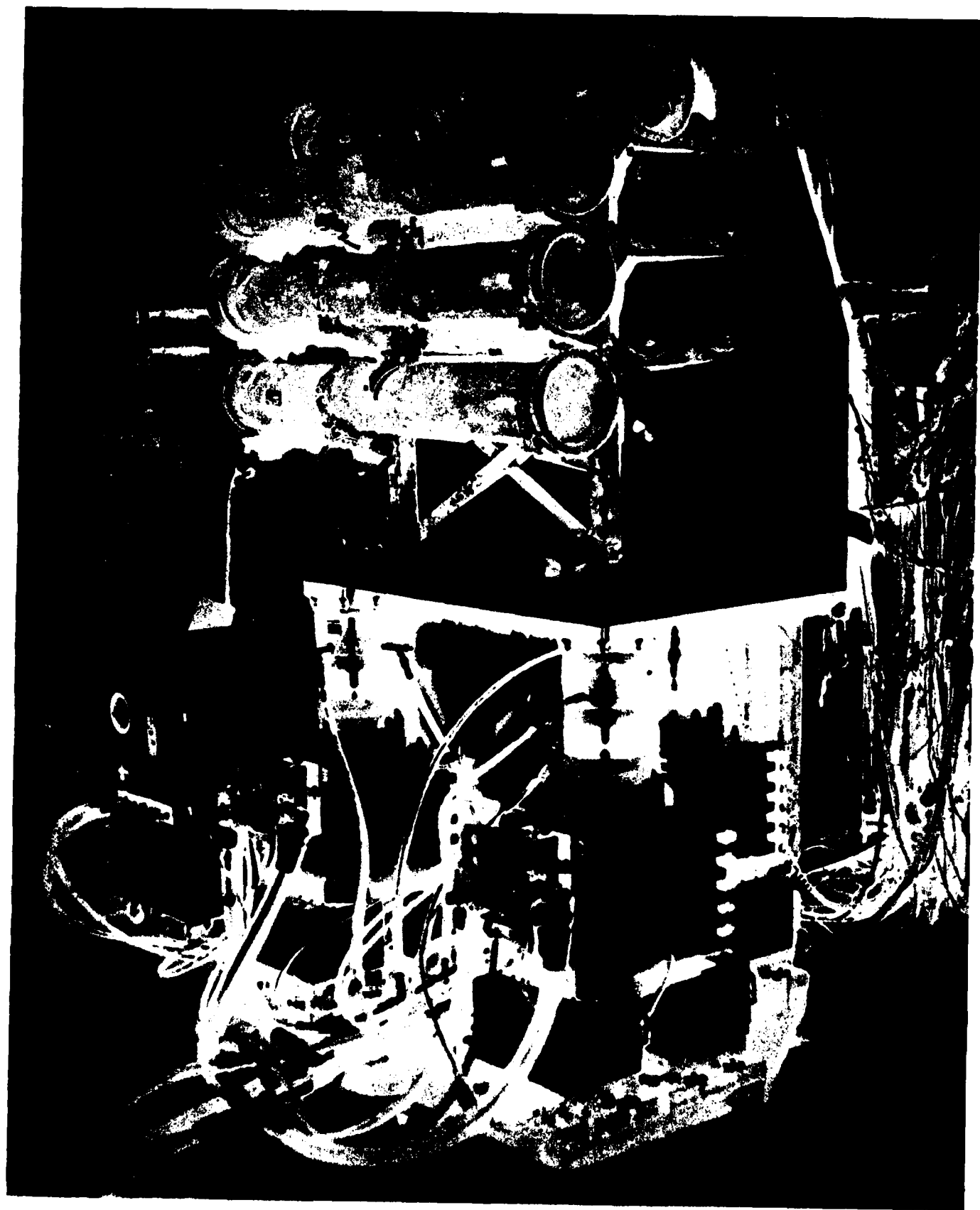
FIGURE 11

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QUESTIONS AND ANSWERS
Mr. Henry Pusey
CAPT. K. M Duff
Col. Ralph L. Kuster, Jr.
Mr. James Daniel

Question by Mr. Hubert Sauter:
The question is directed toward CAPT Duff and specifically it refers to the
recommendations about the face-to-face contact, about sitting in on some of the
program manager reviews and also having access to some of the problem
identification sessions. My feeling is that those recommendations are excellent
for some of the centers. SVIC, for example, is a government operated center d
center where the employees are government employees and so on. But I'm not so
sure that it would be equally appropriate for some of the contractor operated
centers because I have heard over the years that they sometimes have difficulty
in gaining access to some of the information which the Services may feel is
appropriate for government, but perhaps inappropriate for contractors. I was
wondering whether CAPT Duff had any recommendations or suggestions of how these
other folks could interact with those recommendations.

CAPT Duff's response.
Yes, I essentially only addressed a portion of the problem and that is the part
of the 6.2 tech base that is shaped by the government users of the resources,
the laboratories. There is a significant, if not even a major, portion of the
6.2 tech base that is spent by contractors. Their inputs, their recommendations
are in the form of proposals that generally go into the systems command. I am
speaking with respect to the Navy. So, if you interfaced only with the
laboratories that would be relevant only to what the laboratories do to help
shape the claimency for the 6.2 tech base, and there is another signficant
portion of that, that is by contractors through the systems commands. There are
also four universities, Applied Physics Lab at Penn State, Applied Physics Lab
University of Washington, University of Texas at Austin and Applied Physics Lab
Johns Hopkins University where the Navy directs funds to Universities.

I don't have the resources at this time to comprehensively answer your
question. Let me summarize it. Yes, there is a significant portion of the 6.2
tech base that is shaped by contractors through the same type of process that
the laboratories follow, that is through the systems command who claim that
portion of the money in the sorting out of the budget. So, those contractors
that are involved in 6.2 (I presume that the IACs know who they are and are
coordinating through the contractors) identify where the holes are, where the
potential pay dirt is and focus their effort in the tech base. That is where
that dialog should take place and it should come in through the system
commands.

Additional response by Col. Kuster:
I mentioned that I wanted to address that from a Lab viewpoint too. I think a
face-to-face capability is necessary for an IAC. We have a face-to-face
capability in as far as the data search is concerned. We have the capability of
getting into the various data bases that are not in our own organization through
NTIS or through NASA or through various other types. The one thing that you are
not going to find in those IACs that you are talking about is the IR&D programs
run by the corporate organizations in the country. By law the IR&D programs and

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results have to be turned over to the government so that, for those organizations that my divisions are responsible for and my lab are responsible for, I have those resumes of the programs and results of the programs. In many cases they are proprietary and we cannot release those to a nongovernment run laboratory, and that is dictated by law. So, I guess if we are going to have nongovernment run laboratories or at least we don't have the controls on them to protect that proprietory nature of that information, which is only releasable to other government organizations, then I think we have that problem you're talking about and I don't see a resolution unless you can write in that contract some way that they are going to protect the proprietory nature of that information.

Question by Mr. Jack Kolb:
My question was directed toward Col. Kuster and had to do with a couple of his slides which showed a break out of service users; in-house, university and contractors. My first question is, are the university users in conjunction with Air Force work or are these independent university inquiries, such as thesis people, that are simply interested in structures?

Col. Kuster's response:
To use ASIAC automatically they have to be a government contractor and the major universities are. However, we do have a provision that, if we approve it, we can authorize the search or use of the facility for nongovernment, contract sponsored organizations.

Question:
Now, my second question is are you aware of the ONR center; it is not an Information Analysis Center but it is a group that is bending in that direction on structures analysis; Nick Porone is the contact. We are referring to static structures, however, not dynamic structures which I believe is your field.

Col. Kuster's response:
We have static and dynamic structures, yes. We have had a few opportunities to meet.

Question:
All right. My third question is you didn't mention anything about funding. Is most of your operation internally funded?

Col. Kuster's response:
We fund a base level and it is probably in the neighborhood of 25 to 30 percent of the overall renumeration to the contractor that goes through our contract. But we fund it at a base level just to keep it operational and we work up to that base level and we control who works within the base and who we require to reimburse us.

Comment by Mr. Pusey:
I would like to just pursue the issue that was raised by CAPT Duff a little earlier. First, the idea of renaming IACs by calling them a technology assistance support center. I like that because I think it reflects a little bit more than what an IAC name indicates and that is that we in fact are technology brokers between the supplier and the user. I think that is important and it is something we can look at and get DoD blessing on and maybe even bring it about eventually.

Then the second point that you made which I thought that Mr. Sauter addressed a little bit, is the idea of sitting in on the review process for the 6.1, 6.2 programs and the direct contacts with the systems development people in areas where our technology carries us I think is extremely important. We have been doing some of that with the 6.3 and 6.4 people in the sense that our biggest contacts, most direct contacts, are with the laboratories and the R&D organizations that support systems development. I think we can do it on a much more effective basis if we do it in a planned way and find some way to document, if you will, without taking the negative sense of that organization, what we have done in a way that will be useful to both ends of the system. That takes a little looking at but I think it is important.

Comment by Col. Kuster:
Could I just say something in general. Consider developing a technology like the kind of business we are in at the Flight Dynamics Lab. I will go ahead and use metal matrix as an example because it is one of the newer technologies we are working on. We will fund that out to a number of different corporations. We might fund it out to Grumman; we might fund it out to General Dynamics, might fund a short piece of work out to Boeing. Each of those companies will do a little piece of a pie called a total technology information pie, and without this information exchange program you can see that when we go into the second phase of it we might go to different contractors to do the next phase and if the latter does not have some access to the information that the former corporations built together here then they don't have the basis to step off and do the next phase of technological development. So the ability to collect that information, the results of previous work, and to project that into the next phase is absolutely mandatory in our business and we have to have these information centers. That is why we just started this metal matrix center; we just could not collate that information together. I can think of probably a half a dozen other areas where we are probably going to need information centers in the fairly near future just because of that same reason, there are new technologies. They are evolving. We have got to have some way to exchange and control that information flow.

Question by CAPT Duff:
I want to ask a question on this because I thought I detected both in your presentation and in Mr. Daniels an effective means of providing focus and perhaps program assurance to your objectives. It was inferred by both of your presentations that you have some independent funding. In Jim Daniels case it was with respect to the long-term 8-10 year reliability mission. This is in addition, but not directly related to your T&E mission and gives you a legitimate hand in the tech base types of research which makes you a user. In the Army that would correspond to a tech base type of effort that is not the same as your T&E mission. I thought I detected from your last statement that you are an Air Force claiment for funds that are not strictly associated with your IACs function that allows you to push the contractor resources and actually fund their efforts in generating a portion of the tech base that you are managing as a center. Is that a correct perception?

Col. Kuster's response:
When an individual corporation comes in with a contract to do another phase of involvement if we don't have confidence that he has the knowledge of where to go to get the most current and complete base of information that he is going to need to step on to the next phase, we are certainly not going to award the contract. So, we absolutely demand of the contractors that they can go to the

information centers and get that information. Then secondly, we have what we call a multiplication factor wherein we feel that if we pour money into a particular area the contractors are going to have to pour some multiplication of that amount of dollars into that particular area in order to stay up. I will give you an example. If we go to a particular contractor on the east coast and pay him to do one step of technological development in our programming, which is available to all the contractors, they see that we are going to continue into, say, a step three or four or ten or whatever it is, and if they don't complete or at least stay abreast of this intermediate step that is being taken using either IR&D money or company funds, then they are not going to be in a position to compete for the contract in the next phase. So they are forced to put their money into it if they want to stay competitive in that particular technology.

Comment by CAPT Duff:
But the key is that you have Air Force funding for the support of your IACs that makes you not totally dependent upon user use of your information in order to get funded. You have independent funding from the Air Force, is that correct? Where do you get your funds?

Col. Kuster's response:
No (to the Air Force funding). That money comes out of our 6.2 program money.

Comment by Mr. James Pendergast:
DTIC supports nine of these IACs that are represented here with direct money of about 4 million dollars that we budget for as a line item in DLA's budget. IACs also get support from other organizations on a reimbursable basis for special studies that they do for those organizations. The ones tha we are reponsible for, and I think it is true of the ones in the Army, all get a certain amount of basic money from somebody. Same thing is true with the IACs in DARPA and DNA.

I have a question for you folks while I am standing here though. Do you have any suggestions of how the individual IACs or people like myself could get to talk to the people that you have been talking about here now? How do we get to talk to program managers? In the past we talked to all the lab directors and maybe we need to repeat that but do you have any suggestions of what we might do to get our message to those that should hear it, either individually or as it involves the whole program?

CAPT Duff's response:
Yes sir, a person approached me during the last break and asked for a list of those charts that showed who the program element managers were both in terms of of the budget execution program appraisal, budget execution level and at the use level and the purpose he expressed was so that he could identify those that are identified, that are related, to his IACs and contact them directly. Now, the proper method of executing that would be to first establish that personal contact so that identification of names, phone numbers, functions are identified and the then to make a specific arrangement to get together late in the summer. Early in the fall, the program appraisal process is commencing and that program manager is going to have to go front and center with his past performance over the past year and his notional program which will go into the next years POM, which gets finally established near the end of January. To schedule a session with him gives him a total view of how that IAC has been functioning; what the other user needs are that have come in over the past year; what the perception of that center is on what is relevent, what are the primary needs and who the users

are; that session should apply to structuring the next years program. The primary period of time for that is sometime between the August/November period.

Col. Kuster's response:
Jim, in my own case I am not too worried about getting it to the program managers. In the Air Force, program managers are so conservative that they are not interested in Technology. By the time they get appointed to the program manager position the program has been pretty well approved, the technological base for the particular weapons system development has been researched and approved, so there is no technological development required on the program. In the Air Force our program management team is pretty much a management team and then the technical side is kind of a checker/auditor of the adherence to the specifications and schedule and probability of success. They are not interested in demonstrating technology. They are interested in using current technology. The people that come in with the technology are contractors. They do it via the proposal system and if they don't propose it, there is no good way that we can force the new technology into a system. So we have to sell the aerospace community on a new technology and get that into the advance design departments especially. The program managers in the Air Force are pretty much salemen. They are responsible for keeping track of money and keeping the program on schedule and getting that weapon system to meet the required specification of accomplishment. When they get into a problem, they don't hesitate to give us a call. I am very serious about that. We work very close with all the programs. We have an engineering organization that is matrixed into the program office and that is what I would call a routine engineering capability in those program offices. When they get into any area that requires special engineering, they leap for the telephone and call up the laboratories and in nothing flat they have two or three experts sitting right along side them and holding their hand and trying to help them out of a problem that they might have gotten into. We would like them not to get into those problems but unfortunately we can't write specifications fast enough and get them accepted. Anyway, I really think we have a good inlet to all the information data bases, via our contract in our laboratory, in say structures area. Our laboratory is also used by people who are developing material. They use that information capability a lot and they work very closely with Battelle in the materials center and our guidance and control people use it a fair amount, our air mechanics people use it a fair amount and our ground system people use it a fair amount. So, all of the different disciplines of the aircraft/space industry in the laboratory environment are using our inlet to all of the information centers, especially those centers that have their resumes in the NTIS system.

CAPT Duff's response:
What Col. Kuster just responded to was not the same question I was answering. Maybe we need to get a clarification on what the question was. What I was answering had to do with establishing relevance at the 6.1, 6.2 level. When I refer to a program manager I am referring to a 6.2 program manager or a 6.1 program manager. Now let me change the title, if necessary, so there is no further confusion. I am not talking about a product systems program manager. I am talking about a technology program manager who claims the money, who is accountable for how he spends that money in 6.1 or 6.2 to produce research findings and technology development. That is what I am referring to when I counsel here, that the way for the IACs to increase their effectiveness is to get together with that technology program manager who claims the money and who proposes the structure of the forthcoming year's program as to where that money

ought to go how it ought to be spent and who ought to spend it, maybe laboratories, contractors, or universities.

Comment:
Cliff Lanham, I am technology coordinator with Harry Diamond Laboratories. I have the feeling that from what CAPT Duff said there is a possibility we are missing a concept, a term. Being concerned with technology transfer I would like to borrow from the industrial sector, the private sector, that what we need to be concerned with, and I think that the information centers should be concerned with and CAPT Duff got part way along toward, that is the concept of marketing. We're often told in the government that we don't market and that we don't need to have anything to do with that, but I think what we are dealing with here is that the Information Centers should market as opposed to sell. The difference being that you come in with the idea of selling. I have a product that I want you to be aware of and I want you to use it and I bring it to you and I say I'm trying to present this product for its value. If you are not aware and do not cast that very sharply toward the needs of the potential user which you have to understand, then you can't sell it to him. What happens when the guy at the door says, "I've got this brush, it is amazing, you need one." Go away? You need to come in for the idea of marketing. One needs to come in and say "what are your problems?" And investigate what those problems are. And come back and offer solutions to those problems. I think a lot of people can get that idea from looking at the numerous texts on marketing. Not all of those methods are used by industry and it is a highly developed technology in American industry in particular. Not all of those items are going to be of value, but I think it is a very good mode for the information community. I know from dealing with my library, they are excellent in what they do and I know a great many of the Information Analysis Centers are excellent in what they do. The question is why are they not used? The answer is because it is very hard to get the attention of someone who is busy trying to solve his problems. You have to come in as we do in technology transfer in trying to get commercialization and not say, "I'm pushing a technology, I'm pushing an information center," but say "I am here to solve a problem," and to show a knowledge of those problems and to show that you can, in point of fact, solve particular problems that are relevant to what this guy is doing right now. That is an idea that I think needs to get through to the information community, one that is very slowly developing in the technology transfer community, slow to develop and one that is now needed here.

Comment:
I am Sherman Gee and I am here from White Oak (Naval Surface Weapons Center). I was just thinking about our discussion this morning and yesterday. It seems to me that one of the things that we really should not lose sight of, is perhaps also the crux of the problem here, is the fact that IACs were formed, I would presume, with a market consisting of technical specialists. Each IAC is a center of excellence in a particular technical discipline with the idea that the potential users were technical specialists in that discipline. If I am wrong, please say so. But it seems to me that if we are trying to broaden the use of IACs to a bigger community that we ought to focus on how to make the services more useful to a less technical user community. A technical community that are not specialists in structures and dynamics. I can cite as an example perhaps a community which is, let's say as discussed yesterday, those that are concerned with export controls. People in this community have to describe what types of technologies should we protect and what types of technologies can we export freely. People working in this community certainly are very much concerned with

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export controls. People in this community have to describe what types of technologies should we protect and what types of technologies can we export freely. People working in this community certainly are very much concerned with what is the leading edge of technology in different disciplines and who can they rely on. They are themselves not technical specialists. Another example would be our discussion about program managers this morning. It was brought out that program managers themselves are not technical specialists. They are managers, politicians and what have you. We are talking about product program managers and we are talking about technology program managers. They are all probably not technical specialists. Those that are technical specialists would understand in detail what you have in your IACS, so therefore, it is going to be hard to sell your services to these non-technical people.

Now, what I am saying here is that perhaps the nub of the question is how can the IACs expand their services to a user community that is less technically oriented than the user community that was originally envisaged when the IACs were formed. I can propose one step in this direction by again bringing up what Henry Pusey did a few years back and is doing right now. What he did was to prepare a survey of shock and vibration technology for the Navy. He completed this document a couple years ago for a survey of shock and vibration technology in the United States. Now, why was the Navy interested in this? Well, one of the reasons is that we wanted to know where we stood, who the experts were in this country and who we could go to. But then this was only part of the problem. We were also interested in knowing what the centers of excellence are in other countries so that we can better guage how the U.S. stood relative to other countries. One of the objectives is to take a look and try to get a better handle on export control policies for these countries. Another objective is to determine whether there are technologies outside the United States that we don't have and that we ought to acquire. Now, this type of product is a type of product that a less technical user community would really be interested in. Those people who are concerned with strategic planning for the Navy are charged with developing long range plans for the centers, where to invest their dollars in the 5 to 10 year frame, hence, they need to know what are the technology trends. What areas are going to be hot 5 to 10 years away. If you focus your services on the technical specialists only, you run into a big problem there because the technical specialists already know a lot in their technical discipline. What they don't know they have all the contacts in the world to pick up the telephone and call, their peer in so-and-so company, their peer in government or their peer in Europe. The natural inclination is to pick up the telephone and call someone they know and ask them what they can do to help them solve this problem or find the information they are looking for. So, naturally their inclination is to bypass the IACs. But if you decide to broaden your base of users, then I think that what we ought to do is to direct our attention to a less technically oriented community. Thank you.

Mr. Pusey's response:
I would like to respond to that just a second. Your idea is very good and we haven't lost sight of that. Incidently, the first survey that we finished two years ago was on all the western countries, including the non-eastern block countries. The one we are working on now is a survey of the eastern block shock and vibration.

You are correct in what you say and I don't really know the experience of the other IACs but the questions and inquiries that we get at SVIC come from all

sectors and that includes the specialists that are working a problem or on a program. It also includes people who were also dumped into a program and know nothing about shock and vibration but yet they are faced with a problem. We can then put them in touch with the right people, give them some starting literature, do a little education in the process, if you will. That is what Col. Kuster was talking about with ASIAC. He dumps the new engineers in there for a while and lets them get their feet wet.

There are lots of functions of this kind and lots of different customers, including nontechnical types. So I agree with you, I am not against it. I just think quite probably the same type of thing is happening with some of the other IACs.

I think the field of vibration happens to be one of the most exasperating technology transfer areas I have ever worked in. Vibrations is perceived as a difficult area to work in and design for and almost invariably the way we get into a program concerning vibration is when the system has a big problem and it keeps falling apart. So they come up here and now we have to go back and redesign a system and it is rather an expensive process and we just wish we could get people to consider acoustics effect and vibration effect in initial designing of the system and we are working hard trying to get that into the design handbook and get some specifications written that will require it. One area where we are achieving some success is in the satellite area.

On the exchange of information with the foreign friendly nations we have what we call information exchange programs with almost every country in the northern hemisphere that is friendly to the United States and we do keep a fairly decent catalog of documents of the proceedings of those conferences and meetings and of documents published by those various organizations, for instance, NRL in the Neatherlands and ONR in France and various English and Swedish organizations. So we do have a fairly decent knowledge of that in our own field or in this field of structures area and I agree with you that we keep those open and stay abreast of what they are doing.

We have worked several programs that have included three countries. For instance in flutter supression of a wing of an airplane which is gaining providence, as we go into the lighter, thinner structures and carry more ordinance on an airplane, the wing tends to flutter more and we have to reduce the flying speed of the airplane in order to control it. We don't want to do that. We want to keep the airplane flying fast and we want to control the flutter and we have some programs that are working three and four foreign countries together in a joint program to develop active flutter control methodology in program. So, we are working on that and the information is available through those meeting reports and we announce those meetings through our newsletters to the various corporations so they can get out to those meetings and participate. And they do. A lot of the time we will fund a contractor who is working a particular technology area to go over and present the results of his work at one of these conferences. We try to stay up on that.

I would like to share the spot a little bit on that last question because I think I take issue with a couple of the precepts that were contained 'n it. First let me try to sort out what I agree with.

I agree with the point that there needs to be a recognition that there are some less technically oriented aspects of potential, related issues to the mission of

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IACs. I deny that they are not being dealt with or that they are a center aspect of the mission of the IACs, such as dealing with other aspects of technology transfer, international aspects of it, security aspects of it, control, the prioritization that relate to what potential needs might be 10 years downstream. Even though I agree with that point, I think that at least within the Navy the people that deal with those issues are highly technically qualified. I am shocked when I showed up over at the Office of Naval Research and the Office of Naval Technology and I look around at all the Ph.D.s. Essentially they all come out of pure scientific or a mix of scientific and applied research background. They are the ones that deal with the issue.

Now getting back to the aspect of this community itself and the business of collating the work that the IACs do in the business of marketing and relating, pushing the noodle so to speak, in a way that the nontechnical community will be receptive too. I think that all of us have a tendency to feel that those people that control our destiny, feed us the bucks, appraise what we are doing in its adequacy, just don't understand our problem and we need to explain to them how they should properly look at their job of appraising us and determining what we are producing is useful. That is a natural way of thinking, but I think that is self-defeating and I think we need to dispense with that. I think there was room in what we heard here in the presentation as a possible attitude that we need to guard against. If I am misperceiving here, then I am eager to be corrected. Let me take this opportunity then to set that aside. It is not the business of the technical community to make the presumption that the people that are cast with appraising its performance are not qualified just because they don't have Ph.D.s or because they are 5 or 10 years out of their field. The function of appraisal and establishment of priorities can well be performed, and is being performed by people who are technically qualified.

Furthermore, one of the major two aspects that we talked about here this morning in terms of increasing the IACs community effectiveness in providing the needs of the users was to go and listen. That doesn't have anything to do with the technical qualifications of the guy who is telling you what his problems are. It has to do with the qualifications of the highly technical scientists, or bench technologist. To go and listen to the problem and determine whether he can reshape his work or refocus his work to meet those needs is totally independent of the technical qualifications of the guy who is trying to solve his problems.

Question:
I have a rather basic question. My name is Dean Ray, I am with the Federal Emergency Management Agency. I would just like to ask is there a DoD document or some other document that identifies and describes briefly the existing IACs?

Mr. Pusey's response:
Yes. The Defense Technical Information Center published a little red book. It is not the Chairman Mao book by any means but it does list the twenty IACs in DoD and I understand from Hu Sauter that there will be a number of copies of this book available here later today and you can pick them up in the lobby. Incidently, we are pushing to get a more complete description of each of the Information Analysis Centers.

The red book list 20 DoD Information Analysis Centers. The hundred and some Information Analysis Centers that Ruth Smith was referring to yesterday are federally supported in one way or another and that goes well beyond DoD. There

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are a bunch of Department of Energy Centers, Health Education and Welfare and all
sorts of things. We are concerned primarily with the DoD centers, the ones that
serve the Department of Defense. You can get this book from DTIC. The title is:
"Directory of Federally Supported Information Analysis Centers" and the AD number
is A082470. It is available from DTIC and from NTIS.

Question:
Could you have Col. Kuster explain the relation of program elements managers in
this organization in relation to Capt. Duff's question?

Mr. Pusey's response:
Now the question was would Col. Kuster make a comparison between the Navy and the
Air Force.

Col. Kuster's response:
First of all there is no comparison. If you noticed Capt. Duff dealt with a
couple of hundred, no not that many, but you have many, many program elements
that you were dealing with, probably a 180 or so. The Air Force has probably 230
or so program elements. Of those 230 program elements there are about a half a
dozen in our laboratory. Now there are program elements and there are program
elements. There is a 6.1 program element. They all deal with basic research at
the university level in the Air Force; at the desk level if it is in-house.

You have the 6.2 program elements. Our entire laboratory of 800 people operates
on one 6.2 program element worth 55 million or so. The 6.2 program element is of
course the bread and butter of technology development, whether it be in any
service.

Then we have three 6.3 program elements and only one of those 6.3 program
elements would be in much of a position to use the information available the IACs
and that is the program element we run, the structures and materials
demonstration program element. We literally do advance the use of materials,
advanced materials, through demonstrating that material in various subassemblies
of aircraft, satellites or missiles. The other program elements are
demonstrating a different type of technology such as an aero-mechanics or a
flight control technology and the majority of their money is spent on airplane
modifications and flying the aircraft. Gasoline is just eating us up, or fuel,
kerosene, whatever they burn, JP4, is just literally eating our program elements
up dollar-wise. But those program elements are demonstration program elements.
They are really not advancing technology as much as they are demonstrating
technology and as such would not require their contractor to conduct an
information search prior to initiating a contract. For instance, we are
modifying an F16, putting shin canards on it and going up and doing some sideway
flying and anti-longitudinal access control of the aircraft. So they don't have a
requirement to come up to speed on a technology level prior to the demonstration
of those programs, like we do in the structures area. Yes minimal, but not as
much as we require our contractors to do in the structures area.

Then when you get into the 6.4 area, in the Air Force the contractors are
presenting the proposal on a particular effort to the Air Force as I have already
mentioned before, and if we haven't already transfered the technology into the
aircraft industry advanced development teams then we are not going to get it fed
back to us via these proposals. So, we have missed our window of opportunity.
As a matter of fact, I control the 6.2 2-11 program; I am not the PEM on it but I
pretty much control it.

Comment by Mr. Pusey:
I would gather that the comparable program element managers, like at the Naval Development level, hand out the money to the claimants that are back at systems command.

Comment by Mr. Daniel:
I would just like to make one comment, I had not said anything up here today because we are talking about research and development and you would think that test and evaluation would be part of research and develop but at the Missile Command it turns out it only is by organization. I pointed out that the Army Missile Laboratory is the research and development portion of the missile command. Test and evalution directorate is a part of the Army Missile Laboratory, however, test and evaluation directorate is the only organization in the Army Missile Laboratory that gets no line funding whatsoever. We get no funds, period, until we estimate and do work for a customer which could be another division of the Army Missile Laboratory. So, when we are talking about funding 6.1, 6.2, 6.3 as I mentioned in my remarks, we are so low down we don't worry about that because we could care less. We don't have anything to do with that. Some of that money may be used to pay us to do work on research programs for the customer. In addition, other type money may be used. That is just one comment I would like to make so far as my lack of participation in this discussion about this money. We don't deal with it.

The second thing that I would like to say is that I have talked to a number of people at the break and was amazed to find out how many of you represented certain IACs that were working with the research and development at Redstone. I would agree that at Redstone Arsenal if you were attempting to make contacts either to market or to sell your services (I know we don't sell services but you don't know Henry Pusey if you think that) the people in R&D in the various directorate would be the ones to contact; it would not be project managers. The people in R&D, in the laboratory at the missile command are the ones that solve technical problems, and have access to the research money. They do the research and in addition solve technical problems for the project managers. So these are just a couple of comments I threw out in case any of you are interested. I know, as I mentioned before that there are quite a number of you that are working with elements at Redstone that I was not aware of until today and I think that is fine.

Comment:
Sherman Gee from White Oak again. I just want to take a few seconds here to submit a point of clarification regarding my previous comment. I gather it did leave a wrong impression. When I refer to broadening the IACs services to a less technically oriented user community I meant a user community that is less technically oriented in that specialty. The user could be very highly qualified in other technical fields; I just want to make sure that this is corrected for the record.

Mr. Daniel's response:
I think that is a good point. I think one of the marks of an expert is that he is willing and confident enough to standup and say when he doesn't know what he is talking about and goes out and finds another expert in that level. That is the part of the Centers that has the analysis behind it, in my opinion, because he can go and get that specialized analysis using developed methodology.

DoD Information Analysis Center Conference
Wednesday Afternoon, 9 Dec 82
Session IV - Round Table Panel
Mr. Hubert E. Sauter: Chairman

It is my privilege to chair this final session. As you know, our session will address the questions: How do you measure the effectiveness of Information Analysis Centers? I am sure that we can all agree that there are a good number of reasons to discuss this topic. Good management practices dictate that we should have a very businesslike approach to measuring effectiveness. Also, recently the Office of Management and Budget expressed a great interest in the management of information centers. Last September, David Stockman, the Director of OMB, sent out a memorandum to the heads of the executive departments and agencies on the subject of information centers and our speaker this afternoon will address what the Department of Defense is doing to comply with the requirements spelled out in that memorandum. To set the stage, let me quote from the first paragraph of the memorandum.

"Many federal agencies operate or sponsor information centers or similar activities such as clearing houses, information analysis centers and resource centers. These activities collect, maintain and make available information usually on particular subjects or disciplines. Most are established in response to statutory requirements or program needs and their information services are usually available to both the public and the private sector."

Later on in this memo he goes on to say, "Federal agencies have a responsibility to insure that the Federal information resources are efficiently and effectively managed. The General Accounting Office and others have identified instances where the Federal government is providing information services that are readily available from the private sector. In other cases the government provides information services without charge or at less than full cost thereby, impeding the ability of the private sector to provide such information services. Finally, there is evidence that suggests the existence of unnecessary duplication and overlap among the centers sponsored or operated by the federal agencies." In this memo he then charges each of the executive departments to come up with a program to manage or better manage their information centers and they must submit a plan by late this year. This afternoon we will hear how the Department of Defense plans to implement this OMB memorandum. Five questions that must be addressed in the review are, and I will quote again from the memo:

1. "Does the center serve a legitimate and necessary government function?"

2. "Does the information service duplicate similar services provided by other public or private organizations?"

3. "Could the private sector provide the same or similar information services?"

4. "Can the center be consolidated with similar services provided by other federal organizations?"

5. "Is the information service provided on a full cost recovery basis? If not, what are the benefits to the public or to the government of providing the service at less than full cost?"

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I think these questions should be kept in mind during our discussions. Finally, before we actually start the panel discussions, I would also like to recall some of the things that Jerry Persh mentioned yesterday. They are worth repeating because they compliment the OMB memorandum.

His questions if I recall correctly, are:

1. Are the IACs serving a useful purpose that can be demonstrated?

2. Are they filling a DoD need that is otherwise not being fulfilled?

3. Are their products and services in the best form to meet the need of the DoD?

4. Should they be oriented towards the R&D or towards the acquisition production communities?

5. Are the funding allocations aligned in accordance with the DoD priorities?

6. Do changes have to be made in the direction, the coverage of products, the management of funding, etc., of the DoD IAC programs?

When we move on to the panel itself, we will give each of the panel members about five minutes to present their views, and then we will have an open discussion.

At this time, it is my pleasure to introduce Mr. Charles W. Cardiff, Director, Information Control Division, Office of Assistant Secretary of Defense, Comptroller – Management Systems.

DoD Information Analysis Center Conference
Wednesday Afternoon, 9 Dec 1981
Session IV - Round Table Panel
Mr. Charles W. Cardiff: Director

On September 11, 1981, OMB issued Memorandum M-81-14 on Federal Information Centers.

It required the senior officials in DoD to include Agency Information Centers in the DoD Triennial Review Plan (reference OMB Bulletin 81-21/P.L. 96-511 Paperwork Reduction Act). As background, the Defense Department has four senior officials - Section 3506 of P.L. 96-511, item b reads, "The head of each agency shall designate, within three months after the effective date of this Act, a senior official or, in the case of the military departments, and the Office of the Secretary of Defense, officials who report directly to such agency head to carry out the responsibilities of the agency under this chapter. If more than one official is appointed for the military departments, the respective duties of the officials shall be clearly delineated."

The ASD(C) was designated as the DoD senior official which includes OSD/Defense Agencies. A senior official was also designated for each of the military services. The Triennial Review Plan referenced in the OMB Memorandum refers to Section 3506(c)(1) which required these officials to "periodically review its information management activities including planning, budgeting, organizing, directing, training, promoting, controlling, and other managerial activities involving the collection, use, and dissemination of information."

The OMB Memo required agencies to add "information centers" as part of their IRM review. Specifically, the memo highlighted OMB's concern on these points:

Agencies that operate or sponsor "information centers" or similar activities such as clearinghouses, information analysis centers, and/or resource centers.

Activities that collect, maintain, make available information, usually on particular subjects or disciplines.

Activities established in response to statutory requirements on program needs.

Information service usually available to both the public and private sectors.

This became the basis on which the following definition was developed:

"Information centers are . . . activities (which) collect, maintain and make available information, usually on particular subjects or disciplines. Most are established in response to statutory requirements or program needs, and their information services are usually available to both the public and private sectors." An additional criterion in the OMB memo was the word "major." It has not been defined.

At first we thought OMB wanted centers similar to the Federal Information
Centers GSA has located around the country. They are listed in the book of
government operations and organizations. However, this was not the case. The
"information center" requirement was then discussed with the Military Department
Senior Official representatives in October. From this:

1. The Military Departments and OSD would begin developing a list of major
information centers.

2. We notified OMB (November 4, 1981) that our Triennial Review Plans
would include information centers.

3. The basic reference would be the Defense Technical Information Center
Referral Data Bank Directory.

The OMB Memorandum also established criteria to be used in evaluating the
"information centers." These are:

Does the center serve a legitimate and necessary government function?
Does the information service duplicate similar services provided by other
public or private organizations?

Could the private sector provide the same or similar information service?

Can the center be consolidated with similar services provided by other
Federal organizations?

In addition to the criteria, OMB also provided under separate cover some
interesting attribute or management data each agency should know about their
centers:

Name of center
Who sponsors it (Agency/bureau, etc)
Who operates it
Authorizing statute
Objectives and governmental purposes
Primary subject matter and material/media available
Target audience (size, who gets it and percentage usage)
Types of information services provided and how it is made available.
Annual cost (direct and indirect) of operation by FY.
Fee schedule and costs recovered.
Describe benefits.
Year first established.
Geographic location and availability.
Point of Contact.

OMB provided a list of centers as a starting point. Some OMB examples were:

Tri-service and NASA Failure Rate Data Program
Reliability Analysis Center
Metals and Ceramics Information Center
Waterways Experiment Station Technical Information Center
Data and Analysis Center for Software
Defense Documentation Center

The list appeared to be a collection on non-homogeneous items possibly even a "shopping list" for some other future adverse action. The IRM review, however, can address the fiscal concerns of elimination, consolidation or cost recovery/reimbursement associated with any Defense information center.

In looking at the OMB list, one of the first steps would be to determine if we had a naming problem. For example, the words "information center" appears in the title but based on the OMB definition -- was it really a center? If it was not a center, then perhaps a change of name would be required to better describe the facility.

In our December 3, 1981 Review Plan provided to OMB, each Senior Official identified five information activities that DoD would be reviewing during FY 82. Included in the Navy part were two Information Centers: Naval Coastal Systems Center, Panama City, Florida, and the Navy Personnel Research and Development Center in California. The Army had identified the Army Engineer Waterways Experiment Station (WES) Technical Information Center. The Air Force initially listed the Data and Analysis Software Center. OSD would be reviewing the Defense Technical Information Center (old Defense Documentation Center.)

Basically, DTIC is a major information resource for DoD and the review should verify if it is required; provides a benefit and is efficiently and effectively managed. What this means is that OSD, through the Defense Audit Service or Tri-service Team, is responsible to look at the Defense Technical Information Center in terms of its basic purpose. The review will evaluate the Center against the OMB criteria and look at the interface with Military Departments and Defense Agencies.

Mr. Jerome Pearson
Air Force Flight Dynamics Laboratory

I am representative of the users of the IACs and I am an engineer who has worked in structural dynamics of spacecraft, aircraft and launch vehicles. I have been with the Air Force for about 10 years now and before that I was with NASA for 10 years. I do serve on the technical advisory group for the Shock and Vibration Information Center and so I have at least some awareness of the kinds of problems facing the IACs and I would like to give you a few of my thoughts on what one can do in this present kind of budget climate to insure the survival of this kind of activity.

In the first place I have been in the field for quite some time now and I was surprised to find out how many IACs there really are in existence. I read a lot of technical literature and a lot of things come across my desk and I don't really feel that I am that insulated from what is going on in the world, but until this last year or so I had no idea there were hundreds of IACs and organizations like this dispensing technical information in various areas. I think this indicates that there is not enough publicity of who you are and what you are doing and the technical people, which is who I represent, are not really fully aware of your organizations, of your capabilities and what you can do to help them out in their jobs. They have technical problems that they need to have answers for and as it has been said before, they ask their colleagues, they ask people they know in the area, but if they are not connected with your IAC, your organization, that doesn't get them plugged into the system other than just going through DTIC and a literature survey and that kind of thing.

It has been my experience that most of these organizations have grown up attached to a particular DoD or other component and have been mainly an in-house kind of operation and have spread from there. I think that is an indication of why they are not as well known in the field as they could be. They are really not completely covering the entire field. So, I think the first order of action to solve this problem is to make sure you do advertise yourselves and make yourselves known.

Another thing is in the area of trying to access your capabilities and how well you are doing your job and answering information inquiries; counting the number of requests I don't think is really going to do it. What I would like to see is an indication of how many people are working in the field that your IAC covers and how many of those people do you reach. How many of those people are aware of what you are doing and what percentage of that field are you getting your information to or who knows of your uses and send inquiries to you rather than saying we have processed 5,000 requests for information last year, was that 50 percent of the field or was that 1/10 of 1 percent of the field.

I think you need to make sure the information you have is not only thorough and accurate but that it is properly accessible to the using engineers. If you do not make that first step of catologing information, you will find that the information gets lost in some unknown data bank somewhere and you can't dredge it out. I have heard the expression used several times in the last day or so; we will just use a keyword and we will dig it out and we will have it from that aspect. Well, if you don't use the right keyword or if documents are not keyed with the proper keywords right at the very beginning you can't dig it out.

I found this out a few years ago when I invented a new method, a satellite
process. I thought it was a new method. I did a very thorough literature search
and all that and I looked up the kinds of things that I could think of that might
cover this area and I found absolutely nothing. However, what I failed to do was
look under "skyhook." Now you old Navy guys may remember that back in World
World II we always joked that to support something we just need a skyhook, which
is something you just hang on a cloud and hold things up with so you don't have
to have support mechanisms. Well, it never occurred to me when I was inventing
my satellite process that one would call it a skyhook and yet the one paper that
proceeded mine in the literature was an article in Science magazine about 1966
which was called a Skyhook. It never occurred to my abstractor, it never
occurred to me and apparently it never occured to the abstractor of that original
article in Science that there was some interconnection between an elongated
satelite and a skyhook. So, I think that first step is an all important step.
If you want to make that information available you have got to have it cataloged
properly and you have got to have it so that it can be dredged out of the memory
banks.

The next speaker will be Mr. Pebly who is the Director of the Army Plastics and
Technical Information Evaluation Center.

Mr. Harry Pebly
Army, Plastics Technical Evaluation Center

How do you measure the effectiveness of information centers? That is a question we wrestled with ever since we started this business. Obviously it is not easy or we would have had answers by now. It is a question, we all realize, that we have to try to find answers to so I wrote a series of steps or questions I think we would have to each go through. Incidently, I think some of this is going to repeat what Jerry Persh and perhaps what some of my peers are going to say too. I was glad to see Jerry make some of these points and I will repeat them.

First of all I think you have to look through each Center - what was the purpose in creating the Center? Okay, obvious enough, but just remember there were only two or three Centers actually concieved at the DoD level. To present in a little history lesson for the younger people here, first was the Titanium Center which went to Battelle and has since grown into metals. Then along came Plastics and there was Ceramic and Graphite which was later merged with metals. Many other Centers had already been in existence, but it wasn't until Walter Carlson headed the Office of the Chief of Technical Information for DoD that he set up criteria and went around the country and visited other Centers and appointed them as DoD Information Centers, some of them weren't even sure they wanted that anointment.

Lately now, we have the Metal Matrix Composites Information Analysis Center coming from the DoD level. All centers weren't really conceived or created at the DoD and don't necessarily all have exactly the same purposes in mind. So, always make sure that you know what it is that the Center is supposed to do. Then you would have to ask how are they to function to meet the purposes. Most of them I think answer inquiries in a timely manner, write state-of-the-art reports; we all know those lists. Once again, though, all the Centers wouldn't have to be the same. This is the point that Persh is making; you can't have a blanket judgement or evaluation.

How do you measure the effectiveness then? Well, quality and quantity are both going to come in. Like others, I fear that somebody is going to do it that doesn't know anything about the business and simply goes through and counts, for example, how many inquiries you have answered. If you knew that you had the most, then you would think that was probably a pretty good criteria. I don't have the most so, no, I don't want that one used. Hey, you have got to look at the depth we went into, the timeliness, the quality of the information, one thing and another. So, aside from that guy who is number one, I think there would probably be agreement that just pure numbers aren't enough in comparing Centers. Now, within a Center and on a year to year basis I think it has merit and you should be doing that. Are you growing, are you decreasing? Decreasing isn't necessarily fatal but you should at least be finding out and explaining and understanding why that is. So, within a year to year effectiveness, I think numbers and quantities has some purpose.

Quality then of course, is where we really finally come to grips with the thing. How are you going to judge the quality and the value which is the effectiveness? My most current thinking as to how, if I had that responsibility: you can't do it with one group, one committee, one panel, whatever, trying to cover all the Centers because you would have to have that real expertise. I wouldn't want the Metals people coming to PLASTEC or Plastics people going to Ceramics and Graphite.

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You have got to have some guys who really know what the problems are, what the needs of DoD are in materials. You have to hope they could, with a combination of their expertise, look in depth at the kind of answers your giving to inquiries, see how timely your responses are, see if you are indexing material correctly. I'm glad you made that point about coming up with sort of a half subjective, half objective answer. Who would be on that panel? That would be a tricky thing. You ask me to appoint it, sure, I will make sure my friends are on there who are going to give me a good rating. Am I going to be happy with somebody else who is on there? I think there is a way that I could live with; to have some of my peers to come in and really spend some time and look intensively at what is being done and measure it against what they know about DoD requirements.

Later on I hope we get back to something else. I just want to mention it now so we don't forget it and that is the effectiveness has certainly been impaired, at least in my shop, by the static level of funding and this isn't the time or the place to go asking for more funding and it is certainly not a criticism of my sponsor who is here who does everything that he can for funding. But in an example this morning, Jim Daniels said how useful a directory of testing people would be. Well, we put out a directory for a number of years in our field. Knowledgeable Government Personnel in Plastics, revised about every three years, very popular, sold well. I haven't been able to do that now for a half a dozen years because of the cutback in funds. You don't write a report now if you don't have sponsor for it that's about the way we operate. So, if you say how does the cutback in funds hurt and impair your effectiveness, this is one concrete example that occurred to me this morning.

One other note that I will raise is the amount of work done by each Center. Questions that were raised a few minutes ago by Jerry remind me of a list that Walter Carlson drew up years ago. I don't know if I have those in my file or not. When he was head of DoD he had some questions that had to do with what percent of your community do you serve, how many repeat customers do you have, and there were half a dozen like that and they would be useful also to look at in this light.

The next speaker will be Mr. Harold Mindlin who is the Director of the Metals and Ceramics Information Center, a contract operated center rather than an in-house center.

Mr. Harold Mindlin
Metals and Ceramics Information Center

I have a little bit of a problem in that at noon today I was thinking about one of our past members of this group, Y. Touloukian, and I was looking for some of the words he might of used; I was going to suggest that maybe we try to contact him. But with due respect to the man, we had sat at several previous meetings like this and so I have a little bit of a problem of repetition. I think there have been some measures made of our effectiveness in not a direct way but an indirect way. We are trying to market ourselves in two areas. One being to a very large technical community out there, both in the Defense and the related industries. And we are also trying to market outselves within a very, very small community within DoD. I could talk a lot about what we have done for the group outside and I could probably talk a lot about what we have done for the group inside. The little group within DoD that watches us sees we have failed because several years ago there were several suggestions made about focal points and DoD groups to evaluate the Centers and nothing has happened. If we look at our funding, the funding has remained constant and that in itself is saying that maybe they are satisfied with what we are doing or I think in another sense it means we have failed in marketing what we should be doing. All these nondirect measures, these measures that we don't like to address, have been reflected in many of our activities.

If we look at our contacts with the community out there, the Defense community outside, our personal experiences again goes two ways. We still get requests for technical notes and small reports we put together back in the early sixties. They still pop up as references; we still think they are a very good activity. We do sell handbooks. We sell a lot of handbooks; we get very good reports; our Current Awareness Bulletin goes out to a lot of people, but numbers don't always mean anything. The responses have been good so we feel we are doing our job with the technical community. They seem to feel that we are doing something. The fact that we are not able to put out as many state-of-art reports or put out new handbooks with the frequency that we did at one time, I am not sure has made the proper impression upon the proper people. We have cut back our activities. Many of the things that were said this morning I felt were excellent. We do have to get out, we do have to market, but I think the first thing we are going to have to do is get some of the resources to do that. We spend a lot of time selling what we are doing in trying to recover costs and in many respects we are cutting off the people that want the technical information because we are telling them that, look, if it is more than an hour or two, you have to get a purchase order number or we are going to have to find some other mechanism because we are required to charge you for such services.

I think effectiveness measurement has got to be a more persistent effort on our part and a more cooperative effort on our part. The IACs must do a more persistent job both with the indirect and direct methods of measuring effectiveness.

Question:
I was wondering, has this level funding that is in effect had any effect on your ability to obtain the information and keep to the state-of-the-art as far as the industry is concerned?

Mindlin's response:

Yes it has. One way it has is that we are not as visible as we were some years ago. We used to be in a position to send technical people to meetings, to conferences, to program reviews. Now, we don't have the travel funds. We had people going to the technical association meetings, participating in those meetings. We don't do that. The amount of support we are able to give to the people now to review our technical documents is much less than it was even five years ago, because we have given them the same amount of money we did five years ago to handle reviews. Our current Awareness Bulletin is now down to once a month and ours is slightly different than others; we have a large technical content. That has been the biggest effect that we have had from the level funding. We just don't have as many technical hours on the program as we did at one time.

Question:

Well, what about the Government/Industry Document Exchange Program (GIDEP) or other information exchange programs. Is there any forward motion in getting that type of a thing going?

Mindlin's response:

Let me make sure that you understand. We get technical reports. As Harry Pebly pointed out, at one time we had a technical member of our staff stationed on the West Coast making contact with the aerospace companies and essentially getting the data before the ink dried on the reports and we don't do that now. The quantity of the technical reports that we get has gone down somewhat. Also, many of the reports have limited distribution on them now. When people are not sure what the classification is, it appears that they put limited distribution on them and sometimes we have to be very careful how we abstract them for the Current Awareness Bulletin. We have to be very careful how we put them into our data base.

Question:

Am I reading you right. Are you saying that we went from an active to a passive role?

Mindlin's response:

We are not as active as we would like to be. We are more passive than we were. We don't have the resources to go out and talk with the contractors face-to-face as was suggested this morning.

The next speaker will be Mr. Charles Fridinger who is from the Naval Surface Weapons Center.

Mr. Charles E. Fridinger
Naval Surface Weapons Center, White Oak

Just so you know where I fit into this picture I am here as a user of IAC services. After listening to the conference and the questions and answers and hallway conversations, I think I may be at one of the lower levels of users here. My regular job is a small section that deals with vibration in an environment simulation branch. As such, there are about ten professionals and some additional support people that deal primarily in vibration; analyzing, predicting and testing. At the moment I am serving as a branch head which is about 50 people, but once again, two thirds of these people are in the shock and vibration area. As you might expect, most of my contacts are through and with the Shock and Vibration Information Center and I serve as a member of the technical advisory group to the SVIC.

As everybody has said, it is almost impossible, at least it seems so far to be almost impossible to determine effectiveness of IACs in terms of numbers that can be entered into computers so that you come up with one answer. This is the popular way of determining effectiveness. As a user down at the end of the line, this doesn't bother me. I am sure that the Shock and Vibration Information Center is very effective. I use it quite a bit and I use it even when I don't call them weekly. There is a tremendous amount of information that is published in the digest, that is put out in the symposia and subsequently published in the bulletins which is a source of information on nearly every project in this lab that I deal with. I think one thing that we have to make clear is that we are, when we talk about effectiveness, really talking about the short-term effectiveness of IACs. There is absolutely no way to measure the long-term effect because there is an accelerating effect of everybody having a nice base of information to start on. So, we can't tell where we would have been if we didn't have IACs.

Given that, I think I could answer most of the questions that were asked about how IACs are effective. I'm still not sure that I could convince anybody or write it down so that it could be put in any kind of a quantitative or qualitative report. Many of my engineers are trained using information that has been generated and developed in these symposia or in the monographs that are put out by the Shock and Vibration Center. Probably, if they were asked that question, they might give a negative answer as to whether they use the information centers. I think a lot of people give a quick negative answer when they really just haven't thought over the problem. So I really don't have any answers on how to measure effectiveness. I am personally convinced that the IACs are very effective and I am hoping to hear some additional answers from this group.

The next speaker will be Mr. George Darcy from the Army Materials and Mechanics Research Center.

Mr. George Darcy
Army Materials and Mechanics Research Center

I would like to say a few words that may seem a bit trite at the beginning but the reason we are here is to make sure it is nailed down tight. 'What are you going to evaluate' should be thought out very carefully and it sounds like a natural thing but I don't think it is always natural and I will get to some more remarks on that in a minute. Once the criteria of the requirement is established, there has to be yardstick to match up to it. You need these two elements. Then proceed with the evaluation. I think sometimes evaluations go along at the same time the criteria are being developed. Certainly, evaluation criteria may have to change from center to center or from contract to contract, area to area, or mission.

I think another thing that has to be done is certainly look at your contract and mission statement. I think sometimes centers don't do all the things they are supposed to do and sometimes they evolve into other things. Perhaps the contract should be changed or amended. It is also a good thing to go back to and quote from, it keeps us a bit alert.

Now, there are many things that are really appendages to the stated things we are supposed to do that are so hard to measure. Is the nation really training engineers to use information service, centers and sources? I tend to think not. I have interviewed a lot of young graduates and I find them rather naive about information sources. Some rather startling remarks from people from prestigious universities at the lower degree levels who frequently go on to be our engineers.

There is certainly a need for corporate memory as more and more government activities are contracted out. The corporate memory, the internal government corporate memory, is being lost and needs to be retained and an information center is one way to attempt to do that. There are a lot of road blocks. This morning we heard how nongovernment people have trouble getting into government review meetings. So, there are these roadblocks that still can occur but the corporate memory advantage can be there.

In a recent speech, General March who is Commander of the Info Systems Command, and this is printed in Aerospace Daily on November 17, has come up with a problem. The problem is that the Info Systems Command has 700 engineering vacancies. A very substantial number. In the number of engineers that they have today, only 66 percent are quoted as being experienced compared to 83 percent in 1978. So, there is an engineering shortfall. He goes on with a plan to up the engineering schools and equipment and of course it is a rather long-term solution, but there is an engineer shortage today. Both in the government and certainly in the rather large segments of private industry as well. This certainly portends the need to make the existing engineers more efficient and how better to do it than through an information center. That is one certain tool that we could have.

Now, Mr. Fred Newman, who is the Chief of Personnel at DARCOM was on public television about two weeks ago. He quoted at that point in time that in the Army there were 60 Senior Executive Service technical vacancies and I don't know how many engineering vacancies. So, those numbers perhaps compare with those in the Air Force.

Now, these are numbers once again but they show a national trend. Is this a requirement now that the info centers should help to solve the efficiency of the engineers nationally? Harry Pebly brought up something that I think is an important thing. Number of calls per month. 1,600 somebody said yesterday, but I call up and I get lousy data and I never call back. Repeat calls as Harry said I think are very important. I reviewed some information from NTIAC, the center that I supervise as Contracting Officers Technical Representative (COTR), and I was rather amazed at the number of repeat calls from organizations and industry; 6, 7 and 8 revisits to NTIAC for more information, more searches and special studies and the like. I think if somebody is not getting what they want, they certainly won't come back. If you see them coming back a half dozen or more times, then you begin to think that maybe you are doing the right thing, at least for them.

There have been numerous studies setting up criteria and yardsticks. Yesterday it was mentioned that there was this study and that study and I referenced one myself here. I think anyone going into the overall managerial studies of these centers and their effectiveness and efficiencies should look at all the studies and there have been some very sensible and sane studies made. There is a wealth of information in these studies. Virginia Sternberg's doctoral thesis was done some ten years ago and has a lot of very valid points in it which I think we can all use.

Ruth Smith brought up the second tier level enhancement. That is what I think we really should be aiming at. When the engineer runs out of information obtained by going down the hall he moves to the second tier and that is where the information centers should aim in and perhaps that should be an effectiveness measure. What's our second tier effectiveness; use that as a criteria.

I think we are certainly not going to solve it all here this afternoon but those are some thoughts I have how we come up with some evaluation criteria.

The next speaker will be Mr. Henry Pusey, Director of the Shock and Vibration Information Center.

Mr. Henry C. Pusey
NRL. Shock and Vibration Information Center

How do you measure effectiveness? It seems we have sat around the table before and kicked this around a number of times and it boils down to the fact that from the comments that I have heard previously here and at previous discussions, there is no single measure of effectiveness. The second point I think is that it is not the kind of a yardstick that we are going to design here this afternoon because the issues are far too complex. A number of them have been raised here today. You need to look carefully at this. Whether this is really a quantitative measure or is it something else. It may be purely qualitative. I have a way of measuring the effectiveness of an encyclopedia, for example. I take a subject about which I know quite a lot and look it up in the encyclopedia and if they do it justice, I think it is a good encyclopedia, if they don't, it is a lousy encyclopedia. Now, that is probably a bad yardstick because after all, the mechanical engineer who wrote that section that I am looking up may well be an inferior mechanical engineer and the biologist who writes another section may do an outstanding job. Yet, my perception of that encyclopedia is that it is a lousy encyclopedia. Similarly, if you go into a library and the library has the book that you want that day, that is a good library. If it doesn't, you wouldn't go back to that place again; they are not good at all. Now is that fair? Of course it is not.

The point I am trying to make is that I would stress continuing to urge Dr. Millburn and Dr. Young, who seem very interested in this area, to establish at the DoD level an advisory panel on Information Analysis Centers and as a subordinate thing to that panel, perhaps, a task group whose job is to come up with specific recommendations for how DoD management will in fact evaluate the effectiveness of IACs as they perform their function in the DoD Scientific and Technical Information Program. I think it is a tough enough thing to do that you need a task group/working group to look at it in depth and very carefully to be sure that there are not faulty measurements that come to light.

Mr. Darcy said sometimes the criteria for evaluation is developed along with the evaluation being done. I have some evaluations where there haven't been any criteria at all. They didn't know what they were looking for. The results will obviously show that that was the case.

So, that is all I have to say. I am looking for some good ideas too. I think we need help here, but I really think the final evaluation that is made of Information Analysis Centers should be done after due deliberation by a group that is assigned a job of doing it.

Question:
I just want to catch one point about your example with the encyclopedia. Is it true that peer review minimizes this type of a problem?

Pusey's response:
I think it would. And of course you can argue that because there is one area in an encyclopedia that isn't well done, then in effect as an overall volume, it is lacking something, so it is not as good certainly as some that are totally complete and so on.

Comment by Mr. Cardiff:
Yes, it was interesting, because three of the people on this panel are on the
OMB list of activities to be looked at. Like I said before, I don't know where
they got which one should or should not be included in a review process, but I
also detect a sense of nervousness on the audiences part. Your comments made
about the Defense Audit Service coming in and cutting your staff in half and
taking out your support activities to help you do your job, that is not the
exercise that I think we are going through. It is the concept that was
mentioned on the panel, I forgot who mentioned it but it was a sense of going
back to ask: is the Center doing what it is supposed to do or has it branched
out into areas that it shouldn't be bothered with?

I have in my office the Department of Defense Forms Program. The DD Forms that
some of you might be familiar with. A lot of times when a functional manager
gets concerned or has to respond to a information requirement he chooses to go
and generate a Department of Defense Form to collect the data. What happens is
the mission gets started and the guy moves on and before long 10 years have gone
by and that form is still in the inventory and believe it or not people are
still filling it out and they have no idea where it goes and why they have to do
it. We started last year a little exercise. We looked at all forms that were
10 years or older. We had forms that went back 25 years. That is not to say
that it wasn't still needed, we just wanted to see if there was an existing
requirement for it. Now that exercise is still going on, but we have already
cut 8 percent of the forms out - 32 forms. Now we have the same problem there
in measuring the cost savings in terms of not having this in the system. What
does this save the Department of Defense? The concept is straight forward in
the sense that if you don't need it, why keep it around. I think that is what
they are doing here. I think that the Office of Management and Budget has a
bunch of information activities out there that have grown up; that are in
existence; that might be duplicating other activities. This is probably a good
time, now that we have the law, to go back and look at it and see if we are
fulfilling a function that is needed and if we aren't, then what is going to
justify it. I would say that the list that they have given us is not
necessarily the list that we are going to end up with. Regardless of that, we
are still going to have to go back and look at the Centers and find out what
they are doing and what purpose they serve and if they are useful.

Response by Mr. Sauter:
Thank you very much. I think we can certainly open this up now to any other
discussion from the floor. I would like to have you think about one thing: if
you had to choose just one thing upon which to measure the effectiveness of a
Center, what would that be, because in the real world quite often we don't have
time and we have to make decisions and those decisions are in fact made and
quite often, as all of us here agree, these are very, very subjective and it
depends upon the perspective, the mood of the individual that has to make that
decision which is not a very businesslike way to operate.

Question:
When you do your evaluation of particular Centers, is it also going to be part
of the evaluation to recommend additional fundings where you find centers that
perform a service but do not have a funding to keep the very commercial
technology or communication services required within the technical community?

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Mr. Cardiff's response
I don't see why you can't put that in there. Let me give you an example of where we went over to OMB and provided them a list of ADP systems that the Defense Department was considering reviewing in 1982. The reason we were at OMB is that they had to testify to the Government Ops Committee on what OMB was doing to implement this law and they were looking for help. And in that conversation it came out that they wanted a spectrum of ADP systems in their life cycle so that they could look at all the ramifications and the one thing they brought up was the difficulty that the Air Force has had on a particular system with GSA, getting the paperwork processed, getting the delegation of procurement authority justified and they were saying, at least the way we interprete it was, when you go in there you are looking at everything. If one of the answers is that this Center is providing a useful service and it needs more resources to do its job, I don't see why you can't put that in that review. You may not get more money but I don't see why you can't put it in there.

Question:
I am with the Federal Emergency Management Agency. My name is Dean Ray and I'm doing very similar work to what Mr. Cardiff is doing. I have a question for Mr. Cardiff. When you define a system as you provided the information to OMB, were you talking about hardware systems or applications? The reason I am asking this question is I am concerned with how much detail you hope to provide to OMB in terms of each IAC.

Mr. Cardiff's response:
The list we provided them was ADP systems. It was a combination of the hardware and the software that could be a particular mission. Now, the level of detail, what they wanted for each information activity, not information center but information activity, of which IACs are a subset, was a description of the activity itself. In otherwords, to describe what it does, and then why were you looking at it. Why did the Department of Defense pick this particular thing out of all the information activities it has got? The theory was you want to work on those items that can show progress in terms of information management.

Question:
Are they permitting you to use selective review or are you going to have to go through the review process for each center?

Mr. Cardiff's response:
No, it is up to us to decide which one we will review and when. And that was the third piece. We had to give a milestone schedule on when we were going to do it and the resources associated with it.

Question:
Three people have alluded to funding: Harry Pebly and Harold Mindlin did it on cost recovery. Why don't you address the question of, can I afford it? It doesn't matter how good you are or how much you do, but can you afford it, like when you buy a car.

Pusey's response:
I am glad you brought that question up. It reminds me of what Walter Carlson said at the last information conference fc: DoD. He said, how do you measure the effectiveness? You measure the cost of not knowing. I think that makes a lot of sense. That is one way to look at an information activity. How much does it

cost you not to know not to have that resource available to you? If you are
trying to look at it in terms of dollars that is one way to do it   For Mr
Cardiff here, I think I would just point out that most of us, I think I could
speak for all of the information centers here, have no objection at all to a
review. In fact we have been encouraging such a thing for the last couple of
years on a regular basis. The problem is not the question of a review the
nervousness comes when you wonder who is doing the review and in who's eyes are
you going to be evaluated and what criteria are they going to use and that is
what we're really kicking around here today.

Mr. Cardiff's response:

Let me just follow that up. I didn't really mention this list that goes over to
OMB. The reason for that is they have a requirement to assure congress that they
are managing the information resources area and they are going to pick and choose
the ones they are going to participate in. So, what they wanted was this list
with the discription and milestone schedule and why we are doing it so that they
can decide which ones they will look good on in participating. So, we have the
same nervousness. When we come up with our list, the 20 that we send over there,
we have the same concerns. We don't want OMB coming down and managing us in our
systems. Even though they gave us this suggested list and they gave us another
suggested list we only picked the ones on there that we thought were good for DoD
to be looked at if OMB chose to do that, and then we also picked the ones that we
felt confortable with. We did not take everything that they suggested. That is
our problem too, we have to be concerned about the fact that when we submit this
list they will pick off of there the ones they are going to participate in.

Now aside from that list, the military departments and OSD will also have more
activities that we are going to do ourselves. And again, that would be between
the military departments and their subentities or between OSD and the defense
agencies. That is where perhaps some of these types of activities would come on
the list.

Your suggestion about this council is a very good one. One of the actions that
we now need is to establish an information resource council to pull together the
senior people that have been designated responsible for information management
and have this council review the subactivities that go on underneath it, of which
this could be one that you just mentioned. That has not been fully staffed yet
but I think it is an excellent idea because right now we are working in an area
that is really hard to get a handle on. Information is a huge area. Just
because they passed the law last December doesn't mean we have all the answers
yet. We don't, but we are chipping away at it, trying to get a handle on it.

Pusey's response:

I had just one quick thing here. You mentioned in your first presentation the
Naval Coastal Systems Center that the Navy chose. That surprises me, if they
think it is an information activity because it is one of the NAVMAT laboratories,
research and development laboratories. Unless they are looking at the library
facility there, I am a little surprised.

Mr. Cardiff's response:

It probably would be the library.

Comment from the Audience:

I would like to make a comment about the suggestion on having forms for the
engineer or the user to fill out when he uses the facilities. As a person who

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has filled out a lot of those forms in the past, that is a chore that I hate to do and I have to admit that the last one of those forms that I got is still sitting on my desk and they haven't called for it so obviously they don't need it, so I probably never will fill it out. But I think the problem is that not only is the form a chore for the guy who is getting information, but it is not always pertinent and to the point. If you are in an area where you have just invented something and you are looking for any precedent, you don't want any hits. So, when you get back a measure of service form that says how many hits did you get and I didn't get any, that was great, that wasn't terrible, that was great. In another case if you have got a field that has been very highly worked in and there are a lot of papers being produced and a lot of interest going on, in that case then you do want a lot of hits. So, from that standpoint, you can't really tell for sure just from how many hits you got whether it was any good or not. I think it might be better if you could have the information person wait about a week and then call the engineer back and get him on the phone. He may not fill out a form but he may give you a couple of minutes on the phone and you can ask: did it save you any time, did it shorten your work, can you give us some kind of measure, was it worthwhile.

The other comment is that if you want to find some measure of how useful the information is to the using agency you might want to try to ask how much would they be willing to pay for it. I think user fees are an eminently fair way of doing this kind of thing. I have about a half million dollar research budget and I put about 2 percent of that in information services. I think that is money well spent. I don't think that is too far off the mark from other technical people who would be willing to pay for their information, also.

Comment by Mr. Sauter:

I guess I would have one comment on user fees. We certainly in DTIC have been living with user fees for many years and we put them in, I guess, not for the reason that most people put them in. We put them in as a control mechanism to actually dampen the enthusiasm for things that used to be free. The problem I have with payment as a measure is that, yes, you are willing to pay for it if it is not a chore to get the monies to do it. If you had a petty cash kind of thing where you could go and get five bucks or something like that, no problem. From our experience we have found that most people tend not to use it if there is that charge. Again if it is $20,000 or 50,000, no problem, you can probably sign it, but we have found that a lot of people just don't have the authority to sign chits for two or three dollars. So, there are those kinds of problems that relate to charging for services.

Comment from the Audience:

I wanted to expand on Mr. Darcy's comment. There have been a number of academic looks at the Information Analysis Centers and I would call our attention primarily to four years of studies sponsored by the NSF done by Metrics, Incorporated. Of course, I have a vested interest in calling out that one in particular because they say some very fine things about the center I am associated with. In their summary after setting up criteria for evaluating the centers, he comes to several conclusions. One is that even under the most conservative or pessimistic interpretations, the actual benefits of an IAC such as TEPIAC far outweigh its cost. The second conclusion, the one we have heard time and time again, is that the centers are obviously underutilized, and the third one is the cost of going any other way is horrendously more than the alternative the IACs provide.

These studies have been published they have been funded by NSF and there is a
background of many manyears of professional effort that went into analyzing the
IACs.

Comment by Mr. Gonzalez:

I am Lou Gonzalez, I'm the new guy on the block, the Metal Matrix Center. Many
of you say what can we offer? I do have some ideas along the line of Henry
Pusey in the search for criteria effectiveness. I have been a member of the
Information Science for many years now and it seems to be that they have been
searching for measures for effectiveness for over 15 years in this area. Maybe
effective measures don't really exist to the satisfaction of anyone and maybe
they never will. Maybe we ought to shift to a DoD military orientation in which
case I submit things that could be measured are such things as readiness to
serve. Is your Center ready day by day to serve someone? That is what the
operations manager is worried about. Keeping his Center in the condition that
he can respond. So, the readiness to serve concept should be looked into. Not
so much as a measure of effectiveness but maybe as a measure of performance.

Then the relevant use of resources. Are you using your resources to serve your
users or are they going elsewhere? This whole business of effectiveness versus
obsolescence of need we are mixing up here. Maybe Centers should be phased out.
There is a method to disestablishing Centers, as well as, establishing them.
Maybe there is a lifecycle of Centers that ought to be looked into. They are
born. They serve a job. There are two ways they can go. They can be expired
forever or they can go toward the private sector such as the Machineability Data
Center did recently where the private sector could now provide information on a
technology more effectively and more efficiently than the military or DoD.
There are technologies that become buried in the commercial uses more than in
the military after a while and maybe the private sector should take these over.
There should be a program where the private sector should be allowed to flourish
or perish. I think this constant search of measures of effectiveness to me is
like chasing this so called Skyhook. It is looking for clouds that you are
never going to wrap your hands around. When we do have them, is anybody going
to believe them? Then we have a program to get around evaluations or to really
cover up bad performance. So, maybe we should start to look for measures of
performance as opposed to this and look for obsolescence of need and maybe this
should be done in an annual program. Those are some of my ideas.

Comment from Mr. Kolb:

I don't think it has been emphasized that a sponsor is not necessarily the one
that provides all the funds for the Center. I have been referred to several
times today as a sponsor of some of the Centers when in fact some of the Centers
that I help in the process of management and with some funding, the bulk of
their funds don't come from my program. They come from the parent organization
where the center resides. I think that has been overlooked today. As a result,
one might ask the question: If in fact the parent organization where the Center
resides is content with the function of the Center, are they necessarily looking
for measures of effectiveness anymore than they are looking for measures of
effectiveness of their metrology laboratory or optics laboratory, or something
like that. It is just another technical service entity within the entire
laboratory structure. I venture to say that the Waterways Experiment Station is
one that first comes to my mind. We only provide them $50,000 per year for
Centers and I am sure the operation of what otherwise is known as the Center is
probably more like a quarter million dollars. The difference comes from within

the laboratory. Some of the work that they do doesn't even get identified as
Center product because they serve perhaps on a project in which a publication is
generated from the laboratory as a laboratory rather than a Center publication.

Comment by Mr. John Wilson:
I would like to follow up on I think something both Mr. Cardiff and the Director
of the Metal Matrix Composites Center mentioned. It seems to be we are here on a
sort of double defensive. For one thing we sit here faced with the fact that our
vocation may be cut out as well as our money. What we are trying to ignore, I
think, and what people like Cardiff are trying to say and which came through from
people like CAPT Duff and is certainly coming through from people like David
Stockman is that there is a major shift, not just toward information, but toward
less information in government. The fact is that there are major aspects of
government that this administration, and not necessarily just this one but you
could see glimmerings of it before, are willing to cut out; major chunks and
information may be one of those chunks. So, when you go to justify the
information center you may justify it thoroughly as we think, and it may well be
that you justify it on a sound basis but it may be that there are other places
for the money to go. I think you have to face that. In a way there is an
overtone that information is sort of welfare for technology. If you can cut
other welfare programs, you can cut out information. We don't like that, but
nonetheless, I think you have to look at it in that aspect. Particularly when
you look at something like NTIS which they are willing to turn over to the
private sector and essentially say that if it goes down the drain, do we care.
This comes particularly home to me because I am with NASA and so we have a major
function just like Hu Sauter, just like Joe Coyne does down at TIC, Oakridge. We
believe that obviously we have to have this warehousing function, at least of
getting the reports and referencing them on line, because that is something you
have to have. You can't spend all this money on information and then let it
dissolve. Can you? Maybe they can.

So, in that light it seems to me that when you start looking at evaluating
information, you are making a great mistake to nickel and dime it. Just to go in
and say something like you have to save some money and you are only going to save
thousands, that will count. But, nonetheless, you almost have to go in that
ballpark and you may stay away from justifying what you do and take the offensive
as I understand from Joe Coyne and he gave me a set of his viewgraphs used when
he goes before Congressional Committee. What he does is build up all the
information that has been built up by billions of dollars worth of research over
the year, by Defense Department, by, in his case, Energy, by NASA and he then
puts a price tag of 100 billion dollars on the information that he has in TIC.
Then he points out that certainly Mr. Congressman, for this 10 or 15 million
dollars, you certainly can't begrudge me my budget, can you?

Then it seems to me that when CAPT Duff came through, the way I heard him was to
say you have got to tie information to major mission activities. Not something
that is incidental. Not something that may indeed help some program here and
there but tie it to major mission and the way we are trying to do this at NASA
is tie it to our major mission - The Shuttle. If that doesn't survive, we don't.
Therefore, we are trying with our program to tie it as much as we can,
particularly looking at numerical data bases and looking at material bases to see
how we can improve the access to these data bases, particularly online for the
Shuttle program.

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Also, it seems to me that in this aspect you do have to look at information for management. When you get into the Defense Department, where we are here today, or whether you look at Energy or at NASA, it is technical management. What is it's level of expertise? I think we get off the track if you try to look at the vertical, what you are looking at is horizontal. Everything we do is an expertise of a kind. Cardiff sits there looking at forms. If you don't think that is technical, try it for a while. So, we are living in a world of different technologies. They are horizontal as well as vertical and we should realize that.

I think the bulk of the Information Centers still are simply peddling information and dumping in on somebody's door and wanting a pat on the head, whereas, some information centers solve problems. They don't just get information. They bring it in, they do something with it and when it comes to a center solving problems you are going to find people who will then fund it. I think in that case it is a matter of not only just charging but actually going out and finding major new funding mechanisms. These mechanisms may just be simply that getting big programs could give you big chunks of money, but you do it for solving problems.

Comment by Mr. C.Y. Ho:

As many speakers pointed out because all Centers are different, is the measure of effectiveness only applied to my field and not to everybody else? I represent the Thermophysical and Electronic Properties Information Analysis Center (TEPIAC). I think the effectiveness of IACs can be measured by the analysis capability of the IAC in our field, not everybody else. That is, to measure the effectiveness of information analysis of the center. As you know the difference between the Information Analysis Center and the library information center is the word "analysis" in the middle of our name. So that effective analysis is one of the criteria that can be measured.

For example, in the material property field, what the user needs are the analyzed recommended values of the property of the material. The second choice is all the raw data from the references that normally they don't want to have. The third choice is just all the references in a big box, 200-300 references. They don't want to read that, so in our area people want first what you have already evaluated; analyzed recommend values or not. That is the first they want to get.

The second one by which effectiveness can be measured is the dissemination capability. For example, no matter how much money you have in your center you cannot disseminate right to the user to use. To put it only in your own center is no use for it at all because nobody else uses it. I think in 1976 there was a study by DLA which spent a lot of time studying the users needs and also the users evaluation of IACs. The study pointed out that the best product or service that can be offered by an IAC are handbooks, data books. Once the user gets a copy on his shelf he can use it whenever he wants to without any additional charges. If handbooks are outdated then they are no good. If the handbooks are updated then they would be useful.

Also, the new trend is delivering the information by on-line interactive data base. I don't mean references, because too many places can search almost everything or other major systems. If you have your hard information right in the computer, people can search the information directly. That should be the most useful thing.

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Third point, the effectiveness of the IACs can be measured, can be evaluated based on whether the products are readily usable. A product, like a handbook, if it is so complicated that you can't find what you want, is not useful. As in the format of a presentation, the format of a handbook is really important as far as effectiveness.

The fourth point is the effectiveness of the IACs can be measured by whether you can provide a quick response to meet the urgent DoD needs.

Mr. Sauter's closing remarks:
I would like to thank all of the members of the panel for their participation here this afternoon and I would like to thank all of the people who attended the conference. We appreciated you taking the time from your busy schedules to attend the Conference and we will look forward to seeing you again. Thank you all.
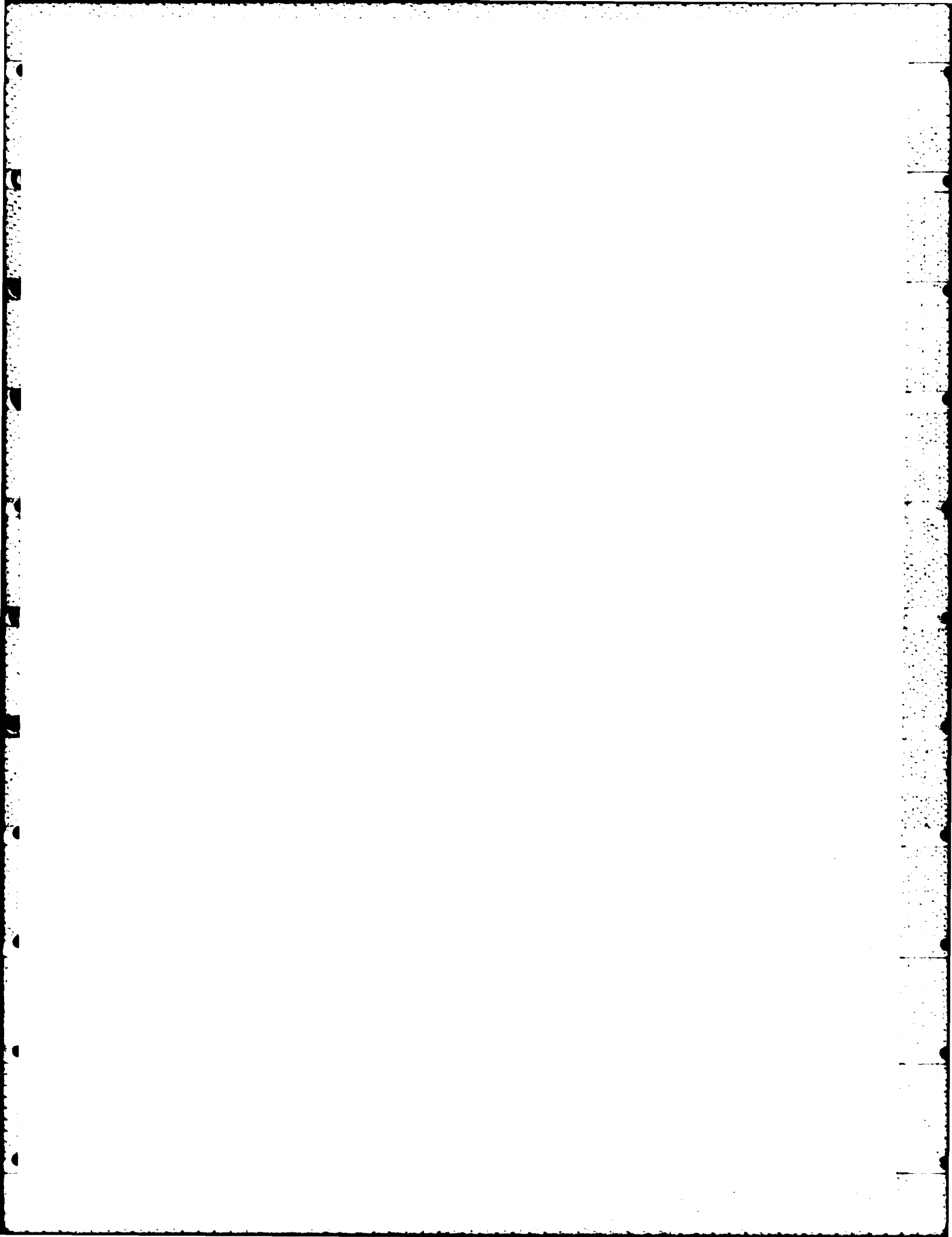
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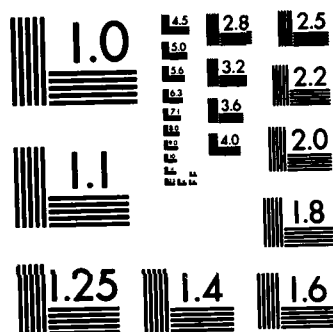Washington, D.C.   20301

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