The original documents are located in Box D15, folder "Electronic Industries Association, "Congressional Responsibility in Defense Planning, Washington, DC, March 15, 1960" of the Ford Congressional Papers: Press Secretary and Speech File at the Gerald R. Ford Presidential Library.

WEEKLY REPORT

to the ELECTRONICS INDUSTRY

FOR INFORMATION · NOT FOR PUBLICATION

contents

Vol. 16 ---- Number 12

March 22, 1960
#60-292

highlights

EIA Conference speeches cite vital role of electronics; 4-day Washington meeting draws record attendance. (Green Lead Story)

President Hull to get Association's Medal of Honor; nomination lauds contributions to industry's progress. (Green Lead Story)

400 attend Defense Market Planning Seminar; hear ideas on how to get more defense value from better planning. (Yellow Lead Story)

New bill covering basic research patents introduced by O'Mahoney; gives government firm hold on patent titles. (Section A)

York indicates that Army may get $25 million in frozen NIKE-ZEUS funds to launch miniature parts fabrication. (Section A)

House schedules hearings on problem of proprietary rights and data; to stress effects on small businesses. (Section A)

RADIO-TV PRODUCTION FOR THE WEEK ENDING MARCH 11: TELEVISION 102,939; RADIO, 350,468, INCLUDING 149,147 AUTO RECEIVERS.

ELECTRONIC INDUSTRIES ASSOCIATION
1721 De Sales Street, N.W., Washington 6, D.C.

U P C O M I N G E V E N T S

EIA

Eastern Credit Committee -- Mar. 22 -- Hotel Manger-Vanderbilt, New York City.
Western Credit Committee -- Mar. 23 -- Hotel Bismarck, Chicago, Ill.
Terminations Committee -- Mar. 24 -- Plaza Hotel, New York City.
1st Annual Semiconductor Marketing Forum -- April 5-6 -- Hotel Roosevelt, New York City.
36th Annual Convention -- May 18-20 -- Pick-Congress Hotel, Chicago, Ill.
Second EIA Conference on Value Engineering -- Sept. 7-8 -- Los Angeles, Calif.
Fall Conference -- Sept. 13-16 -- French Lick-Sheraton, French Lick, Ind.
Radio Fall Meeting -- Oct. 31 - Nov. 2 -- Syracuse Hotel, Syracuse, N.Y.
Winter Conference -- Nov. 29-30 and Dec. 1 -- Fairmont Hotel, San Francisco, Calif.
Third Conference on Maintainability of Electronic Equipment -- Dec. 5-7 -- San Antonio, Texas.

Government-Miscellaneous

IRE International Convention -- Mar. 21-24 -- Coliseum & Waldorf Astoria Hotel, New York City. (IRE)
1st Annual Symposium on Human Factors in Electronics -- Mar. 24-25 -- Auditorium, Bell Telephone Laboratories, New York City. (IRE)
6th Nuclear Congress -- Apr. 3-8 -- N. Y. Coliseum, New York City. (IRE)
Army Symposium on Static Relays -- Apr. 12-13 -- U.S. Army Signal Research and Development Laboratory, Fort Monmouth, N.J.
Conference on Automatic Techniques -- Apr. 18-19 -- Sheraton Cleveland Hotel, Cleveland, Ohio. (IRE)
National Aeronautical Electronics Conference -- May 2-4 -- Dayton, Ohio. (IRE)
Western Joint Computer Conference -- May 2-6 -- San Francisco, Calif.
PGMTT National Symposium -- May 9-11 -- Hotel Del Coronado, San Diego, Calif. (IRE)
Electronic Components Symposium -- May 10-12 -- Washington, D.C.
Electronic Parts Distributors Show -- May 16-18 -- Conrad Hilton Hotel, Chicago, Ill.
1960 Conference on Standards and Electronic Measurements (IRE and NBS) -- June 22-24 -- NBS Boulder Laboratories, Boulder, Colo.
National Convention on Military Electronics -- June 27-29 -- Washington Hotel, Washington, D.C.
WESCON -- Aug. 23-26 -- Ambassador Hotel, Los Angeles, Calif. (IRE)
National Electronics Conference -- Oct. 10-12 -- Hotel Sherman, Chicago, Ill.
Mid-America Electronics Convention -- Nov. 14-16 -- Kansas City, Mo. (IRE)
Eastern Joint Computer Conference -- Dec. 11-14 -- New Yorker Hotel, New York City. (IRE)

Exhibits

IRE National Convention -- Mar. 21-24 -- Coliseum & Waldorf Astoria Hotel, New York City. (IRE)
6th Nuclear Congress -- April 3-8 -- New York Coliseum, New York City. (IRE)
Electronic Industry Parts Show -- May 16-18 -- Conrad Hilton Hotel, Chicago, Ill.
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Vital Role of Electronics Cited By Government Spokesmen at EIA Conference

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President Hull to Get Medal of Honor; Record Attendance at 4-Day Washington Parley

The vital role of the electronics industry in national defense, safety in the air, and the development of Signal Corps communications facilities provided the theme of EIA's spring conference in Washington last week before a record-breaking attendance of members and Government guests.

During four days of industry meetings at the Statler Hilton Hotel several hundred members of EIA heard outstanding Government and military spokesmen discuss the importance of electronics and the responsibilities of industry, while all five divisions and major committees reviewed problems and programs designed to broaden membership services and activities to keep abreast of the industry's growth.

Highlights of the conference, March 15-18, were:

1) President David R. Hull was selected by the Board of Directors to receive the 1960 EIA Medal of Honor for "distinguished service contributing to the advancement of the electronics industry" at the Associations' convention dinner on May 19th in Chicago.

2) E. R. Quesada, Administrator of the Federal Aviation Authority, praised the electronics industry for its part in the tremendous development of aviation and the vital communication, navigational, and safety facilities required by today's air craft.

3) Defense officials, a member of Congress, and industry executives discussed means of getting "more defense for the dollar" at an all-day seminar sponsored by the Military Products Division.

4) Major General R. T. Nelson, Chief Signal Officer, cited the technical progress of electronics at a membership luncheon marking the one hundredth anniversary of the Signal Corps.

Selection of President Hull as EIA's "man of the year" climaxed the industry conference and Board of Directors meeting on Friday. In nominating Mr. Hull as recipient of the Medal of Honor, Chairman H. Leslie Hoffman, of the Annual Award Committee, pointed out that the honor is a recognition of his long service and many contributions to the progress of the electronics industry both in the Navy Department and industry. Mr. Hull is serving his second term as President of EIA. (See detailed story following.)

Tribute to Industry

Before an audience of more than 500 members and guests from Government and the Military Services, Mr. Quesada reviewed FAA's plans and programs designed to provide safer and more efficient aviation facilities for the nation.

"Electronics has had its impact on the growth of the aviation industry," he said. "Likewise the electronics industry has benefited from the inexhaustible market generated by the Air Age. Manual and mechanical systems and devices in aircraft have been replaced by smaller, lighter, less expensive and more efficient electronics packages.

"The remarkable progress in electronics in the last decade is a tribute to engineers and scientists of the world who have dedicated their efforts to research and development. And, I might add, a tribute to the electronics manufacturers for their efficiency in producing the products of research and development for distribution to the users. In this regard, your organizations have promoted, not only our nation's productivity but have furthered the well-being of its individual citizens as well.

"As we look now to the future, aviation will rely on the efforts of men such as you to an increasing extent to provide the necessary airborne devices, navigational aids, and communications equipment that are the life's blood of a safe and efficient air traffic system. Your steady growth over the past several years reflects the increasing dependence that we are placing upon your industries in helping us reach our objectives. And I would say, without hesitation, that the electronics industries, big as they are, are only beginning to tap their productive potentialities. Your greatest years still lie ahead."

(The text of Mr. Quesada's address is included as a supplement to this Weekly Report.)

President Hull, in introducing Mr. Quesada and head table guests, cited the growth of the electronics industry since 1950 and pointed out that half of its sales today are to Government. Among the 150 guests of EIA were members of Congress, high-ranking Government officials, and military officers.

The Defense Planning Seminar on March 15 drew about 400 representatives of Government agencies and industry representatives to hear Government and industry spokesmen at an all-day and evening session. Among the speakers were Representative Gerald Ford, Jr., (R.,Mich.) ranking member of the House Armed Forces Appropriations Subcommittee; John M. Sprague, Deputy Assistant to the Secretary of Defense; and President Hull.

(A detailed report on the seminar follows and text of the talks by Messrs. Ford and Sprague are included as a Weekly Report supplement.)

Scientific Advance Noted

Reviewing the progress of communications during the 100 years of the Signal Corps' history, General Nelson said:

"In no area of human endeavor have changes been more marked than in our scientific pursuits. . . . . And in no area of scientific endeavor has change and progress been more notable than in this total field we call electronics. The advances of the past 10 years in electronic science and in the development and application of electronic devices, which increased man's capabilities manyfold have been phenomenal. Their effect is cumulative. The technological gains that can be expected in this relatively young and imaginative science during the next few years are such that few would attempt to predict them. Invention -- in a sense -- has become the mother of necessity."

The Signal Corps has built an airborne radar that can produce a radar map with almost the quality of a photograph, General Nelson revealed. A prototype of the "aerial surveillance platforms" will be demonstrated next month.

(The text of General Nelson's address is included as a Weekly Report supplement.)

Culminating the four days of industry meetings, the Board of Directors endorsed recommendations of the Legislative Policy Committee for more vigorous support of the Associations' legislative program. This includes proposals to require identification of foreign-made electronic components, repeal or modification of the Walsh-Healey Act, and enactment of a law to encourage foreign investments.

At the same time the Board approved the Committee's recommendation that EIA oppose legislative proposals which would authorize the Federal Communications Commission to establish performance standards in the manufacture of television receivers and would give the Secretary of Labor broad authority to investigate industry's costs and profits before recommending higher tariff rates to offset lower wage levels in countries shipping goods to the United States.

Chairman Robert C. Sprague, of the Electronic Imports Committee, reviewed EIA's efforts to obtain limitations on Japanese shipments of electronic products to this country and said there are indications that Japan is considering the adoption of voluntary quotas on its electronic exports to the United States. He pointed out EIA's complaint that growing imports of Japanese semiconductor products are threatening national security is being investigated by the Business and Defense Services Administration of the Department of Commerce.

Chairman Hoffman, of the EIA Spectrum Committee, informed the Board progress also is being made in the Association's efforts to bring about a more effective administration of the radio spectrum despite an apparent stalemate in legislative developments. Government officials are in the process of reorganizing and strengthening the process of allocating Government channels to the military services and executive departments, he said.

Change in By-Laws Proposed

The Membership and Scope Committee recommended to the Board of Directors that EIA's By-Laws be amended to define more clearly an electronic manufacturer and eligibility requirements of Associate and Special members. Definite recommendations will be submitted to the membership at the EIA convention in Chicago May 18th.

President Hull also nominated past Presidents Sprague, Hoffman, and Leslie F. Muter as a Nominating Committee to recommend EIA officers for the next fiscal year, and appointed Mr. Muter and Charles M. Hofman as Co-Chairmen of the 1960 Convention Committee.

Upon recommendation of the Parts Division, H. F. Bersche, of the RCA Tube Division, was elected one of two Association representatives on the Board of Directors of the Parts Show Corporation. Mr. Bersche will succeed Jack Hughes, of Littelfuse, whose term of office is about to expire.

All five divisions met on March 17 to review and act upon their respective programs.

Chairman Ben Edelman, of the Educational Coordinating Committee, informed the Board of Directors that the TV Educational Guidebook, which has been under preparation for several months, has now been completed and will be published as soon as arrangements can be made with one of several interested organizations.

The Consumer Products Division, under Chairman Marion S. Pettegrew, authorized EIA to prepare and obtain cost estimates on a standard seal which all phonograph manufacturers may use if they wish to indicate compliance with EIA's "music power output" standard for stereophonic phonographs.

The division reiterated its opposition to the FCC proposal which would empower the Commission to establish performance standards for television receivers and decided to select an industry witness to testify if and when hearings are held on the bill by either the Senate or House Interstate and Foreign Commerce Committees.

The Division Executive Committee also authorized informal protests to the FCC that manufacturers and distributors of foreign-made radio and TV sets are not filing certificates, as required of all manufacturers by the FCC, indicating compliance with the radiation limits established by the FCC in cooperation with EIA. The Committee was told that only one Japanese manufacturer to date has complied with this requirement.

The Consumer Products Division reviewed two proposed promotion programs and decided to forego this year a television merchandising program because plans could not be completed in time for mid-summer distributor meetings. A report was received from Chairman L. M. Sandwick, of the Phonograph Section, indicating that the proposed high fidelity stereophonic phonograph advertising campaign is still under consideration by individual manufacturers. If enough manufacturers agree to participate,he said, the program will be initiated in early fall.

Military Officers Guests

The Military Products Division, under Chairman Sidney R. Curtis, was host to a number of guests from the Military Services and the Defense Department including the following: RADM Edward G. Metzger, Assistant Chief for Contracts, Bureau of Naval Weapons; Brg. Gen. Walter R. Graalman, Deputy Director Procurement, Directorate of Procurement & Production, Hqs., Air Materiel Comman; Ralph Clark, Assistant Director of Defense Research & Engineering (Communications); Cdr. J. M. Malloy, Staff Director, ASPR Division, OASD (Supply & Logistics); and William H. Moore, Executive Assistant to the Assistant Secretary of the Navy (Material).

At an afternoon session members of the Military Products Division heard Colonel C. C. Segrist, Deputy Commander of the newly-established Electronic Systems Center at L. G. Hanscom Field, Massachusetts, describe the organization and its functions. Colonel Segrist said that ESC will be responsible for all major Air Force electronic and communication systems and would operate on a par with the Ballistic Missile Center and Aeronautical Systems Center. William Sen, Technical Advisor to the Commander of ARDC's Comman and Control Development Division, described responsibilities of the Hanscom Field operation.

Upon recommendation of the Military Systems Management Committee, which met on March 16 under Chairman C. F. Horne, the Military Products Division took under consideration establishment of a new divisional committee to consider problems arising under the weapons systems concept, particularly between prime and subcontractors and large and small electronic manufacturers. The Policy Committee was asked to develop a recommendation for action at the May meeting of the Division.

The Parts Division, under Chairman W. S. Parsons, decided to employ a staff engineer who will deal exclusively with the standardization activities of parts manufacturers in the EIA Engineering Department. The division also reviewed the current Walsh-Healey proceeding for the electronic components industry and plans for the International Electro Technical Commission conferences in New Delhi, India, this fall. The division also discussed plans for expanding its membership and recommended to the Board of Directors the employment of a staff member to spend full time soliciting new EIA members.

Members of the Parts Division Executive Committee on March 16 toured the Naval Research Laboratory in Washington.

Chairman J. A. Milling reported that the Distributor Relations Committee is cooperating with the Electronic Representatives Association in the implementation of EIA's Unit Territory Plan. Wilfred L. Larson, one of the EIA representatives to the ERA, reported on his conferences with the Electronic Representatives Association and its plans for regional industry conferences.

The Tube and Semiconductor Division, with Vice President L. Berkley Davis presiding, reviewed current proceedings involving tube and semiconductor products under the Walsh-Healey Act, and received reports on the operations of the EIA Standards Laboratory.

Foreign Marking Asked

The division also reviewed the problem of increasing Japanese shipments of semiconductor products to the United States and adopted a resolution recommending that the Board of Directors act to obtain legislation which would require the permanent marking of all imported tube and semiconductor products. Members also reviewed the recently established policy whereby the Air Force acts as a single service procurement agency for common electron tubes.

Meetings were held, prior to the session of the Executive Committee, by the Cathode Ray and Allied Tube Section, Receiving and Allied Tube Section, Semiconductor Section, and Transmitter Tube Section.

The Industrial Electronics Division, with Irving Koss acting as Chairman, decided to establish a Statistical and Marketing Data Committee to develop more accurate reports on the growth of industrial electronic products. The Division received a report on its first marketing conference held in New York in January and decided to hold another such seminar within the next six months.

Proposals for establishing new sections, including Instrumentation, Educational TV, Citizens' Radio, Navigational Aids, and Medical Electronics, were discussed, but action was deferred. The division decided to schedule an organizational meeting of instrument manufacturers in the near future.

Reports were received from the Amplifier and Sound Equipment, Broadcast and Closed Circuit, Land Mobile Communications, and Microwave Sections which had met the previous day.

Among other committees which met during the conference was the Service Committee which had as its guest speakers managers of TV-radio manufacturers. Chairman S. R. Mihalic reported that the writing of the customer relations manual for service technicians had been awarded to the McGraw-Hill Writing Service.

# # # # #

President Hull's Electronic Career Began with Service in Navy During World War II

President D. R. Hull, who on May 20 will receive EIA's Medal of Honor, was selected by the EIA Board of Directors and Annual Award Committee for his long military and industry service and many contributions to the advancement of the electronics industry.

While leading many industry activities during the past two years as President of EIA, Mr. Hull's affiliation with electronics covers more than a quarter of a century. He has been an executive of the industry since his retirement from the Navy in 1948 with the rank of captain. He is now Vice President of the Raytheon Company in charge of its defense programs with headquarters in Washington. Before joining Raytheon in 1950, he was with International Telephone and Telegraph Corporation as Vice President and Director of Capehart-Farnsworth Corporation.

Following graduation from the Naval Academy in 1925, Mr. Hull specialized in underwater sound and radar development prior to World War II. When war began, he became head of the Electronics Design Branch of the Navy Department. He then advanced to Deputy for Electronics and finally to Assistant Chief of the Bureau for Electronics, the senior Navy position in electronics materiel.

In 1943, for his pre-war work, Mr. Hull received a Navy commendation ribbon and citation from the then Secretary of the Navy, Frank Knox, "for his outstanding service in coordinating the entire Navy's radar research and development program while serving as Assistant to the Director of the Naval Research Laboratory." For his service during the war he also was awarded the Legion of Merit.

Mr. Hull was born in 1903 in Newton, New Jersey. In addition to a Bachelor of Science degree from the Naval Academy, Mr. Hull holds a Master of Science degree from Harvard University. He has been awarded fellowships by the Institute of Radio Engineers and the Acoustical Society of America. He has been a Director of EIA since March, 1956, and President since May, 1958.

# # # # #

13 New Members Admitted to EIA

The EIA Board of Directors admitted 13 new members on March 18, bringing the membership to 342. The new members are:

Electronic Consultants, Inc., Hempstead, N. Y.
Electronics Investment Management Corp., San Diego 1, Calif.
Harman-Kardon, Inc., Westbury, Long Island, N. Y.
McDonnel & Co., Inc., New York 5, N. Y.
McDonnell Aircraft Corp., St. Louis 66, Mo.
Polytronics Laboratories, Inc., Clifton, N. J.
Ruder & Finn, Inc., New York 22, N. Y.
Standard Rectifier Corporation, Santa Ana, Calif.
Stanford Research Institute, Menlo Park, Calif.
Syntron Company, Homer City, Pa.
Tucor, Inc., South Norwalk, Conn.
U. S. Transistor Corp., Syosset, L.I., N. Y.
Vought Electronics, Div. of Chance Vought Aircraft Inc., Dallas 22, Texas.

Membership of Wiltec Electronics, Inc., South Norwalk, Conn., was merged with Tucor, Inc., South Norwalk, Conn.

The following memberships were terminated:

Midwest Speaker Company, McGregor, Iowa
Oak Electronics Company, Buffalo 3, N. Y.
Pan-Electronics Corp., Griffith 1, Georgia.

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EIA
Vol. 16, No. 12 March 22, 1960

400 Attend Last Week's Defense Market Planning Seminar

Hear Government and Industry Ideas on More Defense Value from Better Planning

More than 400 representatives of government agencies and electronic firms last week attended a full day of speeches and panel discussions on how to stretch the national defense dollar by better market planning.

The Defense Market Planning Seminar was conducted by the Marketing Data Committee of EIA's Military Products Division. It was held in the Statler Hilton Hotel in Washington on the day prior to the start of the Association's 3-day Spring Conference.

EIA President David R. Hull, in the keynote speech, stated the seminar's theme of More Defense Per Dollar and expressed the hope that the event would result in the formation of closer government-industry ties "in an area where we lacked them."

John M. Sprague, Deputy Assistant Secretary of Defense (Comptroller) and one of the seminar's two principal speakers, told the luncheon meeting that greater industry participation in weapons systems planning is complicated by the rapidly changing nature of the Defense Department's technological needs.

Rep. Gerald Ford, Jr. (R., Mich.), the second major speaker, outlined at the seminar dinner nine ways in which Congress could assist defense agencies and industry in getting more out of money appropriated for defense.

(Full texts of the addresses by Mr. Sprague and Rep. Ford appear in the Supplemental Information section of this Weekly Report.)

The panel which discussed military service programs and planning was headed by Sidney R. Curtis, Senior Vice President of Stromberg-Carlson and Chairman of the EIA Military Products Division. Members of the panel were Rear. Adm. L. D. Coates, Director of Development Planning, Chief of Naval Operations; Brig. Gen. Elmer L. Littell, Commander, Army Signal Supply Agency; Col. Eugene C. LaVier, Air Research and Development Command; and Dr. Howard Wilcox, Deputy Director, Defense Research and Engineering.

The Panel discussing industry programs and planning was chaired by Vice Adm. John H. Sides, Director, Weapons Systems Evaluation Group, DOD. Panelists were L. Eugene Root, Vice President of the Missiles and Electronics Division, Lockheed Aircraft Corp.; Dr. Richard C. Raymond, Manager of Technical Military Planning, General Electric Co.; J. H. Richardson, Marketing Director, Hughes Aircraft Co., and Dr. N. I. Korman, Advanced Military Systems Director, Radio Corporation of America.

Some highlights from talks by the seminar panelists follow:

Adm. Coates saw a possible increase of 20 percent in the electronic industry's share of the defense budget during the next 10 years. He said this would amount to $2.4 billion worth of new business to the industry, even if the total defense budget were to remain at its present level.

Gen. Littell proposed adherence to "5 R's" to facilitate pooling of the efforts of the military services and industry to gain better defense planning. They were: Requirements, Resources, Realism, Reciprocity, and Responsiveness.

Col. LaVier described the recent reorganization of the Air Research and Development Command and the consequent reorientation of R&D planning philosophy and operation. One new program, he said, will result in the publication of Technical Forecasts which industries can use to determine what ARDC is supporting in their fields, who the responsible agencies are, and what research goals are in future years.

Dr. Wilcox said the addition of mobile, airborne, and ocean-borne weapons to the Nation's defense structure will place the country at a "static point in the strategic weapons race" within the next few years. At this point, he said, there should be a tapering off of strategic weapon requirements which will permit a bigger buildup of requirements for limited wars.

Mr. Root called for increased government-industry cooperation. "It seems to us that in many respects the defense industry is an integrale part of the over-all U.S. defense establishment. It may well make sense for planners in the DOD and industry to cooperate even more closely in the task of matching defense needs with timely systems in order that our country might achieve the maximum defense for the resources expended," he declared.

Dr. Raymond stressed the importance of studying each promising new idea. "It is probably more economical in the long run to tolerate some degree of over-lapping and duplication than it is to argue out each case and then to build obsolete equipment on the basis of the agreement," he pointed out.

Mr. Richardson said that marketing is essential to a defense industry to accomplish representation of military needs and requirements to the company and representation of the company's applied technology to the military. Modern marketing practices are needed, he said, to enable industry to "properly put its skills at the disposal of DOD and, in the end, help provide for the national security."

Dr. Kroman defined the separate areas in which the military services and industry should handle systems planning. With its research development, design, production and service agencies, he said, industry "is more acutely aware of possibilities for weapons and military devices which arise out of technology, engineering and production. It has greater insight as to what might be done with weapon characteristics, performance, lead times, costs, and dates of obsolescence, " he stated.

# # # # #

O'Mahoney proposes new patent legislation - Sen. Joseph C. O'Mahoney (D., Wyo.) has introduced a bill (S 3156) which he said would provide for the protection of interests of the United States in basic research with respect to patent rights arising from research sponsored by the government.

Sen. O'Mahoney, who is chairman of the Senate Subcommittee on Patents, Trademarks and Copyrights, said the measure was aimed at determining whether patents resulting from government sponsored research should be allowed to become the property of private contractors "who are themselves the beneficiaries of government subsides."

The bill would require the National Science Foundation, which coordinates basic research throughout the government, to determine the possible adverse impact on basic research of patent and technical information clauses contained in research contracts let by government agencies. It also would provide for review of contracts by both the Foundation and the Justice Department. Formal expression of their views would be required before a patent and technical information clause giving exclusive commercial rights to the contract could be included in important basic research contracts.

The bill was sent to the Senate Judiciary Committee for referral to the Subcommittee on Patents. Hearings have not yet been scheduled, a subcommittee spokesman told the Weekly Report.

Sen. O'Mahoney said a subcommittee investigation of the Science Foundation found the agency "suprisingly indifferent to the kind of patent and technical information provisions used in its own research grants as well as in contracts and grants let by other government agencies."

The investigation also disclosed, he said, that Foundation Director Alan T. Waterman "was not even aware that there were being widely used in government research contracts patent and technical information clauses which encourage the contractors to maintain undesirable secrecy with respect to basic research."

Commenting on the bill, he said: "If there is to be any patenting at all of the products or by-products of government basic research, it would seem desirable for the government, rather than private contractors, to hold title to the patents and for the government to have freedom of accessibility and the right to disseminate the resulting scientific and technical information."

Army may get $25 million of NIKE-ZEUS fund - The Army may get $25 million from frozen NIKE-ZEUS antimissile funds to be used to set up production lines for small electronic components, Dr. Herbert York, Director of Defense Research and Engineering, indicated last week.

The money, part of $137 million designated for preproduction work on NIKE-ZEUS but withheld from the Army by the Administration, would be used to set up automatic production lines for fabrication of miniature electronic parts used in the antimissile system.

Dr. York also said that more research is required on NIKE-ZEUS. This was taken to mean that release of the $25 million would not mean immediate release of the entire preproduction sum.

The Army first asked the Department of Defense for the preproduction funds last month in testimony before the House Science and Astronautics Committee. Production lines for the small components were described as the most important part of the preproduction program.

Hearings begin next week on proprietary rights -- Three days of hearings will begin March 29 on the problem of proprietary rights and data and its effect on small business, Rep. Abraham J. Multer (D., N.Y.), Chairman of the Subcommittee on Government Procurement of the House Small Business Committee, announced last week.

Rep. Multer said in a statement that complaints to the committee have indicated that a small business concern under subcontract to a prime contractor or on direct procurement with the Department of Defense is required to submit complete proprietary data on products or techniques which it has designed and developed with its own resources.

Some small businesses have complained, Rep. Multer said, that this requirement might cause them to disclose "invaluable technological data as well as trade secrets."

The committee will hear testimony from prime contractors and officials of DOD in response to the complaints. Defense and industry officials will also testify on the Armed Services Procurement Regulations concerning proprietary rights and related matters, Rep. Multer said.

Committee approves officer-hiring bill -- The House Armed Services Committee last week approved a bill which would withold retirement pay from retired military officers working for defense contractors.

The bill (HR 10959) would also require ex-officers to register if they joined a firm doing business with the Department of Defense. Contractors would be required to report such hirings.

Dropped from the bill was requirement of stiff criminal penalties for officers selling to DOD within two years of their retirement. The requirement, supported by Subcommittee Chairman F. Edward Hebert (D., La.), was removed by a subcommittee vote of 28-4.

The final draft of the bill was approved by the full committee by a vote of 34-1.

DOD establishes new committee on engineering drawings -- The Department of Defense has established a special committee to aid in development of a program for unification and standarization of engineering drawings.

The Defense Drawing Practice Industry Advisory Committee will advise the director of the Armed Forces Supply Support Center in formulating the program. It will consist of 15 industrialists and educators and one member and an alternate member from each military service.

New bill requires security decisions to be on record -- Legislation which would require decisions involving government contractors or Federal workers under security or loyalty programs to be made on the record was introduced in the House last week.

Introduced jointly by Reps. James Roosevelt (D., Cal.) and Frank Thompson, Jr. (D., N.J.), the bill (HR 11151) adds a single paragraph to section 12 of the Administrative Act. The amendment reads:

> "Notwithstanding any other provision of law, the decision or adjudication by any agency as to its officers, employees and agents in the course of the administration of any Federal employee loyalty or security program or law and as to officers, employees and agents of any contractor with the United States in the course of the administration of any industrial security review program or law shall be made on the record as contemplated by this Act and shall be subject to all other provisions of this Act."

Its sponsors said the bill was designed to strengthen the President's February 20 executive order revising industrial security procedures. The order has "run into a barrage of criticism" for not establishing enough safeguards for employees whose loyalty is questioned, they said. The measure was referred to the House Judiciary Committee.

Group sets capacitance values for triodes - Review of 6FH5 capacities has brought agreement that grid-to-plate capacitances of triodes used in neutralized high frequency applications should be rated as bogey values rather than maximums, according to a report of a recent meeting of the JT-5.4 Subcommittee on Radio-TV Ratings of Low Power Electron Tubes.

In another action the subcommittee, meeting under Chairman A. J. Haley of Westinghouse Electric Corp., recalled for minor corrections re-registrations for the 1B3GT, 1U5, 3V4 and 6BR8 prepared by JT-5.4 and issued with a letter of ballot by JT-5.

A copy of the JT-5.4 working draft of the "Low Voltage Rectifier Manual of Practice" was sent to the British Valve Association in reply to a request for exchange of information of construction on retifier rating charts.

The progress and current status of noise figure measurement standardization was reviewed by the chairman of the Advisory Group. The subcommittee decided to request permission through JT-5 to have the EIA laboratories undertake a noise source evaluation program.

Symbols approved for storage tubes - The JT-6.12 Subcommittee on Storage Tubes. D.W. Davis of International Telephone and Telegraph, Chairman, recently completed agreement on symbols to be used in electrical in-visual out-storage tubes.

Detailed review of Performance Characteristics 72.4-4375 was completed at the same meeting. Essential concurrence existed on both the characteristics to be measured and the method of measurement.

Committee drafts measurement standard - The JS-9 Committee on Industrial Signal Transistors recently completed the first draft of a measurement for Re (^{h}ie).

The Committee, C. D. Simmons of Lansdale Tube Co., Chairman, also discussed Vb'C_c and a first draft of a standard on minimum requirements for collector-to-emitter voltage rating for RF-IF transistors. A first draft of tunnel diode Registration Data Format was also drawn up.

The Committee reported that the Low Power Audio Registration Data Format is complete and is being held pending Council action on the RF-IF Format, now on letter ballot.

Other Registration Data Formats in various under preparations are High Power RF Oscillators and Amplifier Transistors, RF Mixer and Connector Transistors, and switching Transistors, the Committee reported.

Dean resigns R-20 chairmanship - William W. Dean recently resigned as Chairman of the EIA Engineering Committee R-20 on Packaged Audio Equipment. The action was made necessary because of a change of his responsibilities in the General Electric Co.

Under Mr. Dean's chairmanship, the Committee formulated the newly issued Standard RS-234 on Power Output Ratings of Packaged Audio Equipment for Home use.

Harris Wood, Chairman of the Entertainment Receiver (R) Panel, was expected to appoint a new chairman soon.

UL okays power supply cords - The Underwriters' Laboratories, Inc. announced on March 4 that flexible power supply cords type SP-2 and SPT-2 are acceptable for commercial use if the length of the cord does not exceed eight feet. Type SJ and SJT cord will continue to be required if the length is more than eight feet.

REMARKS OF
MR. JOHN M. SPRAGUE
DEPUTY ASSISTANT SECRETARY OF DEFENSE (COMPTROLLER)
BEFORE THE ELECTRONIC INDUSTRIES ASSOCIATION
"DEFENSE MARKET PLANNING SEMINAR"
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Mr. President, Members of the Defense Market Planning Seminar, and Guests:

We in the Defense Department always welcome these opportunities to meet and discuss with our partners in industry the mutual problem of national defense. I couldn't help but wonder, however, why anybody would want to spoil the luxury of relaxing after a good lunch with a discussion of so contentious a subject as the defense program and budget.

The Electronic Industries Association members, like all contractors servicing the Department of Defense and the Military Assistance Programs, are understandably interested in the immediate and long-range future -- the weapons and level of effort of tomorrow which will grow out of today's research and development.

I am sure you will agree that the world of electronics, more than many other industries, can look forward to expanding civilian markets as well as increased use of its products and know-how by the military and space programs. The level of defense buying is, of course, directly related to the assessment of the threat which, for the immediate future will probably mean, as Mr. Gates told the House Appropriations Committee, continued high defense budgets. The electronics share of these budgets is forecast to increase over the next several years as the aircraft share, for example, declines.

Admittedly, it would be desirable to be able to lay out longer range defense programs so that industry could more fully participate in the planning of future weapons systems. But, today's military planning, both contemporary and long range, presents a constantly changing spectrum. While the useful life of many of the conventional hardware items can be forecast with considerable confidence, the military life expectancy of some of the more sophisticated follow-on items is greatly influenced by the rapid changes in the state-of-the-art which may obsolete an item even before test and evaluation is completed. This greatly complicates the task of detailed long range planning with industry.

With respect to over-all defense planning, it seems to me that a thorough understanding of the major factors which determine the size and character of the annual defense program and budget is an essential prerequisite.

To begin with, defense programming and budgeting consist of much more than an assessment of the military threat, a determination of the military requirements, the costing of those requirements and the adding up of the costs. Certainly, the defense program and budget must, in total, not only be equal to the assessment of the threat but must also provide an adequate margin of safety. But military requirements, like the assessments of the military threat, are not susceptible to precise determination. Furthermore, the defense budget cannot be planned and formulated in isolation. It must be developed within the framework of the entire Federal budget, the entire government economic and fiscal policy and, indeed, the entire national strategy.

Today's threat to our national security, as many experts on this subject have pointed out before, is not only military. It is also political, economic and even psychological. To cope successfully with such a multi-sided threat, we must have a balanced national strategy wherein the military, political, economic, and the psychological aspects are all welded together into an integrated whole. The risks inherent in each of the threats must be carefully weighed and brought into proper balance, recognizing that security can never be absolute and that a certain degree of residual risk must be accepted in each area.

Nor is this composite threat ever static. The world moves on, circumstances change, and the degree of risk inherent in each element of our national strategy also changes. Thus, the national strategy must be constantly reassessed and the relative emphasis placed on each element adjusted to conform with the new challenges of ever-changing circumstances. The defense program and budget, therefore, must not only provide adequately for the national security but must also be tied in with all the other considerations affecting the total national budget and the total national strategy.

We all understand that military policy cannot be separated from foreign policy and that military policy must be the strong right arm of foreign policy. Our treaties, commitments and peaceful objectives around the world all have an important bearing on the size and composition of our defense forces.

But is it not always understood that military policy is also related to economic policy and that economic factors have an important, although secondary, influence on the over-all level of the defense effort at any particular time.

While it is true that the U.S. economy, today, could support a larger defense program, that is not the real issue. Experience has shown that the defense program is enmeshed in a whole array of interrelated economic factors -- the historical dangers of inflation; the tax burden in relation to economic incentives; the size of the national debt in relation to interest rates and monetary policy changes in the balance of payments, etc. From a national point of view, all of these factors have a bearing on the over-all level of defense expenditures.

I need not belabor the reasons why the Government must be ever alert to the dangers of inflation -- the inequity to those on fixed incomes, the distortion of values, the weakening of our competitive position in world markets, and the undermining of the strength of the dollar. But, in a free enterprise economy in peacetime, the Government's role in the fight against inflation is indirect. Its most important weapon is a balanced budget or, if at all possible, a budget surplus.

The national debt is now at an all-time high. Within the last two years, the average yield on long-term Government bonds has gone from 3.1 percent to 4.3 percent, and the cost of shorter term borrowing to as high as 4½ and 5 percent. Interest on the national debt has gone up from $7.7 billion in fiscal year 1959 to an estimated $9.4 billion for 1960 -- well in excess of <u>total</u> Federal expenditures as late as 1940. Here, again, is an urgent reason why the Federal budget should be balanced and, indeed, if at all possible, a surplus achieved.

More recently we have encountered a problem new to our generation of Americans -- a large adverse balance of payments. In calendar year 1958 the United States suffered a balance of payments deficit of $3.4 billion. Part of this deficit was offset by the withdrawal by other countries of $2.3 billion from our gold stocks, the largest single one-year loss of gold in the history of the U.S. The rest of the deficit was, for the most part, added to foreign short-term dollar holdings in the United States, thus increasing the liabilities against our gold stocks at the same time these stocks declined.

In 1959 the balance of payments deficit totaled $3.7 billion, and another $1.1 billion was withdrawn from U.S. gold stocks, bringing the total down to $19½ billion, the lowest point in twenty years. At the same time our short-term liabilities to foreigners have reached an all-time high of well over $19 billion, compared with less than $7 billion at the end of World War II.

These trends, like the increasing cost of the national debt, point to the need for a conservative fiscal policy; that is, a balanced Federal budget and, if at all possible, a budget surplus. This would be a major contribution to the maintenance of confidence in the stability of the dollar, as well as to strengthening our competitive position in world markets.

There is one aspect of this balance of payments problem that is even more directly related to the defense program. Defense expenditures abroad entering the balance of payments total over $3 billion a year and are, in large part, associated with the deployment of U.S. forces overseas. They include spending by our military and civilian personnel overseas; pay of foreign nationals employed by U.S. forces; and purchases of materials, supplies and services of all types. Thus the defense program directly contributes to the unfavorable balance of payments situation.

It may be argued that the Federal budget problem could be solved by increasing present tax rates. Let me simply point to the fact that the total tax take of Federal, state, and local governments is higher today than it has ever been in our history -- including World War II and the Korean War.

But perhaps more important is the relation of the tax burden to economic incentive at almost all income levels. In our kind of economic system, we must rely on the efforts of private individuals to strengthen and expand the U.S. economy. A constantly growing economy is, of course, something we would want for its own sake. But there is now another reason why we must ensure the continued growth of our economic strength. The Soviet leadership has chosen to make economic competition another arena in the struggle between Freedom and Communism, and we must be prepared to meet this aspect of the total threat.

If the military threat were of temporary duration, we would perhaps be justified in setting aside consideration of these economic factors until more tranquil and less troubled times. But I think we can all agree that the kind of threat we face today is likely to continue for many years to come. Already, almost ten years have elapsed since the Nation explicitly recognized the long term nature of the Communist threat and adopted the policy of defense for the "long pull". This policy, first enunciated by General Marshall in December 1950, envisaged an increase in the defense effort to an adequate level and one which would be sustained indefinitely if need be.

By and large, we have followed this policy fairly consistently since that time. For example, the general level of the defense effort was not increased during the Lebanon and Quemoy crises. Neither has it been decreased as a result of all the talk about disarmement. Even the recent Soviet announcement of a one-third reduction in the numerical strength of their active forces has not seriously suggested a deviation from this "long pull" policy.

Our policy of maintaining a steady, stable level of effort over the "long pull" is, of course, complicated by increasing costs, more importantly, by very rapid technological changes in military hardware.

While the general price level appears to have stabilized somewhat in the last year or so, there is still some upward drift in many price indices of importance to the defense program.

More directly, even without a general pay increase, the cost of military personnel goes up about two to three percent a year. This comes about from a somewhat higher grade structure; increased longevity pay; an increased number of dependents and, therefore, dependents allowances; the new program of enlisted proficiency pay; and a steady increase in military retired pay.

Even while numbers of men, military units, military installations, and inventories of older conventional weapons gradually decline, operation and maintenance costs continue to increase each year. The costs per flying hour, per steaming hour, for an overhaul of a ship, an aircraft, or an engine, continue to go up, due largely to the more complex weapons being incorporated into the forces.

But most important of all is the increased procurement cost of these new and more complex weapons. The cost of a fighter airplane, for example, has increased by over thirty times since World War II; the cost of a submarine (POLARIS), twenty-fold. A modern supersonic bomber costs nearly one hundred times its World War II predecessor, the B-17. The Navy's nuclear-powered carrier which is currently under construction will probably cost eight times as much as the carrier which fought the Battle of Leyte Gulf.

Staggering sums have been invested in our presently operational weapons systems. To date, our B-52 strategic bomber fleet alone represents a capital investment of nearly $9 billion, excluding supporting tankers, air-to-ground missiles, etc. Through the present fiscal year, investment in our continental air defense system for protection against just manned bombers amounts to more than $17 billion.

The weapons systems of tomorrow will require additional billions of dollars of investment before a substantial operational capability is achieved. For example, through June 30, 1959 we had committed to the ballistic missile program -- ATLAS, TITAN, MINUTEMAN, POLARIS, THOR and JUPITER -- a total of more than $7 billion. An additional $3 billion will be put into these big missiles this year, raising the total to $10 billion. The investment in all our missile programs -- both big and small -- will reach over $31 billion by next June. Even in terms of unit costs, the amounts involved are staggering. Last year the President mentioned that the average cost of the first nine squadrons of ATLAS worked out to about $35 million per missile on launcher.

These cost increases are, of course, related to the rapidly increasing complexity of new weapon systems, as you in the electronics industry well know. But it should not be overlooked that these new weapons systems also have much greater combat effectiveness than the systems they replace. Therefore, they are not needed in the same numbers. We have seen this trend operating for some time and it is bound to continue into the future.

The defense budget process is further complicated by the fact that military technology is moving so fast that whole weapons systems are being obsoleted while still in production -- and, in some cases, even while they are still under development. You are no doubt all familiar with some of the major cancellations in the last year, such as the SEAMASTER jet-power seaplane, the boron fuel program, and the F-108 long-range interceptor aircraft.

Thus, we are constantly faced with the problem of reviewing all of the weapons systems in the program to reassess their relative importance and to eliminate, as promptly as possible, those which have been overtaken by events. This is not an easy or one-time task. As Secretary of Defense Gates stated recently to the House Appropriations Committee:

"These changes are coming fast and are drastic. The defense program must be kept under continuous review. Programs which looked promising only a short while ago have become marginal in importance in the light of technical advances. This compels a continued shift in emphasis and resources from older to newer programs, and the outright termination of some programs."

Now as to the mechanics of planning and formulating a budget program under these difficult circumstances --

The crux of the problem within the Executive Branch of the Government is to strike a proper balance, in terms of priorities, among military requirements, space exploration, civilian needs, future economic growth, the tax burden, debt management, etc.

The heart of the problem within the Defense Department is to provide adequately for the national security by achieving, within the resources that are available, the best possible balance among combat forces-in-being, the procurement of hardware for these forces, and the research and development of new weapons systems for the future.

Now there are no doubt many different ways in which a defense budget can be formulated within these parameters. Since any one year's defense budget is essentially just another annual installment on a continuing program, it is not unreasonable to take as the starting point in this process the budget level of the preceding year.

In order to provide some flexibility in the review process, it was agreed this year that the Services would submit what we call basic budgets aggregating about $40.1 billion in new obligational authority and $40.6 billion in expenditures. In addition, they were to submit other desirable programs as an addendum budget, bringing the total submissions to $43.7 billion in new obligational authority and $41.8 billion in expenditures.

It was contemplated that the basic budget submissions would represent the hard core of top priority requirements for combat ready forces, military hardware, and new weapon systems development, together with the related construction.

The addendum to the basic budgets were intended to provide, regardless of past individual Service funding levels, a means of achieving the necessary flexibility to increase the emphasis on selected top priority programs, and to finance other high priority projects or promising developments which could not be accommodated in the basic budgets.

However, the Services were not precluded from submitting items over and above these limits, and the Army, Air Force, and the Advanced Research Projects Agency did so.

This approach was quite similar to that used in the development of the fiscal year 1960 defense budget. Then, too, the Services were requested to submit a basic budget plus an addendum. In fact, this approach is very similar to that used even before the Korean War. Here is how the Director of the Bureau of the Budget, Frank Pace, described the preparation of the fiscal year 1951 budget some ten years ago. He said: (and I quote)

"We would provide /the President/ with certain factual information as to where certain policies would lead. From that the President set a ceiling on the armed services, which was last year, I think, generally known as $15 billion.

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"There is also the proviso that if within that limitation it is impossible to include certain programs which the Secretary of Defense considers of imperative importance to the national defense, they shall be included in /order/ of priority in what is termed the 'B' list."

The FY 1961 budget requests, totaling $43.9 billion in new obligational authority and $42.6 billion in net expenditures, as actually submitted, were then subjected to the careful scrutiny of the staff of the Office of the Secretary of Defense to trim out any "soft" items which might appear therein and to make recommendations on other items requiring priority attention. Following the presentation of the staff evaluations to the Secretary and Deputy Secretary of Defense, discussions at both the Secretarial and the staff level were held with the Military Departments in order to resolve outstanding problems. This review laid particular stress on major weapon system programs which were considered on a Defense-wide basis -- without regard to Service sponsorship. In this way it was hoped to focus attention on the missions to be performed rather than on the Service budgets as such.

A special effort was made this year to assure that all the responsible officials of the Department of Defense -- particularly the Service Secretaries, and the Chiefs of Staff, both in their individual capacities and in their corporate capacity as the Joint Chiefs of Staff -- participated in the review of the annual military program. Although the members of the Joint Chiefs of Staff, in their capacity as the military heads of their respective services, are intimately acquainted with the details of their own budgets, they must also, in their corporate capacity as the Joint Chiefs, consider the defense program as an entity.

To facilitate this aspect of their work, the staff of the Joint Chiefs was furnished the budget submissions of each of the Services, together with various analyses and evaluations prepared by the staff of the Office of the Secretary of Defense. The staff of the Joint Chiefs, which was substantially increased by the Defense Reorganization Act of 1958, was therefore in a position to analyze and evaluate -- from an over-all military point of view -- the programs submitted by each of the Services.

The Department also had the benefit of the active participation of the Office of the Director of Defense Research and Engineering similarly established by the Defense Reorganization Act of 1958. I am sure it is obvious to all of you that because of the increasingly difficult technical problems involved in modern weapon systems, the Defense Research and Engineering staff has a major role to play in the formulation of the defense program and budget.

In all of these ways the Secretary of Defense sought to bring to bear on the fiscal year 1961 defense program and budget the collective knowledge and judgement of the entire top command, both civilian and military, of the defense establishment.

The defense budget developed in this manner was then presented by the Secretary of Defense to the President at Augusta. The major issues related to the to the composition and size of our military forces, to the priority of weapons systems, to the timing of procurement, and to the composition of the defense research and

development effort -- were all thoroughly reviewed with the President. The Service Secretaries and the Chiefs of Staff were then invited by the President to present directly to him their individual views and comments on the defense program and budget proposed for fiscal year 1961.

As a final step in the process, the defense budget was discussed in the National Security Council. Here the Secretary of State, the Secretary of the Treasury, and the Director of the Budget, as well as the Secretary of Defense, and others, joined with the President in giving final consideration to the defense program and budget in context with the total national strategy.

From this long and painstaking review process, extending from early September to early December of last year, there evolved a defense budget totaling $40,927 million in new obligational availability, and slightly less than $41 billion in net expenditures. Of course, the Services started their planning long before their September submissions.

I think it can be fairly stated that every one of the major issues raised in the Congressional hearings and in public discussion of the Defense budget since it was transmitted to the Congress in mid-January, was thoroughly and carefully considered during the budget review. In fact, virtually every argument made, pro and con, on these issues had been heard during the budget review. But as former Secretary of Defense McElroy stated before the Senate Appropriations Committee last year:

> "In the defense program we are dealing with extremely difficult problems for which there are simply no pat solutions -- no simple answers. In many areas -- looking into the future -- we are dealing largely with assumptions, calculations, estimates, judgments. It is not surprising then, that there are differences of opinion even among experienced, professionally competent men.
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> "Nevertheless, the fact remains that the responsible officials -- military and civilian -- still have the task of studying these divergent points of view and arriving at a specific program.... No one would advocate trying to do everything that every individual would like to see done. This would not only be beyond our resources but would simply dissipate our efforts and weaken rather than strengthen our military power. So, we are faced with the necessity of making decisions among various alternatives -- in other words, of exercising judgment, of making 'hard choices'."

There is no question but that the 1961 budget reflects some very hard choices. But in the judgment of the President and the Secretary of Defense the 1961 defense budget does provide for those programs which are essential to our national security.

REMARKS OF
THE HONORABLE GERALD R. FORD, JR.
REPRESENTATIVE IN CONGRESS FROM MICHIGAN
BEFORE THE ELECTRONIC INDUSTRIES ASSOCIATION
"DEFENSE MARKET PLANNING SEMINAR"
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CONGRESSIONAL RESPONSIBILITY IN DEFENSE PLANNING

Mr. Chairman, participants in the Seminar on Defense Market Planning, and guests. It is a high honor and a rare privilege for me to have the opportunity to participate in this function this evening. But first I think I ought to set the record straight.

It is always dangerous for anybody in political life to appear under false colors, or to participate in an unfamiliar area.

I have strong aversion toward those in political life who place a halo over their heads and march down the road pushing people aside, just because of a reputation.

I had an experience a few years ago, when I first became a member of the House Committee on Appropriations, which certainly set the record straight as far as I was concerned.

Back in 1951 I was member of the so-called River, Harbor and Flood Control Subcommittee, better known as the "Pork Barrel Subcommittee" on Appropriations. Back in those days, we were trying to curtail and reduce spending in so-called non-military areas, so that we could devote a greater part of our appropriations to the military effort in Korea.

The five of us on this subcommittee, both Democrates and Republicans, took a very stern and I think justifiable viewpoint that no new projects would be inaugurated in this next fiscal year.

We came to the floor of the House with an Appropriation Bill that was, to put it mildly, austere, and we thought our handwork was well done and something that would be universally acceptable.

Lo and behold, when we hit the floor of the House with this very tight budget, we were met with not universal support, but overwhelming condemnation by our colleagues.

Each of the five of us took our turn in trying to defend our handiwork.

Being the junior member of the minority side on this particular subcommittee, I came last in trying to justify our action. I took lots of books and papers down to the floor of the House to make this erudite exposition of why we had done what we had done. After speaking thirty minutes or so with considerable self-satisfaction and pride in my own comments, I walked up the center aisle. I got about halfway up, and a good friend of mine, a Texas Democrat, reached over and grabbed my arm. He Said:

"Jerry, that is the best Texas longhorn speech I ever heard."

Quite frankly, I was apprehensive as to what he had in mind. But I asked him:

"Ken,what do you mean by a Texas longhorn speech?"

And he smiled very sweetly and he said:

"Jerry, down in Texas a longhorn speech is one that has two points far, far apart, with plenty of bull in between."

I can assure you I have been somewhat self-conscious and apprehensive about any speech I have made subsequently.

Now, to be honest with you, from past experience I would feel much more at home here this evening if I were making a purely political speech. Not that I necessarily do too well in that kind of an arena, but I can assure you I am more accustomed to that atmosphere.

I might say that, bearing in mind the tenor of this seminar, I resisted some temptation and rejected any such kind of a speech, because it is my impression and my feeling that you people here are in this seminar for other purposes.

However, I would also feel much more at home making a speech if I were presenting, as one of the members of our subcommittee, the Defense Department budget to the other members of the House of Representatives -- not because I am any real expert, but on a relative basis, I might know a bit more than some of my colleagues.

But I am a little apprehensive here this evening, because in talking to you people, I am faced with a very sophisticated, a very knowledgable audience, on issues that are certainly highly technical and very comprehensive in their scope.

I might also say that I feel a bit uneasy because I have met some of you in this distinguished audience and know others who represent a substantial portion of one of America's great industries.

In checking the facts and the records during the last week or so, I have found that the electronics industry is the fifth largest manufacturing industry in America. Secondly, it is an industry which, in the short span or relatively short span of fifty years, has grown from the invention of relatively simple vacuum tube to the phenomenal sales record of about eight billion dollars in production in a single year.

The magnitude of the electronics industry really does not hit the public with the impact that it should. Even some of us deal with military appropriations on a day-to-day basis, year after year, five or six months each year, do not appreciate the situation as we should.

Just yesterday, Lieutenant General Authur Trudeau, Chief of Research and Development for the Department of the Army, said to our Subcommittee something which really opened my own eyes, and I quote.

"Electronics in general has seen a ten-fold increase since World War II and another ten-fold increase can be expected by 1970. This is the fantastic area of development where the old vacuum tube circuits are now being micro-miniaturized to one-tenth, one-hunderdth, and one-thousandth of their original size and volume. This means a tremendous savings in bulk, weight and power requirements for an across-the-board application to all types of Army equipment."

This statement was highly significant to our Subcommittee and to me.

This was followed by another statement by General Trudeau's deputy, which made a tremendous impression on me.

"We know that if we go to war today, an Army Corps will have 23,000 electromagnetic emission devices in an area sixty miles on a side, whereas there were something like 9,000 such emissions or devices in use in 1958, in the same area."

These kind of facts and figures in very technical sense certainly make me apprehensive and a little bit uneasy when I try to talk to an audience such as this.

It seems to me, as I have read this summary of the history of the electronics industry, that it is truly an Horatio Alger industry. And furthermore, in my opinion, the industry could not have grown as it has by leaps and bounds unless there had been among you, before and now, individuals who in their own right are Horatio Algers.

It is my judgment and opinion that the electronics industry could not have grown with such spectacular success to the point where, one, it is one of the most vital contributors to our national security, or, two, it is one of the most essential elements in America's industrial growth and efficiency, or, three, it is one of the most helpful and beneficial contributors to our day-to-day enjoyment of the fabulous sixties -- without, one, the inventive and scientific geniuses that are with you, and, two, the management wizards which I am sure must have been before and present today, and, three, the 700,000 skilled workers who produce the products of those who invent them and manage them.

I might also say that I feel a bit ill at ease tonight because in this distinguished audience there are members of the Army, the Navy and the Air Force team, who together make up the most powerful, the most versatile and the most alert military force in the history of the world.

The military history of the United States covers more years and more pages in our record books than the history of the youthful, or relatively youthful, electronics industry. Each of the military services has had its renowned leaders and its periods of greatest glory. Never once, to my knowledge, have our military leaders failed us in a time of crisis. I am confident that our military leaders of this era will give America the preparedness to maintain our national security in the months and years ahead.

Now, although I am a bit self-conscious in such a group of experts from two groups with distinguished records, I can say with conviction I am bolstered a bit by the fact that I speak to you tonight as a representative of the freest and, I believe, the finest legislative body in the history of the world. It should be obvious to all of you that the Congress has its odd and sometimes time-consuming ways of doing things, particularly at the present time. But in our nation's history, I say with all the vigor at my command, that it has made its full share of contributions to our nation's progress and success. I can say without hesitation or qualification that in comparison to all other legislative bodies in the history of man, its record is unmatched.

Now, thus far in my comments I have tried to be generous and complimentary to the electronics industry, the United States Armed Forces, and the executive branch of the government generally, and to the Congress.

In the past, each group or organization has met every challenge with a response that has overcome the obstacles of the day.

However, each of you know, as I do, that such success in the past does not insure victory in the future. We only win the battles of tomorrow, or the battles ahead, if we do the following things.

One. Admit our weaknesses and errors.

Two. Come up with some new ideas once in a while.

Three. Work together on mutual problems.

Four. Work just a bit harder.

Five. Dedicate ourselves ever increasingly to our American System.

Now, today in the series of seminar or discussion groups that you have participated in, covering a period of about twelve hours, as I figure out the schedule, you have attempted to seek methods of obtaining more defense per dollar through planning.

In all sincerity, I wish it could have been my privilege to be a listener in some of your discussions during the morning and afternoon sessions. I could have benefitted immeasurably by being in those discussion groups and listening to the comments made by you experts.

I am confident that whatever is accomplished by this meeting, or others comparable to it, will be derived from cooperative or joint effort.

My part of the program today involves what Congress can do to get more defense per dollar through planning.

As I sat thinking about what contribution I could make here today, I wondered how a Congressman could make a contribution in military planning. When I think of planning, I think of the long-range program that should be laid out and carried on. Now, in the House of Representatives, we have a two-year term, which is somewhat restrictive in how we can participate in a long-range project.

That reminded me of a story that was told to me by an older member of Congress the first year I served in the House, back in 1949. He had been in the House for thirty years, or thereabouts, and he came over and he sat down beside me on the floor of the House one day and he said, "Jerry, do you know the definition of a Congressman?"

Being very deferential to someone with all that seniority, and with my lack of it, I said, "No, I do not."

He said, "Well, the definition of a Congressman is the shortest distance between two years."

I can assure you that is true. And anybody who has that term of office can hardly in many respects make commitments on a long-range planning program.

But I do think that Congress as a whole, regardless of individuals, can make a contribution so that we can get, in my judgment, more defense per dollar through planning.

First, there should be a stabilization of funding at an adequate level.

Anybody who studies military approprations over the last fifty years in the United States cannot help but be struck with the fact that our policy up until recent years was one of funding the military programs on a feast-or-famine, peak-and-valley basis.

Before World II there relatively limited appropriations made for the Army and the Navy. From that low level of funding, we went to the astronomical heights of $70 billion or $80 billion a year during World War II. At the end of World War

II we went down to the valley of about $13 billion in military appropriations. The Korean War awakened us to the problems at our doorstep, and we zoomed back upward to an annual appropriation figure in the neighborhood of $60 billion or $70 billion per annum.

I think anybody who is objective will come to the conclusion that this feast-and-famine, peak-and-valley program of military funding is costly in time, it is costly in dollars, and, unfortunately, it is costly in American lives.

Such a program was abandoned in 1953, and since that period of time, a relatively high and relatively stable military appropriation program has been in being. I for one subscribe to and wholeheartedly endorse such a policy. Fortunately, the Congress has bought such a policy, although we seem to have from time to time some differences of opinion within limited areas as to what is enough or what is too much. But nevertheless, compared to the days before World War II, and compared to the days before Korea, our military appropriation program today is infinitely superior, both in stability and as to adequacy. This is a good program.

Now, this relative stability and relatively high rate of spending does not mean, in my judgment, that a military appropriation bill should be immune from Congressional investigation and Congressional action. As a matter of fact, under the Constitution, that is our responsibility -- those of us both in the House and in the Senate.

It is my judgment that in the main those directly responsible in the House and the Senate make a conscientious effort to exercise good judgment in this area.

I might also say that the threat or the reality of Congressional investigation of proposed funding programs helps to sharpen up a bit the programs that have been approved by the executive branch of the government.

I have talked individually with witnesses who have come before over Committee, and they have said that this experience of being interrogated by some of the sharper and more incisive members of our Committee makes them become more certain of the justification of what they are proposing to the Congress.

And so, through this process, I think we do get more defense per dollar in the United States.

Secondly, I think Congress can get more defense per dollar through prompt Congressional action on the annual appropriation bill for the Army, Navy and Air Force.

Most of you know that the President submits to the House and the Senate the budget in January of each year. It would be expected that this appropriation bill would become a matter of law by the beginning of the fiscal year, July 1. In checking the history of recent appropriation bills for the Department of Defense, I find this to be the case - that only one out of the last ten military appropriation bills from fiscal year 1951 through fiscal year 1960 was enacted into law by the beginning of the fiscal year involved.

It was October in one year when the appropriation bill became law. And it seems to be traditional that the military appropriation bill will become law in either late July of August.

This, of course, puts the military appropriation bill well into the next fiscal year. As a matter of fact, it almost overlaps the preparation of the military appropriation bill for the next fiscal year, as far as the executive branch of the government is concerned.

It is my strong feeling that Congress could do a service to the executive branch of the government, the military and industry, if we would get the military appropriation bill out of the way, into law, by the beginning of the fiscal year.

It has been done as an exception. I can say to you that it looks like it will be done for fiscal year 1961 -- not because of the urgency of military matters, but because of the urgency of certain political matters.

Thirdly, I think Congress can get more defense per dollar if it would remove the requirement for annual authorizations, in addition to annual appropriations. As most of you know, in three areas today we require an annual authorization as well as an annual appropriation. One is in military construction. This has been traditional for some time. Since 1958 we have had this requirement as far as the National Aeronautics and Space Administration is concerned. Thirdly, since 1959 we have been faced, I might say, with the threat that this onerous task will be thrust upon us in the area of operational aircraft, missiles and ships.

I am a little prejudiced and I may be treading on dangerous ground, so I should not speak too lenthily on this subject. But for the life of me, I cannot see the necessity or the requirement for an annual authorization, in addition to the annual appropriation. I am positive that this double analysis and action by the Congress in these three vital areas - military construction, National Aeronautics and Space Agency, and aircraft, missiles and ships - will extend and expand the lead time in getting the job done.

A good example of that is the experience we had during the last session of the Congress, when the budget, the actual obligation authority for the National Aeronautics and Space Agency, did not get approved until the last days of the Congress. The reason for the delay in appropriations was the delay in approval of the authorization bill.

In the area in which the National Aeronautics and Space Agency operates, at least at the present moment, time is of the essence, and Congress, in my opinion, was negligent in imposing this dual submission on the executive branch of the government.

I hope that we see the wisdom of removing this requirement in the days ahead.

Now, this requirement not only extends lead time, which many of you people are trying to reduce, but it also adds to the cost of getting the job done.

I happened to be reading a trade publication the other day which reported some testimony before one of the House committees on this problem by Brigadier General Robert J. Friedman, Air Force Budget Director. I suspect that General Bill Lawton of the Army and Admiral Lot Ensey of the Navy would concur in these observations. But let me read what Bob Friedman had to say about this dual requirement.

"We cannot identify which dollars applied to a given aircraft procurement are new appropriations, which are recoupment dollars, or which are reimbursement dollars. In fact, any attempt to do so would require a complex and costly additional accounting system and would serve no useful purpose. Instead, the Air Force hopes to retain flexibility to increase or cut amounts applied to given line items of the program to allow for changes in requirement, changes in priorities, or technological development."

It seems to me that this annual authorization and appropriation action certainly is bound to add cost to our defense and related programs.

It is obvious, of course, that having to appear before four committees of the House and the Senate, rather than two, places an undue burden on those who have the responsibility of justifying and executing the programs. This is a waste of manpower, in my judgment, without any compensating benefit in the long pull.

So on the basis of lead time, cost and effort, it seems to me Congress could help in this area by doing away with the requirement for annual authorizations plus appropriations.

Fourthly, I think Congress can get more for the defense dollar by closer contact or liaison between industry and the legislative branch of the Congress.

Those of you who are familiar with the process that we go through each year know that the respective members of the House and Senate, in committee, get primarily the justifications given to us by the witnesses from the military and executive branch. I do not quarrel with the competence or the integrity of those who testify. But I do not think all the wisdom in these areas resides in those who come before us.

It seems to me that we, on a committee such as the one I serve, could benefit immeasurably from some assistance from industry.

Now, unfortunately, because we have had in the past some long and extended sessions of the Congress, it is not practical for us on the committee to get out and have opportunities to meet with industry as I think we should. And I do not believe that our committee, for example, should bring in industry to testify before it, but we can accompl the same result by a different method.

It would be my hope that if we have shorter sessions and more concentration, it will mean that our committee, and others, could individually and collectively visit industrial facilities, talk with those in industry, so that we get more than a one-sided or single-sided viewpoint. I think it would be helpful and beneficial to those of us on the committee who go through this process every year.

Fifth, I thing Congress can get more defense per dollar if it would forget local goegraphical pressures.

Now, I admit at the very outset this is an idealistic and utopian prescription. But looking at the way the system operates, I find that in too many instances local interests are more interested in keeping a plant going that they are in the Defense Department getting the most for its money. And I also find that local interests -- and I admit they may be well-intentioned -- are sometimes interested in the continued production of products, despite the fact that those products in the rapidly changing world we are in may be obsolescent or obsolete.

It seems to me that in reaching for the new military objectives which we must consider our national surrvial will be the foremost and, I hope, exclusive prerequisite.

It is obvious to you, as it is to me, that Congress, on occasion, disrupts sound military planning and inevitably adds to defense costs if it succumbs to local pressures.

Sixth, Congress can get more defense per dollar if it would eliminate partisan policies for the consideration of defense policies, programs and fundings.

Again, I must admit that this may be a bit idealistic and utopian, particularly in a presidential election year. But I must say, and I say this with deep conviction and sincerity, that the chairman of our Subcommittee, Congressman George

Mahon of Texas, in my judgment approaches the problems of defense spending and the problems of defense programming and planning as objectively as any member of Congress that I know. I do not always agree with him. But I can say that he sets a high standard that could well be followed by others in either the House or the Senate. And if such a standard were maintained, I am certain and positive we would get more defense per dollar from the money that the taxpayers make available for these programs.

Seventh, Congress can get more defense per dollar if we do not hamstring, by inflexible legislation, the full utilization of knowledgable personnel, either civilian or military.

Many of you may not be familiar with the fact that last year, during the consideration of the appropriation bill for the Army, Navy and Air Force, on the floor of the House, an amendment was offered which read as follows, and I quote:

"None of the funds contained in this title may be used to enter into a contract with any person, organization, company or concern which provides compensation to a retired or inactive military or naval general officer who has been an active member of the military forces of the United States within five years of the date of the enactment of this Act."

That was offered on the floor of the House, without prior warning to our Subcommittee.

The first vote was 130 in favor of it and 131 opposed. That was a fairly close margin. On a subsequent vote, it was 125 in the affirmative and 147 in the negative.

It is almost incomprehensible to me to visualize the harm and damage that would have been done to our defense effort if such legislation had been enacted into law. But I say to you that Congress apparently, or at least one branch of the Congress, was somewhat tempted to enact such legislation last year.

The net result of the introduction of this amendment to the appropriation bill was the Hebert study and proposed action in the same area.

I am not an authority on what Representative Hebert and his subcommittee have proposed, but I say to you, as I have said to people elsewhere any restrictive legislation which limits the utilization of knowledgable people in my judgement would be harmful and detrimental to the defense program of the United States.

I am familiar with some of the arguments which have been made that certain things would result because of past contacts, friendships and so on. I happen to have more faith in the Americal people, in all areas, and consequently I have no fear of this threat as far as we are concerned.

Eighth, in my opinion, Congress can get more defense per dollar if we encourage invention, not roadblock it by restrictive legislation. The most recent area where Congress has, in my judgment, roadblocked progress, was in the National Aeronautics and Space Act of 1958. I trust this provision in the law will be amended.

At the outset, let me make this thought clear. No one can conceivably object to the normal procurements where proprietary rights are freely given by a company in those cases where the government supports all or a major portion of the research and development program. However, our individual scientists and our small businessmen need the protection of patents to give them both the incentive and the opportunity to prosper and to grow, to invest their time, their money and their prestige in enhancing our country's progress.

Our large industrial organizations need the protection of their proprietary rights to give them the full incentives required to cause them to make large investments in well-equipped private laboratories, manned by highly skilled, trained and well-paid scientists.

Those people who propose the exclusive control and use of the patents by the government in commercial fields are mistakenly evoking the principle that the state should control basic rights, the know-how and the means of production.

The bald, cold facts of life are that if we wish to deter the Communists from overt military action, if we wish to defeat the Communists in the market places of the world, then we must fully implement our free enterprise system. We must provide every reasonable and proper incentive in profit and prestige to provide both technological advancement and high volume-low cost production.

My final point is that Congress can get more defense per dollar, perhaps, by the establishment, by legislation if necessary, of an independent and continuing National Defense Planning Group, which would encompass or have within it knowledgable representatives from industry, from the executive and military branches of the government, and the legislative.

Perhaps this again is utopian and idealistic, but it seems to me, as we face the threat that we do face, we must come up with something that could be helpful in the days and months and years ahead.

We know, perhaps in this group better than in others, that this country faces a full spectrum of challenges -- education, the growth and strength of our economy, our military posture. This challenge, it seems to me, can be met, but I do not think it can be met by sunshine soldiers or summer patriots. And you cannot make footprints in the sands of time by sitting down.

As we face the challenge, those of us here and our fellow citizens can be confident that if we rededicate ourselves to the principles that have brought us in America to the high level of success that we have today, we should have no fear for the future tomorrow.

ADDRESS BY E.R. QUESADA, ADMINISTRATOR,
FEDERAL AVIATION AGENCY, BEFORE THE
ELECTRONICS INDUSTRIES ASSOCIATION
GOVERNMENT-INDUSTRY DINNER, STATLER
HILTON HOTEL, WASHINGTON 25, D.C.,
6:30 P.M., MARCH 17, 1960

ELECTRONICS AND THE FUTURE AIR TRAFFIC CONTROL

I am indeed happy to be with you tonight and to discuss some of the more challenging problems facing us in the aviation community. This evening I hope to give you an up-to-date report on our plans and programs to provide safer and more efficient aviation facilities for the nation.

Aviation and electronics have come of age during the lifetime of many of us here tonight. What's more, the two industries have grown up together. The years following Orville Wright's historic 12-second flight at Kitty Hawk have been years of phenomenal progress for both aviation and electronics. Electronics has had its impact on the growth of the aviation industry. Likewise the electronics industry has benefited from the inexhaustible market generated by the Air Age. Manual and mechanical systems and devices in aircraft have been replaced by smaller, lighter, less expensive and more efficient electronics packages. The remarkable progress in electronics in the last decade is a tribute to engineers and scientists of the world who have dedicated their efforts to research and development. And, I might add, a tribute to the electronics manufacturers for their efficiency in producing the products of research and development for distribution to the users. In this regard, your organizations have promoted, not only our nation's productivity but have furthered the well-being of its individual citizens as well.

As we look now to the future, aviation will rely on the efforts of men such as you to an increasing extent to provide the necessary airborne devices, navigational aids, and communications equipment that are the life's blood of a safe and efficient air traffic system. Your steady growth over the past several years reflects the increasing dependence that we are placing upon your industries in helping us reach our objectives. And I would say, without hesitation, that the electronics industries, big as they are, are only beginning to tap their productive potentialities. Your greatest years still lie ahead.

Now what are the objectives of the Federal Aviation Agency? There are many, but there is one that takes number one priority; Air Safety.

We must attain air safety to the most absolute degree possible, for every type of aircraft that uses the navigable airspace, whether large or small, jet or piston-engine, whether flying under visual or instrument flight conditions, from take-off to touchdown.

I believe we have made excellent progress in the field of safety, through more and better navigational and communications equipment, through research and development activities, improved flight standards and air traffic control regulations and procedures, higher medical standards and pilot qualification, and many other related factors. This progress has been due to the efforts of not one agency or one group, but rather to the cooperation and hard work of the entire aviation community.

The aviation picture today is rapidly becoming more complex. The airspace, which was more than adequate when I started my flying career 35-odd years ago, is literally shrinking as the result of increasing air traffic and the introduction of bigger, faster, and higher-flying transport planes and thousands upon thousands of business and private aircraft. Today we have over 100,000 active aircraft in the United States. Of this number 70,000 are civil. We estimate that by 1965 we will have 83,000 civil aircraft in our national inventory. In terms of hours flown, we expect general aviation aircraft to jump from its current rate of 12 million hours per year to 16 million by 1965. This will be an increase of 33 percent in the next five years. These statistics are staggering in themselves, but when we consider the fact that next year we will have 225 jet transports operating in our system, the immensity of the task we face strikes home with stark reality. Now then, what are some of the specific problems associated with modernizing our national system of aviation facilities? First, to accommodate increased numbers and complexity of aircraft in smaller blocks of airspace, and still maintain safe separation between aircraft, we must provide a measure of flexibility in our air route structure to permit the more efficient utilization of our precious commodity -- airspace. This requires improved navigation devices both on the ground and in the air. Our ultimate goal is to provide a navigation reference throughout the airspace from the ground to the highest altitude at which aircraft will fly. This means that we must provide facilities which will permit aircraft to be flown off-airways -- off the established air routes -- a system in which aircraft are not necessarily required to fly from navigation aid to navigation aid.

There are available today, in various stages of development, many navigation systems that will permit off-airways, point-to-point flight. At our National Aviation Facilities Experimental Center, in Atlantic City, we are currently experimenting with Doppler navigators, pictorial displays, self-contained dead-reckoning computers and other techniques to determine how this equipment can be used in a system based on ground-referenced devices. The accuracy of position information required for air traffic control demands at this time that self-contained airborne navigation systems be updated periodically by reference to a ground navigation facility. The VORTAC network being implemented throughout the country will provide accurate azimuth and distance information to facilitate this updating.

I would emphasize here that radar, our primary surveillance tool, plays a most important role in increasing the number of aircraft that can be safely flown in a given block of airspace. In addition to our own radars, the FAA has controllers at 38 Air Defense Command sites to provide radar advisory service under a joint use arrangement.

So far, my discussion has been pretty much directed to separation problems in the lateral plane. Of no less importance, and of at least equal complexity, are the problems associated with maintaining vertical separation between aircraft.

The ground-determined height of aircraft has long been a missing dimension in air traffic control. We are currently developing an air height surveillance radar. A "receiver only," passive system, it uses an S-Band air surveillance radar as the target illuminator. The antenna system is a 160-foot high structure, consisting of three antenna arrays, arranged to form an equilateral triangle, 60 feet on each side. The height-finding radar is designed to furnish comparative heights of aircraft within 50 miles of the airport complex.

We also need altitude information on aircraft that are in the enroute area, beyond the reach of our height-finding radar. There are several possible means of obtaining this information. One method we are investigating involves the use of the radar beacon system. A radar beacon, of course, is by nature a data link. The radar beacon system can provide the four essential bits of information required for positive air traffic control: range, bearing, altitude, and identity. The beacon

system which the FAA is implementing presently provides three of the four, and we are now in the early stages of developing the capability of obtaining aircraft derived altitude information via the radar beacon link. Although our operational beacon capability today is limited, we are rapidly implementing beacons in our high density areas. By July of 1962, we should have operational coverage of the navaigble airspace over the entire country, with over 50 beacons operational.

Another difficult problem facing us today is the ever-increasing demand for radio spectrum utilization. As more and more aircraft are introduced into the system, the overcrowded air traffic control and air navigation frequency bands will reach saturation in high density areas. We do not foresee any significant increase in aviation's share of the spectrum. We must live with what we have and to do this, the FAA will do everything possible to insure that the bands of the spectrum allocated to aviation are assigned and used effectively. We are modernizing voice procedures and seeking ways to improve voice intelligibility. We are working to achieve improved techniques and better frequency stabilization.

We are well aware of the fact that the communications bottleneck must be overcome. We have developed and are currently testing a high-speed, automatic ground-air-ground communication system known as AGACS. AGACS is an experimantal tool with which we will determine the design characteristics for a two-way data link adaptable to the requirements of all users of airspace. Within a two-minute roll call cycle, AGACS handles up a 500 two-way messages. These messages are contained within a single-frequency channel, as is presently used for voice communications. Routine flight instructions and advisory information from pilot or controller are transmitted to the aircraft or control station. Here they are converted into direct reading displays. Voice radio will still be used for non-routine and emergency communications.

Implementation of radar beaconry, data link, VORTAC, and the host of other improvements to the overall air traffic control environment will provide the air traffic controller with the information he needs to move air traffic safely and expeditiously. To be of maximum value to the controller, this information must be correlated and applied swiftly and efficiently. The FAA is developing a Data Processing Central designed to relieve the controller of many of his routine clerical chores and allow him to spend more of his time in his decision-making capacity. The Data Processing Central will automatically print and update flight progress information. It will probe for, detect, and display potential conflicts between aircraft in the system. It will assist the controller in scheduling aircraft for landings. The Data Processing Central will be available for use in the New York area in 1963.

Another extremely important area in which we are making progress is the development of a blind, or all-weather, landing capability.

Last year alone, the airlines forfeited $23 million in revenue because they were not always able to deliver their passengers and cargo to destination airports. The military needs the all-weather landing capability to insure a full retaliatory combat potential. We are currently evaluating systems developed by the Navy and Air Force for their applicability to civil operations.

The introduction of this all-weather landing capability must, of course, be an evolutionary process. Our program is divided basically into three phases. In the first phase, our attention is directed to the improvement of the present instrument landing system (ILS) and the ground control approach (GCA). The second phase of the program involves the testing of an all-weather landing system for interim application where the need is urgent. And, finally, we will develop new techniques for a landing system suitable for the future air traffic environment.

Our National Aviation Facilities Experimental Center is today a full-fledged experimental facility complete with instrumented laboratories, high capacity computer and simulation facilities, and is staffed by a dedicated group, and technically recognized experts in all fields of the informed aviation world. We are in the final phases of the development of improved standard airport lighting. We are evaluating five different visual glide slope systems. We are actively investigating aircraft arresting devices. We are making excellent progress in our program to automate weather measurements and provide for their automatic transmittal to forecast centers. We are actively pursuing a program to collocate high altitude air traffic control and air defense function in the SAGE Super Combat Center.

In our long range planning, we must envision the effects on our control system of the eventual introduction of supersonic and ultrasonic aircraft in the air carrier inventory. When this takes place the human limitation of pilot and crew to control their aircraft will become more apparent. It will be necessary to turn to automatic devices for the airborne environment to achieve maximum safety in flight. The quantity and the complexity of the electronic gear that will go into future aircraft will be greater than what they are today.

Future flight environments will require electronic equipment with greater operating extremes to cope with the variety of new problems created by supersonic speeds. This will not necessarily present new problems in design because much work in this area has been done in the missile programs. It will involve application of known principles and techniques to new equipment.

Powerplant performance and structural fatigue under high temperature conditions will have increased importance to safe operation. These problems will require close monitoring. Sophisticated electronic recording devices may be necessary to accomplish this monitoring.

Control of a supersonic airplane by a so-called autopilot, requires more precise and rapid sensing of airplane deviations from the flight path. Greater speed and accuracy will be demanded in the performance of the necessary corrective actions by the autopilot than are required in the autopilots of current turbine-powered airplanes.

Since the performance of a supersonic airplane is so critical and its instrumentation and control systems are so complex, the pilot will need information on flight parameters faster than can humanly be determined or computed. Therefore, the pilot will need assistance from sensing systems fed into a computer. The computer in turn will provide rapid answers to the pilot.

It is conceivable that ultimately the pilot will only monitor control of the airplane. The intelligence from the computer will be harnessed to provide actual control of the plane. All the parameters for a given flight might be fed into a computer before the take-off and the entire flight to the end of the landing roll would be controlled automatically. The airborne portions of the VOR and DME systems would furnish some of the intelligence used in such a flight control system.

Coupled with flight control, would be automatic control of the various systems in the aircraft, such as engine fuel management, pressurization, anti-icing and deicing systems. This would appear to be the ultimate and will not all come at once. There will need to be intermediate stages in which only a portion of such control is utilized.

Since the take-off of a high speed aircraft is perhaps the most critical portion of a flight, information to show whether to continue the take-off or to abort is very important. This involves sensing of engine power, aircraft speed,

outside temperature, and so forth. The computer will compare this data with ideal parameters and give the pilot information needed. This might logically be one of the first steps in the intermediate stage.

It is easy to see that systems such as I have just described would have to have extreme reliability and fail-safe performance. FAA will determine minimum performance and reliability standards. The equipment will have to meet the standards originally and be maintained so as to continue to meet them.

As you can see, electronic needs for future aircraft will be great.

In addition to the automatic control systems mentioned, the present day navigation equipment such as VOR, DME, LORAN, and DOPPLER will have to give way to more sophisticated electronic equipment to handle future navigation problems. This does not mean that the basic system will change, but rather equipment of those types will need to be redesigned to take advantage of improvements in the state of the art -- to increase reliability and simplicity and to reduce size, weight, and cost.

Our progress to date is in large part attributable to the outstanding contributions of the electronics industries to our programs. Our continued progress and leadership in aviation will require sustained and imaginative research, development and productivity. They will require vitality, creativeness, and the application of new skills and techniques on the part of science, management, and government.

As a regulating agency we cannot cope with the problems which will confront us in the future without your continued help and guidance. I urge that you continue to assist us in whatever manner that is at your command. We will require advice and assistance on performance standards for the new types of equipment. Such standards in the past have been prepared to a great extent under the auspicies of the Society of Automotive Engineers and the Radio Technical Commission for Aeronautics. Many of your member companies have furnished technical assistance on the working committees of those organizations. Continued technical support by working either directly with us when we ask for collaboration or as members of SAE or RTCA will be of great assistance. Knowing of your past record, I look forward to your future support with confidence.

ADDRESS BY MAJOR GENERAL R.T.
NELSON, CHIEF SIGNAL OFFICER,
BEFORE THE ELECTRONICS INDUSTRIES
ASSOCIATION LUNCHEON, STATLER
HILTON HOTEL, WASHINGTON, D.C.,
MARCH 16, 1960

President Hull, Members and Friends of the Electronic Industries Association:

When I was invited to speak to this distinguished audience representing the American electronics industry, I wondered what I might say that would be novel or interesting to you gentlemen who, in effect, live and breathe communications and electronics.

I quickly dismissed the idea that a kind invitation of this nature might have anything to do with me personally. I suspect that I am somewhat like the human cannonball who had been quite indispensable in his peculiar way to the carnival for a number of years. He finally decided he'd had enough of being fired out of a cannon and went to the carnival owner and told him he was going to quit. He had thought it over a long time and was simply tired of being shot from a cannon twice a day. The owner paused and shook his head. "Well, I'm awfully sorry you've made the decision to leave us. I just don't know where we'll get another man of your caliber."

Since I ruled out any personal connection, my only alternative was subject matter which might be familiar to you. But I was encouraged by remembering an old professor at one of the midwest colleges. He mimeographed his examination questions and gave the same test every year. One of his friends asked him if everyone wasn't getting better grades each year. "You've been giving them the same set of questions for ten years," he said.

"No," the old professor answered. "you see, I keep changing the answers."

So it is, as we look about us and take stock of the world in this year of 1960, we find the answers keep changing. One must believe that we are living in the most remarkable and swiftly-changing age in the history of mankind. The philosophy of constant and revolutionary change has become an accepted way of life.

In no area of human endeavor have changes been more marked than in our scientific pursuits. Sparked by dire necessity and the will to survive in the great struggles of our world during these past two decades, our scentists and engineers have made massive assaults on the frontiers of human knowledge. Their successes have exceeded our wildest dreams in other days of not so long ago.

The "state of the art" might be more accurately termed the "race of the art." Breakthroughs are often greeted with mild interest and a question: "What else is new?"

And in no area of scientific endeavor has change and progress been more notable than in this total field we call electronics. The advances of the past ten years in electronic science and in the development and application of electronic devices, which increase man's capabilities many-fold, have been phenomenal. Their effect is cumulative. The technological gains that can be expected in this relatively young and imaginative science during the next few years are such that few would attempt to predict them. Invention -- in a sense -- has become the mother of necessity.

Certain it is that technological advances have followed upon advances in swift succession. While our future course cannot be accurately predicted, we can review the past occasionally, survey our present position, and project our future course insofar as present knowledge will allow us.

This seems a particularly appropriate time for such a review. This year is the United States Army Signal Corps' Centennial Year. On June 21 of this year we mark our 100th Anniversary -- a century of U. S. Army Signals.

Both as a combat arm and as a technical service, the Army Signal Corps has had a proud and illustrious history. This record is counterpointed by the long and productive teamwork given us by American industry. I consider it an honor to have been a part of it and a privilege particularly to be the Army Chief Signal Officer during our Centennial Year. As I tell you something of the history of the Corps I Know you will forgive me if I exhibit more than an ordinate amount of pride, and maybe a little prejudice -- and maybe even a little sentiment.

The contributions of the U. S. Army Signal Corps and industry to increased Army combat capability and to our national welfare over the years have been numerous -- and of such variety as to seem almost unrelated: The Myer flag and code system, his Flying Telegraph Trains, the Beardsley magneto telegraph, the nation's first weather service, the Alaskan Communications System, first military airplane, the first American radar, the first operational electronic air defense system for Army missile batteries, the first weather satellite, and the first communications satellite.

In these contributions there has been a curious progression from the simple to the complex -- a progression so marked and a result so complex as to bear little resemblance to the nature of its origins. There has been also the continuing, unflagging support of American business and industry. From a simple flag and code system for passing signals from one hilltop to another, it is a giant step to voice and teletypewriter signals by radio relay from outer space.

It has always seemed unique to me that it all should have stemmed from one man -- an Army surgeon -- and his interest in helping the deaf. This man, as you may know, was Major Albert J. Myer.

Major Myer was born in Newburgh, New York, in 1827. As a youth, he served an apprenticeship as a telegraph operator, and then went through college and medical school. His graduation thesis was on "A Sign Language for Deaf Mutes." While serving as an Army surgeon, he applied his interest and knowledge of the communications problems of the deaf to the problems of communications on the battlefield. Drawing upon this and borrowing from methods of signaling used by the Indians, he devised a flag and code system which materially improved Army communications capabilities.

As a consequence, he was designated Signal Officer for the Army on 21 June 1860 and became director of the first full-time signaling function of a national army. The services of his signalmen during the Civil War proved so invaluable that his Signal Department was elevated to the status of a Corps by an Act of Congress in March of 1863. Many signalmen he had trained before the War had Southern allegiance and joined the Confederate Army. The Civil War is probably one of the very few conflicts in history where both sides could read the other's signaling system. It occurs to me that the communications intelligence people of both sides must have had sine waves of alternating enthusiasm and despair that maintained a classic 180 degree out-of-phase relationship, depending on who was reading whose signals.

We all recognize that the methods and techniques of communication have undergone profound changes since the adoption of Major Myer's simple "Wig-Wag" system. One wonders what might have been the course of history had not Major Myer been so inspired. Perhaps his greatest contribution to military communications lay not so much in his highly-advanced methods and techniques, but in the fact that his efforts focused attention upon the improved combat capabilities which improved communications made possible.

It is axiomatic that ground forces, to win on any battlefield, must have the means to move, to shoot, and to communicate more effectively than their opposing forces. These three prerequisites are most often referred to as mobility, firepower, and command control. The necessity of effective communications, or in the broader sense -- command control -- as a prerequisite to victory has long been acknowledged. But the relationship between improved command control capabilities and improved combat capabilities has only begun to be fully understood during the past one hundred years.

In this era of powerful new weapons of tremendously increased ranges, informed command control assumes a greater importance than ever before. Dispersal and rapid movement of military forces over a large area is the key to survival and to victory on the modern battlefield. Without the advances that have taken place in the art of communications, command control of forces on the move and so widely dispersed would not be possible. Without these advances also, many new weapons would be unusable in most tactical situations.

By a slowly developing process over this past century, the Army Signal Corps has become what might be called the form and substance of the nervous system of the Army. Beginning on the level of mere sight perception -- that is, the use of the "wig-wag" from hilltop to hilltop, or tower to tower -- the means of communication have been expanded to include practically all of the senses. In developing signal equipment to provide command and control of our modern Army units on the battlefield, the efforts of the Signal Corps are today primarily directed toward these principal mission areas: strategic and tactical communications, combat surveillance and target acquisition, electronic warfare, avionics for Army aircraft, and the broadening field of space and satellite electronics and communications.

In the particular area of combat surveillance and target acquisition, for example, propeller-driven and jet surveillance drones equipped with a wide variety of sensors, such as radar, automatic cameras, infrared, and television devices, are being adapted to the mission of penetrating enemy lines and sending back information of the enemy. We plan to demonstrate a prototype new high-resolution airborne radar next month which can produce a radar map of near photographic quality. New types of mobile and portable ground radars complement these aerial surveillance platforms. In this same area we are working on automatic data processing systems to sort and evaluate enemy and friendly information so that the commander will have the intelligence he needs for a rapid decision.

Through the Fieldata concept for applying mobile computers and data processors to the Field Army, we are developing extended applications of these techniques for vital functions of the Field Army in combat. The first model of MOBIDIC, the largest of these new mobile computers, was delivered early this year to the Army Signal Research and Development Laboratory at Fort Monmouth for evaluation and testing. Others, going down to a minimum tactical computer weighing 175 pounds, are under development.

Some of the early highlights of the remarkable evolutionary process by which Major Myer's early Signal Department brought us to this modern electronics posture in the Army may be of interest to you.

The flag and code system was shortly supplemented by the electric telegraph for communications requirements of the Army in the field. The telegraph itself is an early example of civilian or industry effort in the cavalcade of American electronics. Also, it was because this telegraph system -- derived from civilian effort -- offered a ready and inexpensive means of simultaneous weather reporting from coast to coast that the Army was authorized by Congress in 1870 to establish a national weather service. This service grew rapidly and regular weather reports and storm warnings were in popular demand. Exchange of weather data with foreign nations

led to international cooperation in large-scale scientific efforts. The first of these of consequence was the First Polar Year, in fact the first geophysical year, and involved two Arctic expeditions lasting from 1881 to 1883. The Department of Agriculture took over the weather service as the Weather Bureau in 1891 -- after twenty-one years under Army Signal Corps administration. The Corps has continued in military meteorology. The rocket-sonde which helps us to obtain weather data at higher altitudes than the balloon-borne radiosonde, and the recently developed storm warning network are representative of current efforts in this field. VANGUARD II and TIROS are progressive examples of weather satellites.

About the time the Weather Bureau took over the civilian weather responsibility, the heliograph and the telephone -- added examples of early Army-industry partnership -- were being adapted by the Signal Corps to Army use. Extensive telephone as well as telegraph lines were provided on the combat front in Cuba in 1898 during the Spanish-American War. Radio was first introduced in the military at this same time. The success of the Signal Corps in providing communications facilities during that War led to installation of extensive wire lines not only in Cuba but also in Puerto Rico and the Philippines. In this latter area a great deal of underseas cable was also laid to link up the major islands. Successful accomplishment of these tasks led logically to assignment of responsibility for communications to and within the territory of Alaska in 1900. This initially included cable and wire lines serving not only military garrisons there but all civilian needs as well, to the benefit of mining and fishing interests and other settlements scattered throughout the Territory. As radio, or wireless telegraphy, was introduced into the Army by the Signal Corps, this new technology was also employed to great advantage in the Alaskan Communications System.

Military uses of photography were initially introduced on the Arctic expeditions I mentioned previously. Signal Corps photographic services were first provided on a large scale in the Spanish-American War. Today, the Army Signal Corps serves major still and motion picture as well as television missions in the Army.

Aeronautics and military ballooning could not be pursued as a Signal Corps activity during the Civil War because of a shortage of funds and personnel. But the logical pursuit of activities in this area could not long be denied. Balloons were in reality elevated observation and signal platforms. Aeronautics thus officially became an Army Signal Corps responsibility in 1892.

The success of the Wright airplane in 1903 led to the formation of the Aeronautical Division in the Signal Corps in 1907 -- and a contract with the Wright brothers for an airplane to meet Army specifications. Thus the U.S. Army Signal Corps became the "marsupial" parent of a famous son -- and what a large competent boy he turned out to be! I am speaking of that service now known as the Department of the Air Force.

Other developments, which in a sense have even more profoundly affected the course of human and scientific events, were radio and radar. Development of the radio by industry and adaptation of it to military communications by the Signal Corps soon revolutionized Army communications in combat. The Signal Corps added its significant refinements, too -- such as development of the superheterodyne circuit and still later the invention of frequency modulation by Major Edwin H. Armstrong.

Colonel William R. Blair, Director of the U.S. Army Signal Corps Laboratories at Fort Monmouth, New Jersey, from 1930 to 1938, is considered the "father of radar" and holds the fundamental and basic American patent. From the Signal Corps' pioneering in the development of our country's radar have evolved the many radars used in the military and those employed in numerous civilian applications such as navigation, storm tracking and air lines flight direction and control.

In this exhibition of proud paternity, I do not mean to imply tht the Army Signal Corps has stood alone throughout this past one hundred years -- that it alone has provided the effective command control for today's modern Army.

I am too well aware of the historical dependence of the Signal Corps upon the American communications and electronics industry for technical knowledge and skills and for quantity production. We in the Army Signal Corps pride ourselves on having a close, cooperative relationship with industry -- from concept to hardware in the field. We know these accomplishments of the past 100 years would not have been possible without the assistance of civilian invention and private industry.

With the alternating periods of expansion and retrenchment that have characterized the activities of our armed forces throughout their history, it has been basic Army policy to maintain a nucleus or token-force in peacetime which can be expanded as needed in time of emergency. From the standpoint of quantity production of communications and electronics equipment, we depend primarily upon private industry.

WE are, within available funds and resources, developing quick reaction electronic capabilities through such activities as those carried on at the Electronic Defense Laboratory in California to further utilize the know-how and skill of American industry. The core of our preparedness policy is predicated upon Army-Industry teamwork.

The soundness of such a policy was well demonstrated in World War II. Numerous examples of record production in record time against superhuman odds are well within the memory or knowledge of all of us here. Partly because of this policy and partly because of the nature of the electronics business, this teamwork between the Army Signal Corps and Industry has become a tradition. Civilian inventors during Civil War days assisted Major Myer in the development of the Army's first electrical communication device, the Beardslee magneto-electric telegraph set. The very first military balloon was developed by a civilian -- Professor Thaddeus Lowe. The Signal Corps looked to Industry for the airplane, for the telephone, for the radio, adapting these items to military needs and improving them where possible. Our new family of tactical radios, including small belt or helmet versions and the mobile radio switching central, the 4-wire communications system and the push-button telephone are development examples of some current improvements of these means.

A remarkable adaptation of electronics research to Army needs, and one of vast significance to military operations, is that embodied in our micro-module program. Full application of this concept -- the ultimate in current miniaturization technique -- will go far toward reduction of Army logistical problems, increasing Army mobility, and reduction of cost and maintenance of our electronic equipment.

Or perhaps even greater significance is the impact of this program upon the future electronic design and capabilities of satellites, rockets and missiles. The implications of size reductions ranging between ten and twenty to one is obvious. Compression of radio assemblies to the size of sugar cubes means great savings in critical space and weight -- thus permitting either higher payloads and increased ranges or, where desired, smaller missiles.

Experiments in space communications have been aided greatly by the micro-module concept and earlier micro-reduction techniques. Project SCORE, the first military experiment in space communications, a year ago last December demonstrated for the first time that voice, teletypewriters, and even <u>multiple</u> teletypewriter signals could be received, stored, and then retransmitted by a satellite orbiting in space. Project SCORE -- the initials stand for <u>S</u>ignal <u>C</u>ommunications by <u>O</u>rbiting <u>R</u>elay <u>E</u>quipment -- was a development of the Army Signal Corps and industry, under the jurisdiction of ARPA, the Advanced Research Projects Agency of the Defense Department.

The first communications satellite -- in which the Army-developed communications "package" was aboard a satellite placed in orbit by an Air Force ATLAS missile on December 18, 1958, was the forerunner of several other types now being developed.

These developments of this so-called "Space Age" offer inspiring new vistas in the communications and electronics business. They offer the possibilities of tremendously improved global and space communications. Where these trails will eventually lead us, no one can say -- no one knows -- just as none could have foreseen that the trail blazed by Major Myer could have led to where we find ourselves today.

As we stand now upon the threshold of our second centry, it is evident that the future presents many challenges and many opportunities. The way ahead will not be easy. True, the nature of the game keeps changing, but the composition of the team and the goal we seek remains the same. Our energies will continue to be directed toward keeping our country's Army progressively modern and in a high state of combat readiness. "Teamed-up" with industry and working together in that spirit of partnership which has become a tradition, I am confident we in the Army Signal Corps will accomplish our mission -- and that we will share with you a golden new era for Army communications and civilian communications as well.

PROCEEDINGS

of the

DEFENSE MARKET PLANNING SEMINAR

March 15, 1960

Washington, D. C.

ELECTRONIC INDUSTRIES ASSOCIATION

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ELECTRONIC INDUSTRIES ASSOCIATION

STATEMENT BY EIA PRESIDENT

On March 15, 1960, the Electronic Industries Association held its first Seminar on Defense Market Planning. These Proceedings are the papers presented by the distinguished representatives of the electronic industries, the Armed Services, the Executive, and the Legislative branches of Government.

EIA is proud to have sponsored this unique Seminar with its timely theme of "more defense per dollar through planning". We have received much favorable comment on bringing together the planners of both industry and government where understanding was improved by the give and take of forthright commentary. The number and variety of the questions posed to the Panel members reflected a keen interest in this type of activity.

The common interest of all the participants in achieving more defense per dollar should be emphasized. Industry is no less interested than the Military Services, or the Congress, or the Executive Departments, in achieving this goal. I believe that all those who have a responsibility in defense planning agree with Representative Ford when he observed that

> ....Congress can get more defense per dollar, perhaps, by the establishment, by legislation if necessary, of an independent and continuing National Defense Planning Group, which would encompass or have within it knowledgable representatives from industry, from the executive and military branches of the government, and the legislative.

Whatever the final solution, EIA will continue its efforts to contribute to achieving more and better defense for this country for each dollar spent.

D R Hull

D. R. HULL
President, Electronic Industries Association

COMMITTEE FOR DEFENSE MARKET PLANNING SEMINAR

Washington, D. C.
March 15, 1960

David R. Hull
Vice President, Raytheon Corporation
and
President, Electronic Industries Association

James D. Secrest
Executive Vice President
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Radio Corporation of America

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EIA Defense Market Planning Seminar

Washington, D. C.
March 15, 1960

Morning Session

Military Panel

"Service Programs and Military Planning"

Chairman

Sidney R. Curtis
Senior Vice President
Stromberg-Carlson Division
General Dynamics Corporation
and
Vice President
Electronic Industries Association

A U.S. NAVY VIEW OF THE MARKETING PROBLEMS OF THE ELECTRONICS INDUSTRY

Presented By

Rear Admiral L. D. Coates, USN *

This is a defense market planning seminar, and certainly, with almost 60% of total electronics business done with the military, the trend of military spending is vitally important. Nevertheless, I believe the remaining 40% is important too, and without confining myself to defense electronics, would like to offer some observations on trends in general.

First a note on pessimism and the dangers of prediction: when I was a high school boy I used to put together radio sets and read a magazine called Radio News. I remember in 1924 being disheartened by an article predicting that the growth of broadcasting would mean the end of the ham operator. I don't know how many broadcast stations there were then, but by 1934, the first year of the FCC, there were 600, and now there are over 10,000, including AM, FM, and TV. This growth must have been even more than Radio News expected. What became of the ham operator? Last year - in one year - his numbers increased by 18,099 to reach a new total of 204,280.

Bad news often gets attention while good news goes unnoticed. Many of you were caught in last year's cancellations of the Regulus II missile, the Goose decoy, and the P6M, F8U-3, and F108 airplanes. While these newsworthy events were happening, the number of radio station licensees grew quietly by 85,000 and the number of licensed transmitters by 300,000 in the same year.

Now for some trends. In order to set the framework let's look at the size and mix of the present market: For 1959, the total electronic industry market was $10.131 billion. This was split $5.935 or 58.5% military; $1.648 or 16.3% industrial; $1.585 or 15.7% consumer; and $.963 or 9.5% replacement parts.

The $5.935 billion that was the electronic industry's share of last year's defense dollars is up from $560 million in 1950; a better than ten-fold increase! I will not attempt to guess what future defense budgets may be, or even whether they will continue to rise, but even a very conservative extrapolation of the trend in electronics' share of the total, would lead to a very substantial increase.

Electronics accounted for only 4% of all defense expenditures in 1950. Last year electronics' share was 14%. Does a further increase to 20% in the next ten years seem too optimistic? This much percentage increase would amount to $2.4 billions of additional business to the electronics industry, even if the total defense budget remains constant; more if it grows.

* Director, Development Planning, Chief of Naval Operations

For similar reasons it seems obvious that there must be further growth and expansion in the non-military market for electronics, both in consumer products and industrial use. It is here that I would like to urge the electronic industry to increase its efforts in marketing, not only to develop the potential for the additional business that certainly exists in these areas, but also for healthy diversification to spread the risks and hazards of business. There are too many companies that are too narrow in their range of products and too easily hurt by minor readjustments in military programs or by changing technology. I also urge more strenuous efforts to diversify within defense business. This would do us both good. If you expand the range of your talents in defense electronics you run across new ideas, and increase not only your chances of picking up new business, but also your ability to do a good job for us.

New business is not found just by wearing out shoe leather looking for it. You have to develop it yourself by research; by spending company funds on investigations that may or may not pay off, and by initiating developments. I know of no logical way to arrive at a "correct" ratio of research to sales, but you should ask yourself whether you are doing enough. The national trend is sharply upward. National Science Foundation estimates that the total funds for all scientific research and development in the U.S., government and private, are now about $12 billion, up $7 billion from 1953.

In suggesting diversification within the military I was naturally thinking of the tremendous range of electronic interests of the Navy. Let me name a few, and point out areas of potential future growth.

The communications needs of the world are growing at an accelerating rate, and the available frequency spectrum cannot grow. There is an ever more urgent need for more efficient use of available frequencies to increase traffic capacity, requiring large scale research and engineering effort. The Navy will use tactical data links carrying digitalized information among ships, aircraft, and ground forces. Very low frequency, long used in communicating with submerged submarines will become increasingly important with further development. We are already using the moon for long range communications, and will soon be using artificial satellites for this purpose, as well as for accurate navigation of ships by electronic means.

Further great expansion of missile range instrumentation is to be expected, together with improvements in telemetry and automatic data reduction.

You have read recently how the ARPA satellite tracking complex known as the SPASUR System developed and operated by the Navy detected an unknown non-radiating satellite later identified as the re-entry body from Discoverer V, launched on 13 August. Detection of this object was not definite until the 2nd of February and positive identification was not made until 19 February. Earlier detection and identification was hampered by the fact that this experimental Dark Fence installation produces over a mile of tape per day, all of which must be visually scanned and manually interpreted. Checking back for identification involved the re-examination of many miles of stored tape. This remarkable achievement, and the difficulty of its accomplishment, point up the need for further improvement and automation of the means for detecting and tracking satellites. The number in orbit probably will increase radically, and manual methods will not serve.

Anti-submarine warfare is a field of the highest importance to the Navy, wherein there is urgent need of new ideas in electronics, including sonar, radar, infra-red, magnetometers, fire control systems, sonobuoys, bathythermographs, and related communication, navigation, data processing, and display equipment. ASW electronics involves shore bases, submarines, surface ships, and aircraft.

With the growing probability of a nuclear stalemate, our ability to wage non-nuclear limited war is receiving greater attention. So far, few new weapons are involved and the application of new electronics is limited, but the renewal of interest in this kind of warfare is recent, the need for improvements and new ideas is great, and the potential for new electronics will develop.

Electronic warfare, that is, countermeasures and counter countermeasures, is another important field that has had insufficient attention in the past and is now beginning to get increased emphasis. It includes passive detection, direction finding, and analysis of enemy signals; jamming and deception of all kinds, the protection of our own equipments from enemy efforts to detect, analyze, jam, or deceive; and the proper counter-reactions to such enemy efforts.

The technical and marketing potentials in computer technology are so obviously vast and widespread, with so many military and industrial applications already in operation or under development, and they have been so much discussed recently, that I mention them only to avoid being accused of overlooking this most rapidly growing of all electronic technologies.

No talk on electronics would be complete without an appeal for greater reliability, and I would like to add my plea for more attention here, please. However, I believe reliability comes more often from careful design and good workmanship than from lavish expenditure of dollars. We must have reliability at a price we can afford. We have sometimes paid too much for it, or worse yet, paid for it without getting it. This is a competitive world, and we have got to keep improving the product and beating down its price.

In closing, I would like to suggest three ways to keep in touch with advanced planning in naval programs. They are:

(1) Use your bureau contacts. All of the bureaus have programs for encouraging industry cooperation and they will be glad to help you.

(2) Increase your visits to Navy laboratories, particularly during sponsor's days when detailed program information is given to visitors.

(3) Read what the Services have told Congress. I particularly recommend the following title:

Department of Defense Appropriations for 1961
Hearings before the Subcommittee of the Committee on Appropriations
House of Representatives 86th Congress
Part 2 - Policy Statements, Service Secretaries and Chiefs of Staff
U.S. Government Printing Office

This is a limited printing not on sale to the general public, but your Congressman might help get you a copy or your Washington representative can go to the Library of Congress and read it for you.

"THE 5 R's FOR SOUND DEFENSE PLANNING"

Presented By

Brigadier General Elmer L. Littell, USA *

Distinguished guests and ladies and gentlemen, it is indeed a privilege for me to be included in this distinguished panel, and to have this opportunity to speak to you on behalf of the Army concerning a theme which is of vital interest to all of us here today..... "More Defense Per Dollar Through Planning." Now, what does this theme mean to you? Does it mean our present planning is inadequate ?..... Too little?..... The wrong kind?..... In need of revision?..... That we are not getting the maximum defense for our tax dollar.....or does the theme very simply point to planning as the road or key which will open the door and provide the military services, industry and the nation with the maximum defense possible within the limited budgets made available to the military by Congress.

What is the Army outlook on planning? Why is defense planning most difficult in spite of all the planning that takes place, starting from the Joint Chiefs of Staff, down to the supply manager who must live in a searching and inquiring environment, constantly seeking better, faster, and less costly ways to utilize our defense resources.

I want to propose a 5-R approach to sound defense planning -- more about that later -- but first, I'd like to assess the scope and environment of the planning problem from an Army standpoint.

The wide range, complexity, and size of the Army's responsibilities and activities pose a challenge to Army planners and managers. The Army operates the largest supply system in the world -- which includes handling certain requirements for the Navy, the Air Force, and the Military Assistance Program -- and manages a bulk stock inventory of approximately $20 billion.

We in the Army supply business must maintain a constant awareness that our sole reason for being is to provide logistical support to our national defense effort. We are also aware that we can not accomplish this goal alone, that in order to achieve our objectives, we must increase our planning and coordination with industry and with such important industry groups as represented here today, the Electronic Industries Association.

One of the Army's most pressing problems is to keep its equipment modern in these days of steadily rising costs and mushrooming changes in technology. Once when the troops were furnished a piece of equipment, it could generally be planned that it would last until worn out -- or that it could be utilized for training even after being replaced. Now, more and more equipments are replaced long

*Commanding General, U. S. Army Signal Supply Agency

before wearout, due to technological obsolescence, and in some cases so quickly become obsolete that they have no usefulness left at all. This costs money and may be considered by some to be wasteful. Others look at this as the price we must pay for assurance that our Army remains continually modern. It is now more important than ever that the procurement of equipment be planned most carefully. This logistical aspect is perhaps less dramatic and impressive than the research and development itself, but we who are involved in the planning feel that it is equally important nonetheless. Development of new and startling combat materiel is of little use to troop units unless ways are found to allocate scarce dollars for its timely production in useful amounts, as well as support and maintain it. In short, the aim of Army planning is to obtain the greatest possible return from the taxpayer's dollar investment so that the Army's inventory of equipment will not only be the most modern, but the most effective in combat. The military posture of the Army -- its modern capability is linked to the equipment posture of all divisions of our combat organization. One good weapon or electronic system can't be divided among a number of combat divisions.

Electronics is becoming more essential to all aspects of military activity. How does the Army manage its electronics program? The over-all program with minor exceptions coincides with and falls within the mission and responsibility assigned to the Chief Signal Officer of the Army.

This year the U.S. Army Signal Corps celebrates one hundred years of Army signals 1860-1960. We now stand together on the threshold of the next 100 years. The men and women in the military, in industry, in our educational and scientific institutions, and in our civilian Government have made substantial contributions to our growth. Their vision, skill, and teamwork during the past 100 years, have produced an outstanding record in communications-electronic achievement -- not only for the military but for our civilian economy as well.

About 85 percent of the communications-electronic end items and components used by the Army are planned and managed by the U.S. Army Signal Corps. This percentage does not include electronic equipment utilized in the Army missile programs -- these are primarily handled by the Ordnance Corps. The remaining 15 percent of the communications-electronic items although managed by other Army Technical Services, are developed, procured, tested, and issued to troops, in basically the same manner.

Based on present known requirements, a field Army of the 1960's will be equipped with upwards of 75,000 Army-operated electronic emitters..... as compared with 30,000 electronic emitters used by an Army at the end of World War II. It is therefore essential that these equipments be compatible -- this requires advance planning and testing.

The rate of technological change in conventional communications equipment, the utilization of transistorization, modular construction, miniaturization, new multiplex techniques, single side-band, and electronic telephone central office switching brings us face-to-face with a costly modernization problem. In addition to this, we find that we need more and more equipment to provide new capabilities unthought of only a few years ago ----- For example, electronic fire coordination of air defense missiles, detection and location of weapons and moving targets on the ground, detection and measurement of radiation, high quality data transmission and automatic data processing.

These new items are enormously expensive and our requirements studies must be thorough and good to convince Congress to provide the funds to buy them. However, we appreciate that there must be a limit to the amount of money Congress can make available to the services to do their particular job. One sure way to get more defense for our dollar is to adopt keener and more efficient buying habits. We must be more and more selective in our buying and buy only the most critical and most essential items. We can't afford to buy unnecessary frills on equipments. We must analyze our requirements realistically and invest in systems and equipments whose performance is adequate for a particular mission accomplishment and made available by industry at the lowest possible cost.

We must look for the best buy possible - this is rarely the most expensive. The "best buy" may lack certain features which are "nice to have" but which are not really essential to filling most needs.

Allocating resources and deciding which programs should be supported and which abandoned is a very difficult task for military planners - especially since there are more items available for procurement than the Army has money to buy. We are placing more and more premium on making earlier decisions on big problems. We're examining our projects and stopping, not just slowing down, non-profitable ones.

We plan over a 5-year period in item detail for the orderly acquisition, overhaul, and disposal of assets of equipment. When we study an item of equipment, we assemble all of the best available information not only for the item now in the hands of troops and doing the job, but also for the development item which will replace it, and for any substitute items. We at the Army Signal Corps inventory control point in Philadelphia see a steady improvement over the years in the coordinated planning that goes into equipment studies. Let me tell you something of what goes into these plans.

Our supply planners work closely with research and development people to forecast as accurately as possible when a new item will be ready to put into production. This not only enables us to budget the necessary funds for its production, but enables us to plan exactly how many more of the current item we must buy. Depending upon its relative essentiality and other considerations, such as the availability of funds, we must often take a calculated risk and not procure the current item to meet our full requirements.

Sometimes the relationships between development items and existing items become rather complex and complicate our supply studies greatly by requiring studies to be made by what we call "families" of equipment. At best, forecasts of when new items will complete their development and testing and become "ready-to-buy" are speculative because they are subject to set-backs. Each year we are making further improvements in our ability to pin down these new item phase-in dates, and thus improve our overall planning.

Our supply planners work very closely with what we call the "users" of the equipment -- notably the Continental Army Command at Fort Monroe, Virginia, representing the field armies, and the Army Air Defense Command at Colorado Springs, Colorado. This is so that our quantitative requirements

will be based upon the best, competent estimates of what both the troop program structure and the Troop Equipment Allowance Tables are going to look like at the end of the 5-Year planning period. The troop structure is an ever-changing thing, reflecting developments in combat techniques many of which are as revolutionary as new equipment, and equipment planning must reflect these changes as best as can be forecast. Here again, we see constant improvement in our ability to coordinate our equipment planning.

Our determinations concerning how much of each item we are going to buy or dispose of, and when, affect more than the items of equipment themselves. Equipments have a long "logistical tail" of supporting repair parts, supplies, dry batteries, installation units, test sets, and training and maintenance literature. In some cases, this tail costs more than the dog.

We assign various status codes to the end items which have application to start up or shut off, as appropriate, buying and disposal actions for the items making up the tail. As we improve our ability to plan for the end items, we correspondingly improve our planning for all of these other items which, though smaller, are just as important insofar as the Army's combat effectiveness is concerned. Similarily, we use our equipment planning data to plan the extent to which we must finance industrial preparedness measures such as development of production sources and the maintenance of production tools and facilities in layaway.

The Army's 5-Year planning system which is used by our troop planners, our research and development planners, and our supply planner provides a tool for getting the best balanced combat posture from the funds made available. Each year this tool is made sharper and more effective by improvements in our detailed planning procedures.

The Department of the Army's logistical research effort -- our value engineering -- includes studying many projects to insure Army responsiveness to growing strategic and tactical operational requirements. Our study of logistical cost factors is directed toward attaining more hardware for fewer dollars. We are studying the long-range impact of electronic equipment design trends upon logistical concepts and future logistical planning -- we are seeking ways to increase reliability -- ways to shorten or control the Army's lead time reducing the span of time from concept to capability which now averages about 12 years.

There are many facets to our relations with industry in our defense planning program. The Army is very proud of its efforts of sharing with industry its future plans and the enlistment of industry in future problem-solving activities. The qualitative development requirement information program, known to many of you as Q-D-R-I, initiated by the Ordnance Corps is rapidly being adopted by other Army Technical Services. This program has been designed to assist participating organizations in conducting their voluntary efforts effectively. The qualitative development requirements information program includes information regarding current and future requirements for development of new items, components, materials, or techniques which effect earliest feasible exploitation of new knowledge. Army research & development and procurement & distribution activities are organized to allow for a constant two-way relationship with industry.

To facilitate planning by industry, the U.S. Army Signal Supply Agency is planning to recommend to higher authority in the Department of the Army that a digest of its procurement program be released in the near future. The recommendation will provide for making the release as detailed as possible within the limits of security regulations. It must be recognized that this proposed listing will be subject to various uncertainties, such as changes in requirements, fund limitations, and item substitutions. It is hoped, however, that industry can thereby be furnished a basis for determining areas of bidding and production planning.

The Army is continuing to emphasize planning in several areas which will minimize delays in delivery of materiel and reduce costs. These include advance planning so that Government furnished equipment is received in good condition and in adequate time to permit their being incorporated into the end items; planning timely provisioning of spare parts to assure concurrent delivery of spare parts with the end equipment; and holding preproduction planning conferences with the contractor promptly after award of contracts on major items to clarify any technical, contractual, or production problem areas. Further, the Army is increasing its use of indefinite delivery type requirements contracts, thus providing the contractor with information on the maximum and minimum quantities he can plan on producing during a 12 month period.

In turn, contractors can do much in the area of planning to improve procurement operations to our mutual benefit. For example, it is most important that contractors plan to deliver drawings concurrently with shipment of the first production item. Where all such drawings are delivered promptly, industry will benefit from the wider opportunity for bidding afforded by good procurement data. Where Government owned tooling is required to be utilized on other contracts, contractors should plan to deliver any such tooling held by themselves or their subcontractors in good condition promptly to the Government upon completion of their orders.

Planning all actions necessary to meet contractual delivery requirements are always of the utmost importance to the Army, since any delay in deliveries can seriously jeopardize overall military planning and preparedness. There are also instances where deliveries on one contract are to be used for Government furnished property on another and the slightest delay by the initial contractor may cause serious repercussions in the ultimate deliveries to the using forces. Thus, the importance of forward planning by contractors to meet delivery schedules cannot be overstressed.

We need industry's help in designing equipment for simplified maintenance, for facility of transport, and for maximum interchangeability.

The Army invites industry to participate in exercises and maneuvers where they may share with the Army in the evaluation and use of their manufactured equipment under simulated combat conditions.

Through a reciprocal training and visiting program designed to strengthen the civilian-military team, members of industry and the Government each have an opportunity to become better acquainted and more understanding of each other's mission and problems.

The Army's procurement operation, as it exists today, is both complex and involved. This is due in part to the numerous laws, regulations and controls which have been established to assure full protection of the interests of both the Government and industry. It is, therefore, of the utmost importance that through appropriate and intelligent forward planning on the part of both parties, we detect and resolve potential problem areas, thus effecting economies in effort, time, and monies.

The Army looks at large and small firms as teammates in our defense program. Big and small businesses are dependent on one another for tasks they cannot economically handle themselves.

We must be and are responsive to policies which provide for awarding contracts to small business and depressed labor areas.

Total net Army procurement expenditures for FY-59 -- with business firms only -- amounted to $4,957,065,000. Of this amount, awards to small business firms on a prime contract basis amounted to $1,740,121,000 or 35.1%.

One of the most significant gaps that exist in military-industry relations is one that I would like to call the intelligence gap. It is in this area that we need more avenues of communication both horizontal and vertical so that we may better pool our resources, our know-how, our creativity and productivity. We must seek ways to cut through the fog of words and conflicting opinions. We must capitalize on the unique abilities of each member of the defense team. We must consider the momentum of going organizations and include in our planning the time considerations necessary to start, stop or reverse the chain of actions and reactions to current operations and plans. We must not be like the man winking in the dark -- he knew what he was doing but no one else did.

In our long-range planning program we must be peace planning as well as defense planning. Therefore, we must try to find the basis for a sound planning program.

My primary recommendations for improving military-industry planning can be highlighted by what I would like to again refer to as the 5 R's.

(Figure 1)----Just as the scholastic 3 R's epitomize the abasis for a sound education -- I am proposing adoption of the 5 R's as essential considerations for sound defense planning.

(Figure 2)----The 5 R's are -- requirements, resources, realism, reciprocity, and responsiveness.

(Figure 3)----requirements -- both qualitative and quantitative, form the basis or beginning of any planning program. Requirements establish the targets for defense planning. Within the Army, obtaining and releasing information on our current requirements presents no major problem. However, in the areas of specific requirements for long range planning there are real problems due to ever-changing conditions and the restraints necessary to prevent security violations. We in the Army are constantly seeking ways to express our requirements more accurately, so that both military and industry planners might better aim their talents at the requirement targets.

(Figure 4)----The next R--is resources. Here I include all resources of the military, industry, scientific, and educational team. Included are not only financial resources of each but also their physical facilities, scientific, technical and administrative skills. All these resources must be loaded into the planning gun which is aimed at the requirements target.

(Figure 5)----The third R is realism. Here I refer to the need for realistically evaluating our requirements and resources to insure the planning gun and our resource bullets are powerful enough to hit our requirements target. Let's not try to shoot a lion or bear with a water pistol. Let's not try to hit the moon with a B-B gun--or on the other hand, don't use a cannon to kill a fly.

(Figure 6)----My fourth R is reciprocity. Here I mean the reciprocal obligation or action of defense and industry planners to share their observations, their determinations, their skills, their plans -- within the bounds of security and proprietary rights -- with each other. We must each contribute to making the national defense pie better and less costly by more sharing.

(Figure 7)----The last R and one that I consider most essential for defense planners is responsiveness. Here I mean the ability of planners to react quickly to change. To be organized for it and be ready, willing, and able to accept change as an inevitable component of progress. Here lies the greatest challenge to planners. We must not grow so fond of our present plans that we become static and inflexible to the ever-changing demands of the future. We must be constantly molding the present to meet the challenges of tomorrow. But, we must remember there is always the time when we must "freeze" our plans and go ahead with them even though some more changes might be more helpful.

Responsiveness -- flexibility is essential in modern military-industry planning just as it is in military operations. Management processes too, must be equally pliable.

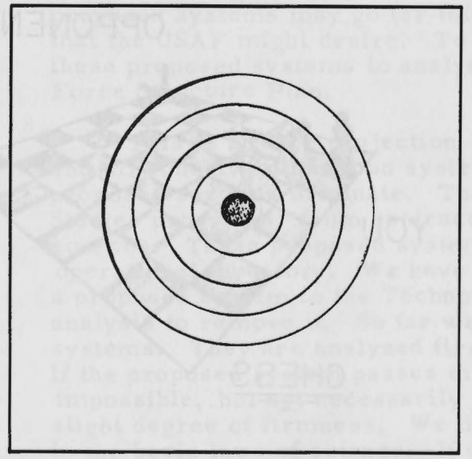
Just as in tennis, we never know where our opponents will hit the ball next, (Figure 8) or like chess ---- each move counts ---- except that in national defense we are playing for big stakes and there is no prize for second place.

In summary, might I say there has never been a man-made plan so perfect that couldn't be improved upon. We must always be striving to do better -- to improve what already is good. It is my sincere hope that today at this EIA symposium we can find ways to improve our defense planning. May the 5 R's for defense planners which I have proposed -- requirements, resources, realism, reciprocity, and responsiveness serve as the basis for further discussion. May our discussions and the defense plans that follow insure that we get the maximum defense perdollar through planning.

5 R's FOR SOUND DEFENSE PLANNING

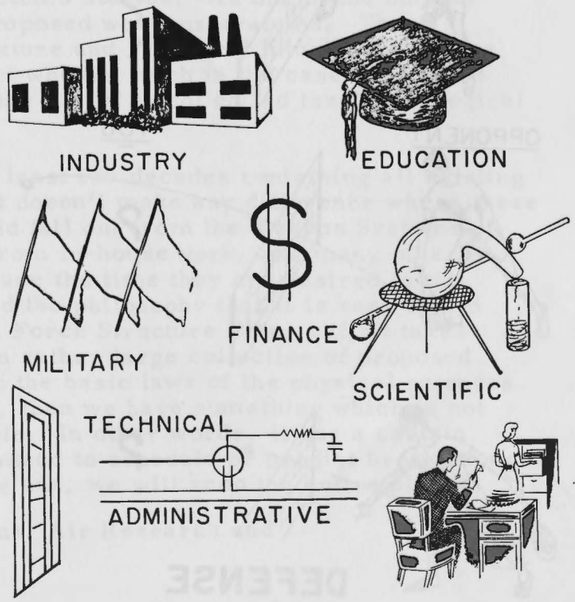
1 REQUIREMENTS
2 RESOURCES
3 REALISM
4 RECIPROCITY
5 RESPONSIVENESS

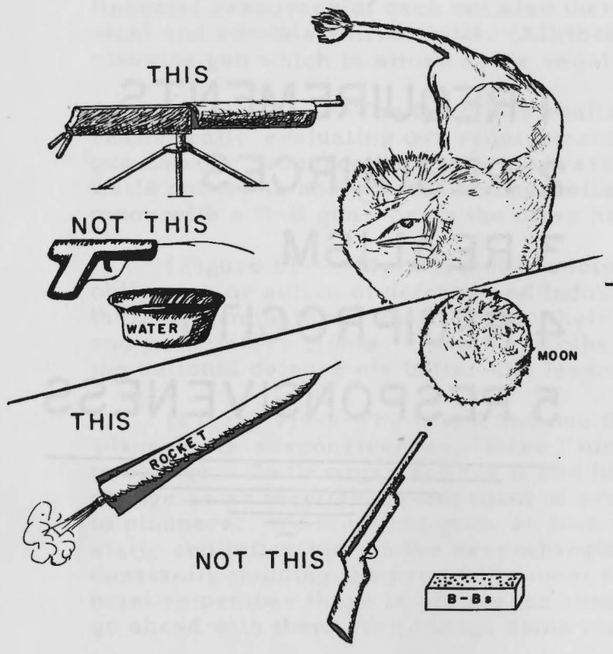
REQUIREMENTS

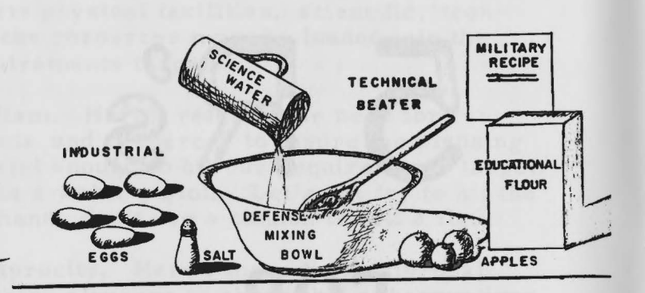


TARGET

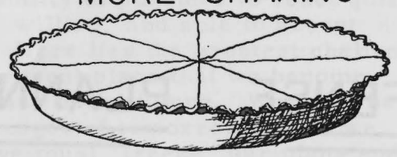
RESOURCES



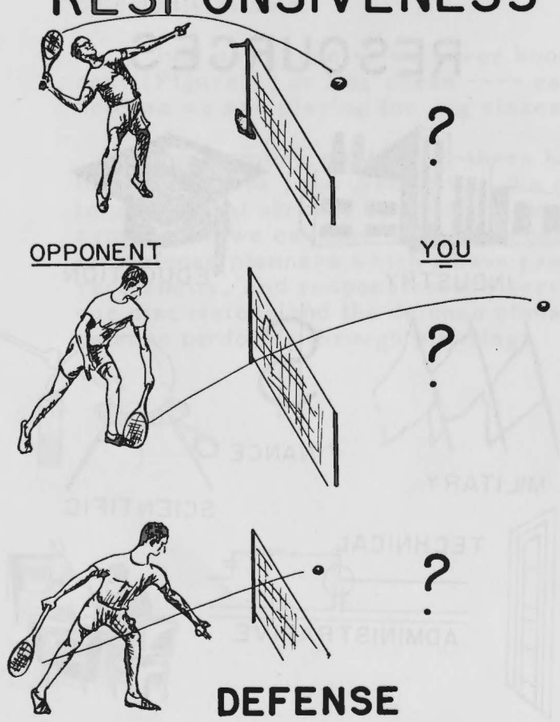


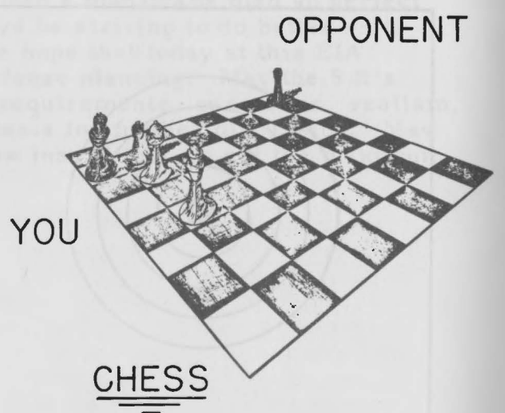


CONTRIBUTING TO MAKING OUR
NATIONAL DEFENSE PIE
BETTER AND LESS COSTLY
BY
MORE SHARING



NATIONAL DEFENSE PIE





ARDC DEVELOPMENT PLANNING

Presented By

Colonel E. C. LaVier and Colonel Thomas Love*

Gentlemen: As you know, the Air Research and Development Command has been recently reorganized. Under the guidance of Lt. General B. A. Schriever, ARDC Commander we have reoriented the research and development planning philosophy and operation. It is my purpose today to acquaint you with our new approach and the implications it will have on applied research in the electronics industries area. Actually the identical approach is being taken in all applied research areas.

In the designation of the Air Force Ballistic Missile Division, Wright Air Development Division, and the Air Force Command and Control Development Division as product-oriented divisions, we have posed for us a problem similar to that of the industries represented here, of, "how does one achieve a capability of producing certain desired products and at the same time orient a sufficient amount of effort in the future to be competitive?" Competition in our business is a very serious requirement!

The ARDC Development Planning philosophy consists of three main areas. These are the weapon systems studies, the analysis which encompasses the Technological Force Structure Plan, and the Planning Objective Structure. Elaborating on the weapons systems study area, close Air Force-Industry partnership unites their combined scientific talents toward broad conceptual studies and toward specific weapons systems studies. As one of the outputs of broad conceptual studies, we have proposed weapons systems. These proposed systems may go far into the future and represent future capabilities that the USAF might desire. To find out whether such is the case we subject these proposed systems to analysis by the use of a tool called the Technological Force Structure Plan.

This is a force projection for at least two decades containing all existing and all conceivable weapon systems. It doesn't make any difference where these proposed systems originate. They could fall out from the Weapon Systems Studies programs, from contractors, from in-house work, and many other sources. These proposed systems include the time they are desired in the operational inventory. We have adopted the philosophy that it is easy to add a proposed system to the Technological Force Structure Plan, but, it takes analysis to remove it. So far we have a rather large collection of proposed systems. They are analyzed first as to the basic laws of the physical sciences. If the proposed system passes this test, then we have something which is not impossible, but not necessarily probable. In other words, it has a certain slight degree of firmness. We do not intend to schedule or predict breakthroughs in the basic laws of science. If we have one, we will redo the entire plan.

*Office of the Deputy Chief of Staff/Plans, Air Research and Development Command

The second step is to group in any particular time period the mix of vehicles or concepts that have similar theoretical capabilities. This grouping now lends itself to a more comprehensive analysis and a selection. Results will lead to a second degree of firmness and to the definition of the Planning Objective. In other words it is now a hypothetical or potential system that has survived the test of analysis and which is now a promising candidate for applied research support. Of course, such candidates also will be within the framework of the Air Force guidance documents.

Now that we have some idea of how we arrive at a Planning Objective, let's look at it in more detail. A Planning Objective carries two dates. The first is the date that the applied research in the many areas of concern should mature. The second is the date that the system is desired in the operational inventory. It also contains such items as a description, the military objective or capability desired, the desired performance characteristics, and finally the technical references.

These Planning Objectives are assigned to one of the product-oriented divisions, to become a portion of the ARDC technical plan. This division will now complete the technical plan by listing the required technology that makes this hypothetical system a reality at some specified time in the future. It is through this medium that we derive the applied research effort of the command. The definition of the effort within each technical area that spells out "what" we want to do is called an Applied Research Objective (ARO). Such applied research objectives establish the technical goals that must be accomplished. After the survey of the ARO's on "what" must be done, we will survey what is being done. Thi s survey will not only cover those elements being performed by the entire ARDC but will take cognizance of the research being performed by other services and government agencies.

After surveying what must be done and what is being done, in each of the technical areas that support a Planning Objective the balance is itemized and this becomes the Air Force applied research schedule. Of course, the elements of research to be done may be carried under several Planning Objectives. To make this useful, these elements will be collated according to technical area and will be released as the "Technical Forecast" to industry and the scientific community. These releases will be in a manner similar to the Technical Program Planning Document and Applied Research Planning Document Release Programs which these "Technical Forecasts" replace. Some of the ones that may be of particular interest to those industries represented here will be the Technical Forecasts of : Navigation and Guidance, Communications, Electronics Techniques, Materials and several others. Since these Technical Forecasts will be the summation of research to be done in a particular technical area, programmed by years, they should be of great value to industry. The electronics industries for example could see what research we are supporting in their areas, who the responsible agencies are, and what research goals (ARO's) we hope to attain in future years. This should provide an input into the future planning of industry as to the functions, the facilities, the manpower, and other plans that are required to secure the optimum functioning of the industry-military team effort.

So far I have discussed how we obtain Planning Objectives and how they are used to initiate the Air Force applied research program. The date mentioned in the Planning Objective such as PO65K is the maturity date at

which a technical capability should be attained. This capability means that from here on out it is an engineering integration problem to bring this hypothetical system into being. Our desire is to set into motion the required effort ahead of this maturity date so that the decision to develop will arrive simultaneously with the capability to do so. In order to do this we preceed the maturity date by one to two years with the initiation of a weapon system study. Thisstudy will survey the total effort in all technical areas supporting this Planning Objective and, depending on the number of weapon systems contractors engaged, will give the Air Force a number of different approaches to the operational achievement of that Planning Objective. The selection of the optimum approach will start the development cycle. At this time the Air Force decision to develop will have entailed several analyses, operations research, cost effectiveness studies and should represent the best possible technical approach at the earliest possible time.

The Planning Objective approach to the Air Force applied research program will go into effect in the 1962 fiscal year.

The product-oriented divisions have received the Planning Objectives and are presently preparing the Technical Plan for their achievement. A month from today the Air Force technical people will meet as a group and start hammering out the combined, coordinated, applied research program. The technical release program is expected to occur the last quarter of this calendar year.

ARDC TECHNICAL PLAN

PART I: Planning Objective: (No.)

A. Hypothetical System: (Brief descriptive title)

B. Military Objective: (Brief description of specific military capability desired)

C. Desired Performance Characteristics: (Range, altitude, speed, payload, CEP, etc.)

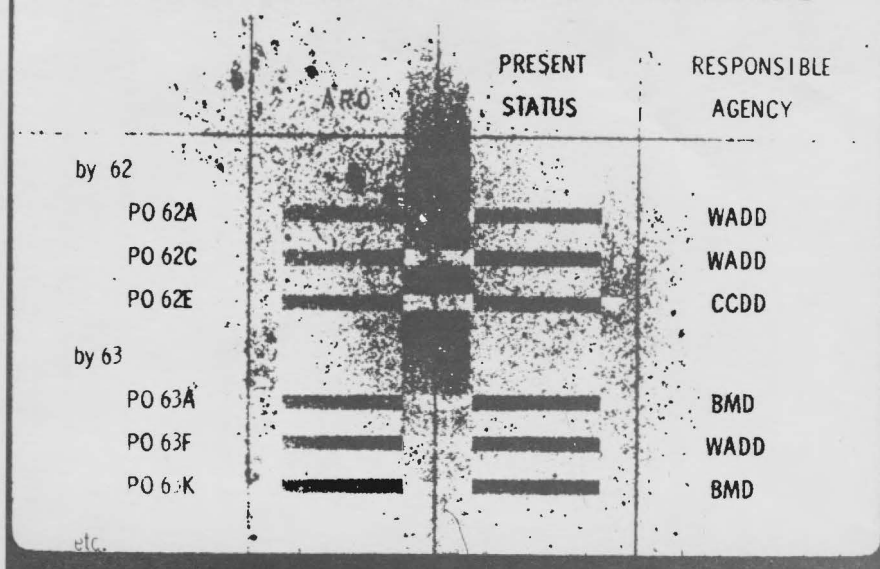
D. Reference Documents: (Intell, WS Studies, NAS, SAB, etc.)

PART II: Technical Analysis:

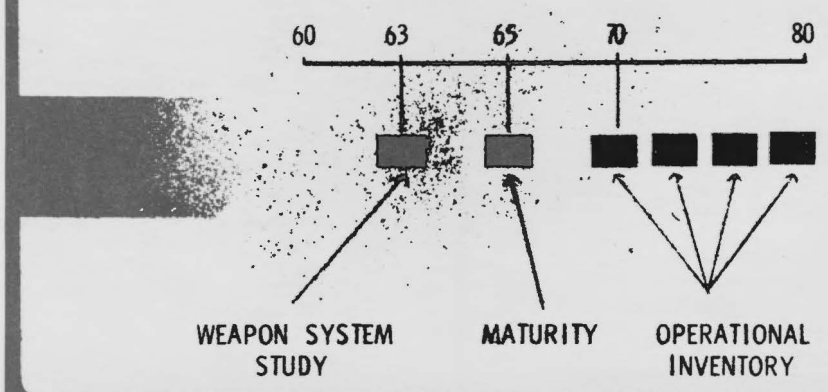
TECH AREA	ARO	PRESENT STATUS
Propulsion	A.	A.
Materials	A.	A.
	B.	B.
Weapons	A.	A.
Etc.		

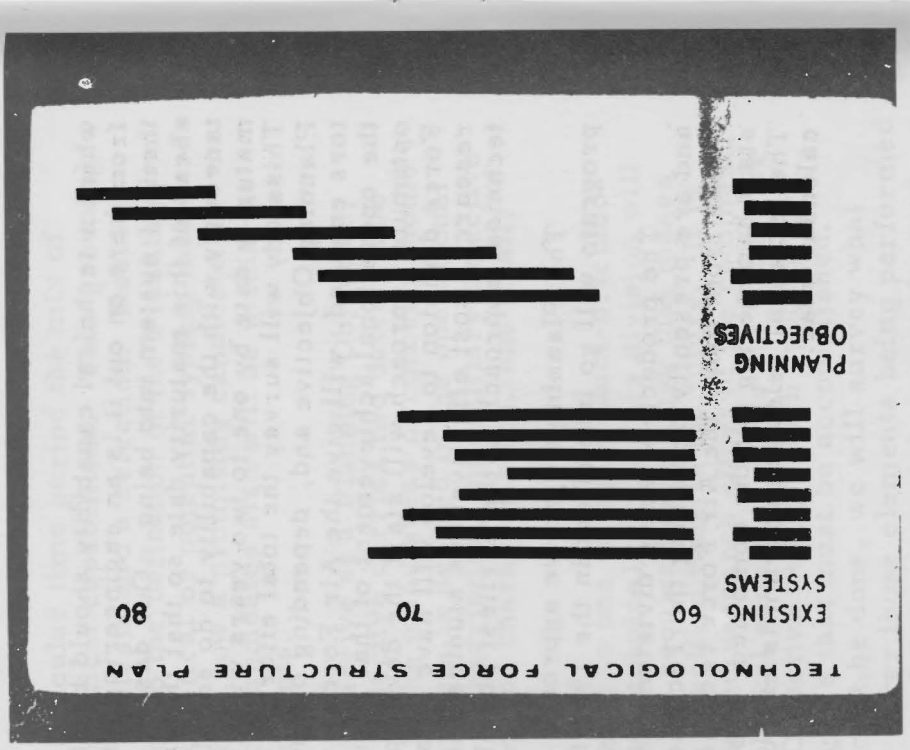
PART III: Technical Possibilities:

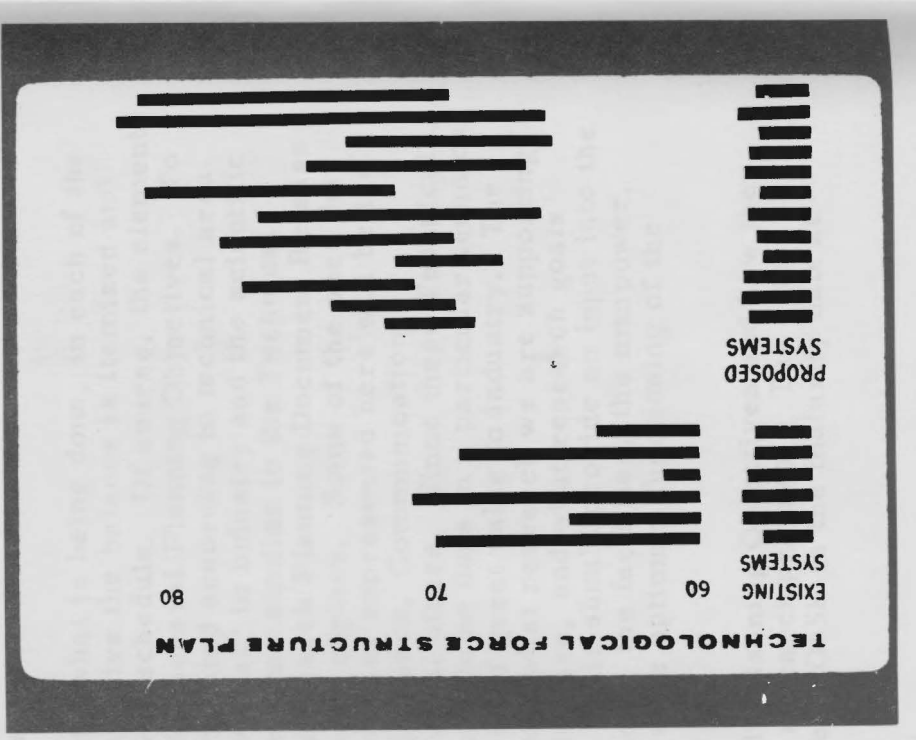
THE TECHNICAL FORECAST for MATERIALS

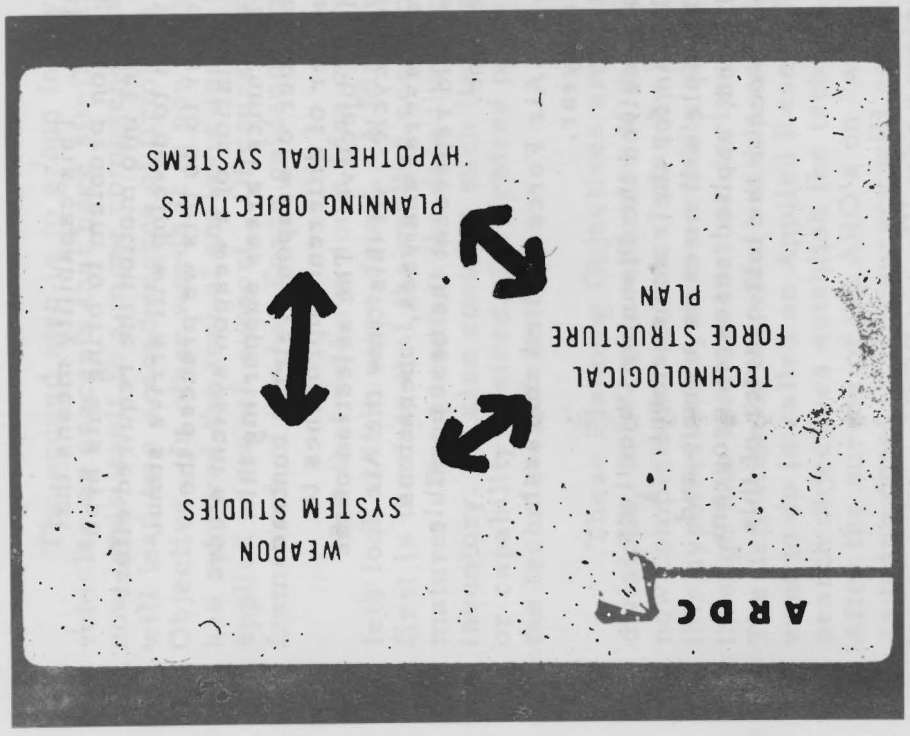


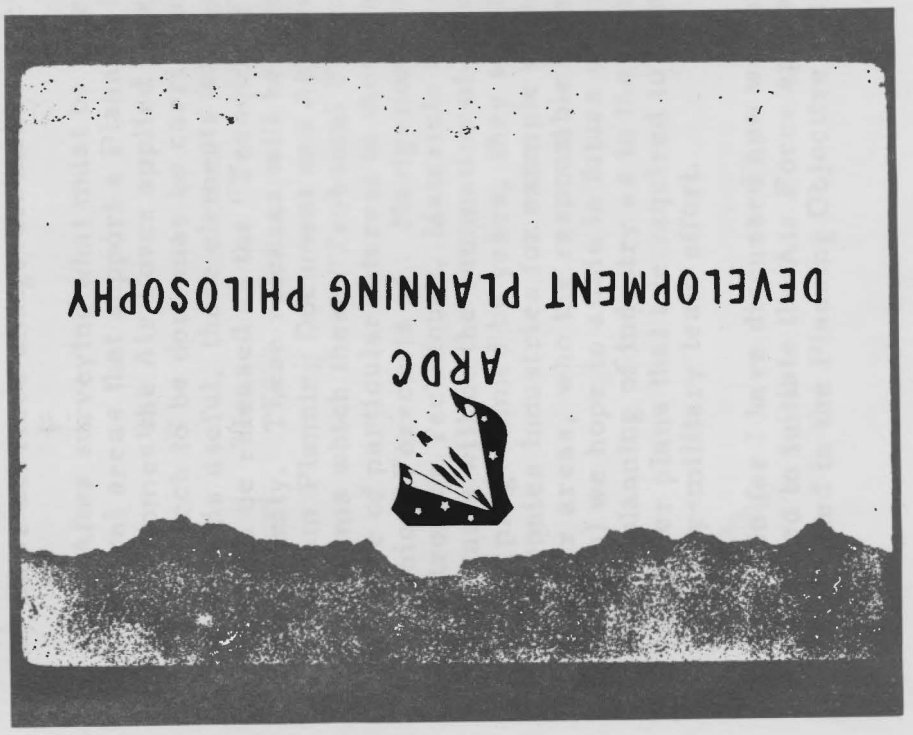
TECHNOLOGICAL FORCE STRUCTURE PLAN

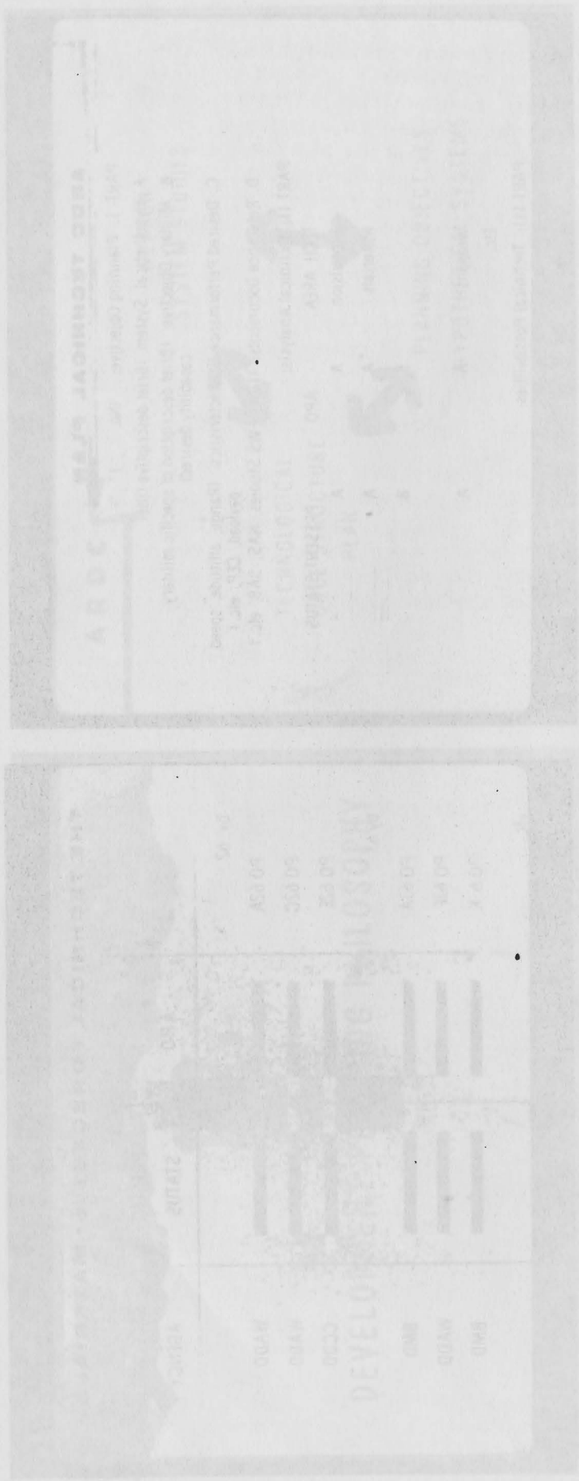


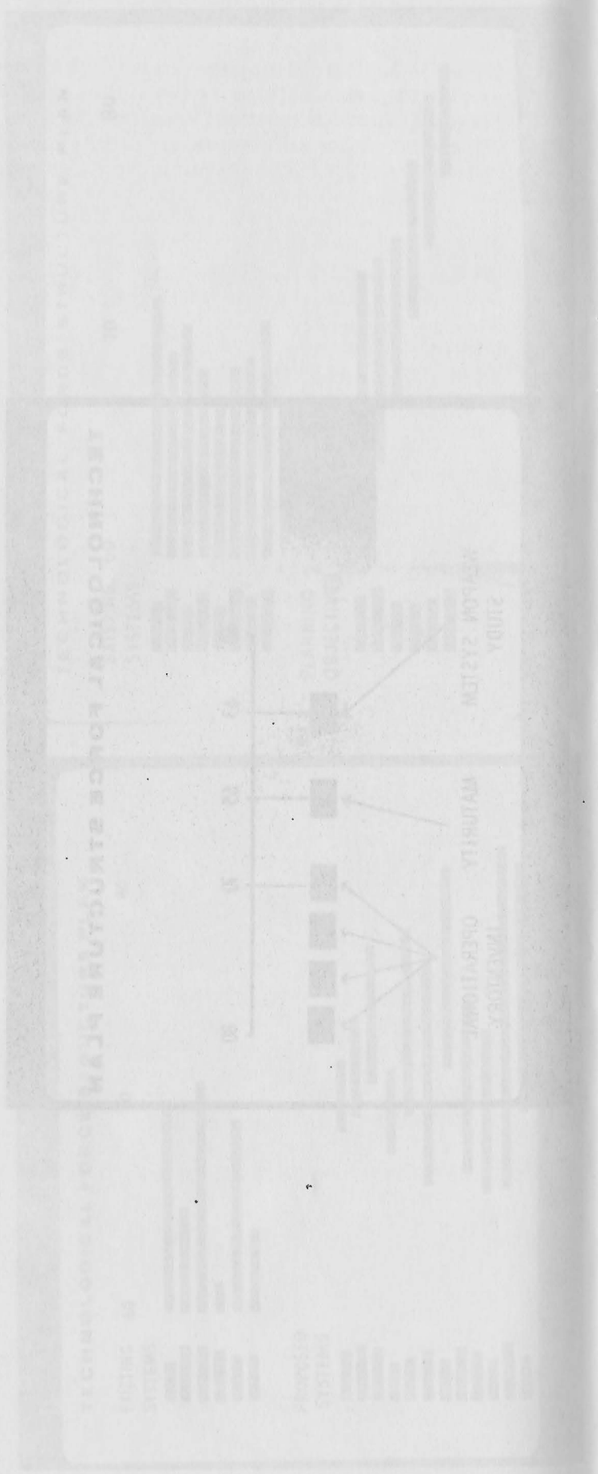












Luncheon Address

Hon. John M. Sprague
Deputy Assistant Secretary
of Defense

Remarks of

John M. Sprague

We in the Defense Department always welcome these opportunities to meet and discuss with our partners in industry the mutual problem of national defense. I couldn't help but wonder, however, why anybody would want to spoil the luxury of relaxing after a good lunch with a discussion of so contentious a subject as the defense program and budget.

The Electronic Industries Association members, like all contractors servicing the Department of Defense and the Military Assistance Programs, are understandably interested in the immediate and long-range future -- the weapons and level of effort of tomorrow which will grow out of today's research and development.

I am sure you will agree that the world of electronics, more than many other industries, can look forward to expanding civilian markets as well as increased use of its products and know-how by the military and space programs. The level of defense buying is, of course, directly related to the assessment of the threat which, for the immediate future will probably mean, as Mr. Gates told the House Appropriations Committee, continued high defense budgets. The electronics share of these budgets is forecast to increase over the next several years as the aircraft share, for example, declines.

Admittedly, it would be desirable to be able to lay out longer range defense programs so that industry could more fully participate in the planning of future weapons systems. But, today's military planning, both contemporary and long range, presents a constantly changing spectrum. While the useful life of many of the conventional hardware items can be forecast with considerable confidence, the military life expectancy of some of the more sophisticated follow-on items is greatly influenced by the rapid changes in the state-of-the-art which may obsolete an item even before test and evaluation is completed. This greatly complicates the task of detailed long range planning with industry.

With respect to over-all defense planning, it seems to me that a thorough understanding of the major factors which determine the size and character of the annual defense program and budget is an essential prerequisite.

To begin with, defense programming and budgeting consist of much more than an assessment of the military threat, a determination of the military requirements, the costing of those requirements and the adding up of the costs. Certainly, the defense program and budget must, in total, not only be equal to the assessment of the threat but must also provide an adequate margin of safety.

But military requirements, like the assessments of the military threat, are not susceptible to precise determination. Furthermore, the defense budget cannot be planned and formulated in isolation. It must be developed within the framework of the entire Federal budget, the entire government economic and fiscal policy and, indeed, the entire national strategy.

Today's threat to our national security, as many experts on this subject have pointed out before, is not only military. It is also political, economic and even psychological. To cope successfully with such a multi-sided threat, we must have a balanced national strategy wherein the military, political, economic, and the psychological aspects are all welded together into an integrated whole. The risks inherent in each of the threats must be carefully weighed and brought into proper balance, recognizing that security can never be absolute and that a certain degree of residual risk must be accepted in each area.

Nor is this composite threat ever static. The world moves on, circumstances change, and the degree of risk inherent in each element of our national strategy also changes. Thus, the national strategy must be constantly reassessed and the relative emphasis placed on each element adjusted to conform with the new challenges of ever-changing circumstances. The defense program and budget, therefore, must not only provide adequately for the national security but must also be tied in with all the other considerations affecting the total national budget and the total national strategy.

We all understand that military policy cannot be separated from foreign policy and that military policy must be the strong right arm of foreign policy. Our treaties, commitments and peaceful objectives around the world all have an important bearing on the size and composition of our defense forces.

But it is not always understood that military policy is also related to economic policy and that economic factors have an important, although secondary, influence on the over-all level of the defense effort at any particular time.

While it is true that the U.S. economy, today, could support a larger defense program, that is not the real issue. Experience has shown that the defense program is enmeshed in a whole array of interrelated economic factors -- the historical dangers of inflation; the tax burden in relation to economic incentives; the size of the national debt in relation to interest rates and monetary policy changes in the balance of payments, etc. From a national point of view, all of these factors have a bearing on the over-all level of defense expenditures.

I need not belabor the reasons why the Government must be ever alert to the dangers of inflation -- the inequity to those on fixed incomes, the distortion of values, the weakening of our competitive position in world markets, and the undermining of the strength of the dollar. But, in a free enterprise economy in peacetime, the Government's role in the fight against inflation is indirect. Its most important weapon is a balanced budget, or, if at all possible, a budget surplus.

The national debt is now at an all-time high. Within the last two years, the average yield on long-term Government bonds has gone from 3.1 percent

to 4.3 percent, and the cost of shorter term borrowing to as high as 4 1/2 and 5 percent. Interest on the national debt has gone up from $7.7 billion in fiscal year 1959 to an estimated $9.4 billion for 1960 -- well in excess of total Federal expenditures as late as 1940. Here, again, is an urgent reason why the Federal budget should be balanced and, indeed, if at all possible, a surplus achieved.

More recently we have encountered a problem new to our generation of Americans -- a large adverse balance of payments. In calendar year 1958 the United States suffered a balance of payments deficit of $3.4 billion. Part of this deficit was offset by the withdrawal by other countries of $2.3 billion from our gold stocks, the largest single one-year loss of gold in the history of the U.S. The rest of the deficit was, for the most part, added to foreign short-term dollar holdings in the United States, thus increasing the liabilities against our gold stocks at the same time these stocks declined.

In 1959 the balance of payments deficit totaled $3.7 billion, and another $1.1 billion was withdrawn from U.S. gold stocks, bringing the total down to $19 1/2 billion, the lowest point in twenty years. At the same time our short-term liabilities to foreigners have reached an all-time high of well over $19 billion, compared with less than $7 billion at the end of World War II.

These trends, like the increasing cost of the national debt, point to the need for a conservative fiscal policy; that is, a balanced Federal budget and, if at all possible, a budget surplus. This would be a major contribution to the maintenance of confidence in the stability of the dollar, as well as to strengthening our competitive position in world markets.

There is one aspect of this balance of payments problem that is even more directly related to the defense program. Defense expenditures abroad entering the balance of payments total over $3 billion a year and are, in large part, associated with the deployment of U.S. forces overseas. They include spending by our military and civilian personnel overseas; pay of foreign nationals employed by U.S. forces; and purchases of materials, supplies and services of all types. Thus the defense program directly contributes to the unfavorable balance of payments situation.

It may be argued that the Federal budget problem could be solved by increasing present tax rates. Let me simply point to the fact that the total tax take of Federal, state, and local governments is higher today than it has every been in our history -- including World War II and the Korean War.

But perhaps more important is the relation of the tax burden to economic incentive at almost all income levels. In our kind of economic system, we must rely on the efforts of private individuals to strengthen and expand the U.S. economy. A constantly growing economy is, of course, something we would want for its own sake. But there is now another reason why we must ensure the continued growth of our economic strength. The Soviet leadership has chosen to make economic competition another arena in the struggle between Freedom and Communism, and we must be prepared to meet this aspect of the total threat.

If the military threat were of temporary duration, we would perhaps be justified in setting aside consideration of these economic factors until more tranquil and less troubled times. But I think we can all agree that the kind of threat we face today is likely to continue for many years to come. Already, almost ten years have elapsed since the Nation explicitly recognized the long term nature of the Communist threat and adopted the policy of defense for the "long pull". This policy, first enunciated by General Marshall in December 1950, envisaged an increase in the defense effort to an adequate level and one which would be sustained indefinitely if need be.

By and large, we have followed this policy fairly consistently since that time. For example, the general level of the defense effort was not increased during the Lebanon and Quemoy crises. Neither has it been decreased as a result of all the talk about disarmament. Even the recent Soviet announcement of a one-third reduction in the numerical strength of their active forces has not seriously suggested a deviation from this "long pull" policy.

Our policy of maintaining a steady, stable level of effort over the "long pull" is, of course, complicated by increasing costs, more importantly, by very rapid technological changes in military hardware.

While the general price level appears to have stabilized somewhat in the last year or so, there is still some upward drift in many prices indices of importance to the defense program.

More directly, even without a general pay increase, the cost of military personnel goes up about two to three percent a year. This comes about from a somewhat higher grade structure; increased longevity pay; an increased number of dependents and, therefore, dependents'allowances the new program of enlisted proficiency pay; and a steady increase in military retired pay.

Even while numbers of men, military units, military installations, and inventories of older conventional weapons gradually decline, operation and maintenance costs continue to increase each year. The costs per flying hour, per steaming hour, for an overhaul of a ship, an aircraft, or an engine, continue to go up, due largely to the more complex weapons being incorporated into the forces.

But most important of all is the increased procurement cost of these new and more complex weapons. The cost of a fighter airplane, for example, has increased by over thirty times since World War II; the cost of a submarine (POLARIS), twenty-fold. A modern supersonic bomber costs nearly one hundred times its World War II predecessor, the B-17. The Navy's nuclear-powered carrier which is currently under construction will probably cost eight times as much as the carrier which fought the Battle of Leyte Gulf.

Staggering sums have been invested in our presently operational weapons systems. To date, our B-52 strategic bomber fleet alone represents a capital investment of nearly $9 billion, excluding supporting tankers, air-to-ground missiles, etc. Through the present fiscal year, investment in our continental air defense system for protection against just manned bombers amounts to more than $17 billion.

The weapons systems of tomorrow will require additional billions of dollars of investment before a substantial operational capability is achieved. For example, through June 30, 1959 we had committed to the ballistic missile program -- ATLAS, TITAN, MINUTEMAN, POLARIS, THOR and JUPITER -- a total of more than $7 billion. An additional $3 billion will be put into these big missiles this year, raising the total to $10 billion. The investment in all our missile programs -- both big and small -- will reach over $31 billion by next June. Even in terms of unit costs, the amounts involved are staggering. Last year, the President mentioned that the average cost of the first nine squadrons of ATLAS worked out to about $35 million per missile on launcher.

These costs increases are, of course, related to the rapidly increasing complexity of new weapon systems, as you in the electronics industry well know. But it should not be overlooked that these new weapons systems also have much greater combat effectiveness than the systems they replace. Therefore, they are not needed in the same numbers. We have seen this trend operating for some time and it is bound to continue into the future.

The defense budget process is further complicated by the fact that military technology is moving so fast that whole weapons systems are being obsoleted while still in production -- and, in some cases, even while they are still under development. You are no doubt all familiar with some of the major cancellations in the last year, such as the SEAMASTER jet-power seaplane, the boron fuel program, and the F-108 long-range interceptor aircraft.

Thus, we are constantly faced with the problem of reviewing all of the weapons systems in the program to reassess their relative importance and to eliminate, as promptly as possible, those which have been overtaken by events. This is not an easy or one-time task. As Secretary of Defense Gates stated recently to the House Appropriations Committee:

> "These changes are coming fast and are drastic. The defense program must be kept under continuous review. Programs which looked promising only a short while ago have become marginal in importance in the light of technical advances. This compels a continued shift in emphasis and resources from older to newer programs, and the outright termination of some programs."

Now as to the mechanics of planning and formulating a budget program under these difficult circumstances --

The crux of the problem within the Executive Branch of the Government is to strike a proper balance, in terms of priorities, among military requirements, space exploration, civilian needs, future economic growth, the tax burden, debt management, etc.

The heart of the problem within the Defense Department is to provide adequately for the national security by achieving, within the resources that are available, the best possible balance among combat forces-in-being, the procurement of hardware for these forces, and the research and development of new weapons systems for the future.

Now there are no doubt many different ways in which a defense budget can be formulated within these parameters. Since any one year's defense budget is essentially just another annual installment on a continuing program, it is not unreasonable to take as the starting point in this process the budget level of the preceding year.

In order to provide some flexibility in the review process, it was agreed this year that the Services would submit what we call basic budgets aggregating about $40.1 billion in new obligational authority and $40.6 billion in expenditures. In addition, they were to submit other desirable programs as an addendum budget, bringing the total submissions to $43.7 billion in new obligational authority and $41.8 billion in expenditures.

It was contemplated that the basic budget submissions would represent the hard core of top priority requirements for combat ready forces, military hardware, and new weapon systems development, together with the related construction.

The addendum to the basic budgets were intended to provide, regardless of past individual Service funding levels, a means of achieving the necessary flexibility to increase the emphasis on selected top priority programs, and to finance other high priority projects or promising developments which could not be accommodated in the basic budgets.

Nowever, the Services were not precluded from submitting items over and above these limits, and the Army, Air Force, and the Advanced Research Projects Agency did so.

This approach was quite similar to that used in the development of the fiscal year 1960 defense budget. Then, too, the Services were requested to submit a basic budget plus an addendum. In fact, this approach is very similar to that used even before the Korean War. Here is how the Director of the Bureau of the Budget, Frank Pace, described the preparation of the fiscal year 1951 budget some ten years ago. He said: (and I quote)

> "We would provide (the President) with certain factual information as to where certain policies would lead. From that the President set a ceiling on the armed services, which was last year, I think, generally known as $15 billion.
>
> * * * * * * *
>
> "There is also the proviso that if within that limitation it is impossible to include certain programs which the Secretary of Defense considers of imperative importance to the national defense, they shall be included in (order) of priority in what is termed the 'B' list."

The FY 1961 budget requests, totaling $43.9 billion in new obligational authority and $42.6 billion in next expenditures, as actually submitted, were then subjected to the careful scrutiny of the staff of the Office of the Secretary of Defense to trim out any "soft" items which might appear therein and to make recommendations on other items requiring priority attention. Following the presentation of the staff evaluations to the Secretary and Deputy Secretary of Defense, discussions at both the Secretarial and staff level were held with the

Military Departments in order to resolve outstanding problems. This review laid particular stress on major weapon system programs which were considered on a Defense-wide basis -- without regard to Service sponsorship. In this way it was hoped to focus attention on the missions to be performed rather than on the Service budgets as such.

A special effort was made this year to assure that all the responsible officials of the Department of Defense -- particularly the Service Secretaries, and the Chiefs of Staff, both in their individual capacities and in their corporate capacity as the Joint Chiefs of Staff -- participated in the review of the annual military program. Although the members of the Joint Chiefs of Staff, in their capacity as the military heads of their respective services, are intimately acquainted with the details of their own budgets, they must also, in their corporate capacity as the Joint Chiefs, consider the defense program as an entity.

To facilitate this aspect of their work, the staff of the Joint Chiefs was furnished the budget submissions of each of the Services, together with various analyses and evaluations prepared by the staff of the Office of the Secretary of Defense. The staff of the Joint Chiefs, which was substantially increased by the Defense Reorganization Act of 1958, was therefore in a position to analyze and evaluate -- from an over-all military point of view -- the programs submitted by each of the Services.

The Department also had the benefit of the active participation of the Office of the Director of Defense Research and Engineering similarly established by the Defense Reorganization Act of 1958. I am sure it is obvious to all of you that because of the increasingly difficult technical problems involved in modern weapon systems, the Defense Research and Engineering staff has a major role to play in the formulation of the defense program and budget.

In all of these ways the Secretary of Defense sought to bring to bear on the fiscal year 1961 defense program and budget the collective knowledge and judgment of the entire top command, both civilian and military, of the defense establishment.

The defense budget developed in this manner was then presented by the Secretary of Defense to the President at Augusta. The major issues relating to the composition and size of our military forces, to the priority of weapons systems, to the timing of procurement, and to the composition of the defense research and development effort -- were all thoroughly reviewed with the President. The Service Secretaries and the Chiefs of Staff were then invited by the President to present directly to him their individual views and comments on the defense program and budget proposed for fiscal year 1961.

As a final step in the process, the defense budget was discussed in the National Security Council. Here the Secretary of State, the Secretary of the Treasury, and the Director of the Budget, as well as the Secretary of Defense, and others, joined with the President in giving final consideration to the defense program and budget in context with the total national strategy.

From this long and painstaking review process, extending from early September to early December of last year, there evolved a defense budget totaling $40,927 million in new obligational availability and slightly less than $41 billion in net expenditures. Of course, the Services started their planning long before their September submissions.

I think it can be fairly stated that every one of the major issues raised in the Congressional hearings and in public discussion of the Defense budget since it was transmitted to the Congress in mid-January, was thoroughly and carefully considered during the budget review. In fact, virtually every argument made, pro and con, on these issues had been heard during the budget review. But as former Secretary of Defense McElroy stated before the Senate Appropriations Committee last year:

> "In the defense program we are dealing with extremely difficult problems for which there are simply no pat solutions -- no simple answers. In many areas -- looking into the future -- we are dealing largely with assumptions, calculations, estimates, judgments. It is not surprising then, that there are differenses of opinion even among experienced, professionally competent men.
>
> "Nevertheless, the fact remains that the responsible officials -- military and civilian -- still have the task of studying these divergent points of view and arriving at a specific program .... No one would advocate trying to do everything that every individual would like to see done. This would not only be beyond our resources but would simply dissipate our efforts and weaken rather than strengthen our military power. So, we are faced with the necessity of making decisions among various alternatives -- in other words, of exercising judgment, of making 'hard choices'."

There is no question but that the 1961 budget reflects some very hard choices. But in the judgment of the President and the Secretary of Defense the 1961 defense budget does provide for those programs which are essential to our national security.

EIA Defense Market Planning Seminar

Washington, D. C.
March 15, 1960

Afternoon Session

Industry Panel

"Industry Programs and Defense Planning"

Chairman

Vice Admiral John H. Sides, USN
Director, Weapon Systems Evaluation Group

SYSTEMS PLANNING IN INDUSTRY

The Link Between Military and Industrial Planning

Presented By

Dr. N. I. Korman *

In this country, we have arrived at the stage in our development where there is little question as to the desirability of advanced planning. The question is no longer whether we should plan, but how. This morning's discussion has attempted to portray how planning occurs within the Defense Department. This afternoon's discussion will concern itself with how planning occurs within industry.

I should like to take as my main thesis how industry does its systems planning and how this can be the major link between military and industrial planning. A great debate has been raging for the past year or so as to whether systems planning and management should reside primarily with industry or primarily with the military services. It is not my intention to take up one side or the other in this debate, but rather to show that the military services and industry are each uniquely fitted to handle certain aspects of this planning and that coordination of their individual planning efforts can be most helpful and productive.

Let us review first the areas of planning information in which the Defense Department and its military services are and should be preeminent. They are best informed as to the enemy's power, capabilities, and intentions. They are also most acutely aware of our own nation's military posture. They can best judge what the enemy's total resources are and how these resources might best be used to greatest advantage against us. They are also the best judges of what our own resources are and how these resources might be used to give us the best possible defense posture for the future.

On the other hand, industry, with its research, development, design, production, and service agencies, is more acutely aware of possibilities for weapons and military devices which arise out of technology, engineering, and production. It has greater insight as to what might be done with weapon characteristics, performance, lead times, costs, and dates of absolescence.

I want to make myself perfectly clear as to what I mean. The decision for strategic offense as to the proper mix of B-52's, B-58's, Atlas', Titans, Minutemen, Polaris', etc., is properly and strictly a Defense Department decision, subject to the policies laid down by the President and Congress. However, we in industry can and do provide valuable information for this decision making by advising not only as to equipment characteristics and performance, lead times, and cost, but also as to how equipment life and performance may be extended by re-engineering and refitting, and when obsolescence makes such re-engineering and refitting unwise.

*Director, Advanced Military Systems, Radio Corporation of America

With this introduction, let us proceed now to see how industry carries out its systems planning.

What is Systems Planning? First, let us see how we obtain our source material for systems planning. Useful source material is of several sorts and is gathered in various ways. The main problem here is with the tremendous amount of material available; assembling, collating, and interpretation constitute the main problem. The planner must continually guard against accepting one-sided opinions; he must avoid forming an early opinion on fragmentary data because it is so easy to verify almost any point of view if one looks primarily for confirming data.

Let us see what sorts of information we need and how we gather it.

There is general background information -- status of the cold war; U.S. strengths, weaknesses and intentions vs. enemy strengths, weaknesses, and intentions; U.S. strategy vis-a-vis enemy strategy; relative importance of strategic offense, strategic defense, limited land warfare, sea warfare, etc. Here we find our material in numerous periodicals and books, published statements by our political and military leaders, and analyses by several of our University Institutes for Foreign Affairs.

There is information on specific weapons and equipment in being, under development and study. Here we find that the trade magazines and newspapers are excellent sources not only for their day-to-day recording of events, but for the summaries and analyses which they publish from time to time. Of course, security considerations limit the thoroughness, accuracy, and timeliness of their coverage; but they are excellent for the purpose of general guidance which can be augmented in the proper way for those who have a "need-to-know".

When we come to acquiring knowledge as to the capabilities, limitations, and problems with specific weapons, equipment, and systems, we find that the three services have information available for those who can establish the proper level of security clearance and "need-to-know." The Air Force's SR's, the Army's QDRI's are excellent examples. Here, we find that the industrial planner obtains information in proportion to his willingness to give information in return. The quality and quantity of information he can receive in the long run is in proportion to the quality and quantity of work he does on the problems. The sponge who seeks to soak up information and give nothing in return soon dries up his sources. The planner who comes back with ideas, suggestions, and searching questions is rewarded with being taken more and more into the confidence of the armed services.

The knowledge as to scientific, engineering, and industrial possibilities and innovations must come primarily from the planners' own organization. It can be supplemented and checked by information gleaned from consultants, the proceedings of technical societies and in other ways, but unless the bulk of the experts in these fields are indigenous to the planners' own organization, this organization stands little chance of surviving in the intense competitive struggle. The problem of the planner is to recognize, utilize, and exploit the skills inherent in his company. However, he must be alert to gaps in the knowledge and skills of his organization and be ready to fill them by association with a company that does have the missing attributes or by acquisition in some other way.

Since the utilization of the scientific, engineering, and industrial know-how of the planners' organization to solve the equipment and systems problems of the military services is in essence the main job of the systems planner, let us examine in more detail how the systems planning function is carried out.

Let us look first at the planners themselves -- what kind of men are they? first and foremost, they are creative technical men with the broadest possible outlook. They are mature and known for their excellent judgment. They do not particularly aspire to the running of large organizations because they prefer not to be burdened with the associated administrative load. They are familiar with the skills, capabilities, strengths, and weaknesses of their company. They have personal abilities and reputations which enable them to tap and utilize the skills which reside in their company. They are very active in seeking an understanding of military problems in a way which will enable them to utilize the fruits of technology in the solution of these problems. Collectively, they should possess skills which cut across the entire scope of the technology which they hope to utilize in the solution of the military problems.

Now the study projects, how are they selected? A typical study project should not last longer than three to six months without re-examination. After that period, it should be redefined if it is to continue. Projects are selected based upon their importance to the defense effort and upon the likelihood that they can be solved with the knowledge and skills of the company. Suggestions for likely projects come from the military services who are usually quite happy to discuss their problems with industrial concerns whom they think might be helpful to them, from suggestions from within the company, and, most important, from the system planners themselves. This last source is most important because it is a truism that proper definition of a problem is almost tantamount to its solution and the true skill of the systems planners is largely in their ability to define their systems problems.

In the establishment of a systems study project, the appropriate experts in the Defense Department must be consulted to obtain the military viewpoint as to what they consider to be important attributes of a solution. This military viewpoint need not be taken too literally or adhered to too slavishly. The military people usually are only too happy to hear to what extent the industry system planner thinks his requirements can or cannot be met. In some cases, the military viewpoint may be acquired informally; in other cases, security considerations dictate the proper degree of clearance and "need-to-know." In all cases, the quality and quantity of the information obtained is dependent primarily upon the degree of confidence with which the military people believe that they will get ideas and suggestions in return for their information.

Proper backing must also be obtained from the appropriate functions in the system planners' company. Failure to obtain such backing can result in lack of support during the system study phase and, worse, lack of enthusiasm to pick up the results of the study for further implementation.

The systems planners, in addition to acquiring a background as to the military necessities, must also acquaint themselves with the technological facts which may bear upon possible solutions. To this end, they consult with the experts in their companies, employ expert consultants, and peruse the literature.

In the next phase, he attempts to generate and evaluate as many ideas as he can which might be pertinent to his problem. Here, a combination of solitary and group action isbeneficial. "bull sessions" with bright young idea men from within the organization are interspersed with the introspective deliverations of the mature creative experts of the systems planning function.

The ideas which survive the process are used in the synthesis of possible systems. Such systems are then subjected to analysis for reliability, performance, effectiveness, cost, lead time, enemy countermeasures, and many other factors, to determine whether any of them can indeed help solve the military problem and, if so, which solution might be best.

As I have outlined it, the system planning function sounds very orderly and straightforward. In real life, it is seldom so. It goes by fits and starts. The various steps are intermingled with each other and many times we arrive at tentativesolutions while we are still trying to state the problem. Many times, important military constraints on the solution can only be seen as the solution itself is being formulated. Many times, a systems study only serves to highlight other problems which need solutions.

Assuming, however, that a systems study serves to highlight an important military problem and to indicate a solution to it; what do we do next, how do we implement our solution?

To implement the results of a system study, the system planners must first secure corporate endorsement of their work. They must establish to what extent their company will continue further studies, to what extent it will go in reorganizing to prosecute further work, and whether it will commit itself to produce the requisite equipment in the time and for the cost indicated.

Having established these points, the study results may be presented to appropriate parties in the Defense Department along with its recommendations. In important studies, usually a number of different presentations must be made, each emphasizing those points in which the particular audience is interested. Operations people are interested in somewhat different aspects than R&D people, who, in turn, are interested in different aspects than the training and maintenance people. Oftentimes, questions arise for which ready answers are not available; this makes necessary auxiliary studies with subsequent exposition of their results.

As an example, in connection with the studies which preceded the BMEWS program, over fifty presentations were made by my organization alone over a period of a year before a decision was made to proceed. Other competing organizations probably made as many presentations as we did.

Finally, with acceptance of the study results may come action in the form of reoriented research, initiation of development, creation of new organizational alignments within the company, etc. These and many other points will be covered by the succeeding speakers.

PRODUCT PLANNING IN GENERAL ELECTRIC

Presented By

Dr. Richard C. Raymond*

Having been associated with military product planning in an increasingly direct fashion over the last fifteen years, it is a real pleasure for me to discuss the subject before such a distinguished audience.

I shall discuss the purposes of product planning within General Electric, the kinds of people who do this work, the over-all effectiveness of the work from the Company standpoint, and some ways in which it could be improved.

As you realize, product planning is only one important phase of business planning. The word product, as I shall use it here, means anything we make for delivery to the military, from a piece of wire to a large weapon system.

Purposes of Planning

I believe that the major purpose of product planning at any level in any organization is to provide the executive at that level with factual information which will allow him to place his resources in a pattern of bets which will improve his expected payoff.

The fact that military product planning is done in the face of very large uncertainties is obvious to anyone who reads the newspapers. If planning were a certain deductive technique leading to precise conclusions, it would not be necessary to carry on a public debate regarding the exact size of military force necessary to guarantee security. Our planners could compute the exact numbers.

Planners have thus fallen rather easily into the languages of gambling and insurance. These languages are designed to cope with uncertainties. In defense the major uncertainties we face are those of the military threats which will be levelled against us, the technological developments around which we can build new weapon systems, the economic support available for our defense effort and, certainly not least, the political decisions which will govern our needs for weapons.

To give a better understanding of the purposes of product planning in General Electric, I should like to digress a moment and discuss decentralization of management.

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General Electric is a large technical business. It is probably as diversified as the Department of Defense, although only one-tenth as large. Some years ago, the General Electric Company under the leadership of Mr. Ralph J. Cordiner, whose name is familiar to many of you, undertook a program to decentralize the management of the Company. Stated briefly, decentralization is achieved by assigning responsibility and authority for each management decision to the lowest level in Company organization where an adequate scope of information is available for that decision. Responsibility is placed on the individuals who will feel the greatest pain in the event of bad decisions. Appropriate rewards are available to these same individuals for consistently good decisions.

In General Electric's decentralized structure, the basic building block is a component we call the Product Department or Operating Department. There are over a hundred of these, and each operates with considerable autonomy, carrying on all business functions from planning, research, and development through design, manufacture, and marketing of one or more lines of products. Product planning is done both inside the Product Departments and at higher levels. In the typical Product Department there is a marketing section which includes a few people devoted specifically to the product planning function. There are also technical planning groups who serve some of the Division general managers. A Division in G. E. is a cluster of perhaps three to eight Departments whose businesses and markets are very closely related. There are also planning groups in the "Services" or staff organizations attached to the Executive Office.

My own group, the Technical Military Planning Operation (TEMPO) is a part of the Defense Systems Department. It serves primarily the Defense Electronics Division which consists of five Departments oriented toward defense requirements. Some service is also rendered to other Divisions and to the officers at the corporate level.

People Who Do It

Product planning is decentralized in General Electric in a way which goes with the management decentralization scheme. In our Product Departments, product planning people are usually experienced in the equipments and markets of the particular Department in which they work. They are interested in the products lying within the product scope of that Department and lying in time immediately beyond the items which are currently being developed. This means that they are normally looking two to five years into the future.

In the Defense Electronics Division, we in TEMPO support the product planners in several Departments with a team oriented at the five-to-fifteen-year future period. We have no restriction as to product scope and no ties to any particular product line. TEMPO now has about one hundred and fifty people professionally qualified for the substantive work of the organization. We attempt within this group to cover all of the major fields of human knowledge which are applicable to defense problems. The work is divided roughly into three phases. These are, first, prediction of the five-to-fifteen-year future global situation; second, synthesis of preliminary system and equipment designs to operate in this future environment; and third, evaluation of proposed equipments and systems on a cost-benefit basis.

TEMPO's Environment Operation is a small interdisciplinary group of social and physical scientists who make a continuing study of the world of the future, in terms of fundamental factors such as population and economic and scientific resources. This study has resulted over the last two years in a number of conclusions which have served to give us broad general guideposts in thinking about future systems. It has also revealed the nature of some specific requirements and has provided reasonable backgrounds in which to evaluate future systems. This year we are examining the prospects for international stability through 1975.

In the Synthesis Operation we do feasibility studies of new technical devices and we integrate these into compatible systems. Our equipment descriptions are carried only far enough to permit performance estimates and rough cost estimates. The people in the Synthesis Operation include physicists and several kinds of engineers.

The Evaluation Operation is peopled by economists and mathematicians, operations research specialists, and experts in particular fields such as logistics and reliability. These people are responsible for comparing various ways of accomplishing specified defense missions in the future. They reflect these comparisons in terms of the requirements for scarce items, such as dollars in the Federal budget. Devices or systems which show up well in the evaluation process naturally take their places in our future environmental predictions.

At the corporate level there are a number of services or staff officers who have organizations of experts in the functions common to all of our businesses, such as finance, employee relations, research, engineering, marketing, and so on. Some of these functional experts also participate in planning and their services are available not only to the corporate executive office and staff, but also at the Operating Department level when a particular competence is needed in depth.

In addition to these regular employees, we maintain consulting agreements with recognized experts in many highly specialized fields. These people are called in for specialized advice and counsel in their particular subject areas.

Over-All Effectiveness

A measure of the effectiveness of product planning at the Department level lies in the fact that product planners are still hired and maintained by most of the Departments of the Company, including those in industrial and consumer commercial businesses as well as those in the defense area. I believe that this fundamental economic test shows that product planning is a recognized and needed function. My own organization is probably not old enough as yet to permit a reliable reading on its performance from the mere fact of its existence. We have been growing steadily since August of 1956. We now see planning operations of various sizes being organized in other Divisions of the Company, and we see somewhat analogous organizations in other companies. We are probably the largest industrial venture in this function, although we are, of course, still fairly small compared to several organizations of the non-profit variety which do this work for the Government.

I am perhaps prejudiced in this matter, but I believe that TEMPO has been able to contribute a great deal of significant information to our customers.

in Government and to managers at many levels in the Company. As our communication ability grows and our experience deepens, we shall be able to do a much better job. As I said earlier, we see the major purpose of planning as that of calculating relative risks, or in other words providing better odds for the bets which our managers must make in the presence of very great uncertainties. It is often difficult to make a precise evaluation of our work. This is particularly true when we must tell a very busy manager that his particular product line is apt to be very short-lived because of forces beyond his recognition and control.

General Electric believes that it is a part of good corporate citizenship to participate with the Government in the selection, development, manufacture, and installation of defense products. We seek to provide those which promise the best chance of giving rational, workable, economical defense of the Nation. We enjoy responding to Government requirements. We also believe that we must contribute our own ideas through the paths which the Military Services have established for this and through unsolicited proposals. We believe that the problems of national defense are so numerous and so complex, and that the need for continuous progress is so great that the Nation must not turn down any promising idea without some exploration. Further, we believe that the communication and decision time required to establish a complete, agreed-upon centralized approach to most defense problems cuts very seriously into the useful service life of defense systems. It is probably more economical in the long run to tolerate some degree of overlapping and duplication than it is to argue out each case and then to build obsolete equipment on the basis of the agreements.

How Could Planning Be Improved

Planning is primarily a matter of generating, collecting, handling, and analyzing information and drawing probabilistic conclusions. These must then be prepared, stored, and communicated to others. It would be easy to conclude that anything which will speed up the flows ofinformation would be of great help in the process. Unfortunately, however, this simple approach does not give the expected results. There are, of course, certain revisions in the industrial security procedure which would greatly expedite this flow and reduce the overall cost considerably, but we now have available so much information that a simple increase in the flow will not be much help. Instead of concentrating on quantity, we need to develop processes for storing, retrieving, and routing this information in accordance with the needs and abilities of people. A man's rate of information transfer is naturally and fundamentally very limited. The situation in science and technology, as well as insociology and politics, is such that no single human being has the power to grasp a large situation in detail and to make all of the necessary decisions. If we increase the flow of information, we must also have an improved organization and understanding on the part of the people who deal with it. This is accomplished in part through management decentralization, but it also requires a training and attitude on the part of the people operating the planning force which is difficult to develop among rugged individualists. There is considerable room for improvement both in the mechanisms by which we handle information and in the organizations and training of the people who do the work, both in and out of the Government.

Another point which would allow us to improve defense planning considerably would be a public recognition that defense expenditures are like insurance premiums and not like a dole or a WPA project. Defense expenditures should not be used to keep a particular set of companies in business or to benefit the labor surplus areas of the Country. The costs associated with a modern weapon system are so fantastically high that we cannot afford to buy less than the best. It is a major fallacy to buy our defense insurance on a basis of price alone when a small improvement in performance or in the rate of system obsolescence far outweighs the cost advantage of going to a cheaper supplier. Competence, innovation, and follow-through of the equipment into the field are individually expensive, but they are necessary. In the long run they are economical.

Even with all of the improvements we can make in the next few years, it is hard to see how human organizations are going to keep up with the rapid advance of our national situation and our technologies. Planning will help some, but it does not offer a panacea. It cannot be effective unless it is coupled with intelligent and dedicated management, with good engineering, with good work on basic science and technology, with responsible manufacturing and product service, and perhaps not least, with a little bit of luck.

MARKETING AND MARKETING PLANNING IN THE DEFENSE MARKET

Presented By

John H. Richardson* and Stahrl Edmunds**

Let us begin by examining the salient characteristics of the defense market in order to determine the kind of market place with which we are dealing and to indicate the need for modern business practices. There are nine such characteristics.

First, it is a fluctuating market. The volatility of sales in the defense market typically has far exceeded that of the non-defense markets, even in comparison wo such durable-goods areas as primary metals and machinery, normally considered among the most volatile. We do not anticipate a perpetuation of such violent fluctuations --- to the contrary, we look upon this market as becoming more and more stable --- yet past patterns should not be ignored.

Second, the military market is very large --- currently about $41 billion when viewing the Department of Defense budget as a whole and some $17 to 18 billion when considering major procurement and research and development expenditures. To grasp the magnitude of these figures, compare this market, for example, to chemical and allied products, which constitute about a $25 billion market. Petroleum represents a $35 billion market, rubber products about a $6 billion market, tobacco manufacturers about a $4 billion market, textile mill products about a $15 billion market. Thus the national defense market represents one of the largest segments of spending in the entire U.S. industrial spectrum.

The third feature to consider is future growth rate. The growth rate in the military market since the end of World War II, has represented a rate of growth of eleven percent per annum. However, recent projections suggest that the military market will be fairly stable or grow at an average rate of some three percent per year for the next decade, depending upon international conditions.

Thus while the total Department of Defense market has grown at a very rapid rate in the last decade, its rate of growth will slow down for the next ten years. A slowing down in the rate of growth in any market raises important problems for a firm operating in that market. The fact that the total opportunities are growing at a decreased rate makes it much more difficult to maintain an individual firm's rate of growth in a changed environment.

Changed Product Mix is the fourth factor to consider, for vast changes in the military market have taken place in the last decade. Spending on

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intercontinental ballistic missiles and space units was virtually nothing ten years ago. However, fiscal 1961 finds these as major items of expenditure. For aircraft companies, the changed product mix has meant a transformation in their fundamental functions. Formerly, the airframe was the most significant element of aircraft cost, and integration of all parts of the aircraft was the responsibility of the airframe manufacturer. In the new military market of missiles and space units, electronics and propulsion take on strikingly greater significance and become, in fact, the main segment of the market.

Technological Pace, rapid enough in every modern market, reaches unparalled heights in the military market. Technological changes have proceeded so rapidly that we have rather calmly accepted the jump from air travel at 620 miles per hour to satellites and 18,000 miles per hour. This awesome rate of change, which sets our times apart from all others, serves to emphasize the absolute necessity for understanding and putting into practice the most advanced business systems, methods and attitudes if our present structure is to survive in the technological revolution.

Changed Research-to-Production Mix is characteristic number six. In the modern defense market, technological changes, as we have mentioned, proceed so rapidly that the ratio of production expenditures to research expenditures will continue to shift toward heavier research and development expenditures. It has been stated that the age of mass production is being killed off by space. This has important implications for the economical utilization of current production facilities. In addition, as this mix shifts favorable consideration must be given to increasing profit rates applicable to research and development to finance facility modernization required to meet the technological challenge.

Contract Continuity is a seventh salient characteristic---or problem--- of the defense market. It is sometimes argued that the defense business is relatively less risky because even on terminations the contractor is reimbursed for costs and profit on costs. However, the big risk in defense business arises from a firm's inability to maintain a continuity of contracted effort. Due to the very complexity of their product, defense contractors must maintain an abnormally high percentage of technical competence --- both staff and facilities --- the sound perpetuation of which can only be realized by reasonably stable contract support.

The eighth characteristic: Specialized Production Operations. Defense contractors are geared to produce final products that have the most exacting performance requirements in technological history. As a consequence, their production operations and processes are highly specialized --- that is, geared to the product's needs. Thus, as his loading fluctuates, the defense contractor is not in a competitive position for he cannot readily adapt or divert either his staff or his plant to other products of less exacting performance characteristics for sale in commercial fields.

Finally, consider competition. It is interesting to note that competition has become one of today's most pressing challenges. We have witnessed a complete transition from the relative lack of interest in defense business that existed before Korea to the emergence of well managed, capable companies now clamoring to do business in this market place. No longer does any organization have a "corner" on any segment of military technology.

THE ESSENTIALS OF A MARKET PLAN

The nine characteristics of the defense market may be summed up simply as constituting a market of inordinate change. When a market is characterized by inordinate change it must, of necessity, be carefully studied to be understood. This process of study requires (1) the organization of data and (2) the summation of the data into a market plan.

The organization of data to understand the defense business is no small task. One purpose of this seminor is to consider the need for and availability of data required to do the planning job in both the military services and defense industries. Such an effort is of great significance to both the quality and cost of planning that can be done. We are in the early stages of data organization and handling in the defense area, with all of its consequence of duplicate effort, false starts, and inadequate knowledge on all of our parts.

Despite all of these problems of getting adequate adata, all of us --- military and industry planners alike --- must make the best plans we can with the data presently at hand. Let me describe how this is currently being done in our company. The first step has been a very undramatic one, that is, the creation of a central file for all the data that the company obtains in its ordinary course of business. Into this file go such things as (1) clippings from newspapers and periodicals, (2) trip reports, (3) published budget documents and Congressional hearings, and (4) copies of planning documents for which the company has established a need to known The operation of such a file over time can accumulate an impressive body of data, at least impressive in quantity. The real problem is to make some sense out of the scattered bits of data, that is, the summation of the data into some pattern. The studious examination of the materials in this file is the beginning of a market plan. The results of such study provide an overview of the market, which is in our minds the first element of a market plan.

At this point let me enumerate all four elements of a market plan to help keep this discussion in perspective. The four elements of a market plan are:

1. An overview of the market.
2. Program selection.
3. Formulating the action steps.
4. Carrying out the actions.

The overview of the market is constructed simply by using specific customer requirements as building blocks to put together a picture of the total market. As an example of this type of effort I would like to show you our view of NASA requirements and funding over the next decade. Notice the emphasis on the booster program in early years. This emphasis shifts to space probes in the later years with consequent new requirement in payload and instrumentation. Similar charts can be constructed for the various military and commercial requirements. The sum of all psuch programming of customer requirements is the overview of the market.

After identifying all the funding needed to finance future requirements for NASA, and the total Department of Defense, it is important to determine

whether this funding is possible within the limits of available budgets. Frequently, the budget constraints force program cancellations or stretch-outs --- a fact of which, I am sure, all of here are painfully aware.

The second step in developing the market plan is program selection. The problem here is to align the skills and capabilities of the company with appropriate programs identified in the market overview.

A hypothetical illustration of such program selection is shown in the next chart which shows the addition of new program areas to existing product lines. Obviously this program selection is based upon a preliminary market analysis indicating ability to contract for the program and technical assessment to determine the ability to design the system.

The third element of the Market Plan is to formulate the action steps needed to consumate the program. On the technical side this means preliminary design and specifying and scheduling the follow-on research, design, and development to be done. On the marketing side it means carrying the message to the customer in such a manner that it will enable him to understand and prefer the operational effectiveness and cost of your proposal versus his alternate choice. The organization of actions needed for two-way communication with the customer is a substantial task. We at Hughes have enumerated some 397 marketing decisions which are made implicitly or explicitly in order to provide the customer with sufficient knowledge to make an intelligent evaluation of a proposal. Seen in this light I believe you will agree that marketing is a formidable and necessary task, one that deserves the same careful, scientific effort that engineers apply to design problems.

The last element of the market plan is to carry out the action steps that have previously been determined in the plan. This is the doing or operating side of marketing; and the key element is managerial skill in arranging all the elements that make up the "Marketing Mix." To make this statement clear, let me discuss more fully what I mean by the "Marketing Mix."

THE MARKETING MIX

The "Marketing Mix" encompasses all those company functions which have been integrated in the interest of accomplishing marketing objectives. In order for the Mix to be most effective, it is necessary to analyze its functional elements to be sure that, first, the necessary elements are all present; second, that they are individually strong; and third, that they are blended together in an optimum manner in the support of the Market Plan.

Mr. Robert Hills, President of the consulting firm, Marketing Dynamics, Inc., speaks of the marketing mix as the "seeing, planning and doing functions." It is not feasible here to discuss each of these functions in detail but only to treat them with sufficient pertinent comments to place them in proper perspective.

The seeing and planning functions have already been discussed, so let me just summarize the nature of their assignment in the Marketing Mix. What about the first function: "seeing"? The Seeing function is performed by an Information Processing Activity tailored to the needs of each company.

Market analysis most assuredly is charged with the responsibility for accumulating and analyzing data pertaining to immediate customer desires and needs, but it also has infrequently practiced responsibility for searching the long-range total behavior of the market. It is fundamental, it seems to me, that the gross present and future dimensions of any market must be envisioned as clearly as possible before long-range objectives, plans, short-range objectives and programs can be offered for consideration.

The "planning" function of the marketing mix is usually termed product planning, however, for our discussion of "planning" we will be referring to the all-encompassing requirement for marketing planning.

Marketing planning in its broadest sense has two purposes:

1. To evaluate marketing opportunities available to the company and to select those which are best in relation to the strategic objectives of the company.

2. To develop plans which insure capture of each opportunity selected, based upon study of the requirements for success.

Modern marketing planning is thorough, bold, creative, and objective. It leaves nothing to chance if prior study is possible. --- Planning forces consideration and analysis of all aspects of a problem or opportunity. It weighs alternatives. It identifies risk. It compares results with cost to achieve. --- Planning encourages creative thought. It invites innovation. It gives purpose to marketing actions. Planning brings order, efficiency and confidence. Lack of it leads to disorder, improvisation, and actions based on expediency. Without imaginative and dynamic planning, the enterprise will flounder and must accept mediocrity, if not decay.

Planning begins with the defined objectives of management. It develops strategy and tactics shaped to these objectives. It orients marketing actions to the future, rather than to the past. It is in the future where opportunities live. This kind of planning mobilizes power and capability behind each marketing program. It brings profit and growth to the company skilled in its use.

Customer needs and wants must be anticipated since the responsibility of a leading supplier does not end with the capacity and ability to meet the customer's known needs, but rather includes actual assistance to the customer in determining what his needs are going to be in the future.

The "doing" function is crucial to success in modern marketing systems. This is where the product or service meets the buyer. This is the action phase of marketing. This is where plans are executed, where advertising appears, and where products are seen and purchased. --- This function aims at more than today's sale. It goes after respect and confidence from each buyer. It builds customer loyalty not alone to the product but also to the company and its purposes. It wants to create repeat business for the future as it makes each sale today. --- Satisfied, loyal customers have never been more valuable than today. Confidence and loyalty, although intangible in character, are assets of enormous value to any company when they prevail in customer minds. Actions taken within this basic function will enhance customer loyalty, or reduce it. This indicates its importance.

The "doing" functions typically include advertising, contracting, sales, public relations and service.

Advertising, so aptly put by Mr. Merck of Merck & Co., "is a paid message delivered by someone else to influence an audience toward a profitable sale of your product." Advertising should be considered and treated as an investment rather than as an expense and should receive the same careful planning that is afforded the product itself to insure that product, institutional and recruitment benefits are realized to the extent and in the proportions desired.

Contracting has become more and more a major contributor to the welfare of the enterprise. The day of "administering the paper work" is far behind us. Government and industry experts have properly collaborated to elevate the contracting process to a level where "businessmen" are essential to its fulfillment.

Sales, more commonly referred to as Market Development, Applications Engineering, Advanced Program Development and the L like contributes importantly to the market analysis and product planning functions. This organizatio does not perform in the typical salesman fashion of presenting wares for sale, however, responsibility for complementing customer needs and requirements and company capabilities is centered here. Sales is charged with the responsibility for representing the enterprise to the customer in the development of a business relationship, for assuring that the enterprise is responsive to all requirements contributory to the finalization of a joint endeavor --- and for maintaining constant customer and enterprise satisfaction with the product or service. While sales and contracting are often considered to be a single function, in reality they are two distinct responsibilities, each requiring special skills. That is not to say that in some cases members of either organization could not make equal contributions to the other, just as individuals in engineering, production, sales and contracting, for instance, complement each other as members of a sales team.

Public Relations, as envisioned here, refers to that responsibility the enterprise has for attending to customer and general public needs which usually fall outside of the more direct channels which exist between the customer, on one hand, and contracting, sales and services on the other. Of primary importance is the link which Public Relations provides between the company and the portion of the public which directly or indirectly affects its future to assure that accurate and timely coverage of the company's activities is disseminated. This function should be established with its specific charter as an integral member of the marketing mix.

The final "doing" function is service. Responsibility for the product, of course, does not cease when delivery is made to the customer. On the contrary, complete customer satisfaction can only exist when the product is expertly and continuously supported even after it is in service. In truth, the product is the company in the minds of those using it, and therefore in the service area, more than in any other function of the marketing mix, the corporate image receives its most challenging test.

SYNTHESIS OF THE MARKETING ELEMENTS

We have not reviewed all of the elements that one could include in the marketing mix, but those mentioned are particularly worthy of consideration by our industry. We might have added sales promotion, sales training, dealer relations, warehousing, production scheduling and, in fact, finished goods inventory control. But whatever the elements one may include in the marketing mix, the important point is that there must be a complete understanding --- and an effective synthetis of these functions or "modern marketing" will not exist in the enterprise.

CONCLUSION

Now some of you here, particularly in the services, may well ask: What difference does it make if modern marketing exists in a defense enterprise? I am well aware of the solidly entrenched idea in government that the military services are never "sold" anything, rather---they "buy" systems that they know they want. From this viewpoint, marketing is regarded as nonessential, if not useless.

If the military establishment and the defense industries were small, I would agree with this. But they are not small. The number of people and dollars are, in fact, enormous. For the same reason that the town hall form of democracy in the United States had to evolve to representative government with the increase in size, so too have we had to move toward a representative form of liaison between government and industry. We are gathered here to improve that representation and liaison, to make it more factual, more orderly, and more objective. This, too, is exactly the purpose of marketing in the defense industries. It is a form of representation: first, the representation of military needs and requirements to the company, and secondly, a representation of the company"s applied technology to the military. I submit that when this task of marketing or representation is done in a factual, orderly and objective way, it produces several real advantages in the defense effort.

The benefits to the military services of an orderly marketing approach are:

1. More depth of effort is concentrated by the supplier on selected requirements of the services. That is, an overview of the market enables the supplier to select those future requirements most in line with company skill and capability. Having made a judicious selection, the company can concentrate technical effort on a few well-executed design studies, rather than scattering inadequate technical efforts across a host of requests for proposals as they happen to arrive in the mail.

2. The military service obtains a more factual statement of product advantages under an orderly marketing approach. When a company has a market plan, its "marketing mix" is organized to carry a more effective message of its technical recommendations to the customer. This effort takes the form of improved proposals and explanations which enable the services to do a better job of evaluation.

3. The company establishes a more continuing relation to serve the military well. The recognition of the modern marketing concept by management, from the first "seeing" of a new requirement to the final "doing" of field service and support, commits the company to devote all of its energies to providing the military services with systems that will be effective and reliable in operational use.

4. Company effort which is market or customer oriented achieves lower costs because it is selective, because it aligns customer needs with company skills, and because the final test of its effort is a usable product and a satisfied customer.

For these reasons, I submit that modern marketing practices including dynamic marketing planning are far from being non-essential. Instead --- only if these modern business practices are employed can industry properly put its skills at the disposal of the Department of Defense and, in the end, help provide for the national security of the United States.

COMPANY PLANNING IN THE DEFENSE INDUSTRY

Presented By

L. E. Root* and G. A. Busch**

Challenges to the Defense Planner

At the outset of this discussion, we would observe that the job of a planner in the defense industry (and certainly within the military establishment itself) is an exceedingly tough one these days. To point up this observation, we might examine some of the more important challenges that the planner faces:

Right at the top of the list is the state-of-the-art, which seem to be changing, in fact is changing, at an ever-increasing rate; on the basis of this factor alone, a company's over-all plan cannot remain fixed for long, but must be regularly and frequently looked at and updated.

Another challenge, and one that is surrounded with the greatest uncertainty, is the future trend in the East-West conflict. The complex intermingling of sabre rattling, of disarmament negotiations, of notorious scientific advances, of summit conferences, and the volatile shifts in the domestic political situations in certain members of this world's family of nations tempts one to plan by ground rule rather than by rationale.

Then there is the challenge of projecting military requirements. Responsive to the vagaries of the East-West conflict, and to the changing state-of-the-arts, estimates of future military requirements oftentimes tend to be short-lived.

Finally, there is the matter of the state of the budget. Here is a factor which, by contrast to the others, is stable; but this very stability in the face of changing technology and changing requirements creates a highly competitive aura within the defense establishment and within the defense contracting industry that the planner cannot afford to overlook.

So, from a company that has engaged in defense planning for a number of years, to any of you who may more recently have joined the ranks, may we say earnestly and sincerely that there is no "tried and true", or easy, or infallible pattern to be followed. But one can say with fair assurance that to be reasonably successful, a program of defense market planning must be a continuing program, and it must include a realistic appraisal of the technical outlook, an understanding of military needs, and an assessment of likely economic constraints. We shall return to this subject later.

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Controlling Parameters of Company Planning

Turning to the matter of over-all company planning, let's ask ourselves: How can planning be used to assist management in guiding the over-all course of a defense contractor's business? Fig. 1 suggests that there are several separable, but interacting planning functions typically at work. To focus these functions on the controlling parametersof over-all company planning, namely return on investment and growth, we have called out on the chart the sales forecast on the one hand and the programming and coordination of the company's resources on the other.

A good sales forecast depends upon planning that is both outwardly and inwardly oriented. Here, the outwardly oriented planning is concerned with the environment in which the company will compete. The results of such environmental planning manifest themselves in the form of projections of the potential demand in each of the company's product/market areas, and in the assessment of the likely characteristics of competition. On the inward side, planning is concerned with the projection of the company's capabilities to effectively capture a proper share of the potential demand in the face of the expected competition.

Turning to resources planning, we are here concerned with the preferred deployment of the company's technical resources, of its production base, of its marketing organization and its finances.

Company Planning Must Consider Both Military and Non-Military Business

It is not uncommon in the defense contracting business, for contractors to have both military and non-military product lines. In such cases, as the figure suggests, over-all company planning must recognize this fact and take account of the market opportunities, competitive situation, and resources requirements of both the defense and non-defense market sectors, in order to arrive at an optimal balance in terms of return on investment and growth.

With respect to the defense sector, in facing up to the task of over-all company planning, the changing requirements of the military customer and the advancement of technology indicate that marked changes in the characteristics of the company must be considered. In the traditional airframe manufacturing industry the shift in emphasis from manned aircraft to missiles and space vehicles has caused the typical company to noticeably add to and reshuffle its kit of skills. The aircraft-oriented weapon systems of a decade and more ago are being replaced with systems where technical excellence in fields like electronics and propulsion is every bit as important as the flight sciences. To remain competitive, the "airframe company" of yesteryear has found it mandatory to diversify its capabilities in consonance with the diversified requirements of its traditional customer, the military services. In simple terms one could coin an applicable phrase to express the situation: "Diversify or Die!"

Another factor of great import to over-all company planning stems from the fact that, barring a "hot war", the effective demand for the defense

industry's products is likely to grow at a somewhat lower rate than that for the U. S. economy as a whole. Accordingly, many defense contractors have seen fit, in their over-all company planning, to undertake programs of diversification in non-military product/market areas at the same time that they are building up diversified skills to better compete in the defense market.

Let's consider the case of the Lockheed Company, which for the past several years has been following what our board chairman, Robert E. Gross, has referred to as a "concentric" growth policy.

Under this policy, our basic skills as an aircraft manufacturer have been progressively enhanced through several paths along the traditional three-way route to diversification: broadening of our in-house skills, development of new products and new markets, and acquisition of new skills and experience. And in our acquisitions, we have aimed at such complementary skills as are necessary for us to take greater advantage of non-military situations that hold some affinity for our traditional skills.

When such opportunities are realized, the return is what we might call synergistic. In other words, the return on the combined skills can be made larger than the sum of the separate returns on the parent and the acquired skills. This has been called the "two plus two equals five" effect.

You may find the following brief review of the diversification steps which Lockheed has taken in the last year or so of interest in terms of the subject of over-all company planning. Here they are in chronological sequence:

November 1958. We began civilian production of the JetStar, first small corporate plane we have built since the 1930s.

December 1958. With Mexican industrialists, we formed an affiliate, Lockheed-Azcarate, to build light utility planes in Mexico.

March 1959. Lockheed Electronics & Avionics Division was created.

March 1959. We signed an agreement for West Germany to manufacture F-104G Starfighters under license. Canada, the Netherlands, Japan, and Belgium, subsequently selected the Starfighter for defense use and manufacture in their countries.

March 1959. Lockheed bought Puget Sound Bridge & Dry Dock Company, Seattle shipbuilding, ship repair, and heavy construction firm.

March 1959. Lockheed's role in Project Argus high altitude nuclear detonations was revealed. We later participated in space probes that identified and measured radiation in the Van Allen belt.

April 1959. We formed Lockheed Aircraft International as a wholly owned subsidiary to develop and expand foreign opportunities.

May 1959. Lockheed announced an agreement to acquire Stavid Engineering, versatile military electronics firm. Stavid became a wholly owned subsidiary in September.

September 1959. Lockheed was revealed as the principal contractor for three leading U. S. satellite systems, Discoverer, Midas, and Samos, all using our Agena orbiting vehicle.

October 1959. Lockheed Nuclear Products began National Aeronautics & Space Administration study of radiation at space temperatures.

December 1959. We agreed to buy a substantial minority interest in Aeronautica Macchi, Italian aircraft-shipbuilding-motor vehicle firm.

December 1959. Lockheed Electronics Company was formed to integrate our acquired and in-house electronics interests and further penetrate military and industrial markets.

January 1960. We began reconstructing a Navy ship for advanced oceanographic surveys, a step toward our underseas research goal.

January 1960. NASA selected our advanced Agena B for series of orbital flights that will put Lockheed for first time in the deep space probe business.

February 1960. Lockheed agreed to purchase a 50% interest and provide management assistance to Grand Central Rocket Company, the nation's fourth largest producer of rocket motors and solid fuels.

February 1960. We acquired Colby Steel and Crane companies adding to our abilities in steel fabricating, shipboard and land cranes, and materials handling.

Now you should not get the idea that just taking such steps as these leads automatically to growth, or to diversification, or to a payoff in profits. None realizes this better than do we as we start the immense job of digesting these expansion moves. We know that we have a big job ahead in integrating these new activities, nurturing them to substantial size, making them profitable, and unifying them so that they contribute to an improved return for our shareholders.

We expect the major part of our sales and earnings in the next few years to come from aircraft, missiles, and spacecraft -- the more traditional fields for our company -- but we hope that our diversification steps constitute a foundation for future growth. This is a tough league, and we are approaching it with deep humility -- "running scared".

In Figure 2 we show schematically how the structure of the Lockheed company is changing as a result of these recent moves. The inner ring is the traditional area of our company's business: By far the largest part of our volume is in the manufacture of commercial and military aircraft. In 1959 this was 48% of our volume -- but for the first time the proportion fell to less than half the total. Add to this percentage another 9% or so for aircraft modifications, repair, and services of various kinds.

In the next expansive ring is 39% of our business -- in missiles, satellites, and space research. And inthe outer ring is the remaining percentage represented by shipbuilding and general heavy construction

work -- a field that we entered less than a year ago -- and other peripheral activities.

You will notice, too, that our chart shows progress toward diversification even in our traditional fields. Aircraft manufacturing and service is diversifying into scientific and industrial products of various kinds, nuclear research and products, and electro-mechanical devices and instrumentation. And there is increasing emphasis in foreign aircraft sales and manufacturing programs -- to the point that we now have a substantial backlog in this area and are active in a dozen or so foreign countries.

And our newer ventures are diversifying. From the missile field we are moving into electronics, both military and industrial, and into propulsion. And in shipbuilding we are spreading into steel fabrication, cranes, and oceanography.

We fully understand that to bring these new activities to the full realization of their potential will take considerably money, management, technical effort, and time.

But the changing nature of our business has made such risk-taking necessary, we believe, if our company is to grow. Our goal in over-all company planning has been to select these diversification steps carefully so that they eventually, along with perhaps other new moves, will fill in a reasonably complete spectrum as we see it.

Clearly, non-military opportunities are of increasing interest these days to those concerned with over-all company planning in the defense industry. But, in keeping with the theme of this seminar, we shall concentrate on the defense side of the house as we discuss the evolution of company planning at Lockheed, and describe two selected applications of such planning.

Evolution of Company Planning at Lockheed

It is fair to say that over-all company planning has always gone on within the Lockheed organization as in all companies; however, prior to 1952 such planning was done informally by the Company's key operating executives. As their operating duties permitted, these executives would from time to time discuss our industry's problems and prospects with government, military, and civilian people. From such exchanges, and from their depth of experience in our business, these senior operating people planned and guided the affairs of Lockheed. However, late in 1952, recognizing the need to "provide more effective management of our company under new and changing conditions", Lockheed separated the over-all corporate functional and policy-making responsibilities from operating responsibilities. This move toward decentralization reduced the operating load on the Company's senior officers, and permitted them, as the newly constituted Corporate Policy Committee "to devote more time and effort to extensive long-range planning and the determination of basic policies." The Corporate Development Planning Department was established early in 1953, to provide staff support to the Policy Committee's long-range planning responsibilities.

In 1957 our Policy Committee decided to markedly expand the diversification studies underway in the Corporate Development Planning Department, and so a Diversification Task Force was organized in the late summer of that year. More recently, the company has found it timely to augment the market research activities of the Corporate Development Planning Department through the establishment of a Market Research Department under the Vice President-Sales. In addition to company planning at the headquarters level, defense planning in a somewhat narrower sense goes on throughout much of our line organization.

Two Applications of Company Planning at Lockheed

Against the backdrop of this brief description of the evolution of company planning at Lockheed, a couple of examples of how the results of such planning have been applied will be presented. Our first example concerns the Lockheed Missiles and Space Division. In World War II days, Lockheed began a program of research, development and engineering in the field of pilotless aircraft and their control systems. By 1953, when the Corporate Development Planning Department was established, the Company had established a competence in this new field. One of the very first projects undertaken by the Development Planning Department was a review of the U. S. guided missile situation, and a qualitative estimate of the outlook for this product/market area. Partly on the basis of the resulting recommendations of the Development Planning Department, and partly on the basis of management's intuitive recognition of the ultimate importance of a bolder approach to this new product/market area, Lockheed established a Missiles Systems Division in November of 1953. In the words of Mr. Gross's announcement, the "immediate effort of the new division will be in research and development, but our long-range objectives cover the design, development and manufacture of pilotless guided missiles and their systems." He further called for "expansion at once on all fronts of missile system research and development."

Another example of the application of company planning at Lockheed is manifested in the new corporate entity known as Lockheed Electronics Company. As in the case of missiles, Lockheed has been engaged in military electronics activity for many years. Our competence in electronics had its beginnings in the 1940's when we procured and installed large volumes of electronics systems in military and commercial aircraft. Such activity led to the design and redesign of a variety of electronics gear for practical application. In those early days we adapted electronics into a rocket-firing radar-autopilot combination that made possible the F-94 Starfighter series as an effective all-weather interceptor. Our P2V Neptune, introduced at the end of World War II, has electronic devices that even today make it a prime Navy aerial weapon for locating and destroying submarines. Our RC-121C and WV-2 flying radar stations, built for the Air Force and Navy, carry tons of radar and other electronic equipment to keep a look-out for approaching enemies and to help guide fighters to the attack.

In the 1950's, as Lockheed's missile capabilities grew at an increasing rate, so did our competence to undertake the research and development, engineering and production of military electronics systems. Responding to the apparent shift in the relative and absolute importance of electronics

in the military product/market area, Lockheed's Development Planning Department, Diversification Task Force and Missiles and Space Division carried out a series of planning studies in the middle 1950's which led to the establishment of an ad-hoc Electronics Task Force in 1958. As a result of the work of this ad-hoc group, and of the continuing work of the Diversification Task Force, Lockheed established a new Electronics and Avionics Division in early 1959, and acquired the Stavid Engineering Company later that year. As the Stavid acquisition was completed last September, we undertook several company-wide conferences, including all divisions and subsidiaries, for the purpose of finding ways and means to lessen duplication and make our total electronics program more effective. Concurrently, we reexamined the historical characteristics and future outlook of the electronics market.

We look for a continued rapid expansion in the demand for the products of the electronics industry, and we confidently expect that this market will double in size during the decade of the 1960's. Before discussing our present view of the military electronics outlook, we would call your attention to the industrial sector of the market shown on Figure 1. As you can see, we look for the industrial/ electronics/ business to turn up sharply in the middle '60's, and to exceed the military and space sector by the end of the decade.

It is our feeling that, reflecting the changing mix in weapons systems, during the next decade the level of procurement of electronics related to aircraft will steadily decline, whereas expenditures for electronics related to missiles and space vehicles and to their ground environments will increase by a factor of 2. During this period, research and development expenditures in the field of electronics are expected to increase by an order of magnitude, reaching an annual rate of more than $1 billion by 1970. As missiles and space systems become progressively more important, the share of the total DOD and NASA procurement and research and development expenditures that are devoted to electronics is expected to rise, from about 1/5 of the total in 1958 to perhaps 1/3 of the total by 1970.

As an outgrowth of this company-wide electronics planning, at the end of 1959 we combined Stavid Engineering and the Lockheed Electronics & Avionics Division into our new Lockheed Electronics Company.

The Lockheed Electronics Company (LEC for short) has four operating divisions organized to develop further the military competence we already have, and to build along the most logical lines possible to meet the requirements of government and civilian customers. The four divisions are supported by an LEC headquarters staff which, as shown on the slide, includes planning as one of its five functional groups.

The Military Systems-Stavid Division of LEC will do research, development, manufacturing and marketing of electronics systems and sub-systems in the government market area. Among the areas of concentration of this division will be air, ship and ground-based radar; ASW; fire control; and missile guidance. The Information Technology Division will engage in the development and marketing of systems and products dealing with the transmission, processing, storage, retrieval and display of data. The Avionics & Industrial Products Division will develop, manufacture and market devices related to aircraft and

missiles, as well as systems and devices designed to improve human productivity in processing of materials by utilizing automatic controls and product programming. The Engineering Service Division will provide field service on all LEC products and systems after the equipment becomes operational.

Some General Comments on Defense Market Planning

So much for the application of company planning at Lockheed. We shall conclude our remarks by presenting a few observations on the general subject of defense market planning.

Figure 3 graphically illustrates our view of the three pillars of successfull defense planning:

A realistic appraisal of the technical outlook

An informed understanding of military needs

A careful assessment of likely economic constraints.

We submit that the important challenge to planners in both the DOD and industry is the achievement of the preferred temporal phase-matching of technical feasibility and military requirements within the constraints of the military budget.

The assessment of likely economic constraints on the Department of Defense is a many-sided task, and many very able men are wrestling with it. For one thing, the economic outlook of the United States is of pertinence. Perhaps of even greater importance is the international political situation, particularly the likely trend in the East-West conflict. As suggested earlier, the inability of the best of planners to cope with the uncertainties in this area sometimes inclines one to establish what he considers to be the most reasonable ground rules regarding this key variable in order to carry forward the planning process. Then there is the U. S. domestic political situation which affects the resources available to the federal government, and the disposition of these resources among competing non-defense, as well as defense needs.

Turning to the technical pillar of defense planning, it is probably fair to say that technology, and its underlying basic and applied research, is of dominant importance in the achievement of a superior military posture. It has been said that technical eminence is a never-ending race; as Figure 4 suggests, the pace of this race seems to be quickening. Advances in technology, spawned by the work of our, and our adversaries', basic and applied research laboratories, permits of the development of weapons of war of ever-increasing effectiveness. At the same time such advances subject the existing inventory of weapons to a high rate of technical obsolescence.

For the moment entering the dream world, were it not for the fact of economic constraints, the planners in the military establishment and the defense market planners in industry might create a reasonably satisfactory analytical model as a tool for coping with their problems. If cost were no

object, the performance of the weapon systems in the active inventory could be made to always closely approach the state-of-the-art limit, through the costly processes of compressing design and production lead times and frequently replacing the active inventory with brand new models.

But cost is an object -- a very compelling object these days -- which brings us back sharply to the statement that the key challenge to defense planners is the achievement of the preferred phase-matching of technological feasibility and military needs within the constraints of the DOD budget. Figure 5 schematically illustrates this challenge.

Consider, if you will, that as a result of research programs underway here and abroad the state-of-the-art available to the system designer is inexorably advancing with time. The outlook for the state-of-the-art available is critically dependent upon when the snapshot of the outlook is taken -- for even the best of planners cannot foretell with certainty the trend in the normal evolution of technology -- much less the breakthroughs. Referring again to Figure 5, let's assume that the situation presented there is as viewed today, t_o. Based on our t_o assessment of the threat, of the trend in the state-of-the-art available and of the economic constraints likely to prevail, we estimate that a certain weapon system must be replaced by a new, advanced system at some certain date in the future, let's call it $t_{operational}$.

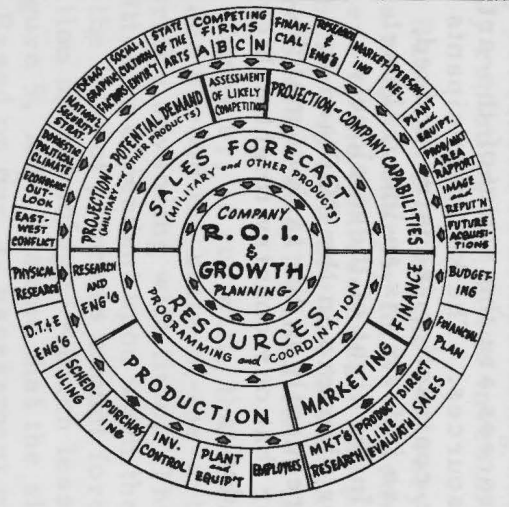
The military planner charged with laying the ground work for the introduction of an advanced system at time $t_{operational}$, or the defense contractor hopeful of successfully competing to supply a system to replace the existing system at $t_{operational}$, might visualize three alternative choices, let's call them System A, System B and System C. Consideration of System A may indicate that it offers performance characteristics noticeably superior to those of Systems B and C; but upon further analysis it may be apparent that the state-of-the-art required to bring System A into operation exceeds the state-of-the-art "available" at $t_{operational}$, and far exceeds the state-of-the-art "available" at the time that the decision must be made to go ahead with the design and production of the system to meet the operational date. In the overly simplified situation thus described, the prudent planner would reject System A. Similarly, he would likely reject System C on the basis that even though it is superior in performance to existing systems, and requires a state-of-the-art beyond that currently available, by the critical time $t_{operational}$ the performance of System C will be significantly inferior to other systems (such as System B) which can, with reasonable design and production lead times, be introduced by $t_{operational}$. So, on the basis of this schematic approach, a planner viewing the situation at t_o would likely conclude that his best bet is System B, and that he should be ready to participate in competitive study and proposal activity at t_1 with the goals of obtaining a contract at $t_{go\text{-}ahead}$ and providing an operational system at $t_{operational}$.

It should be noted that such planning based on today's assessment of the situation should be carefully reviewed at t_1, and at intervening periods, in order that it might be determined if the dynamic changes typical in the defense business have markedly altered the situation as it seemed to exist at t_o.

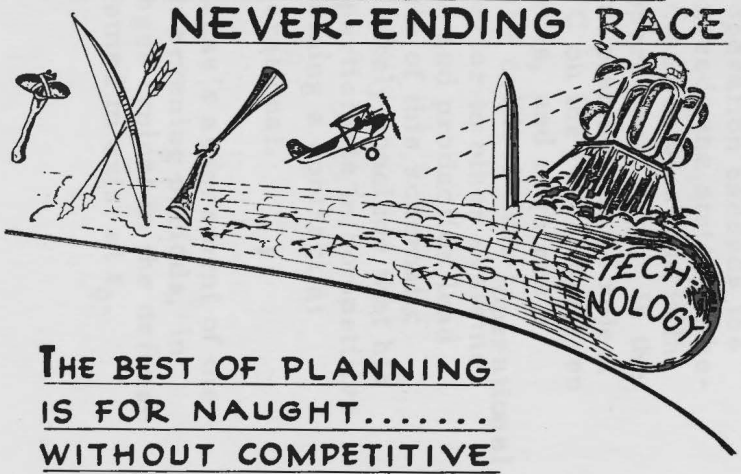
To sum up, this matter of planning in the defense area is clearly an iterative process. The key variables in the process are the state-of-the-art, the defense requirements and the available resources. The key participants are the military establishment and the defense contracting industry; indeed, it seems to us that in many respects the defense industry is an integral part of the over-all U. S. defense establishment. In the light of these closely related, common interests, it makes sense for planners in the DOD and in industry to cooperate ever more closely and frequently in the task of matching defense needs with timely systems in order that our country might achieve the maximum defense for the resources expended.

THE KEY PILLARS OF DEFENSE PLANNING

COMPANY PLANNING - *AN OVERVIEW*

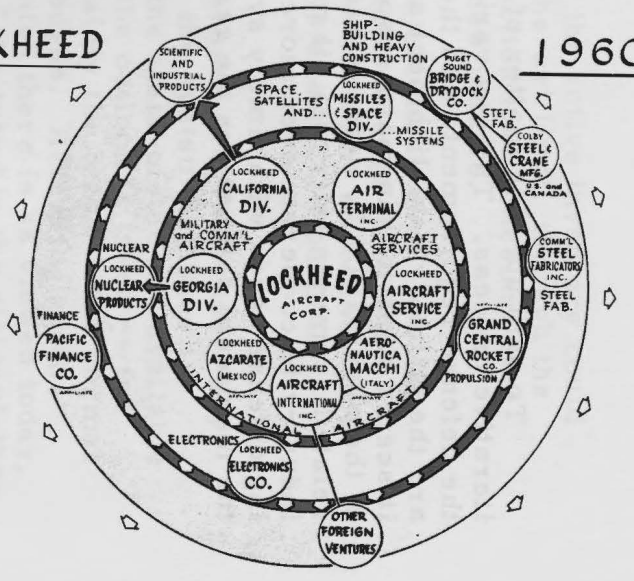


TECHNICAL EMINENCE IS A NEVER-ENDING RACE



THE BEST OF PLANNING IS FOR NAUGHT..... WITHOUT COMPETITIVE TECHNOLOGICAL BASE

LOCKHEED 1960



A KEY CHALLENGE TO DEFENSE PLANNERS:
PHASE MATCHING OF STATE-OF-ARTS -REQUIRED and -AVAILABLE

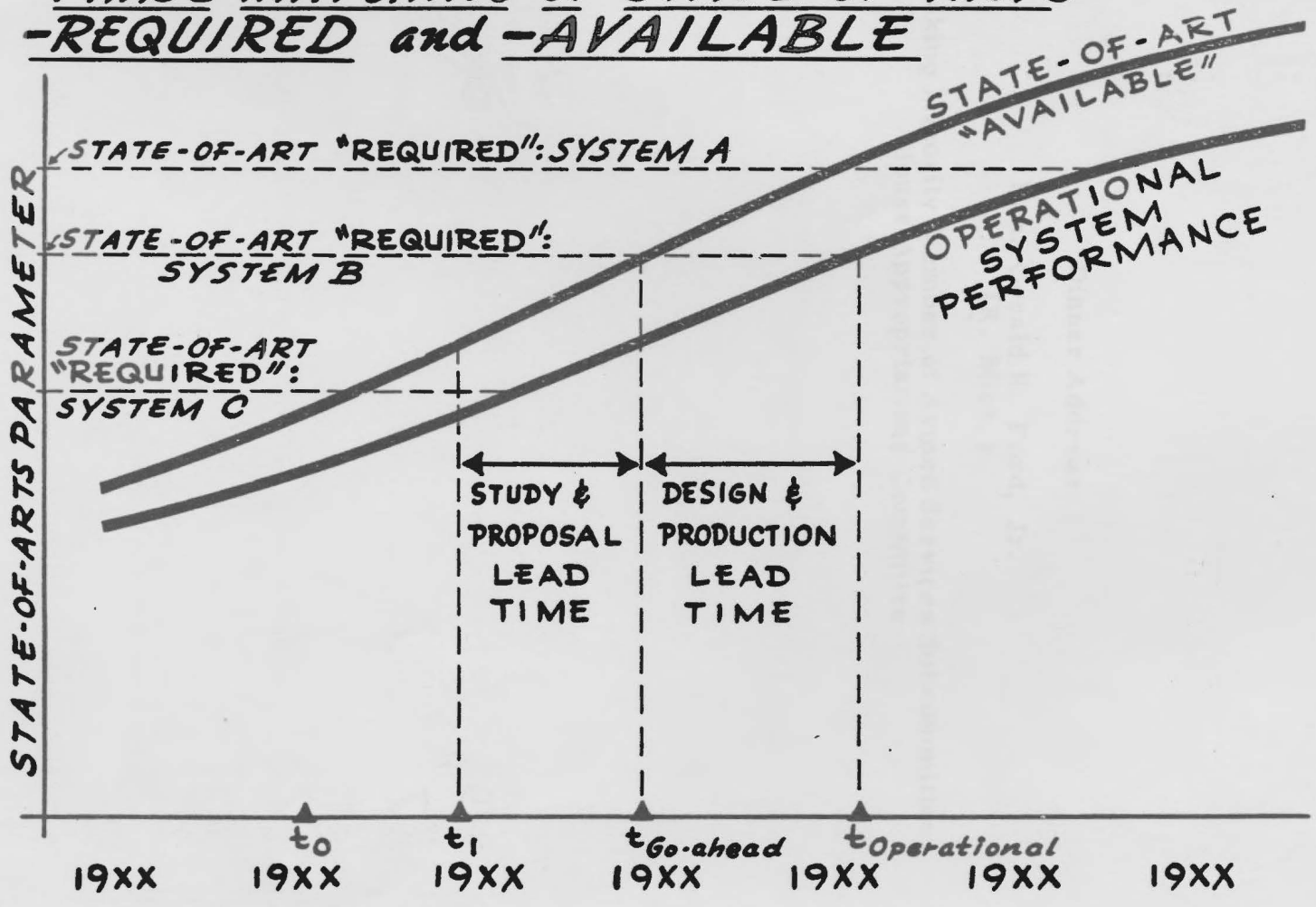


FIGURE 5.

Dinner Address

Hon. Gerald R. Ford, Jr.
(R. Mich.)

Ranking Minority Member of Armed Services Subcommittee
House Appropriations Committee

CONGRESSIONAL RESPONSIBILITY IN DEFENSE PLANNING

Presented By

Gerald R. Ford, Jr.

Mr. Chairman, participants in the Seminar on Defense Market Planning, and guests. It is a high honor and a rare privilege for me to have the opportunity to participate in this function this evening. But first I think I ought to set the record straight.

It is always dangerous for anybody in political life to appear under false colors, or to participate in an unfamiliar area.

I have strong aversion toward those in political life who place a halo over their heads and march down the road pushing people aside, just because of a reputation.

I had an experience a few years ago, when I first became a member of the House Committee on Appropriations, which certainly set the record straight as far as I was concerned.

Back in 1951 I was a member of the so-called River, Harbor and Flood Control Subcommittee, better known as the "Pork Barrel Subcommittee" on Appropriations. Back in those days, we were trying to curtail and reduce spending in so-called non-military areas, so that we could devote a greater part of our appropriations to the military effort in Korea.

The five of us on this subcommittee, both Democrats and Republicans, took a very stern and I think justifiable viewpoint that no new projects would be inaugurated in this next fiscal year.

We came to the floor of the House with an Appropriation Bill that was, to put it mildly, austere, and we thought our handwork was well done and something that would be universally acceptable.

Lo and behold, when we hit the floor of the House with this very tight budget, we were met with not universal support, but overwhelming condemnation by our colleagues.

Each of the five of us took our turn in trying to defend our handiwork.

Being the junior member of the minority side on this particular subcommittee, I came last in trying to justify our action. I took lots of books and papers down to the floor of the House to make this erudite exposition of why we had done what we had done. After speaking thirty minutes or so with considerable self-satisfaction

and pride in my own comments, I walked up the center aisle. I got about halfway up, and a good friend of mine, a Texas Democrat, reached over and grabbed my arm. He Said:

"Jerry, that is the best Texas longhorn speech I ever heard."

Quite frankly, I was apprehensive as to what he had in mind. But I asked him:

"Ken, what do you mean by a Texas longhorn speech?"

And he smiled very sweetly and he said:

"Jerry, down in Texas a longhorn speech is one that has two points far, far apart, with plenty of bull in between."

I can assure you I have been somewhat self-conscious and apprehensive about any speech I have made subsequently.

Now, to be honest with you, from past experience I would feel much more at home here this evening if I were making a purely political speech. Not that I necessarily do too well in that kind of an arena, but I can assure you I am more accustomed to that atmosphere.

I might say that, bearing in mind the tenor of this seminar, I resisted some temptation and rejected any such kind of a speech, because it is my impression and my feeling that you people here are in this seminar for other purposes.

However, I would also feel much more at home making a speech if I were presenting, as one of the members of our subcommittee, the Defense Department budget to the other members of the House of Representatives -- not because I am any real expert, but on a relative basis, I might know a bit more than some of my colleagues.

But I am a little apprehensive here this evening, because in talking to you people, I am faced with a very sophisticated, a very knowledgable audience, on issues that are certainly highly technical and very comprehensive in their scope.

I might also say that I feel a bit uneasy because I have met some of you in this distinguished audience and know others who represent a substantial portion of one of America's great industries.

In checking the facts and the records during the last week or so, I have found that the electronics industry is the fifth largest manufacturing industry in America. Secondly, it is an industry which, in the short span or relatively short span of fifty years, has grown from the invention of relatively simple vacuum tube to the phenomenal sales record of about eight billion dollars in production in a single year.

The magnitude of the electronics industry really does not hit the public with the impact that it should. Even some of us who deal with military appropriations on a day-to-day basis, year after year, five or six months each year, do not appreciate the situation as we should.

Just yesterday, Lieutenant General Authur Trudeau, Chief of Research and Development for the Department of the Army, said to our Subcommittee something which really opened my own eyes, and I quote.

"Electronics in general has seen a ten-fold increase since World War II and another ten-fold increase can be expected by 1970. This is the fantastic area of development where the old vacuum tube circuits are now being micro-miniaturized to one-tenth, one-hundredth, and one-thousandth of their original size and volume. This means a tremendous savings in bulk, weight and power requirements for an across-the-board application to all types of Army equipment."

This statement was highly significant to our Subcommittee and to me.

This was followed by another statement by General Trudeau's deputy, which made a tremendous impression on me.

"We know that if we go to war today, an Army Corps will have 23,000 electromagnetic emission devices in an area sixty miles on a side, whereas there were something like 9,000 such emissions or devices in use in 1958, in the same area."

These kind of facts and figures in very technical sense certainly make me apprehensive and a little bit uneasy when I try to talk to an audience such as this.

It seems to me, as I have read this summary of the history of the electronics industry, that it is truly an Horatio Alger industry. And furthermore, in my opinion, the industry could not have grown as it has by leaps and bounds unless there had been among you, before and now, individuals who in their own right are Horatio Algers.

It is my judgment and opinion that the electronics industry could not have grown with such spectacular success to the point where, one, it is one of the most vital contributors to our national security, or, two, it is one of the most essential elements in America's industrial growth and efficiency, or, three, it is one of the most helpful and beneficial contributors to our day-to-day enjoyment of the fabulous sixties -- without, one, the inventive and scientific geniuses that are with you, and two, the management wizards which I am sure must have been before and present today, and, three, the 700,000 skilled workers who produce the products of those who invent them and manage them.

I might also say that I feel a bit ill at ease tonight because in this distinguished audience there are members of the Army, the Navy and the Air Force team, who together make up the most powerful, the most versatile and the most alert military force in the history of the world.

The military history of the United States covers more years and more pages in our record books than the history of the youthful, or relatively youthful, electronics industry. Each of the military services has had its renowned leaders and its periods of greatest glory. Never once, to my knowledge, have our military leaders failed us in a time of crisis. I am confident that our military leaders of this era will give America the preparedness to maintain our national security in the months and years ahead.

Now, although I am a bit self-conscious in such a group of experts from two groups with distinguished records, I can say with conviction I am bolstered a bit by the fact that I speak to you tonight as a representative of the freest and, I believe the finest legislative body in the history of the world. It should be obvious to all of you that the Congress has its odd and sometimes time-consuming ways of doing things, particularly at the present time. But in our nation's history, I say with all the vigor at my command, that it has made its full share of contributions to our nation's progress and success. I can say without hesitation or qualification that in our comparison to all other legislative bodies in the history of man, its record is unmatched.

Now, thus far in my comments I have tried to be generous and complimentary to the electronics industry, the United States Armed Forces, and the executive branch of the government generally, and to the Congress.

In the past, each group or organization has met every challenge with a response that has overcome the obstacles of the day.

However, each of you know, as I do, that such success in the past does not insure victory in the future. We only win the battles of tomorrow, or the battles ahead, if we do the following things.

One. Admit our weaknesses and errors.

Two. Come up with some new ideas once in a while.

Three. Work together on mutual problems.

Four. Work just a bit harder.

Five. Dedicate ourselves ever increasingly to our American System.

Now, today in the series of seminar or discussion groups that you have participated in, covering a period of about twelve hours, as I figure out the schedule, you have attempted to seek methods of obtaining more defense per dollar through planning.

In all sincerity, I wish it could have been my privilege to be a listener in some of your discussions during the morning and afternoon sessions. I could have benefitted immeasurably by being in those discussion groups and listening to the comments made by you experts.

I am confident that whatever is accomplished by this meeting, or others comparable to it, will be derived from cooperative or joint effort.

My part of the program today involves what Congress can do to get more defense per dollar through planning.

As I sat thinking about what contribution I could make here today, I wondered how a Congressman could make a contribution in military planning. When I think of planning, I think of the long-range program that should be laid out and carried on. Now, in the House of Representatives, we have a two-year term, which is comewhat restrictive in how we can participate in a long-range project.

That reminded me of a story that was told to me by an older member of Congress the first year I served in the House, back in 1949. He had been in the House for thirty years, or thereabouts, and he came over and he sat down beside me on the floor of the House one day and he said, "Jerry, do you know the definition of a Congressman?"

Being very deferential to someone with all that seniority, and with my lack of it, I said, "No, I do not."

He said, "Well, the definition of a Congressman is the shortest distance between two years."

I can assure you that is true. And anybody who has that term of office can hardly in many respects make commitments on a long-range planning program.

But I do think that Congress as a whole, regardless of individuals, can make a contribution so that we can get, in my judgment, more defense per dollar through planning.

First, there should be a stabilization of funding at an adequate level.

Anybody who studies military appropriations over the last fifty years in the United States cannot help but be struck with the fact that our policy up until recent years was one of funding the military programs on a feast-or-famine, peak-and-valley basis.

Before World War II there were relatively limited appropriations made for the Army and the Navy. From that low level of funding, we went to the astronomical heights of $70 billion or $80 billion a year during World War II. At the end of World War II we went down to the valley of about $13 billion in military appropriations. The Korean War awakened us to the problems at our doorstep, and we zoomed back upward to an annual appropriation figure in the neighborhood of $60 billion or $70 billion per annum.

I think anybody who is objective will come to the conclusion that this feast-and-famine, peak-and-valley program of military funding is costly in time, it is costly in dollars, and, unfortunately, it is costly in American lives.

Such a program was abandoned in 1953, and since that period of time, a relatively high and relatively stable military appropriation program has been in being. I for one subscribe to and wholeheartedly endorse such a policy. Fortunately, the Congress has bought such a policy, although we seem to have from time to time some differences of opinion within limited areas as to what is enough or what is too much. But nevertheless, compared to the days before World War II, and compared to the days before Korea, our military appropriation program today is infinitely superior, both in stability and as to adequacy. This is a good program.

Now, this relative stability and relatively high rate of spending does not mean, in my judgment, that a military appropriation bill should be immune from Congressional investigation and Congressional action. As a matter of fact, under the Constitution, that is our responsibility -- those of us both in the House and in the Senate.

It is my judgment that in the main those directly responsible in the House and the Senate make a conscientious effort to exercise good judgment in this area.

I might also say that the threat or the reality of Congressional investigation of proposed funding programs helps to sharpen up a bit the programs that have been approved by the executive branch of the government.

I have talked individually with witnesses who have come before our Committee, and they have said that this experience of being interrogated by some by some of the sharper and more incisive members of our Committee makes them become more certain of the justification of what they are proposing to the Congress.

And so, through this process, I think we do get more defense per dollar in the United States.

Secondly, I think Congress can get more defense per dollar through prompt Congressional action on the annual appropriation bill for the Army, Navy and Air Force.

Most of you know that the President submits to the House and the Senate the budget in January of each year. It would be expected that this appropriation bill would become a matter of law by the beginning of the fiscal year, July 1. In checking the history of recent appropriation bills for the Department of Defense, I find this not to be the case - that only one out of the last ten military appropriation bills from fiscal year 1951 through fiscal year 1960 was enacted into law by the beginning of the fiscal year involved.

It was October in one year when the appropriation bill became law. And it seems to be traditional that the military appropriation bill will become law in either late July or August.

This, of course, puts the military appropriation bill well into the next fiscal year. As a matter of fact, it almost overlaps the preparation of the military appropriation bill for the next fiscal year, as far as the executive branch of the government is concerned.

It is my strong feeling that Congress could do a service to the executive branch of the government, the military and industry, if we would get the military appropriation bill out of the way, into law, by the beginning of the fiscal year.

It has been done as an exception. I can say to you that it looks like it will be done for fiscal year 1961 -- not because of the urgency of military matters, but because of the urgency of certain political matters.

Thirdly, I think Congress can get more defense per dollar if it would remove the requirement for annual authorizations, in addition to annual appropriations. As most of you know, in three areas today we require an annual authorization as well as an annual appropriation. One is in military construction. This has been traditional for some time. Since 1958 we have had this requirement as far as the National Aeronautics and Space Administration is concerned. Thirdly, since 1959 we have been faced, I might say, with the threat that this onerous task will be thrust upon us in the area of operational aircraft, missiles and ships.

I am a little prejudiced and I may be treading on dangerous ground, so I should not speak too lengthily on this subject. But for the life of me, I cannot see the necessity or the requirement for an annual authorization, in addition to the annual appropriation. I am positive that this double analysis and action by the Congress in these three vital areas - military construction, National Aeronautics and Space Agency, and aircraft, missiles and ships - will extend and expand the lead time in getting the job done.

A good example of that is the experience we had during the last session of the Congress, when the budget, the actual obligation authority for the National Aeronautics and Space Agency, did not get approved until the last days of the Congress. The reason for the delay in appropriations was the delay in approval of the authorization bill.

In the area in which the National Aeronautics and Space Agency operates, at least at the present moment, time is of the essence, and Congress, in my opinion, was negligent in imposing this dual submission on the executive branch of the government.

I hope that we see the wisdom of removing this requirement in the days ahead.

Now, this requirement not only extends lead time, which many of you people are trying to reduce, but it also adds to the cost of getting the job done.

I happened to be reading a trade publication the other day which reported some testimony before one of the House committees on this problem by Brigadier General Robert J. Friedman, Air Force Budget Director. I suspect that General Bill Lawton of the Army and Admiral Lot Ensey of the Navy would concur in these observations. But let me read what Bob Friedman had to say about this dual requirement.

"We cannot identify which dollars applied to a given aircraft procurement are new appropriations, which are recoupment dollars, or which are reimbursement dollars. In fact, any attempt to do so would require a complex and costly additional accounting system and would serve no useful purpose. Instead, the Air Force hopes to retain flexibility to increase or cut amounts applied to given line items of the program to allow for changes in requirement, changes in priorities, or technological development."

It seems to me that this annual authorization and appropriation action certainly is bound to add cost to our defense and related programs.

It is obvious, of course, that having to appear before four committees of the House and the Senate, rather than two, places an undue burden on those who have the responsibility of justifying and executing the programs. This is a waste of manpower, in my judgment, without any compensating benefit in the long pull.

So on the basis of lead time, cost and effort, it seems to me Congress could help in this area by doing away with the requirement for annual authorizations plus appropriations.

Fourthly, I think Congress can get more for the defense dollar by closer contact or liaison between industry and the legislative branch of the Congress.

Those of you who are familiar with the process that we go through each year know that the respective members of the House and Senate, in committee, get primarily the justifications given to us by the witnesses from the military and executive branch. I do not quarrel with the competence or the integrity of those who testify. But I do not think all the wisdom in these areas resides in those who come before us.

It seems to me that we, on a committee such as the one I serve, could benefit immeasurably from some assistance from industry.

Now, unfortunately, because we have had in the past some long and extended sessions of the Congress, it is not practical for us on the committee to get out and have opportunities to meet with industry as I think we should. And I do not believe that our committee, for example, should being in industry to testify before it, but we can accomplish the same result by a different method.

It would be my hope that if we have shorter sessions and more concentration, it will mean that our committee, and others, could individually and collectively visit industrial facilities, talk with those in industry, so that we get more than a one-sided or single-sided viewpoint. I think it would be helpful and beneficial to those of us on the committee who go through this process every year.

Fifth, I think Congress can get more defense per dollar if it would forget local geographical pressures.

Now, I admit at the very outset this is an idealistic and utopian prescription. But looking at the way the system operates, I find that in too many instances local interests are more interested in keeping a plant going that they are in the Defense Department getting the most for its money. And I also find that local interests -- and I admit they may be well-intentioned -- are sometimes interested in the continued production of products, despite the fact that those products in the rapidly changing world we are in may be obsolescent or obsolete.

It seems to me that in reaching for the new military objectives which we must consider our national survival will be the foremost and, I hope, exclusive prerequisite.

It is obvious to you, as it is to me, that Congress, on occasion, disrupts sound military planning and inevitably adds to defense costs if it succumbs to local pressures.

Sixth, Congress can get more defense per dollar if it would eliminate partisan policies for the consideration of defense policies, programs and fundings.

Again, I must admit that this may be a bit idealistic and utopian, particularly in a presidential election year. But I must say, and I say this with deep conviction and sincerity, that the chairman of our Subcommittee, Congressman George Mahon of Texas, in my judgment approaches the problems of defense spending and the problems of defense programming and planning as objectively as any member of Congress that I know. I do not always agree with him. But I can say that he sets a high standard that could well be followed by others in either the House or the Senate. And if such a standard were maintained, I am

certain and positive we would get more defense per dollar from the money that the taxpayers make available for these programs.

Seventh, Congress can get more defense per dollar if we do not hamstring, by inflexible legislation, the full utilization of knowledgable personnel, either civilian or military.

Many of you may not be familiar with the fact that last year, during the consideration of the appropriation bill for the Army, Navy and Air Force, on the floor of the House, an amendment was offered which read as follows, and I quote:

"None of the funds contained in this title may be used to enter into a contract with any person, organization, company or concern which provides compensation to a retired or inactive military or naval general officer who has been an active member of the military forces of the United States within five years of the date of enactment of this Act."

That was offered on the floor of the House without prior warning to our Subcommittee.

The first vote was 130 in favor of it and 131 opposed. That was a fairly close margin. On a subsequent vote, it was 125 in the affirmative and 147 in the negative.

It is almost incomprehensible to me to visualize the harm and damage that would have been done to our defense effort if such legislation had been enacted into law. But I say to you that Congress apparently, or at least one branch of the Congress, was somewhat tempted to enact such legislation last year.

The net result of the introduction of this amendment to the appropriation bill was the Hebert study and proposed action in the same area.

I am not an authority on what Representative Hebert and his subcommitted have proposed, but I say to you, as I have said to people elsewhere any restrictive legislation which limits the utilization of knowledgable people in my judgment would be harmful and detrimental to the defense program of the United States.

I am familiar with some of the arguments which have been made that certain things would result because of past contacts, friendships and so on. I happen to have more faith in the American people, in all areas, and consequently I have no fear of this threat as far as we are concerned.

Eighth, in my opinion, Congress can get more defense per dollar if we encourage invention, not roadblock it by restrictive legislation. The most recent area where Congress has, in my judgment, roadblocked progress, was in the National Aeronautics and Space Act of 1958. I trust this provision in the law will be amended.

At the outset, let me make this thought clear. No one can conceivably object to the normal procurements where proprietary rights are freely given by a company in those cases where the government supports all or a major portion of the research and development program. However, our individual scientists and our small businessmen need the protection of patents to give them both the incentive and the opportunity to prosper and to grow, to invest their time, their money and their prestige in enhancing our country's progress.

Our large industrial organizations need the protection of their proprietary rights, to give them the full incentives required to cause them to make large investments in well-equipped private laboratories, manned by highly skilled, trained and well-paid scientists.

Those people who propose the exclusive control and use of the patents by the government in commercial fields are mistakenly evoking the principle that the state should control basic rights, the know-how and the means of production.

The bald, cold facts of life are that if we wish to deter the Communists from overt military action, if we wish to defeat the Communists in the market places of the world, then we must fully implement our free enterprise system. We must provide every reasonable and proper incentive in profit and prestige to provide both technological advancement and high volume-low cost production.

My final point is that Congress can get more defense per dollar, perhaps, by the establishment, by legislation if necessary, of an independent and continuing National Defense Planning Group, which would encompass or have within it knowledgable representatives from industry, from the executive and military branches of the government, and the legislative.

Perhaps this again is utopian and idealistic, but it seems to me, as we face the threat that we do face, we must come up with something that could be helpful in the days and months and years ahead.

We know, perhaps in this group better than in others, that this country faces a full spectrum of challenges -- eduation, the growth and strength of our economy, our military posture. This challenge, it seems to me, can be met, but I do not think it can be met by sunshine soldiers or summer patriots. And you cannot make footprints in the sands of time by sitting down.

As we face the challenge, those of us here and our fellow citizens can be confident that if we rededicate ourselves to the principles that have brought us in America to the high level of success that we have today, we should have no fear for the future tomorrow.

Procurement Trends

STUDY GROUP ON 'SINGLY MANAGED' COMMUNICATIONS will probably turn out to be one of the busiest groups of studiers going, is going to have to work hard to come up with any results at all. Because of the basic nature of communications to any sort of military operations, each of the services has heavily vested interests, will be reluctant to let go of what they have.

TYPICAL ATTITUDE IS ONE OF SKEPTICISM, as expressed by one high-ranking communications officer: "What we have so far is agreement in principle, which isn't much of a trick to do. What is still needed is agreement in detail, and this is going to be tough."

OTHER ROUGH SPOTS IN THE ROAD THIS IDEA MUST TRAVEL include funding and dubious advantages to be gained. To make all existing long-haul communications compatible is going to run up a considerable bill for retrofit type work. Because communications use-rates in all three services are high—even in peace time—the amount of duplication to be eliminated is not all that it appears to be.

SMALL BUSINESS CONTRACTING IS AFFECTED under recent changes in ASPR's, with the requirement for Defense Business Subcontracting Small Business Clause now written into all contracts over $1-million which offer a chance for subcontracting. Short-form settlements on terminations may now be used for procurements up to $2500, instead of the former $1000.

MEASURE OF THE IMPORTANCE OF ASW TO THE NAVY is offered by one flag-ranker with the Atlantic Fleet: Almost all of the submarines we have in the Atlantic have anti-submarine warfare as their primary mission. This is because they are the best means to date of finding other subs, are not affected by so-called "thermal layers" in the water, which render sonar useless.

THE ERA OF SOLID-PROPELLED MISSILES comes nearer, with the Air Force announcement of a 1962 operational date for Minuteman, with first actual squadrons set for 1963. First Polaris is due this year, and by '62 the sub-carried missile should be available in some quantity. In Army's arsenal, first limited-range (35 mi.) test of Pershing announced as being successful.

LIGHT WEIGHT ITALIAN-MADE HOWITZER is generating wide interest, throughout NATO nations, appears likely to be incorporated in the Marine Corps inventory here. Weighing only 2,860 lbs., the weapon can fire an average 5½ rounds per minute, will disassemble to five man-carryable pieces.

EXCELLENT RATE OF RELIABILITY FOR BULLPUP is being claimed by the Navy—in the neighborhood of 90-95%. This is even more remarkable since the missile is unpacked, loaded and fired with no checkout. Navy claims savings because of this in the area of $7-million a year, and may apply it to other missiles. Air Force, meanwhile, has announced plans to put nuclear warheads on their version of Bullpup.

SHORT MILITARY LIFE FOR THE M1551 Ford-built aluminized jeep seems to be in the cards, with no money to buy the vehicle in this year's budget. On the other hand, the M38A1 version, built by Willys is working well with the Marines, with negotiations now in process for an added Marine purchase. In the same area, Marines seem to be paying more attention to the Mechanical Mule as a handy combat tool to have around.

Flexible Spending Bid Endorsed by House Group

House Armed Services Committee members tend to go along with a strong Air Force bid for retention of flexibility in a new law requiring double spending checks on operational aircraft, missiles and ships.

The group recently heard closed-door arguments that new legislation to place operational weapons under separate authorizations apart from the appropriations would require a complex and costly additional accounting system.

While the law will not take effect until fiscal 1962, this year Defense had to submit a preliminary report on all major weapon systems procurement and plans for financing them. Also requested was a plan to permit advanced authorizations of programs including long lead-time items.

Brig. Gen. Robert J. Friedman, AF Budget Director, warned of the problems in applying line-for-line authorizations on weapon systems. He said, "We cannot identify which dollars applied to a given aircraft procurement are new appropriations, which are recoupment dollars, or which are reimbursement dollars."

He continued, "In fact any attempt to so would require a complex and costly additional accounting system and would serve no useful purpose." "Instead," he said, "Air Force hopes to retain flexibility to increase or cut amounts applied to given line items (of the program) to allow for changes in requirements, changes in priorities, or technological developments."

Under the existing system, Air Force may reprogram up $5-million, or institute a new program of less than $2-million, without prior approval by the Secretary of Defense. Quarterly reprogramming reports are submitted to Congress.

To retain flexibility, Friedman urged that this process not be changed.

DOD Common-Use Items Will Transfer to GSA

Defense Department plans to transfer up to a million dollars a year worth of common use procurement items to General Services Administration within the next few years, Assistant Defense Secretary Perkins McGuire told a Joint Congressional Economic Subcommittee.

McGuire said GSA will probably buy about $650-million worth of DOD supplies in fiscal 1960. FY 1958 figure was $354-million. These are mostly commercial items purchased under formal advertised bidding procedures, he said.

But, McGuire said 68% of total procurement expenditures in fiscal 1959 under major weapons categories will continue under negotiated contracting procedures. McGuire said the increasing amount of defense money going into R&D rather than production means there will be no reversal of the trend to use of more cost-reimbursable type contracts.

He said that such contracts now represent 40.9% of military contract dollars. He added that it was defense policy to use this type of contract only when "the nature and perplexity of the procurement is such that the cost of performance cannot be estimated with reasonable accuracy."

GAO Charges High Costs In Nike Procurements

General Accounting Office has told Congress that "unreasonably high" prices were paid on more than $2-million worth of purchase orders for Nike missile parts. Specifically criticized were buying practices of Douglas Aircraft Co., Inc., a subcontractor on Nike-Ajax and Nike-Hercules air defense missiles.

GAO charged Douglas with accepting prices that were unreasonably high when compared with previous costs in ordering parts. As a result of the audit, both Douglas and Army have acted to tighten contract supervision, GAO said.

Parts were purchased from Aerojet General Corp., Radio Plane Co., and J. C. Peacock Machine Co.

Army has also revealed its original request for fiscal 1961 Nike-Zeus program was cut from $1.537-billion to $302-million by the time it was included in the President's Budget. The President's budget request includes $287-million of a total of $328-million requested for research, development, test and evaluation, $15-million for test facilities and nothing for either procurement or military construction.

Army had wanted $805-million for procurement and $389-million for construction. Also, Army is faced with an

SEMINAR ON DEFENSE MARKET PLANNING

Congressional Responsibility in Defense Planning

Introduction - Texas Longhorn Story.

From past experience I would feel more at home if:

(a) making a purely political speech--not that I do so well in that area but I'm more accustomed to that environment.

(b) making a presentation of Defense Department budget to the House of Representatives because I've had that privilege seven years. This is a more sophisticated audience.

Quite frankly, I'm ill at ease this evening because in this distinguished audience there are:

(1) Representatives of one of America's great industries.

(a) An industry that ranks 5th in manufacturing.

(b) An industry which in the short span of 50 years has grown from the invention of a vacuum tube to the phenominal sales record of about $8 billion in products in a single year.

(c) Lt. General Arthur G. Trudeau, Chief of Research and Development, Department of the Army, in recent testimony before the Defense subcommittee on Appropriations had this to say:

"Electronics in general has seen a tenfold increase since World War II and another tenfold increase can be expected by 1970. This is the fantastic area of development where the old vacuum tube circuits are now being microminiaturized to one-tenth, one-hundredth, and even one-thousandth of their original size and volume. This means a tremendous savings in bluk, weight, and power requirements for an across-the-board application to all types of Army equipment."

(d) Major General Wood, Gen. Trudeau's Deputy, had this to say:

"We know that if we go to war today, an Army Corps will have about 23,000 electro-magnetic emission devices in a square 60 miles on a side, whereas there were something like 9,000 such devices in use in 1948 in the same area."

The Electronics Industry itself is a Horatio Alger story. Furthermore there are many individuals in the industry who are Horatio Algers in their own right.

The Electronics Industry could not have grown with such spectacular success to the point:

(a) that it is one of the most vital contributors to our National Security, or

(b) that it is one of the most essential elements in America's industrial growth and efficiency, or

(c) that it is one of the most helpful and beneficial contributors to our day-to-day enjoyment of the fabulous 1960s.

Without:

(1) Inventive and scientific geniuses;

(2) Management wizards;

(3) 700,00 skilled workers.

Also, I'm ill at ease because in this distinguished audience there are:

Members of the Army, Navy, and Air Force team, who together make up the most powerful, versatile, and alert military force in the history of the world.

The military history of the U. S. covers more years and more pages in our record books than the history of the youthful electronics industry. Each of the military services has had its renowned leaders and its periods of greatest glory. Never once have these military leaders failed us in the past. I am confident our military leaders of this era will give America the preparedness to maintain our national security in the future.

Although a bit self-conscious among such a group of experts from two groups with such distinguished records, I am bolstered a bit by the fact that I speak to you tonight as a representative of the freest and finest legislative body in the history of man.

The Congress has its odd and sometimes time-consuming ways of doing things, but in our nation's history it has made its full share of contributions to our success. In comparison to all other legislative bodies in world history the record is unmatched.

Thus far, in my Comments

I have been complimentary to:

(a) Electronics Industry

(b) U. S. Armed Forces

(c) Congress.

In the past each group or organization has met every challenge with a response that has overcome the obstacle of the day. However, such success in the past does not insure Victory for tomorrow. We only win the battles ahead if we:

(1) Admit our weaknesses and errors.

(2) Come up with new ideas

(3) Work together on mutual problems.

(4) Work harder

(5) Dedicate ourselves to the American system.

Today

In a series of seminars and discussion groups, covering a period of about twelve hours, ~~the~~ you as participants ~~are~~ have been seeking methods of obtaining "More Defense Per Dollar Through Planning."

Wish I could have been with you. I could have benefitted as a participant.

To achieve the desired result.

This must be a JOINT EFFORT.

My part of the Program involves: Definition of a Compromise - Shortest Distance between Two Years

What Can Congress Do To Get More Defense Per Dollar through Planning?

(1) Stabilized funding at an adequate level.

(a) Peak and Valley - Feast and Famine
Abandonment - costly in dollars, time, and lives.

(b) Doesn't mean immunity from Congressional review.
Congress has responsibility to challenge all expenditures.

Well conducted Committee hearings where members are the Devil's Advocate can sharpen executive justification.

Congress can get More Defense Per Dollar

(2) Prompt Congressional action on legislation.

(a) Annual appropriation bill.

(1) Budget submitted in January

(2) Should become LAW by July 1st.

(3) Only one out of 10 of the Military Appropriations bills from F. Y. 1951 through F. Y. 1960 were inacted into law by the beginning of fiscal year. It was October in one year with late July or August the most likely.

Congress can get More Defense Per Dollar

(3) Removal of requirement for annual authorizations and appropriations.

(a) Military Construction

(b) NASA – 1958

(c) Operational aircraft, missiles, and ships. – 1959

Objections - Lead time – F.Y. 1960 NASA program.

Additional cost - accounting system (Friedman)

Duplication of testimony -

Congress can get More Defense Per Dollar

(4) Closer contact (liaison) between Industry and Legislative Branch. Limitation on Witnesses.

(a) Present system - long, unnecessarily so, sessions of the Congress preclude committee visits to laboratories and production facilities.

(b) Alternative -

I do not advocate "outside witnesses" before the Committee but the Committee individually and as a group, should investigate by "on-the-spot" trips.

Congress can get More Defense Per Dollar

(5) Forget local geographical pressures.

Idealistic and Utopian

Plants - Products - well intentioned local interests.

In reaching for new objectives we must consider first, foremost, and I hope exclusively, the prerequisites for national survival.

Congress disrupts sound military planning and inevitably adds to defense costs if it succumbs to LOCAL PRESSURES.

Congress can get More Defense Per Dollar

(6) Eliminate partisan politics.

Again Idealistic and Utopian

Congratulate - George Mahon
Sub-committee as a whole.

(7) Do not hamstring, by inflexible legislation, the full utilization of knowledgeable personnel - either civilian or military.

(a) Santangelo proposal

Division Aye - 130 Nay - 131 Teller Yea - 125 Nay - 147

Santangelo amendment:

(Offered to "Procurement" title of bill)

"General Provisions

"Sec. 301. None of the funds contained in this Title may be used to enter into a contract with any person, organization, company or concern which provides compensation to a retired or inactive military or naval general officer who has been an active member of the military forces of the United States within 5 years of the date of enactment of this act."

Congress can get More Defense Per Dollar

(8) Encourage invention, not roadblock it by restrictive legislation.

National Aeronautics and Space Act - 1958.

Congress can get More Defense Per Dollar.

(9) Establishment, by legislation, of an Independent and Continuing National Defense Planning Group.

Would include -
- Executive
- Military
- Legislative
- Industry.

Brig. Gen. Robert J. Friedman
Air Force Budget Director

"We cannot identify which dollars applied to a given aircraft procurement are new appropriations, which are recoupment dollars, or which are reimbursement dollars.

"In fact any attempt to do so would require a complex and costly additional accounting system and would serve no useful purpose.

"Instead, Air Force hopes to retain flexibility to increase or cut amounts applied to given line items (of the program) to allow for changes in requirements, changes in priorities, or technological developments."

At the outset let me make this thought clear: No one can conceivably object, to the normal procurements, where proprietary rights, are freely given by a company, in those cases, where the government supports all or a major portion, of the research and development program.

However, our individual scientists and our small businesses need the protection of patents to give them both the incentive and the opportunity, to prosper and grow----to invest their time, money and prestige in enhancing our country's progress.

Our Large industrial organizations need the protection of their proprietary rights, to give them the full incentives required--to cause them to make large investments in well equipped private laboratories manned by skilled highly trained, and well paid scientists.

Those people who propose the exclusive control and use of patents by the government in commercial fields are mistakenly evoking the principle that the state should control basic rights, the "know-how" and means of production.

The bald cold facts of life are--if we wish to deter the Communist from overt military action--if we wish to defeat the Communist in market places of the world--then we must fully implement our free enterprise system.

We must provide every proper and reasonable incentive--in profit and prestige, to provide both technological advancement and high volume, low-cost production.

September 15, 1960

Industry + Defense Planning

Mr. L. H. Orpin
Electronic Industires Association
1721 DeSales Street, N.W.
Washington 6, D. C.

Dear Lee,

Have been back in Grand Rapids for about a week now trying to get caught up on the necessary and essential aspects of the political situation. As you can imagine, between now and November 8 I andmost others in a similar situation will be mighty busy.

The net result is that I can't in all honesty give the proposed National Defense Planning Group idea the attention that it deserves. I am most unhappy that I did not have the time to follow through before adjournment, but it seemed as though during that period there was far too little time for anything but the necessary legislative and committee matters.

The net result of what I have said above is I just haven't had and will not have the time to do what I promised you and others I would. I am most apologetic. I only hope your Mr. Baker, Mr. Peterson and Mr. Trantham will understand.

After November 8 I will make a conscientious effort to really do something about this idea.

Warmest personal regards.

Sincerely,

Gerald R. Ford, Jr., M.C.

GRF:rm

Mr. Ford and Frank

8/9/60

Lee Orpin of R.C.A.

Called to say "Hello"

01/8/19

rm

ELECTRONIC INDUSTRIES ASSOCIATION

1721 DE SALES STREET, N. W.
WASHINGTON 6, D. C.

June 30, 1960

Hon. Gerald R. Ford
Room 351
House Office Building
Washington 25, D.C.

Dear Mr. Ford:

During your address to the EIA Defense Market Planning Seminar, you proposed the establishment of a National Defense Planning Group which would encompass the Legislative and Executive Branches of the Government, the Military Services, and Industry. The response to this suggestion from representatives both of industry and several government departments, has been most favorable.

The members of the EIA Military Marketing Data Committee, sponsors of the Seminar, agreed to examine the feasibility of such a group. I am happy to tell you that the report of our subcommittee is favorable to the establishment of a National Defense Planning Group. The report recognizes the presence of a void in national planning because no communication link exists between industry, the Administration, the Legislature, and the Services. The report emphasizes that the gap can be effectively filled, and recommends a structure to channel planning data.

The functions of such a group, in our opinion, should encompass spheres much larger than those of any single trade association or other group currently in existence. The members of this subcommittee therefore stand ready to assist the formation of a defense planning group as a matter of individual responsibility toward an improved defense effort.

I am attaching a draft memorandum setting forth in some detail, proposed activities and membership for this organization. We look forward to an early opportunity to discuss with you the appropriate steps toward implementation of this plan.

Yours truly,

L. H. Orpin
Chairman, Seminar Follow-up Committee
Military Marketing Data Committee

cc: The Committee:
W. E. Trantham (Hughes Aircraft Co.)
R. E. Peterson (Philco Corporation)
K. L. Baker (EIA)

Informed opinion in the United States believes that the Cold War will last for many years. Communism has marshalled its entire strength - military, economic, political, and propaganda - for the attack on the West. In order to meet this threat effectively the United States must attain maximum utilization of its resources. The objective can best be achieved through proper planning.

The Executive and Legislative Branches of the Government, the Military Services, and American Industry, hold joint responsibility for the maintenance and growth of a strong national defense. So great an obligation can be effectively discharged only if complete understanding and cooperation exist among these four groups. Introduction of the Industry contribution at an early point in planning would shorten reaction time in our total defense effort. Military requirements and industrial capability should be melded firmly under the guidance of Legislative and Administration policies at an early stage of development. Up to this moment, insufficient weight has been given to the use of industry's planning and development capabilities as a major asset of our national security program. The lack of formal communications between government and industry planners has left these important relationships to haphazard personal contact instead of a stable professional association. No link exists among the four responsible groups to ensure the full flow of information at the planning level.

The real need of industry for authoritative planning information is not recognized, yet the impact of national defense on American industry is immense. For example, over half the annual $10 billion of factory output in electronics is applied to military purposes. The aircraft and petro-chemical industries are similarly affected by defense requirements.

Our economic and military future is tied directly to development of new products evolved from research and development. Last year, $6.7 billion was allocated for R & D by DOD, AEC, and NASA. Proper exchange of planning information will lead to prompt utilization of our scarce research talent and capability, and minimize the peaks and valleys so often encountered in development activity. The cost to the nation of time, material, manpower, and money in achieving improved national defense can be reduced by coordinated forward planning. The establishment of a communication link among the four responsible groups is the first and fundamental step toward the optimum use of the nation's resources. We propose establishment of a National Defense Planning Group wherein the four responsible groups can jointly develop and implement plans to better achieve our national goals. Such a joint planning body is unique in U. S. history but, we believe, reflects today's need for optimum use of the nation's resources in the Cold War.

This organization might be chartered by the Congress and implemented by a joint Congressional resolution. Its primary objectives should be to increase efficiency of the defense effort by providing interchange of planning data:

1. to direct the course of research and development by industry.

2. to minimize the risk of misdirection of effort, leading to wasteful overcapacity.

3. to eliminate violent production fluctuations which contribute to higher dollar cost to the nation.

4. to promote speed and flexibility in meeting changing military requirements.

5. to advise industry on best areas of investment of scarce factors of production (plant, personnel, funds, etc.) to meet military requirements.

6. to indicate levels of capacity and capability of industry.

7. to identify areas of industry strength to be exploited and weaknesses to be corrected for maximum economic strength.

Membership should be drawn from the senior staff level of the Army, Navy, and Air Force; from responsible top level defense industry management; from the Executive - State Department, Bureau of the Budget, National Security Council; and from the Legislative - chairmen and minority party leaders of the Armed Services and Appropriations Committees of the House and Senate. Supporting panels, short-term in nature, would be formed as needed to handle special projects. Representatives of the four major groups with special competence in particular fields would comprise the panels. This organization should be supported by a high-caliber permanent staff.

We believe that the planning gap can be filled, and urge the establishment of a National Defense Planning Group at the earliest possible moment.

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TOP PLANNING GROUP SEEN

A single service National Defense Force has been proposed by Lt. Gen. C. S. Irvine (ret.), former Deputy Chief of Staff for Air Force Materiel.

Citing rapid technological advances as opposed to traditional military concepts, Irvine said such a National Defense Force would "provide operational and logistical flexibility so that the secretary of this defense force could assign military missions to appropriate commands and know that reasonable compatibility and capability existed. It would help eliminate duplication and parochial rivalry."

Irvine said such a force would allow a 50% cut in present DOD personnel and then "the 50% of the military in the Pentagon headquarters that spend their lives in frustrating coordination could then return to operations or logistics with the combat forces."

Irvine said, "I am suggesting here that we have within the Defense establishment a legally constituted board, authorized by Congress and integrated within the total defense procurement setup, to plan, recommend and direct specific actions regarding weapon system research, development, procurement and production."

SINGLE MANAGER NAMED

Secretary of the Army has been designated Single Manager for automotive supplies and for construction supplies.

Under the new assignment, Army will provide all three services with military automotive supplies which include such items as vehicular supplies and repair parts, tires and tubes, engine components and the like, and will provide military construction supplies which include repair parts for construction equipment, diesel engines and components, lumber and related construction items.

Agencies carrying out these assignments will be set up 1 June 1960, to become fully operational as soon as possible.

Also under Army responsibility will come decisions to buy, purchasing, cataloging, standardizing, distributing, and disposing of excess items in the system in these categories.

With the creation of these additional single managers, an integrated distribution system and uniform operating procedures are being developed to ease effective supply operations within the 8 single manager operations now established within the Defense Department.

A-PLANE FUNDS RESTORED

House Appropriations Committee has overruled the subcommittee decision to delete $58-million from Atomic Energy Commission's programed funds for aircraft nuclear reactors. It is in the reactor work that the nuclear powered aircraft program is having its greatest difficulties.

Committee spokesmen said "testimony taken by the committee shows that billions will be necessary to achieve ANP objectives. Prospective date for acquiring a useful aircraft is probably five to eight years in the future."

VINSON HEARINGS END

Hearings before the Vinson special House Armed Services Procurement Subcommittee have come to a close, with Defense Department stating that the Vinson bill to amend procurement laws would slow down military equipment purchasing, increase costs and create confusion in the weapons programs. DOD also said that detailed contracting information proves the worth of incentive contracting.

But in spite of this, Vinson concluded the hearings with instructions to his staff to work out "guidelines" detailing limits on the use of incentive contracts. He said a way to inculcate real incentive provisions and eliminate "bonuses" that are now awarded merely because the target price was too high in the first place must be found.

Stating the Defense Department position, Assistant Defense Secretary (Supply and Logistics) Perkins McGuire said DOD strongly opposes a clause to limit incentive payments to those contractors who can clearly demonstrate cost savings are due to their "skill, efficiency or ingenuity." McGuire said DOD wants all possible reductions and not just those described in the bill.

He said, "If we limit our sharing of cost reductions to those as to which such proof is possible, many other cost reductions would never be made because there would be no incentive for the contractor to make them."

McGuire said the Defense Department agreed with the subcommittee's proposal to establish as the intent of Congress that all purchases should be made by formal advertising whenever it is feasible and practicable. He said Defense is now revising its regulations to this end.

J. Edward Welch, deputy general counsel for General Accounting Office, told the subcommittee that agency generally supports provisions of the Vinson bill (HR 12299). He said the incentive contract is one type that "caused considerable difficulty in establishing fair and reasonable prices."

EMERGENCY FUNDS SEEN

The Senate Appropriations Committee has reported out a Defense money bill containing over $1-billion more in money for the Defense Department than the Administration originally asked for.

Recommended—and supported with funds—in the report were: (1) re-instatement of the B-70 bomber program; (2) speedy development of a reconnaissance satellite; (3) emergency-type funding for Atlas and Titan—to be used as needed—rather than increases in either of those programs.

Included in the Committee bill was $162-million in additional funds for Army modernization, $66-million extra for Navy aircraft and missiles, and $613-million in extra money for Air Force procurement.

Part of Navy's development money will go for development of a Vertical Take Off and Landing assault transport and further work on the Eagle/Missileer programs.

Advanced Research Projects Agency money amounted to $215-million, largely for Project Defender and propellent chemistry.

In voting the money for the B-70 program, the committee noted "This will be enough to provide the necessary funds to progress with the development of a fully modern, supersonic manned bomber. Without these funds as provided by the committee this development program would have been delayed for several years."

Calling it a matter of national emergency to move forward as rapidly as possible on a sound reconnaissance program, Senators added $83.8-million to the Samos program. This, in the committee's words, was enough to "accelerate to the maximum degree possible research and development efforts on the Samos reconnaissance satellite program." Senators felt that this money would be enough to chop nearly a year from the development time needed for an operational version of the sky-spy.

ADDRESS BY REP. GEORGE H. MAHON, OF TEXAS, CHAIRMAN OF THE HOUSE APPROPRIATIONS SUBCOMMITTEE ON DEFENSE, AT THE ELECTRONIC INDUSTRIES ASSOCIATION GOVERNMENT-INDUSTRY DINNER, STATLER HOTEL, WASHINGTON, D.C., MARCH 20, 1958.

THE OUTLOOK FOR DEFENSE SPENDING

After World War II we, as Americans, felt pretty relaxed and secure. We more or less took the attitude that there would not be another war, and even if one should come we were so strong and everyone else was so weak it would not amount to much.

Defense programs and defense spending went down, down, down.

Some objected more or less strenuously, but the general trend was otherwise. Our top civilian and military leaders, the printed records will show, were testifying that we were spending for defense about all the economy would stand. Some said we ought to spend a billion or so more per year, but there was nothing big or spectacular in the picture.

Then came Korea and the disillusionment. Appropriations and spending sky rocketed. A period of a greater degree of awareness of the danger set in and defense spending on a more or less long range basis was raised to a higher plateau.

Last October 4 the first Soviet earth satellite was fired and a few days later the second satellite began to orbit. We were humiliated and embarrassed, angry and frightened. Actually, we didn't behave in a very mature manner, but most people now agree that the shock was good for us.

The Democrats blamed the Republicans and the Republicans blamed the Democrats and they both blamed the Pentagon. This is standard procedure -- always in order!

Nearly everybody wanted to spend quickly about $100 billion, more or less -- any necessary sum in response to the new danger which confronted us. We had hearings galore from shore to shore and everybody was talking about outer space. The interest in what is admittedly a desperately important problem was terrific for weeks.

On January 31, 1958, the Army bailed us out a bit by launching the Explorer and this week the Navy breathed a sigh of relief heard round the world when it launched the baby Vanguard. The little Vanguard wavered up the sky so calmly, climbing like a golden bean stalk and with the speed of Silky Sullivan in the home stretch.

Things are getting back to normal, blood pressures are down now and people would be talking about economy again and cutting the defense budget except for one thing, the deepening recession.

Let's talk about that a bit. Yesterday we passed a resolution calculated to speed up defense spending.

The object is to encourage the Defense Department to spend quickly, but wisely, the defense funds already appropriated for essential national needs. The by-product would be increased employment of labor and industry.

Our objectives are good but there is a danger here. Serious repercussions would result if we should make it appear to our people and the people of the world that we are using our defense program merely as a pump priming WPA sort of thing. This would put us in a bad position before the world and give the Soviet Union a psychological advantage. The Soviets would say that we have not been serious in disarmament talks and in inspection policy demands. They would say we had been play-acting for world opinion -- that we had to prepare for war in order to avoid internal collapse.

There is always a trend toward change in any country. In a dictatorship, inclosed in an iron curtain, the dictators can more or less maintain the status quo through the control of propoganda. But in a democracy such as ours, where there is complete freedom of thought and speech, there is public reaction to every major newspaper headline. Changes in public opinion are precipitous and dramatic. Public opinion has its ups and downs, highs and lows. It is "On again, off again, gone

again Finnegan." It is too bad that in the Soviet Union the forces of human nature are not left free to react in a similar way -- one of the great hopes of the future is that this may some day be true.

In this country we have to recognize the forces of our democracy and act accordingly. To skyrocket our defense program into the clouds at this time would be futile. We are going to operate on a high plateau as long as the present danger exists and that will probably be a very long time, but a program born of fear and hysteria could not exist for long. We love peace and we tend too much toward complacency. It would be wasteful and hurtful to defense to go too far and too fast for a few months and then come tumbling down in a slump of defense effort -- an even sustained program on a somewhat higher-than-the-present level is our best hope.

We need a good healthy Pentagon reorganization, but I am not so sure we are going to get it. I hope so, because we could get more for our defense dollars and there is always going to be, in peace time, ome sort of arbitrary limit or ceiling on defense dollars.

Of course there will be changes in direction of the dollars. We are moving toward smaller divisions, more reliance on missiles and less reliance on conventional weapons. The Navy has mothballed the last battleship and the day of the super carrier is probably numbered insofar as new construction is concerned. The Navy did not ask Congress for a super carrier in the pending 1959 budget, though certain long lead time items are requested -- the brightest spot in the Navy is the so-called Polaris submarine. Congress has bought it lock, stock and barrel and the Navy will have no trouble financing what appears to be the best deterrent weapon in the Navy arsenal.

Anyway you look at it the picture is bright for the electronics industry. Of course, I am not in favor of the Pentagon giving anyone in the industry a contract just to give industry a shot in the arm. Hard contracting and strictly business ought to be the order of the day. We ought to let the weak operators fall by the wayside and adequately reward initiative and good management in small business, and even in big business. We need both kinds, but we do not need wasteful, slipshod operations anywhere.

Is it true what they say about the multitudes in the Pentagon who can say no and the very few who can say yes?

Is it true that committee is piled on committee, organization levels piled on organization levels, and that the wheels of progress are thereby being slowed down?

Does it make sense for the fabricators of missiles and other weapons to boast about the number of parts in a single weapon? Wouldn't it make a lot more sense to boast about a reduction in the number of parts and a greater degree of reliability? Is it true that if for every 1 million words spoken about reliability we had an increase of 1/10 of 1% in reliability, the reliability rate would be over 100%

Is is true that the weapon system concept of procurement is as sound as the defense people maintain that it is? Could it be that in contracting for a weapon system the services could get more by using greater discretion in employing the best people in each field of industry to produce the weapon system? Is there room for improvement here?

It has been said that a politician can never admit a mistake. Is it true that the Defense Department can never and will never admit mistakes and that an abrupt slash in defense appropriations every few years is needed in order to give defense officials an excuse for cancelling low priority projects that should have been cancelled long before? Is it true that the Navajo project could have just as well been cancelled at an expenditure level of 100 million dollars rather than 7 hundred million dollars at a later date?

Industry and the military have just got to get together and make weapons and equipment simpler and cheaper. Even if Congress adopts the Cordiner Report, we could never get enough people in the services to maintain and operate these complex weapons toward which we are moving. Many of the people who are doing business for

the Department of Defense, the engineers and executives, do not know too much about the requirement factor of competitive business. All of their working lives they have been engaged in cost-plus or cost-is-no-object-as-long-as-we-get-results types of engineering and production.

Maybe the Russians are unsophisticated and don't use as much chrome but some say they are able to operate with less lead time. It has been said that the Russians are unsophisticated and that they engineer simpler and cruder weapons.

I wish you people could find a way to communicate to Congress your best thoughts on the matter of Defense, and procurement, and contracting, and the other aspects of military preparedness. At dinners, people talk about what is wrong with the Pentagon, but nobody does anything about it.

In your meetings you should draft ideas and suggestions and make them available to us in Congress in order that we might work with you to get more for the defense dollar.

$40 billions — the approximate fiscal year 1959 budget — is a lot of money even to Americans and it should be spent with great care. All those persons connected with defense spending can be told the best way in which to get the most for our money. But this will take the concerted effort of our military suppliers — you in this room tonight — to so inform the Pentagon and the Congress.

It was good you could be together this evening and exchange ideas. I am honored and pleased that I could be with you on this occasion. We are all working for this country and for the same ideals. In my judgment we will march forward having put our shoulders together, and I want to congratulate you on the fine job your industry has done in the past and will continue to do in the future. The Electronic Industries Association and its member companies should be proud of its achievements. Its future accomplishments will be even greater, I am sure.