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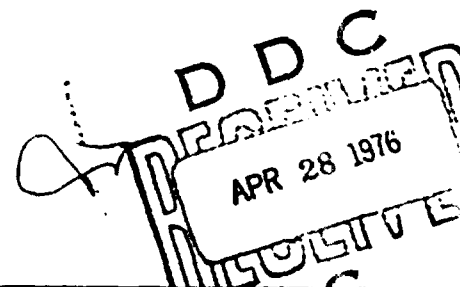
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# Competition in the Acquisition of Major Weapon Systems: Legislative Perspectives

Michael D. Rich



A Report prepared for

UNITED STATES AIR FORCE PROJECT RAND

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| REPORT DOCUMENTATION PAGE                                                                                                                                        |                       | READ INSTRUCTIONS<br>BEFORE COMPLETING FORM                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------------------------------------------|
| 1. REPORT NUMBER<br>R-2058-PR                                                                                                                                    | 2. GOVT ACCESSION NO. | 3. RECIPIENT'S CATALOG NUMBER                               |
| 4. TITLE (and Subtitle)<br><br>Competition in the Acquisition of Major Weapon Systems: Legislative Perspectives                                                  |                       | 5. TYPE OF REPORT & PERIOD COVERED<br><br>Interim           |
| 7. AUTHOR(s)<br><br>Michael D. Rich                                                                                                                              |                       | 6. PERFORMING ORG. REPORT NUMBER                            |
| 9. PERFORMING ORGANIZATION NAME AND ADDRESS<br>The Rand Corporation<br>1700 Main Street<br>Santa Monica, Ca. 90406                                               |                       | 8. CONTRACT OR GRANT NUMBER(s)<br><br>F44620-73-C-0011      |
| 11. CONTROLLING OFFICE NAME AND ADDRESS<br>Project AIR FORCE Office (AF/RDQA)<br>Directorate of Operational Requirements Ofc.<br>Hq USAF, Washington, D.C. 20330 |                       | 10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS |
| 14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)                                                                                      |                       | 12. REPORT DATE<br>November 1976                            |
|                                                                                                                                                                  |                       | 13. NUMBER OF PAGES<br>83 70                                |
|                                                                                                                                                                  |                       | 15. SECURITY CLASS. (of this report)<br><br>UNCLASSIFIED    |
|                                                                                                                                                                  |                       | 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE                  |
| 16. DISTRIBUTION STATEMENT (of this Report)<br><br>Approved for Public Release; Distribution Unlimited                                                           |                       |                                                             |
| 17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)<br><br>No restrictions                                                |                       |                                                             |
| 18. SUPPLEMENTARY NOTES                                                                                                                                          |                       |                                                             |
| 19. KEY WORDS (Continue on reverse side if necessary and identify by block number)<br><br>Competition<br>Government Policies<br>Weapon Systems<br>Procurement    |                       |                                                             |
| 20. ABSTRACT (Continue on reverse side if necessary and identify by block number)<br><br>see reverse side                                                        |                       |                                                             |

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A Examines the prospect of promoting greater competition in the acquisition of major weapons systems from the perspective of the Congress. Congressional support for the use of competition derives from its promise of both direct and indirect benefits. The primary direct benefits are lower prices and greater technological achievement. An additional perceived benefit stems from the view that competition insures fairness. Factors militating against support for greater competition include increasing interest in interservice commonality, inherent antipathy toward efforts involving significant near-term expenditures, the evolution of defense spending into an important tool of social and economic policy, and the relationships of the Congress to the defense industry and the military. A hard sell of the net cost benefits of any advanced acquisition strategy will miss its mark if it is (1) repressive in terms of the flexibility it accords to the Congress, or (2) not supplemented by appeals to considerations other than cost savings. (Author)

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| DISTRIBUTION/AVAILABILITY CODES |                                                   |
| Dist.                           | APPROPRIATE SPECIAL                               |
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14 R-2058-PR

11 November 1976

9 Interim rept.

6 Competition in the Acquisition of Major Weapon Systems: Legislative Perspectives.

10 Michael D. Rich

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PREFACE

The Congress has always monitored defense policy, but until the early 1960s its participation in systems acquisition matters was primarily after the fact. When systems procurement costs of billions rather than tens or hundreds of millions of dollars became common in the 1960s, Congress began to participate actively in the system selection process. Ordinarily, Congress acted through budgetary channels; withholding, altering, or otherwise constraining the funds requested by the Department of Defense was, and remains, the usual control device. Such control has been even more generously exercised in the 1970s, and Congress now routinely inquires not merely into questions of reasonable cost but into matters of requirements, system alternatives, and force structure.

Through the instrumentality of the Commission on Government Procurement, the Congress undertook (from 1969 to 1972) to define processes and procedures for systems acquisition. The establishment of a Congressional Budget Office (CBO) in 1974 was intended, in part, to give the legislative branch a counterpart of the analytic and evaluative capability earlier embodied in the Executive Branch Office of Management and Budget (OMB) and its predecessor the Bureau of the Budget. In a sense both were forced into being by the apparent successes of the Office of the Assistant Secretary of Defense for Systems Analysis, an organization created in 1964 at the instigation of Defense Secretary Robert McNamara. Systems Analysis represented a mechanism by which the Secretary of Defense could understand and assess the reasonableness of systems and funding levels proposed by the individual services: First OMB and later CBO had to develop similar capabilities if they were to cope with the kind of analysis introduced by Systems Analysis. Without such skills, neither the Office of the President nor the Congress could deal adequately with the increasingly complex issues that arose in system selection and acquisition processes in the late 1960s and early 1970s.

The consequences of such institutional developments deserve careful study as does an attendant enlargement of technical understanding among senators, representatives, and the staffs of the several committees concerned with the system selection and funding process. Plainly, acquisition strategies, processes, policies, and institutions are now being affected in ways that were all but inconceivable as recently as a decade ago.

This report addresses one important aspect of congressional intervention: congressional attitudes toward competition between would-be contractors for major weapon systems. Congress has persistently expressed a conviction that competition is somehow beneficial to the systems acquisition process. It is important to understand how competition is defined in congressional usage, and the qualifications that may be attached to it.

This report, prepared as part of the Project RAND research project "System Acquisition Policy Studies," should be of interest to a broad sector of the Air Force planning and systems acquisition community.

SUMMARY

It is widely believed that greater use of competition in the acquisition process would help combat the rising costs of modern weapon systems. Two advanced competitive strategies have been suggested. One is to maintain multiple contractors through the later phases of development. A more ambitious proposal, one designed to inject more rigorous price competition into the procurement of major systems, calls for a new round of bidding for the contract to produce the winning entry from a previous design competition. This report examines the factors affecting the prospect of congressional acceptance of such advanced strategies.

Although congressional references to competition are abundant, the subject rarely finds its way into legislation. During the period studied (CY 1969 to the present), there was but one apparent attempt to legislate competition (at the initiation of the International Fighter Aircraft, or IFA, program); there was also one instance of a congressional mandate that sought to suppress it (the requirement that the Navy Air Combat Fighter be derived from the Air Force Air Combat Fighter).

There is considerable imprecision in the use of the term "competition" that is not limited to the Congress. Rand work in the 1960s used "competition" to refer to price competition, and "rivalry" to refer to technical or design competition in which both price and non-price considerations were taken into account. Rivalry is sometimes subdivided according to the state in which the designs are presented--e.g., paper or prototype competition. The Department of Defense is aware of the distinction between competition and rivalry, but itself calls any acquisition competitive unless it has been sole source throughout its entire development and procurement history. Members of Congress rarely if ever observe the Rand distinction. Both rivalrous selection, used for major systems, and price competition in the context of second sourcing are recognized to be forms of competition. However, protests that too few defense dollars are spent on "competition" often focus somewhat narrowly on formally advertised procurement (price competition) alone. The imprecision may not be significant since, as discussed below, the

academic or theoretical definitions of such terms are inadequate to convey the nature of the selection process actually in use.

Congressional support for the use of competition derives from its promise of both direct and indirect benefits. In theory the major direct benefits are lower prices and greater technological achievement (a better product). Most congressmen seem to appreciate that different varieties of competition promise to yield these benefits in varying degrees. A more interesting question involves the benefits assumed to inhere in particular acquisition strategies. There is, for example, a distinct preference for prototype competition over paper competition. Of particular interest is the evidence of a "carry-over" effect: It is evidently believed that if the source selection date is delayed long enough, so that the configuration of the system is substantially established under "competitive pressures," the benefits of the rivalry in the design phase (in the form of better performance) will "carry over" (in the form of lower prices) into the production of the system.

The value attached to direct benefits does not adequately explain the motivation behind Congress's one attempt to legislate competition in the IFA program. The competition requirement was enacted after the program had begun as a sole-source procurement, the unusually abbreviated competition made it likely that the initially chosen source would prevail, and there was no obvious interest within the Congress in the nature of the competition conducted. The IFA acquisition was not particularly suited to competitive procurement.<sup>1</sup> It is possible that competition for major weapon systems contracts involves an additional and indirect benefit or attraction (indirect because it does not bear on the particular system that is the subject of the contract). Congress apparently regards the awarding of large and long-term contracts without competition as giving the appearance of unfairness (to the rest of the industry), so that an additional and indirect benefit stems from the view that competition, in whatever form, is the functional equivalent of equity.

<sup>1</sup>Technological superiority was a negative criterion; the primary criteria were the speed with which delivery could be begun and the immediate cost; there was only one operative aircraft that fit the bill.

Several factors militate *against* congressional support of the use of competition. First, the growing importance of foreign sales has enhanced the desirability of commonality among services and systems. Reduction of the unit cost of systems already in development or production to attract foreign sales may inhibit competition by inhibiting the development of new systems.

Second, it is not easy for members of Congress to "internalize" the future benefits that otherwise make advanced competitive strategies involving greater initial outlays attractive. In seeking to preserve their seats, those congressmen who are sensitive to increased expenditures in the near term may not view such strategies as self-serving and may withhold support for them. There are also indications that the considerable deference generally paid to the services on questions of weapon development will on occasion result in lessened support for competitive acquisition. Service inclinations are usually to get weapons sooner rather than later, so the Congress could conceivably balk at the time slippages implicit in various acquisition strategies when confronted by service dedication to a single system (or contractor) or by service emphasis on declining force levels.

Third, there is some evidence of apprehension that unfettered competition could lead to attrition among prime contractors--a concern that seems to transcend simple constituency interests. Related to this concern for the defense industrial base is the evolution of defense spending into a tool of social and economic policy. System characteristics and enemy threat are rarely the exclusive considerations when initiation or termination of a program is contemplated. The greater the weight attached to non-price and non-technical considerations (so-called distributional considerations, such as employment effects), the less urgent will seem acquisition strategies that seek to maximize design and price competition.

In practice, because of the attention paid to distributional considerations, competitive acquisition of modern systems bears little resemblance to the academic or analytic concepts of price competition and rivalry. Consciously or otherwise, the Congress appears to value a flexible approach compatible with preserving the defense industrial

base, upholding constituent interests, and using defense spending as a tool of fiscal policy. Congress would not favor rigid price competition that would close off non-price and non-performance considerations. Moreover, any hard sell of the cost benefits of any advanced competitive acquisition strategy will miss its mark if (1) the strategy clearly reduces congressional flexibility, or (2) it is not supplemented by appeals to considerations other than cost savings.

ACKNOWLEDGMENTS

For helpful comments on earlier versions of this report, the author is indebted to Rand colleagues Arthur J. Alexander, Geneese G. Baum-  
busch, Robert F. Coulam, Edmund Dews, Alvin J. Harman, William R. Harris  
Iao M. Katagiri, Benjamin S. Lambeth, Allen D. Lee, Frederic A. Morris,  
Nancy Nimitz, David Novick, Robert L. Perry, and Benjamin Zycher.

The author accepts responsibility for any remaining errors in fact  
and interpretation.

ABBREVIATIONS

|        |                                                           |
|--------|-----------------------------------------------------------|
| ABM    | Antiballistic Missile                                     |
| ACF    | Air Combat Fighter (eventually F-16)                      |
| AFSC   | Air Force Systems Command                                 |
| AMSA   | Advanced Manned Strategic Aircraft (forerunner of B-1)    |
| ASPR   | Armed Services Procurement Regulation                     |
| AWACS  | Airborne Warning and Control Systems (E-3A)               |
| COD    | Carrier on Board Delivery                                 |
| CY     | Calendar Year                                             |
| DoD    | Department of Defense                                     |
| DSARC  | Defense Systems Acquisition Review Council                |
| FY     | Fiscal Year                                               |
| GAO    | General Accounting Office                                 |
| IFA    | International Fighter Aircraft (eventually F-5E)          |
| I&L    | Installations and Logistics                               |
| IR&D   | Independent Research and Development                      |
| JLC    | Joint Logistics Commander                                 |
| LWF    | Lightweight Fighter                                       |
| MAP    | Military Assistance Program                               |
| MIRV   | Multiple Independently Targeted Reentry Vehicle           |
| NACF   | Navy Air Combat Fighter (eventually F-18)                 |
| OFPP   | Office of Federal Procurement Policy                      |
| O&M    | Operations and Maintenance                                |
| OSD    | Office of the Secretary of Defense                        |
| R&D    | Research and Development                                  |
| RDT&E  | Research, Development, Test and Evaluation                |
| RFP    | Request for Proposals                                     |
| RFQ    | Request for Quotations                                    |
| SST    | Supersonic Transport                                      |
| STOL   | Short Take-Off and Landing                                |
| TDP    | Technical Data Package                                    |
| UTTAS  | Utility Tactical Transport Aircraft System                |
| VFAX   | Navy Designation for Forerunner of NACF (once called VFX) |
| V/STOL | Vertical/Short Take-Off and Landing                       |

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## I. INTRODUCTION

For several years, researchers have addressed the problems posed by the immoderate costs of modern weapon systems.<sup>1</sup> In what most readers hoped was a spirit of exuberance, one critic calculated that if the unit cost of military aircraft were to continue to rise at its present rate, in the year 2036 the United States would be able to afford just one aircraft.<sup>2</sup> Whatever its outcome, thus far the increase in cost has significantly contributed to the sharp decrease in the number of aircraft purchased. From FY 1974 through FY 1976, the U.S. Air Force has budgeted for just 541 fixed-wing aircraft.<sup>3</sup> Unfortunately, the need for substantial quantities of aircraft is not declining. In the most recent Middle East war, for instance, 443 aircraft were lost by both sides in just 18 days.

Particular attention has been directed at improving the way weapon systems are acquired.<sup>4</sup> Typically, producers of major weapon systems are selected on the basis of paper designs or prototypes in a non-missionized stage of development. Once the preferred design is chosen,

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<sup>1</sup>Published Rand reports on the subject include Robert Perry et al., *Systems Acquisition Strategies*, R-733-PR/ARPA, June 1971; Gregory A. Carter, *Directed Licensing: An Evaluation of a Proposed Technique for Reducing the Procurement Cost of Aircraft*, R-1604-PR, December 1974; Geneese G. Baumbusch, *The Impact of Required Contractual Clauses on System Acquisition Policies: The Case of Value Engineering*, R-1722-PR, September 1975.

<sup>2</sup>This observation is taken from many of comparable import in an article by Norman R. Augustine, now Under Secretary of the Army, entitled "One Plane, One Tank, One Ship: Trend for the Future?" *Defense Management Journal*, Vol. II, No. 2, April 1975, pp. 34-40. See also *Commanders Digest*, Vol. 18, No. 3, 17 July 1975.

<sup>3</sup>*Air Force Magazine*, Vol. 59, No. 5, May 1976, p. 139.

<sup>4</sup>Admittedly, characterizing any problem as one of high costs has a latent pitfall. It fails to distinguish the product that costs "more than it should" (owing perhaps to inefficiency or excessive profit) from the product that does not cost "more than it should" but nevertheless costs more than the potential buyer is able or willing to pay (owing perhaps to the buyer's poverty or opportunity costs). The attention paid to the acquisition process is for the most part responsive to the first situation.

the designer is awarded a contract to continue the process through series production. Selection of a single source so early in the life of the system has several consequences. Because important design changes are made after most source selections,<sup>1</sup> many decisions having considerable effect on system cost, performance, and availability are made in a non-competitive setting. In addition, awarding the production contract to the winning designer (whenever selected) without competition ignores the possibility that another firm could *produce* the system more efficiently.<sup>2</sup> The narrow use of contractor competition is widely regarded as a prominent deficiency in present acquisition practices.

The weapon acquisition process is so complex as to be impossible to understand fully or to describe using only one perspective or examining just one aspect. The process involves not only many important and diverse actors but also many issues to which there are at once scientific, strategic, economic, political, and moral facets. To date, Rand's studies in systems acquisition policy have concentrated on the technological aspects of program creation, approval, and management.<sup>3</sup> As exhaustive as efforts in this vein are, significant portions of the process are necessarily neglected. In particular, problems are studied and recommendations are offered without an exploration of the role played (or to be played) by the branch of government charged with the penultimate responsibility for acquiring new weapons--the Congress. Since some of the strategies designed to inject more competition into

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<sup>1</sup>Every fixed-wing military aircraft since the F-100 has had significant post-contractor selection design changes. On this point, see B. H. Klein, T. K. Glennan Jr., and G. H. Shubert, *The Role of Prototypes in Development*, The Rand Corporation, RM-3467/1-PR, April 1971, pp. 3-4. This is an unclassified version of a 1963 report.

<sup>2</sup>Even if the winning designer is also the most efficient producer, awarding the production contract without competition theoretically invites monopoly pricing for production units, spares, follow-on buys, etc. A related danger is that competing designers will try to "buy in" by bidding unrealistically low, hoping to arrange a negotiated increase or to recoup on subsequent buys.

<sup>3</sup>Recent examinations of acquisition policy with broader scopes include J. Ronald Fox, *Arming America*, Harvard University Press, Cambridge, Massachusetts, 1974; Murray L. Weidenbaum, *The Economics of Procuring Defense*, Praeger, New York, 1974.

weapons acquisition involve fundamental policy changes, examination of the subject from the congressional perspective can enhance evaluation of new proposals. Insofar as congressional attitudes toward competition reveal a concern for considerations other than cost, they are potentially relevant to a variety of proposed changes.

The approach adopted here is non-normative. Competition is not a guarantee of lower costs. Always present are other variables, such as the type of competition, the contracting methods, and the characteristics of the acquisition. Even then, competition may not be the "best" way to achieve savings: using off-the-shelf technology or promoting inter-service commonality or international standardization are three among many possibilities. Nor may motives and reasons for actions be ignored. To the extent that objectives or purposes are identified and imputed to the Congress as a whole, the wisdom of the actions taken by the Congress is not at all the issue. The focus is on the actions taken and the options considered or available as indicators of the place that competition occupies in the minds of those who approve the procurement process for any system.

This report covers the period from 1969 to the present. It is true that the development, procurement, and deployment of weapon systems is a seamless, continuous process, making it difficult to isolate distinctive eras. For the purposes of this inquiry, however, the choice of 1969 as a starting point is appropriate. The period includes the post-Vietnam return to peacetime force requirements, and it encompasses most of the acquisition histories of most of our current mainline systems (F-14, F-15, A-10, F-16, F-18, etc.). Moreover, it coincides with the major personnel and doctrinal changes that accompanied the Nixon administration. The influence of very recent developments is not assessed. Two new bodies, the Office of Federal Procurement Policy in the Office of Management and Budget<sup>1</sup> and the Congressional Budget Office,<sup>2</sup> will probably affect the weapon acquisition process in time, but both are in their infancy and their effects cannot be known.

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<sup>1</sup>Created by Public Law 93-400, 88 Stat. 796 (30 August 1974).

<sup>2</sup>Created by Public Law 93-344, 88 Stat., 297 (12 July 1974).

Section II presents brief case studies of congressional efforts relating to competitive source selection. Section III summarizes revealed congressional perspectives on issues relating to competition, with emphasis on the identification of competing considerations and external restraints.

#### CONGRESSIONAL RESPONSIBILITY FOR WEAPON SYSTEMS ACQUISITION

The responsibility for weapon systems acquisition within the Congress is fragmented and largely undefined.<sup>1</sup> The great bulk of responsibility is assigned to those responsible for the defense appropriation process, namely the Senate and House Armed Services Committees and the Department of Defense Subcommittees of the Senate and House Appropriations Committees. For the most part, the members of these committees are the only congressmen to take an active, public interest in the subject. Taken together, these congressmen constitute roughly one-seventh of the Congress. Other committees involve themselves with related issues from time to time. Most notable of these are the Federal Spending Practices, Efficiency, and Open Government Subcommittee of the Senate Committee on Government Operations,<sup>2</sup> and the Joint Economic Committee.<sup>3</sup>

<sup>1</sup>The literature on the Congress's role in the formulation of defense policy is extensive, although specific treatment of acquisition policy issues is rare. For excellent discussions of the general nature of the Congress's influence on defense policymaking, see Edward J. Laurance, "The Changing Role of Congress in Defense Policy-Making," *Journal of Conflict Resolution*, Vol. 20, No. 2, June 1976, pp. 213-253; Les Aspin, "The Defense Budget and Foreign Policy: The Role of Congress," *Indulius*, Vol. 104, No. 3, Summer 1975, pp. 155-174; George C. Gibson, "Congressional Attitudes Toward Defense," in Richard G. Head and Ervin J. Rokke (eds.), *American Defense Policy* (3rd Ed.), Johns Hopkins Press, Baltimore, 1973, pp. 358-369; Arnold Kanter, "Congress and the Defense Budget: 1960-1970," *American Political Science Review*, Vol. 66, No. 1, March 1972, pp. 129-143.

<sup>2</sup>See Senate Committee on Government Operations, Subcommittee on Federal Spending Practices, Efficiency, and Open Government, *Weapon Systems Acquisition Reform, Hearings*, 94th Cong., 1st Sess. These hearings were held in May, June, and July 1975.

<sup>3</sup>See Joint Economic Committee, Subcommittee on Priorities and Economy in Government, *The Acquisition of Weapon Systems, Hearings*, 93d Cong., 1st Sess. These hearings were held in Fall 1973.

The Senate Foreign Relations Committee and the House International Relations (formerly Foreign Affairs) Committee annually address defense issues but usually do not consider the subject of weapons acquisition.

Thus, concentrating this examination on the defense appropriation process, with attention to conspicuous relevant efforts of other committees, does succeed in capturing a substantial portion of congressional treatment of issues relating to competitive procurement of weapon systems.

The depth of treatment of such issues is of necessity less than what might be desired for the purposes of a study of this nature. For example, floor debates on the authorization and appropriation bills seldom cover more than a few national issues each year. During recent years, these have included riders for Indochina and Angola funds cut-offs; the ABM, Cheyenne, and C-5A weapon systems; the Trident submarine; and chemical and biological warfare research. Even attention to hearings presents a set of problems. First, because of the volume of business undertaken during limited hours, the hearings of any single committee or subcommittee are usually sparsely attended by the members themselves. Second, few in attendance question witnesses extensively, leaving much of it to professional committee staff members. Third, questions asked by a congressman do not necessarily reveal his or her personal interest since many are written by staff members.<sup>1</sup> The result is that the amalgam of comments, questions, statements, and opinions that emerges is not clearly representative, nor is it clearly complete. That expertise and expressions of interest on a given subject are so limited within the Congress is inherent, but it need not mean that there is an inadequate foundation upon which to offer conclusions. Analysis of what turns out to be a small sample of congressional viewpoints will be conclusive where that group of congressmen determines congressional action and will, at worst, simply be subject to the qualification that the balance of power on any decision is held by a disinterested or non-vocal majority.

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<sup>1</sup> This fact is probably unavoidable and at any rate is never concealed. Sen. Stuart Symington (D-Mo.) once told David Packard between questions, "We have an excellent staff. Many of the questions are drawn up by them." Senate Committee on Armed Services, *Advanced Prototype Development, Hearings*, 92nd Cong., 1st Sess., p. 35. See also Kenneth Entin, "Information Exchange in Congress: The Case of the House Armed Services Committee," *Western Political Quarterly*, Vol. 26, No. 3, September 1973, pp. 434-436.

### THE MEANINGS OF COMPETITION

A by-product of the increasingly abundant expressions of interest or statements of opinion on the subject of competition is that mastery of innumerable acronyms is no longer the primary semantic hurdle in the study of the weapons acquisition process; it is now the understanding of the usage of the word "competition."

It is important to identify the setting of the word and its multiple interpretations. This report concerns source selection decisions and the process leading up to them. The structure of the industry that participates in the process and the comparative military postures of nations are not paramount interests, although each is suggested by the term "competition." Full treatment of the subject of the competitiveness of the U.S. defense industry is not attempted,<sup>1</sup> nor is the question of international military competition addressed. The broad concept of "competition" discussed in this report refers to any situation in which more than one firm seeks to be awarded the same contract.<sup>2</sup>

So far as work at Rand is concerned, there is a somewhat prescriptive set of terms and definitions. The most basic differentiation isolates competition based on the price of the item from competition based at least in part on non-price criteria. Over a decade ago, Johnson and Hall suggested that "competition" should refer only to price competition and that "rivalry" should be used to describe both price and non-price competition.<sup>3</sup> Rivalry in which the selection criterion is the design of the weapon system is sometimes broadly referred to as technical or design competition. A further line can be drawn according to the state

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<sup>1</sup>Therefore, such measures as the Emergency Loan Guaranty Act of 1971, Public Law 92-70, 85 Stat. 178, are not discussed. Dedication to a competitive industrial structure does help to explain congressional attitudes toward competitive source selection, however, and this is explored.

<sup>2</sup>A more comprehensive definition might be: any situation in which more than one firm seeks to be awarded one of a number of contracts. This would encompass recent competitive prototyping programs, the first part of which finds five or so firms seeking to be awarded one of two contracts. Examples include the A-X, Lightweight Fighter, UTTAS, Advanced Medium STOL Transport, and Advanced Attack Helicopter programs.

<sup>3</sup>R. E. Johnson and G. R. Hall, *Public Policy Toward Industrial Structure*, The Rand Corporation, RM-4570-PR, May 1965, p. 11.

in which the design is presented: paper competition, prototype competition, and so on. In the cases where synonyms for rivalrous selection include the word "competition," pure competition is frequently termed "price competition."

Department of Defense spokesmen recognize the distinction between price and design competition<sup>1</sup> but will combine the concepts if questioned about competition in general. Moreover, DoD subscribes to the belief that once there is competition or rivalry of some variety for a system, procurement of the system is forever competitive, even if follow-on buys are conducted in a sole source environment. Thus, in DoD parlance, "competition" characterizes all but sole source acquisition of brand new systems.

Definitions and distinctions observed in Rand reports have been presented to Congress on a number of occasions. In fact, the work by Johnson and Hall that suggested the distinction between rivalry and competition is reprinted in its entirety in a volume of hearings held by a subcommittee of the Senate Judiciary Committee.<sup>2</sup> However, members of Congress have not adopted these distinctions. Similarly, few congressmen honor the categories that the Defense Department uses in its statistics of modes of procurement.<sup>3</sup> Usually when a legislator cites a number as "the percentage of total DoD expenditures spent on 'competition'," he is equating competition with formally advertised procurement

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<sup>1</sup>DoD considers price competition to exist if "offers are solicited and (i) at least two offerors, (ii) who can satisfy the government's requirements, (iii) independently contend for a contract to be awarded to the responsive and responsible offeror submitting the lowest evaluated price, (iv) by submitting priced offers responsive to the expressed requirements of the solicitation." Joint Economic Committee, Subcommittee on Priorities and Economy in Government, *The Acquisition of Weapons Systems, Hearings*, 93d Cong., 1st Sess., pp. 2712-2713 (prepared statement of Arthur I. Mendolia, Assistant Secretary of Defense (I&L)).

<sup>2</sup>Senate Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, *Competition in Defense Procurement, Hearings*, 90th Cong. 2d Sess., pp. 537-597. These hearings were held in 1968.

<sup>3</sup>Appropriations are categorized as follows: "formal advertising," "other price competition," "technical and design competition," "follow-on after price competition," "follow-on after design competition," or "one source."

and nothing else.<sup>1</sup> Consistent with that, condemnation of negotiated procurement is common. An example is this statement by Rep. William H. Harsha (R-Ohio):

It is certain that this peculiar procedure known as negotiation lies heavily at the fatty heart of the whole military procurement problem. Its most outstanding features--competition restriction and dollar-waste--are nurtured, perpetrated, and protected by the secretly arrived-at, sole-source, noncompetitive contract awards which flow, directly and regularly, from the negotiation process.<sup>2</sup>

In terms of the distinction between negotiation and formal advertising, DoD recognizes a middle ground--competitive negotiation--into which conventional rivalrous selection based on technical proposals would usually be classified. Only in protests that too few defense dollars are spent on "competition" does Congress tend to ignore this middle ground.

Compounding this imprecision and inconsistency, acquisition of major systems usually involves selection criteria not covered by either set of definitions but nevertheless acknowledged within the Congress. The task of overlaying congressional notions and inclinations on articulated concepts requires a simplifying synthesis of terms. Competition is best used as a generic term encompassing all the other terms used to denote the evaluation criteria to be used: price competition (in which the determination is based solely on price), design competition or rivalry (in which both price and design characteristics are relevant), and an unorthodox term to be introduced, political competition (in which the criteria include distributional considerations as well as the price and the design).

Advanced competitive acquisition strategies take one of two forms. One might be more precisely termed an "advanced rivalry strategy." It calls for prolonged funding of two or more contractors, each developing its own design. Rather than choosing a source during the validation

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<sup>1</sup>Example: Senator Proxmire's statement that "of all our procurement, only 11 percent is competitive." *Congressional Record*, 17 August 1970, p. 29212. See also *Congressional Record*, 30 July 1970, p. 26633.

<sup>2</sup>*Congressional Record*, 12 June 1969, p. 15762.

or advanced development phase<sup>1</sup> (the usual method), each contractor would continue its work through the full-scale or engineering development phase.<sup>2</sup> This is being tried on a fairly small scale by the U.S. Army in the UTTAS helicopter program. The other form of advanced strategy is more than an extension of present practice. Its objective is to create price competition. One way this might be done is to insert a clause in initial development contracts that would require the developer to agree to license his design to any producer designated by the government. Known as directed licensing, this strategy would permit a design competition to be followed by a round of competition among potential producers for the contract to produce the chosen design.<sup>3</sup> One of the purposes of this report is to illuminate likely congressional response to such advanced concepts.

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<sup>1</sup>This is an early stage in the life of a weapon system. The emphasis during this time is on exploring and demonstrating the technical feasibility of the design approach. Prototypes may or may not be constructed during this phase. Although the terms are often used interchangeably, advanced development is actually the budgetary label for the money used to fund the validation phase. The validation phase is preceded by a concept formulation phase and a program review by the Defense Systems Acquisition Review Council (DSARC), known as DSARC-I.

<sup>2</sup>This phase follows the validation phase and another DSARC review (DSARC-II). Here the emphasis is on identifying, demonstrating, and documenting a satisfactory engineering approach. During this phase tooling is built and operational and support concepts are developed. Engineering development is an older term used originally only when no commitment to production had been made (when a commitment had been made, the term was operational systems development). Full-scale development is the modern term and combines both concepts.

<sup>3</sup>See G. R. Hall and R. E. Johnson, *Aircraft Co-Production and Procurement Strategy*, The Rand Corporation, R-450-PR, May 1967; G. R. Hall and R. E. Johnson, *Competition in the Procurement of Military Hard Goods*, The Rand Corporation, P-3796-1, June 1968; Carter, *Directed Licensing* (1974).

II. CONGRESSIONAL EFFORTS RELATING TO COMPETITIVE SOURCE SELECTION:  
CASE STUDIES FROM THE DEFENSE APPROPRIATIONS PROCESS

Congress makes its most important contributions to formulating national security policy during the military appropriations process. Congressional appropriation for defense is a two-step, yet largely concurrent, process.<sup>1</sup> The Department of Defense Appropriation Authorization Act (hereafter referred to as the Defense Authorization Act) specifies the weapon systems authorized for development and procurement and the funds that may be appropriated for each. It is the product of the Armed Services Committees. The items requiring authorization usually represent about one-third of the defense budget and include RDT&E and procurement of weapons, military personnel costs, naval vessels, etc., and reserve force expenditures. The Department of Defense Appropriation Act (hereafter referred to as the Defense Appropriation Act) appropriates the actual funds. As a rule, the appropriation bill is bound by the monetary limits set in the Authorization Act and cannot fund systems that require authorization but have not received it. The Defense Appropriation Act is primarily the product of the Department of Defense Subcommittees of the Committees on Appropriations. Figure 1 illustrates this process, and Tables 1 and 2 display information about the Acts for the period studied.

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<sup>1</sup>The two-step process has been in existence since 1959. See Section 412(b), Public Law 86-149, 73 Stat. 322 (10 August 1959); Section 803, Public Law 93-155, 87 Stat. 605 (16 November 1973); Section 701, Public Law 94-212, 90 Stat. 153 (9 February 1976). The changes made by the 1974 Congressional Budget and Impoundment Control Act, Public Law 93-344, 88 Stat. 297 (18 July 1974), do not significantly change this particular procedure. See Herbert W. Stephens, "The Role of the Legislative Committees in the Appropriations Process: A Study Focused on the Armed Services Committees," *Western Political Quarterly*, Vol. 24, No. 1, March 1971, pp. 146-162; Louis Fisher, "Senate Procedures for Authorizing Military Research and Development," in Joint Economic Committee, *Priorities and Efficiency in Federal Research and Development*, 94th Cong., 2d Sess., pp. 20-45; Raymond H. Dawson, "Congressional Innovation and Intervention in Defense Policy: Legislative Authorization of Weapons Systems," *American Political Science Review*, Vol. 56, 1962, pp. 42-57.

DEFENSE BUDGET COMMENDED TO CONGRESS BY THE PRESIDENT<sup>a</sup>

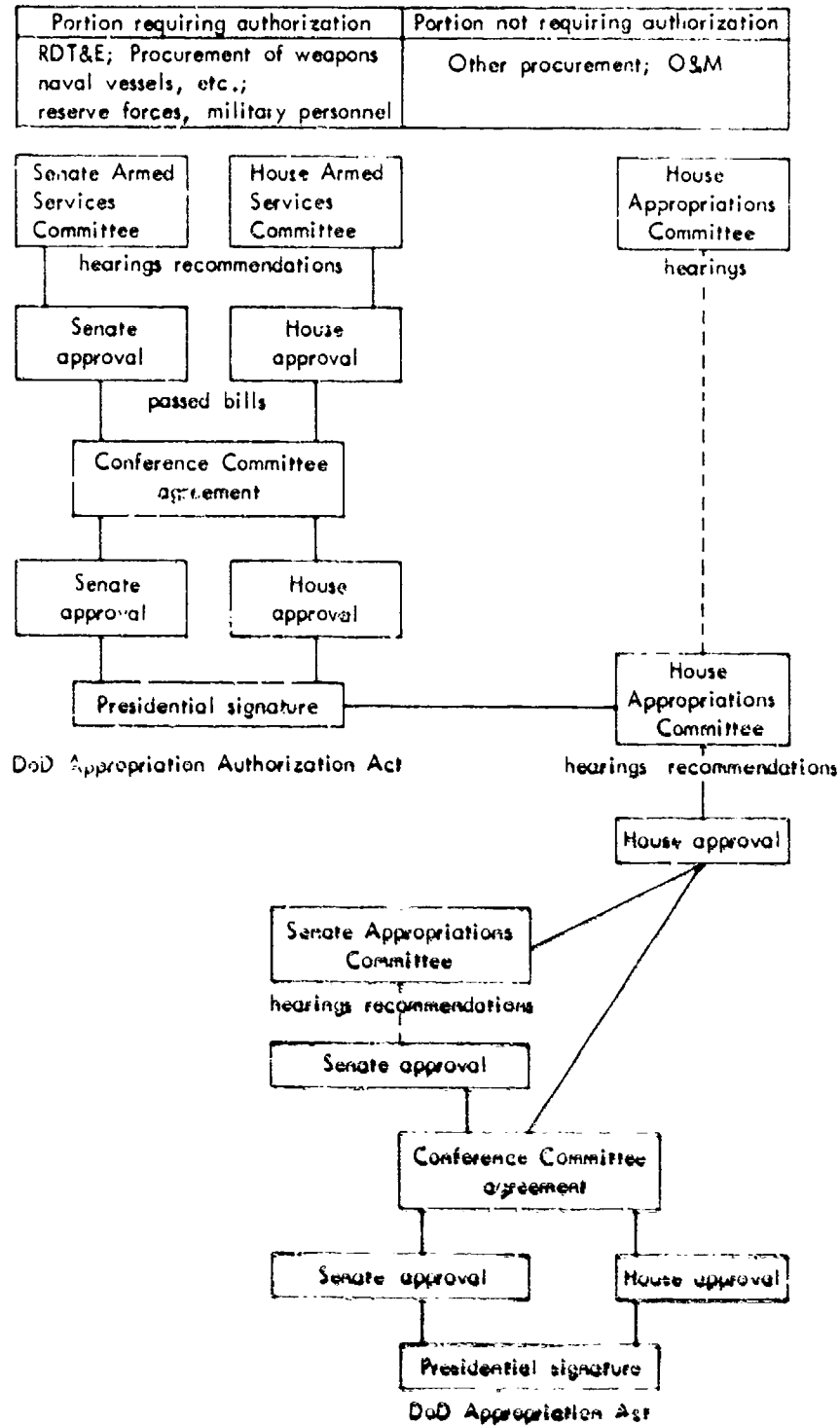


Fig. 1 — Defense appropriations process in Congress

<sup>a</sup> Does not reflect alterations made by 1974 Congressional Budget and Impounding Control Act (effective FY 1975). The processes described in this report occurred before those alterations became effective.

Table 1

DEPARTMENT OF DEFENSE APPROPRIATION AUTHORIZATION ACTS

| Fiscal Year | Public Law             | House of Representatives |             |                          |        | Senate      |      |                          |       |
|-------------|------------------------|--------------------------|-------------|--------------------------|--------|-------------|------|--------------------------|-------|
|             |                        | Date Signed              | Date Passed | Date Conf. Rpt. Approved | Vote   | Date Passed | Vote | Date Conf. Rpt. Approved | Vote  |
| 1977        | 94-361<br>-- Stat. --  | 7-14-76                  | 4-09-76     | 6-30-76                  | 339-66 | 5-26-76     | 76-2 | 7-01-76                  | 78-12 |
| 1976        | 94-106                 | 10-07-75                 | 5-20-75     | 9-24-75 <sup>a</sup>     | Voice  | 6-06-75     | 77-6 | 9-26-75 <sup>a</sup>     | 63-7  |
| 1977        | 89 Stat. 531           |                          |             |                          |        |             |      |                          |       |
| 1975        | 93-365<br>88 Stat. 399 | 6-05-74                  | 5-22-74     | 7-29-74                  | 305-38 | 6-11-74     | 84-6 | 7-30-74                  | 88-8  |
| 1974        | 93-155<br>87 Stat. 605 | 11-16-73                 | 7-31-73     | 10-31-73                 | Voice  | 10-01-73    | 91-7 | 11-05-73                 | 69-12 |
| 1973        | 92-436<br>86 Stat. 734 | 9-26-72                  | 6-27-72     | 9-13-72                  | 336-43 | 8-02-72     | 92-5 | 9-15-72                  | 73-5  |
| 1972        | 92-156<br>85 Stat. 423 | 11-17-71                 | 6-17-71     | 11-10-71                 | Voice  | 10-06-70    | 82-4 | 11-11-71                 | 65-19 |
| 1971        | 91-441<br>84 Stat. 905 | 10-07-70                 | 5-06-70     | 9-29-70                  | 341-11 | 9-01-71     | 84-5 | 10-01-70                 | Voice |
| 1970        | 91-121<br>83 Stat. 204 | 11-19-69                 | 10-03-69    | 11-05-69                 | Voice  | 9-18-69     | 81-5 | 11-06-69                 | 58-9  |

<sup>a</sup>This was the second conference report. The first was approved by the House on July 30, 1975, but was rejected by the Senate on August 1, 1975 (by a vote of 48-42).

Table 2

DEPARTMENT OF DEFENSE APPROPRIATION ACTS

| Fiscal Year  | Public Law              | Date Signed | House of Representatives |        |                          |        | Senate      |      |                          |       |
|--------------|-------------------------|-------------|--------------------------|--------|--------------------------|--------|-------------|------|--------------------------|-------|
|              |                         |             | Date Passed              | Vote   | Date Conf. Rpt. Approved | Vote   | Date Passed | Vote | Date Conf. Rpt. Approved | Vote  |
| 1977         | 94-<br>-- Stat. --      | 9-22-76     | 6-17-76                  | 331-53 | 9-09-76                  | 323-45 | 8-09-76     | 82-6 | 9-13-76                  | Voice |
| 1976<br>1977 | 94-212<br>90 Stat. 153  | 2-09-76     | 10-02-75                 | 353-61 | 12-12-75 <sup>a</sup>    | 314-57 | 11-18-75    | 87-7 | 12-19-75                 | 87-9  |
| 1975         | 93-437<br>88 Stat. 1212 | 10-08-74    | 8-06-74                  | 350-43 | 9-23-74                  | 293-59 | 8-21-74     | 86-5 | 9-24-74                  | Voice |
| 1974         | 93-238<br>87 Stat. 1026 | 1-02-74     | 11-30-73                 | 336-23 | 12-20-73                 | 336-32 | 12-13-73    | 89-2 | 12-20-73                 | Voice |
| 1973         | 92-570<br>86 Stat. 1184 | 10-26-72    | 9-14-72                  | 332-41 | 10-12-72                 | 316-42 | 10-02-72    | 70-5 | 10-13-72                 | Voice |
| 1972         | 92-204<br>85 Stat. 716  | 12-18-71    | 11-17-71                 | 343-51 | 12-15-71                 | 293-39 | 11-23-71    | 80-5 | 12-15-71                 | Voice |
| 1971         | 91-668<br>84 Stat. 2020 | 1-11-71     | 10-08-70                 | 274-31 | 12-29-70                 | 234-18 | 12-08-70    | 89-0 | 12-29-70                 | 70-2  |
| 1970         | 91-171<br>83 Stat. 469  | 12-29-69    | 12-08-69                 | 330-33 | 12-18-69                 | Voice  | 12-15-69    | 85-4 | 12-18-69                 | Voice |

<sup>a</sup> Additional action was taken on January 27, 1976, on the question of military aid to Angola.

The measures discussed below appear to be the most significant of those that have concerned the existence and level of competition in weapon systems acquisition since 1969. The International Fighter Aircraft competition requirement remains the sole attempt by the Congress to legislate competition. The Proxmire "fly-before-you-buy" amendment is an early benchmark in the perceptible increase in congressional concern for improvement in the source selection methods used in weapon systems acquisition. The Navy Air Combat Fighter/F-18 episode is perhaps the most important illustration of the friction between this new concern for improved source selection methods and other, more traditional considerations. And, finally, the unsuccessful FY 1976 data package procurement requirement is the initial attempt at a more fundamental change in the procurement process, the use of more price competition in the acquisition of major systems. Other congressional efforts touching upon the subject of competition (as variously defined) will be briefly discussed as well.

#### LEGISLATED COMPETITION: INTERNATIONAL FIGHTER AIRCRAFT

Congressional references to competition in weapon procurement are not uncommon. The subject almost always arises during the Armed Services Committees' hearings on the Defense Authorization Bill and sometimes enters into floor debates and public statements. It is rare, however, for the matter ever to find its way into a piece of legislation. In fact, the only law in recent years that has sought to legislate competition was the FY 1970 Defense Authorization Act.

Debated in 1969, the bill attracted much controversy. Tempers were still flaring over the 1968 debates on the Sentinel antiballistic missile (ABM) system and were channeled into opposition to President Nixon's new Safeguard plan and further development and testing of the multiple independently targeted reentry vehicle (MIRV) programs. The authorization of funds for chemical and biological warfare research, once routine, became a national issue when Rep. Richard D. McCarthy (D-N.Y.) disclosed that the U.S. Army planned to ship 27,000 tons of lethal World War II nerve gas from its Rocky Mountain Arsenal to the East Coast for dumping into the Atlantic Ocean. Additional debate centered on the Air Force's C-5A Galaxy cargo plane and the Army's

Sheridan Tank. The commitment to Vietnamization had already been made,<sup>1</sup> and in the midst of these controversial programs was the beginning of an effort to supply South Vietnam with a suitable tactical aircraft for use after U.S. withdrawal. Section 101 of the Authorization Act contained the following provision:

For aircraft: for the Army \$570,400,000; for the Navy and Marine Corps, \$2,391,200,000; for the Air Force, \$3,965,700,000: *Provided*, that of the funds authorized to be appropriated for the procurement of aircraft for the Air Force during fiscal year 1970, not to exceed \$28,000,000, shall be available to initiate the procurement of a fighter aircraft to meet the needs of Free World forces in Southeast Asia, and to accelerate withdrawal of United States forces from South Vietnam and Thailand; the Air Force shall (1) prior to the obligation of any funds appropriated pursuant to this authorization, conduct a competition for the aircraft which shall be selected on the basis of the threat as evaluated and determined by the Secretary of Defense, and (2) be authorized to use a portion of such funds as may be required for research, development, test, and evaluation.

What became known as the International Fighter Aircraft (iFA) program actually had its roots in earlier years. Sometime in 1968, the Northrop Corporation submitted a proposal to the Air Force for a modified version of its F-5 Freedom Fighter to replace F-5As, and perhaps F-104s, in the inventories of Allied nations. Deployment of F-5s worldwide, through the Military Assistance Program (MAP), had begun in February 1965 with deliveries to Iran. South Vietnam began acquiring F-5As in 1967. It was becoming increasingly apparent that the F-5A was not a satisfactory counter to the MiG-21s of North Vietnam. The Northrop improvements, including a new engine (for increased speed and shorter takeoffs), better radar coverage, two new machine guns, greater payload, and greater range, were aimed at making the aircraft both more competitive with the MiG-21 and more attractive to foreign purchasers than the Mirage, then being bought by various nations.<sup>2</sup>

<sup>1</sup>The birth of Vietnamization is commonly considered to have occurred just after the Tet Offensive in January 1968.

<sup>2</sup>The importance of the foreign market was underlined by John R. Blandford, Chief Counsel, House Armed Services Committee:

An improved F-5 had obvious attractions. The Air Force did not relish the idea of leaving behind F-4 Phantoms, which were considered too costly, too complex, and too capable (or "provocative") to entrust to the South Vietnamese. The few F-100s and F-102s available did not represent better combat potential than the F-5.<sup>1</sup> In a January 1969 memorandum to Air Force Secretary Harold Brown, Deputy Secretary of Defense Paul Nitze authorized the Air Force to spend \$2 million in re-programmed funds to finance an engineering design analysis by Northrop of its proposal (by then designated the F-5-21). Around the same time, although not clearly by the same memorandum, the Air Force was authorized to spend up to \$200,000 for a study by McDonnell Douglas of the feasibility of stripping down an F-4E for the same purpose.<sup>2</sup> The Air Force spent the money for the Northrop study, but it evaluated the concept of a stripped F-4E in-house without funding McDonnell Douglas.

Before completing these evaluations,<sup>3</sup> the House Armed Services Committee authorized \$14 million for retooling the Northrop plant for F-5-21 production. Secretary of Defense Melvin Laird later denied that the impetus for this action came from the administration; it was widely assumed to have had its roots within the committee itself, and could

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This committee, in an effort to be helpful, in anticipation not only of foreign sales, which we have lost through stupidity on our part, to the French in South America, is now giving you [Air Force] another opportunity with a new administration to come up with something positive so far as foreign sales are concerned. As the chairman [Rep. Rivers] indicated earlier, if we manufacture the airplane in this country, we control the spare parts. If the airplane is manufactured in another country, they control the spare parts. The country that controls the spare parts controls the country, it is as simple as that.

House Committee on Armed Services, *FY 1970 DoD Appropriation Authorization, Hearings*, 91st Cong., 1st Sess., p. 2607.

<sup>1</sup>From information provided for the record by Air Force Secretary Robert C. Seamans, Jr., *ibid.*, p. 2068.

<sup>2</sup>See the testimony of Lieutenant General Marvin L. McNickle, Major General Thomas S. Jeffrey, Jr., and Brigadier General William F. Pitts, Senate Committee on Armed Services, *FY 1970 DoD Appropriation Authorization, Hearings*, 91st Cong., 1st Sess., pp. 1504-1506.

<sup>3</sup>As of 27 May 1969, evaluation of the F-5-21 by Air Force Systems Command (AFSC) had been completed, but review of the stripped F-4E proposal was still in progress. *Aerospace Daily*, 27 May 1969, p. 124.

be traced to Chairman L. Mendel Rivers (D-S.C.)<sup>1</sup> The measure, a supplemental FY 1969 authorization, was never acted upon by the Senate.

When the armed services committees conducted hearings on the FY 1970 Authorization Bill in the spring of 1969, discussion of the program was still confined to the House committee.<sup>2</sup> The Air Force, appreciating that money for development and production of the aircraft was going to have to come out of its own budget, restrained its enthusiasm for the program, probably hoping it would continue as a private venture. The terms on which the Air Force would have supported the program at that time are evident in this exchange between General John D. Ryan, Air Force Vice Chief of Staff, and John R. Blandford, Chief Counsel, House Armed Services Committee:

Mr. BLANDFORD. How much thought have you given to the F-5-21 which you just completed testing at Wright-Patterson, and according to the report we now have has met all of the manufacturer's claims for performance?

General RYAN. The F-5-21, as you are aware, we were allowed to put \$2 million in it. That is all we have been allowed to put in.

Mr. BLANDFORD. Would you like to put more money in this program?

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<sup>1</sup>See, e.g., *Congressional Record*, 6 November 1969, p. 33387. The Chief Counsel to the House Armed Services Committee, John R. Blandford, was very open about the committee's solitary push for the F-5-21, once saying to Rep. Rivers after unsuccessfully pressing Secretary Seamans for a commitment on the plane:

I'm not belaboring it, Mr. Chairman. The point is the committee takes positive action, and because we have initiated some positive action, everyone else says that can't possibly be an intelligent thought because it came from the committee. But if it comes from the Department, it is sacrosanct and it must be infallible. I strongly suggest that somebody take a look at the action this committee took [authorization of \$14 million for retooling of the Northrop plant] to see if it isn't conceivable we could be correct in this situation.

House Committee on Armed Services, *FY 1970 Authorization Authorization, Hearings*, 91st Cong., 1st Sess., pp. 2608-2609. See also the statements of Sen. J. William Fulbright (D-Ark.), *Congressional Record*, 1 October 1970, p. 34582.

<sup>2</sup>The subject of the \$2 million engineering design analysis expenditure did come up once in questioning by Senator Stuart Symington (D-Mo.).

General RYAN. Free, gratis? Do we have to give up something else?

Mr. BLANDFORD. It would come from the Congress, obviously. I know exactly the situation you are talking about, and this is the problem with the F-5-21. Everyone says they would like to have it as long as it is not out of their hide. The hide I am talking about is the Air Force hide, because I will make the prediction for the record that when you pull out of Vietnam, if you don't have it in production, a part of the military program, to provide the South Vietnamese either by giving or selling them, you will be leaving your F-4s over there. Then you will come back to the Congress of the United States and ask for additional F-15s or for more F-4s or something to make up for the slack.<sup>1</sup>

Only after the Air Force had an abrupt change of heart on its \$52 million request for a fifth C-5A squadron did its attitude change. On 24 September 1969, just before the House Committee began its closed mark-up session on the authorization bill, Deputy Defense Secretary David Packard met with Chairman Rivers to request that the \$52 million be switched to the IFA (\$48 million for R&D, \$4 million for the procurement of long-lead-time items).<sup>2</sup> The requested authorization was contained in the bill when it emerged from the committee.

When the committee reported the bill containing the IFA item to the floor, it did not stipulate what aircraft was to become this so-called International Fighter. Rep. Rivers, in introducing the item, repeatedly referred to a "new free world fighter." Rep. Robert Sikes (D-Fla.), who also spoke at length on the floor of the House in favor of the authorization, was more direct:

The authorization proposed by the Armed Services Committee does not call for any particular aircraft or aircraft manufacturer to be considered. It does not give prior approval to any aircraft design, but would leave the Air Force completely free to develop competition for this badly needed fighter.<sup>3</sup>

<sup>1</sup>House Committee on Armed Services, *FY 1970 DoD Appropriation Authorization, Hearings*, 91st Cong., 1st Sess., p. 2607.

<sup>2</sup>A letter from Packard to Rivers confirming the request made at the meeting is inserted in the *Congressional Record*, 9 October 1969, p. 29429. An account of the meeting is reported in the 26 September 1969 issue of *Aerospace Daily*.

<sup>3</sup>*Congressional Record*, 3 October 1969, p. 28407.

At that time, the IFA provision was silent on the subject of competition and was in that regard like any other authorization to commence a new acquisition program. It is doubtful, however, that many congressmen actually believed that the identity of the International Fighter was yet undetermined.<sup>1</sup> Rep. Robert L. Leggett (D-Cal.) was one who did not, and offered an amendment to delete the authorization. Rep. William Fitts Ryan (D-N.Y.), speaking directly after Rep. Sikes's statement that the specific aircraft had not been stipulated, called the authorization "an outright subsidy to a defense contractor--Northrop Aviation--to build a modified F-5 fighter plane for sale abroad."<sup>2</sup> Rep. Lawrence Coughlin (R-Pa.) spoke in favor of the Leggett amendment and clearly indicated his belief that the International Fighter was the F-5-21.<sup>3</sup> Rep. Leggett's amendment was defeated by a voice vote, however, and the IFA authorization remained intact.<sup>4</sup>

The conference committee charged with resolving differences between the House and Senate bills added the competition requirement. (The Senate version contained no mention of an International Fighter.) Senator John Stennis (D-Miss.), Chairman of the Senate Armed Services Committee, credited Rep. Rivers with "bringing up and discussing" the

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<sup>1</sup>Most press accounts of the \$52 million authorization identified Northrop as the producer of the fighter. See, e.g., "House Group Scores Fund Allocated to Fighter," *The New York Times*, 30 September 1969, p. 6.

<sup>2</sup>*Congressional Record*, 3 October 1969, p. 28407.

<sup>3</sup>Rep. Coughlin referred to the unlabeled authorization as the "F-5 procurement authorization." *Congressional Record*, 3 October 1969, pp. 28408-28409.

<sup>4</sup>The intensity of the animosity between Rep. Leggett and Rep. Rivers, at whom this amendment was unquestionably aimed, is not apparent from a reading of the debates. The 7 October 1969 issue of *Aerospace Daily* reported that Speaker John McCormack (D-Mass.) requested that an exchange involving Leggett and Rivers, called one of the most bitter confrontations on the House floor in years, be deleted from the *Congressional Record*. The deletions included a several-minute-long speech by Rivers attacking Leggett by name, Leggett's response, and a rebuttal by H. John Moss (D-Cal.), representing the California delegation on behalf of Leggett. The incident occurred on a day when Leggett and four other Armed Services Committee members, Reps. Otis Pike (D-N.Y.), Lucien Nedzi (D-Mich.), Charles Whalen (R-Ohio), and (now U.S. Senator) Robert Stafford (R-Vt.), offered a series of amendments to delay or defeat procurement of major weapon systems, one of which was the IFA amendment.

provision.<sup>1</sup> The fact that it emerged from the conference committee indicates that in any event Rep. Rivers did not oppose it.

The concern over whether the identity of the IFA was predetermined was not clearly a product of widespread dedication to competitive source selection per se. The IFA would not be used by the U.S. Air Force, a fact prompting some congressmen to argue that it should go forward as a private venture into the defense products export market. Along these same lines, Sen. J. William Fulbright (D-Ark.), Chairman of the Foreign Relations Committee, the overseer of MAP, was greatly disturbed by what he saw as an indefensible usurpation of the jurisdiction of his committee, an attempt at "back door foreign aid."<sup>2</sup>

Regardless of the nature of their dissatisfaction, critics of the problem were not assuaged by the built-in competition requirement. It probably did not sway very many from their belief that Northrop's F-5-21 and the IFA were one and the same. In the first place, the competition language in the law was tempered somewhat by the following passage in the statement that accompanied the conference report:

The authorization would permit modification and/or improvement of existing aircraft now in United States inventories or in inventories of aircraft furnished under the military assistance program.<sup>3</sup>

Then, 11 days after the Authorization Act was sent to the President's desk, the subject surfaced in the Department of Defense Subcommittee of the House Appropriations Committee. Chairman George Mahon (D-Tex.) still assumed that the aircraft authorized for funding was the F-5-21, and he was not shaken after repeated denials by Secretary Laird:

Mr. MAHON. Now, changing the subject: The Freedom Fighter, called the F-5, I believe, has been very much in controversy as between the House and Senate, I believe.

Secretary LAIRD. Mr. Chairman, I don't think the Freedom Fighter should necessarily be tied to the F-5.

Mr. MAHON. Explain that, Mr. Secretary, please.

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<sup>1</sup>*Congressional Record*, 6 November 1969, p. 33389.

<sup>2</sup>*Congressional Record*, 1 October 1970, p. 34582.

<sup>3</sup>*Congressional Record*, 4 November 1969, pp. 32922, 32923.

Secretary LAIRD. Well, there are several aircraft that can be considered Freedom Fighters. The F-5 is produced by one contractor. In the competition which has been ordered by the conference report on the authorization bill, we will not consider just the F-5. If we go forward in this area--and I want to point out that a decision has not been finally made on this program--under the terms of the conference report and the directions given us by the conference we will go into competition. I would assume an aircraft such as the stripped down F-4 would also be considered for this particular role.

Despite Secretary Laird's answer, Rep. Mahon pressed on, inquiring about earlier testimony by Air Force witnesses that the IFA requirement is an outgrowth of Northrop's F-5-21 proposal (answer: "Air Force witnesses were not speaking for the Department of Defense.") Several more questions revolving around the F-5-21 followed. Finally, Rep. Mahon observed that the Air Force testified that the F-5-21 could engage the MiG-21 only in certain air-to-air combat situations. Then, still assuming the F-5-21 was the IFA, he asked, "Rather than improve an older aircraft which still will not be capable of matching the MiG-21 in most situations, should we develop [a new] economical superiority fighter, such as the FXX concept proposed in a recent systems analysis study?" Secretary Laird repeated his answer:

We agreed that selection of this aircraft will be under a competitive process. The criteria have been defined already; that is, it must be relatively simple to operate and maintain, certainly within the capability of Vietnamese.... It must be relatively inexpensive. This is a judgment factor, but, hopefully, sufficient quantities could be produced to enable the cost of less than \$2 million per aircraft. It must be equal to or superior to the MiG-21. Within the framework of these guidelines, specific technical and operational criteria will be developed, against which the competition can be judged fairly on the merit. The selection of this aircraft has not and will not be predetermined.<sup>1</sup>

The subject was dropped and the IFA was ultimately funded (though not as a line item) to the full extent of the FY 1970 authorization.

<sup>1</sup>House Committee on Appropriations, Subcommittee on DoD, *DoD Appropriations, Hearings, 91st Cong., 1st Sess., Part 7*, pp. 470-473.

It is questionable whether there was any degree of rigorous competition. General Otto Glasser, Deputy Chief of Staff, Research and Development, testified:

The only way that an aircraft company can be responsive to the Request for Proposal that has been put out for this aircraft is to take an existing airplane that he has available today, and make modifications to it. Otherwise, he will not be able to meet either the costs or the schedule<sup>1</sup> of the program and be competitive.<sup>2</sup>

The eventual competing aircraft were Northrop's F-5-21; Lockheed's CL-1200 Lancer, a design loosely based on its F-104; LTV's V-1000, derived from its F-8; and McDonnell Douglas's stripped down F-4. General James Ferguson, Commander of AFSC, observed that each of the competing contractors had very similar aircraft then flying.<sup>3</sup> One might quarrel with General Ferguson's modifiers. The V-1000 was inspired by the F-8 Crusader, a heavier Navy aircraft first designed in 1954 for the competition won by the F-4. Private estimates have gauged the V-1000's similarity to the F-8 as about 50 percent. The CL-1200 had just the shape of forebody of the F-104 and resembled a Starfighter even less than the V-1000 resembled the Crusader.<sup>4</sup> The McDonnell Douglas entry was easier to judge, as performance of a stripped-down airplane can be fairly accurately predicted on paper. Actually, only Northrop had similar aircraft in flight: earlier models of the F-5 and a test-bed F-5B with

<sup>1</sup>RFPs were issued on 26 February 1970. Responses were due 48 days later, 6 April 1970. Acknowledging that it was to be an advanced state-of-the-art airplane, the Air Force nonetheless noted that the program is tight enough that "no one with a new airplane or anyone faced with a major modification can afford to get in." *Aerospace Daily*, 12 March 1970.

<sup>2</sup>Senate Committee on Armed Services, *FF 1971-1972 Appropriation Authorization, Hearings*, 91st Cong., 2d Sess., p. 1063.

<sup>3</sup>*Ibid.*, 1013.

<sup>4</sup>By design, the commonality of expensive parts with the F-104C was 75 percent or more. *Aerospace Daily*, 20 November 1970. However, it had a different engine (the TF-10-P-100 used in the F-111F) than either the F-104C or F-104S, a high wing, a low tail, etc. The CL-1200 should not be confused with the Lancer version (CL-1200) later entered in the Lightweight Fighter competition.

the J-85-21 engine (to be used in the F-5-21) installed and flying since April 1969. After selection of the F-5-21 (redesignated the F-5E), General Glasser testified as to the similarity with its predecessor:

The F-5E as you are aware, I am sure, is a derivative of the F-5A/B that we have had for some time, and as such there is no development, per se, of this aircraft. What the F-5E is, is a compilation, a consolidation of the various improvements that were put into F-5s worldwide, some developed by foreign holders of these aircraft. Together with the updating of the aircraft by the addition of the -21 engine, which is simply a higher performance engine. So what we have then is a modernized aircraft which is just a much higher performing aircraft through this incorporation of improvements. It is, therefore, a production aircraft. This is a bit confusing because of the funding rules which require that the test aircraft and the conduct of the test be furnished with RDT&E funds. But there is no development, per se, of this aircraft.<sup>1</sup>

In terms of performance, the CL-1200 was judged by the Air Force to be superior, followed in order by the F-4, V-1000, and F-5-21.<sup>2</sup> Judged by cost, the order was reversed. (R&D costs, which had been expected to vary from \$5 million to over \$100 million depending on the selection,<sup>3</sup> were obviously a major factor.) On 22 November 1970, over five months later than expected, Northrop's F-5E was designated the International Fighter.<sup>4</sup>

The IFA competition provision is of interest apart from its uniqueness. Its enactment was not preceded by extensive or concerted advocacy of competition in Congress (although pressure by the industry against giving Northrop a "sweetheart contract" can be presumed to have been

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<sup>1</sup>House Committee on Armed Services, *FY 1973 DoD Appropriation Authorization, Hearings*, 92d Cong., 2d Sess., p. 9193.

<sup>2</sup>Testimony of General Glasser, House Committee on Armed Services, *FY 1972 DoD Appropriation Authorization, Hearings*, 92d Cong., 1st Sess., p. 4393.

<sup>3</sup>Senate Committee on Armed Services, *FY 1971 DoD Appropriation Authorization, Hearings*, 91st Cong., 2d Sess., p. 340.

<sup>4</sup>It is safe to say that the result was not a surprise. Throughout the competition, a leading trade publication correctly predicted the outcome (*Aerospace Daily*, 19 November 1969, 6 April 1970), although it also speculated on the pros and cons of each competitor (*Aerospace Daily*, 15 June 1970).

exerted). It is certain that no innovative or unusual selection processes were ever contemplated. In fact, there was general disinterest in the nature of the competition required. The acquisition itself did not particularly require competitive procurement. Technical superiority was a minor consideration (the U.S. Air Force was not going to use the plane); the need was for a simple and non-"provocative" aircraft. The primary criteria were the speed with which delivery could be begun and the immediate cost, neither of which is best served by competition if a single adaptable system is available. At the time the IFA competition was held, one aircraft in production fit the bill. Moreover, the Air Force had already spent money to test the required improvements, and fliers from prospective user-nations (S. Korea, Taiwan) had already flown the test-bed F-21 aircraft. The competition requirement presumably was unrelated to the technological and economic benefits conventionally attributed to competition.

There was a good deal of opposition to the IFA program at its initiation. Much of it, when not a product of personality clashes, was inspired by antipathy to the Vietnam War effort, or the private export nature of the program, or jurisdictional disputes internal to the Congress. Many in opposition were dissatisfied with what appeared to be a windfall (or, as Rep. Ryan put it, a "subsidy") to a single contractor. The staging of competition enhances the appearance of equity in the selection process (although non-competitive acquisitions are not inherently inequitable) and the desire for this appearance was at least as strong as the desire for the other benefits of competition. It seems to have had that effect. There was no floor debate on the conference compromise (out of which the requirement sprang) even though there are indications that some congressmen equated the IFA with the Northrop F-5-21 even after the Authorization Act became law. There is also little evidence of any concern about the selection process per se down the road.<sup>1</sup> Thus, one visible accomplishment of the competition provision was the softening of criticism leveled at the program through

<sup>1</sup> However, after the contract award to Northrop, at least one Senator, John Tower (R-Tex.), is reported to have said that his competing constituent (LTV) should have won. *Los Angeles Times*, 24 November 1970.

the creation of what was taken to be an equitable search for a supplier of the aircraft.<sup>1</sup>

#### THE "FLY-BEFORE-YOU-BUY" AMENDMENT

Each year dozens of amendments are offered in both houses of Congress during debates on the defense budget. Frequently, those that are unsuccessful provide as valuable an insight into congressional attitudes as those that are incorporated into law. One such was Senator William Proxmire's (D-Wisc.) "fly-before-you-buy" amendment to the FY 1971 DoD Appropriation Authorization Bill.

In July 1970, the Blue Ribbon Defense Panel appointed by Secretary of Defense Melvin Laird to study DoD procurement and management practices issued its long-awaited report.<sup>2</sup> Among other things, it recommended a new development policy for weapon systems and other hardware "to cause the reduction of technical risks through demonstrated hardware before full-scale development and to provide the needed flexibility in acquisition strategies." The approach was popularly known as "fly-before-you-buy."

"Fly-before-you-buy" did not by any means originate with the Blue Ribbon panel. The technique of building and testing a prototype to arrive at a production decision was the norm for aircraft development until just before World War II. However, prototyping in advance of a production decision was used infrequently in the United States during the next three decades. By 1968, Perry noted that "conventional wisdom" had it that "a prototype is a redundant and often costly adjunct to the design and development process."<sup>3</sup> In part because of work done at Rand,

<sup>1</sup>No opinion is offered as to the fairness of the competition itself (whether the stipulated ground rules were followed) or whether it was effective in generating technological or cost-savings benefits.

<sup>2</sup>Blue Ribbon Defense Panel, *Report to the President and the Secretary of Defense on the Department of Defense* (Washington, D.C., 1970). The panel was chaired by Gilbert W. Fitchugh and its report is often referred to as the Fitchugh Report.

<sup>3</sup>Robert Perry, *A Prototype Strategy for Aircraft Development*, The Rand Corporation, RM-5597-1-PR, July 1972, p. 1. This is an unclassified version of a report originally issued in April 1968. See also Klein, Glennan, Jr., and Shubert, *The Role of Prototypes in Development* (1971)

the late 1960s saw a regeneration of interest in "fly-before-you-buy" prototyping. When the panel's report was published, the Department of Defense was quick to endorse the recommendation. At a press conference on the eve of public release of the report, Secretary Laird announced:

There are many portions of this report that, of course, will be implemented immediately. We have already started on the procurement recommendations of this report. We will be following the policy that is recommended and is the policy that we have started to implement in the Department of Defense of flying before we buy. Buys that will be made will be made on the "fly-before-you-buy" basis.<sup>1</sup>

The announcement received wide coverage by the news media, as it appeared to describe a "new" policy that seemed able to forestall future procurement mistakes. It had ramifications on the role of competition in weapons procurement as well. Not only might it enhance rivalrous selection<sup>2</sup> when used with more than one contractor at a time (another panel recommendation) by providing the services with flyable models of competing designs, but it also conceivably could constitute an initial step toward eventually staging a new round of bidding for production of the preferred prototype.

Within a month of the publication of the report, by an amendment to the FY 1971 DoD Appropriation Authorization Bill, Senator Proxmire proposed that the Department of Defense be required to report to Congress the degree to which "fly-before-you-buy" (as contemplated by the panel and by Secretary Laird's statement) was applied to major weapon systems soon to enter production. The wording of the amendment was

(unclassified version of a 1963 report). Perry recognizes that prototyping as a term is interchangeable with fly-before-you-buy only when the production decision does not precede the prototype evaluation. And accordingly he notes that prototyping, in general, is not inherently incompatible with a development strategy such as "total package procurement." "Prototyping" as used here envisions a delayed and dependent production decision.

<sup>1</sup>Quoted in *Congressional Record*, 17 August 1970, p. 29202.

<sup>2</sup>Competition in which the entrants are evaluated on both price and non-price grounds. See pp. 6-9 for a discussion of definitional problems.

largely taken from the panel report and thus incorporated an endorsement of competitive prototyping. The opposition to the amendment was swift and strong.

The brief debate, which took place on the 14th and 17th of August 1970,<sup>1</sup> revealed five arguments in opposition to the amendment. The timing of the amendment was its first weakness. Senator Barry Goldwater (R-Ariz.) complained that he had had the report in his briefcase for only two weeks and had read just one-half of it. He expressed doubt that many other senators could have accomplished more.<sup>2</sup> A group of senators led by John Stennis argued that the amendment should first be taken up by the Armed Services Committee (which would mean that it would be enacted no sooner than the next year). Senator Stennis also pointed out that inasmuch as it contained only recommendations, the report itself should be subjected to hearings by his committee.<sup>3</sup> Senator Thomas McIntyre (D-N.H.) added that time should be given to DoD to digest and comment on the recommendations before any of them were enacted into law.<sup>4</sup>

Despite Senator Proxmire's reminders that his amendment only required a report and did not require sweeping revisions or automatic funding cutoffs for non-compliance, some senators felt that the measure was too extreme. Senator Goldwater, for instance, called it "the most drastic change suggested in the Department of Defense since 1947 when the last changes were made in the Department of Defense."<sup>5</sup>

Some senators simply believed the amendment was unnecessary. Senator Jack Miller (R-Iowa), for example, pointed out that the Senate was weeding out untested weapons already, such as the Navy version of the TFX.<sup>6</sup> Senator McIntyre pointed to progress of another kind:

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<sup>1</sup>*Congressional Record*, 14 August 1970, pp. 29017-29018, 29039-29053; 17 August 1970, pp. 29201-29218.

<sup>2</sup>Senator Goldwater said, "We cannot judge the soundness of the Fitzhugh Report in debate because nobody knows enough about it, including [Senator Proxmire]." *Congressional Record*, 14 August 1970, p. 29018.

<sup>3</sup>*Congressional Record*, 14 August 1970, p. 29046.

<sup>4</sup>*Congressional Record*, 17 August 1970, p. 29208.

<sup>5</sup>*Congressional Record*, 14 August 1970, p. 29018.

<sup>6</sup>*Congressional Record*, 14 August 1970, p. 29052.

The Cheyenne development contract, written several years ago, made no provision for competitive prototypes, encouraged cost growth, and allowed for much gold plating. The AX contract, on the other hand, was soundly written, emphasized off-the-shelf technology, and included a prototype flyoff.<sup>1</sup>

Additionally, several legislators objected to the amendment on the grounds that it was too vague. Senator Goldwater thought the reference to "goldplating" was unclear:

I think I have a vague idea of what the Senator means. But if we extend the language as far as possible, I point out that we use quite a bit of gold and quite a bit of goldplating.<sup>2</sup>

Senator Stennis detected similar uncertainties. The amendment was expressly limited to major weapon systems, a term that Stennis argued should not be left undefined. Moreover, he felt that use of the term "advanced development stage" lacked precision:

[T]his is a term for which there is no exact meaning so far as we know, and I say that there is no way to get at it except to have hearings and have the words defined, or a meaning, a ceiling and a bottom applied to the phrase by illustrations.<sup>3</sup>

These reservations demonstrate that much of the opposition to the amendment was grounded in non-substantive matters.

The favorable reference to competitive prototyping was also a source of some disagreement and sparked the only discussion of the underlying policies. Senator Peter Dominick (R-Colo.) made the point that "competitive prototypes are good on some weapons and bad on others."<sup>4</sup> Senator Miller added that "with some of the very expensive

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<sup>1</sup> *Congressional Record*, 17 August 1970, p. 29208.

<sup>2</sup> *Congressional Record*, 17 August 1970, p. 29207.

<sup>3</sup> See the exchange between Sens. Stennis and Proxmire on this subject, *Congressional Record*, 17 August 1970, pp. 29204-29205.

<sup>4</sup> Sen. Dominick mentioned the Mark-48 torpedo program as a competitive prototyping program that happened to have "one of the greatest potential overruns of any weapon system program presently underway." *Congressional Record*, 17 August 1970, pp. 29209-29210.

sophisticated weapon systems," competitive prototyping might be frustrated by "the limited number of contractors who could even be interested in a particular weapon system."<sup>1</sup> Senator Proxmire's response was to concur but also to recall that under the proposed amendment, "all they [DoD] need to say is, 'It is not appropriate here; it is not feasible. We have tried this kind of thing before and it does not work well.'"<sup>2</sup>

The Senate rejected the amendment by a vote of 43-22.<sup>3</sup> A summary of the reasons for its defeat includes the feelings that the amendment was premature, too drastic, unnecessary, vague, and inflexible. Although it did not provoke a substantial exchange of views on the fundamental questions presented, the amendment is of note as a first indicator of a growing awareness in the Congress of the need to improve the *process* of acquiring weapons.

#### MANDATED COMMONALITY: NAVY AIR COMBAT FIGHTER

Competitive prototyping has since been embraced verbally by virtually everyone concerned with the weapon systems procurement process, and of course it has also been put into use (though rarely extended into the full-scale development phase). The first two post-1966 programs to feature competitive prototypes, the Air Force's A-X and Lightweight Fighter (LWF) programs, have been subjected to some preliminary analysis at Rand and elsewhere. More interesting in the context of this report is the Navy's search for a lightweight, low-mix tactical aircraft.

The outstanding characteristic of Congress's role in what has become the F-18/A-18 program is its insistence on a course of action that has necessarily restricted competition for the contract award. The insistence has taken the form of denial of Navy requests for funding of new design competitions of its own and attempted consolidation of the Air Force and Navy efforts to arrest their declining inventories

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<sup>1</sup> *Congressional Record*, 14 August 1970, p. 29051.

<sup>2</sup> *Congressional Record*, 17 August 1970, p. 29210.

<sup>3</sup> Members of the Armed Services Committee were generally opposed. Ten voted no, three voted yes (five did not vote).

of fighter aircraft. Specifically, the report of the conference committee on the FY 1975 DoD Appropriation Bill contained this directive:

The Managers are in agreement on the appropriation of \$20,000,000 as proposed by the Senate instead of no funding as proposed by the House for the VFAX aircraft. The conferees support the need for a lower cost alternative fighter to complement the [Navy's] F-14A and replace F-4 and A-7 aircraft; however the conferees direct that the development of this aircraft make maximum use of the Air Force Lightweight Fighter and Air Combat Fighter technology and hardware. The \$20,000,000 provided is to be placed in a new program element titled "Navy Air Combat Fighter" rather than VFAX. Adaptation of the [yet-to-be] selected Air Force Air Combat Fighter to be capable of carrier operations is the prerequisite for use of the funds provided. Funds may be released to a contractor for the purpose of designing the modifications required for Navy use. Future funding is to be contingent upon the capability of the Navy to produce a derivative of the selected Air Force Air Combat Fighter design.<sup>1</sup>

This section examines this episode by pinpointing the times when competition might have been considered and identifying the considerations that militated against its use.

The Navy's air superiority, combat air patrol, and intercept roles are performed by the F-14 Tomcat. The high cost of the F-14A and its Phoenix weapon system contributed to (and then in turn was exacerbated by) contractual difficulties with the prime contractor (Grumman Corp.) and stimulated the Navy's search for a low-cost fighter to bolster its declining force level. In 1973, Deputy Secretary of Defense William P. Clements proposed that prototypes of a stripped-down F-14A (called the F-14X), a Navy version of the F-15 Eagle (designated the F-15N), and a stripped F-4 Phantom be developed as possible alternatives to follow-on F-14s.<sup>2</sup> This proposal, involving an initial request of \$150 million and a total cost of either \$250 million (the estimate of Secretary Clements) or over \$367 million (the estimate of George A.

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<sup>1</sup>U.S. House of Representatives, *Making Appropriations for the Department of Defense, FY 1975* (Conference Report and Joint Explanatory Statement), H. Rpt. No. 93-1363, 93d Cong., 2d Sess., 18 September 1974, p. 27.

<sup>2</sup>Original Department of Defense plans called for a fly-off.

Spangenberg),<sup>1</sup> was denied by the Senate Armed Services Committee as "too costly and of questionable value."<sup>2</sup> A committee statement accompanying the FY 1974 DoD Appropriation Authorization Bill when it was reported to the Senate floor read:

The committee believes the Navy should examine the potential of a completely new aircraft as a possible alternative to the F-14 in the out-years. The Navy should obtain proposals to determine if a smaller and presumably cheaper aircraft can be designed to serve as an air superiority fighter to complement the F-14. Once this determination has been made, the committee desires to receive the Navy determination, including the costs of such alternatives as well as a technical evaluation.<sup>3</sup>

The Navy's response was the formation of a study group (Navy Fighter Study IV), under Commander (later Captain) Jerry O'Rourke, to examine the potential of a lightweight fighter to be the F-14 complement.<sup>4</sup> The study was actually a continuation of one that had investigated the lightweight V/STOL fighter. In November 1973, the O'Rourke group recommended development of a new fighter, with both carrier compatibility characteristics and the capability to perform some attack missions. As

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<sup>1</sup>Director of Evaluation Division, Naval Air Systems Command, 1957-1973.

<sup>2</sup>According to Sen. Howard Cannon (D-Nev.), chairman of the Tactical Air Power Subcommittee of the Armed Services Committee. Senate Committee on Armed Services, Subcommittee on Tactical Air Power, FY 1973 DoD Appropriation Authorization, Hearings, 93d Cong., 2d Sess., p. 5093.

<sup>3</sup>Senate Committee on Armed Services, Report (On FY 1974 DoD Appropriation Authorization Bill), S. Rpt. No. 93-385, 93d Cong., 1st Sess., 6 September 1973, p. 10.

<sup>4</sup>This idea was discussed in Congress two years earlier. On 26 September 1971, Sen. Proxmire proposed that the F-14A be cancelled and replaced by a competitive prototype fly-off program for development of a lightweight air superiority fighter. Sen. Cannon endorsed the idea, but as a means to find a complement to the F-14, arguing that the need for the F-14 was illustrated by the fact that the lightweight F-104 was able to gain only a draw with a MiG during its limited action (2,469 combat sorties between April and November, 1965) in Vietnam. A similar proposal by Rep. William Moorhead (D-Pa.) was rejected by the House in November 1971. Opposition was led by Appropriations Committee Chairman George Mahon (D-Tex.), who pointed to the \$16 million in the LWF program and suggested that it might produce an aircraft compatible to both services.

an "interim" measure, it also proposed the F-14Xs be procured. The new aircraft, first designated the VFX, became known as the VFAX.<sup>1</sup>

This conclusion foreclosed three other avenues. The O'Rourke group eliminated proposals based on the F-15N and the F-14X (probably with reluctance).<sup>2</sup> It also rejected some proposals based on the LWF prototypes being developed for the Air Force. The requests in the FY 1975 DoD budget for \$34 million for VFAX R&D and an additional \$36 million for the missionized version of the LWF, called the Air Combat Fighter (ACF), ran into immediate trouble. The feeling in Congress was that funding of two seemingly parallel efforts smacked of duplication. (In January 1972, the Air Force issued RFPs for a Lightweight Fighter. Three months later General Dynamics and Northrop were selected to build "experimental prototypes."<sup>3</sup> In February 1974, Defense Secretary James Schlesinger announced the decision to pursue a missionized version of one of the two aircraft.)

The task of justifying the two programs fell first to Malcolm Currie, Director of Defense Research and Engineering. He told the House Defense Appropriations Subcommittee:

I do not believe that it will be possible to build a low cost fighter that will fulfill both the Navy and Air Force requirements. The mission of the VFAX and the air combat fighter are sufficiently diverse to preclude one airplane from being completely suitable for both Services.<sup>4</sup>

Currie's position was that the Navy would use the LWF technology and would probably receive scaled-up versions of the LWF prototypes in

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<sup>1</sup>Just as an unnecessary name change would plague the Navy later on, this one was a source of a good deal of confusion in Congress. The change, which was made by OSD on 2 May 1974, was explained as necessary to reflect the fighter-attack nature of the aircraft.

<sup>2</sup>The Navy must certainly have been attracted to the stripped F-14 idea since it would have meant lower unit costs for the mainline version, in addition to lower O&M costs. The study group did recommend purchase of some F-14Xs (minus the Phoenix system) but not as the principal complement to the F-14As.

<sup>3</sup>The other competitors were Lockheed, Boeing, and LTV Aerospace.

<sup>4</sup>House Committee on Appropriations, Subcommittee on Department of Defense, FY 1975 DoD Appropriation, Hearings, 93d Cong., 2d Sess., p. 583.

the envisioned VFAX design competition, but that one aircraft could not serve as both the ACF and the VFAX.

Navy witnesses were questioned in more detail about the factors that supposedly precluded procurement commonality. The VFAX was repeatedly characterized as an aircraft that would replace the F-4 in the Navy inventory and also assume the air-to-ground role of the A-7. The characterization, while accurate and necessary, added to the Navy's troubles, for the Phantom and the Corsair are the quintessence of inter-service commonality in the eyes of Congress. When confronted with this view, the tone of Vice Admiral W. J. Moran, Director of RDT&E in the Office of the Chief of Naval Operations, was almost one of resignation:

Admiral MORAN. There is money to be saved in the commonality that you mentioned, but in trying to tie them together as a joint development program, it has been my experience that when the division occurs, as it seems to occur inevitably, or when the change in priority requires one service to wish to accelerate or another service wants to decrease its support of the program--when that occurs you have a program that somehow seems to require much more top management attention to try to keep it in order and keep it running smoothly, all of the top management located in Washington.

Mr. FINE [Hyman Fine, Professional Staff Member, R&D Subcommittee, Senate Armed Services Committee]. You would agree that the F-4 and A-7 are two fine examples of where one service has made very fine use of another service's development?

Admiral MORAN. I think they are fine examples of that. They are not the kind of joint program discussed.... I am just as much a believer as anyone else in trying to get the most that we can out of our R&D money as rapidly as we can, and I am a great believer in the approach you mentioned in the A-7 and F-4 having one service develop completely a piece of equipment and the other service buying it and using it.

Mr. FINE. Perhaps that might be the better answer, to turn down the Navy request and let the Air Force develop something that might be adaptable to the Navy use.

Admiral MORAN. Well that may be.<sup>1</sup>

Admiral Moran persevered in outlining the difficulties in this particular

<sup>1</sup> Senate Committee on Armed Services, Subcommittee on Research and Development, *FY 1978 R&D Appropriation Authorization, Hearings*, 93d Cong., 2d Sess., pp. 2418-2419.

case (comparing it to the F-401 engine joint development) and the differences from the A-7 and F-4 experience. He recognized the Congress's interest and contrasted it with his own:

A common aircraft is desirable for cost savings of higher production rates. The difficulty, notwithstanding my previous comments as to different priorities, is with the word common and not the desire.<sup>1</sup>

Despite these efforts, the Navy's attempt to win approval for its own development program failed, and in the end the Congress mandated commonality with the Air Force program in the conference committee language quoted above (which also changed the name of the VFAX to the Navy Air Combat Fighter--NACF).

The Air Force source selection of the ACF in January 1975 seemingly also decided the matter for the Navy. Selection of a Navy version of General Dynamics's F-16, for which the prime contractor would be LTV Aerospace Corporation, appeared assured. (At the time, the Navy also had a proposal from McDonnell Douglas based on Northrop's YF-17.) However, the day after the F-16 announcement, Secretary Schlesinger stated that the Navy was still free to choose a fighter that would be "most appropriate in terms of resources and effectiveness."<sup>2</sup> (The Navy had not at that time completed its analysis of the ACF-based proposals, one from McDonnell Douglas/Northrop and three from LTV/General Dynamics.)

On 7 March 1975, Deputy Secretary of Defense Clements wrote to Sen. John McClellan (D-Ark.) and Rep. Mahon, chairmen of the Senate and House Committees on Appropriations, advising them of the status of the Navy evaluation of the NACF proposals. He said that the Secretary of Defense had instructed the Navy to keep its evaluation of *both* firms' proposals in a fully competitive atmosphere.

The Navy later asserted that replies indicating unqualified approval were received. Actually, Rep. Mahon, in a letter of 13 March

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<sup>1</sup> *Ibid.*, p. 2419.

<sup>2</sup> *Aerospace Daily*, 15 January 1975, p. 73.

1975, replied that he had no objection to the approach set forth, but pointed out that the defense subcommittee "expects to carefully review the FY 1976 funding requests [and that he] could not comment on possible Committee action on the FY 1976 request." Sen. McClellan, replying to Clements on 17 March 1975, expressed no objection but added:

I understand that you will notify the Committee of a final selection in May so that the Committee will have the necessary information during consideration of the fiscal year 1976 request for the Navy Air Combat Fighter.<sup>1</sup>

The replies might be more correctly characterized as deferrals to their committees of the question of approval or disapproval.<sup>2</sup>

On 2 May 1975, the Navy announced that it had selected a modification of the McDonnell Douglas/Northrop entry, a decision that was bound from the start to be plagued with trouble. Strictly speaking, the FY 1975 DoD Appropriation Bill conference report required the Navy to use (1) the technology of the Air Force's LWF prototypes, and (2) a derivative of the ACF chosen by the Air Force. The Navy seemed to have followed the first directive by considering only proposals based on the LWF designs.<sup>3</sup> However, once the Navy concluded that none of the designs based on the F-16 were suitable for carrier operations, the second directive began to fall by the wayside. Rather than return to Congress with the news of the failure of the F-16 derivatives, the Navy continued its analysis of the YF-17 and finally decided that the YF-17 derivative would be acceptable if certain modifications were made to accommodate an improved version of the General Electric J-101 turbojet engine, called the F-404. Compounding what was already a risky decision, the

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<sup>1</sup>Quoted in *Congressional Record*, 25 July 1975 (daily ed.), p. H7581.

<sup>2</sup>All three letters are reproduced in Senate Committee on Appropriations, *Lightweight Fighter Program, Hearings*, 94th Cong., 1st Sess., pp. 44-45.

<sup>3</sup>Although one of the three proposals submitted by the LTV/General Dynamics team was a completely new aircraft rather than a modified F-16.

Navy decided that the structural changes<sup>1</sup> were such that the new designation F-18 was more appropriate than F-17. Thus, on the surface, it appeared that the Navy had not followed either of the two directives.

If the decision provoked immediate dissatisfaction or disapproval in the Congress, it was not voiced. The first party to be publicly outraged was the prime contractor of the losing design team, LTV Aerospace Corporation (now called Vought Corporation). On 9 May 1975, LTV filed a formal protest<sup>2</sup> with the General Accounting Office<sup>3</sup> contending

<sup>1</sup>A comparison of the YF-17 and F-18 shows the following differences:

| Characteristics                              | YF-17                | F-18                |
|----------------------------------------------|----------------------|---------------------|
| Weight, empty                                | 16,940 lb            | 20,583 lb           |
| Weight, takeoff<br>(air superiority mission) | 25,500 lb            | 33,642 lb           |
| Length                                       | 55.75 ft             | 55.6 ft             |
| Wing span                                    | 33 ft                | 37.5 ft             |
| Wing area                                    | 350 ft <sup>2</sup>  | 400 ft <sup>2</sup> |
| Horizontal tail area                         | 85 ft <sup>2</sup>   | 85 ft <sup>2</sup>  |
| Vertical tail area                           | 104 ft <sup>2</sup>  | 104 ft <sup>2</sup> |
| Speed brake area                             | 12.9 ft <sup>2</sup> | 13 ft <sup>2</sup>  |

In addition, the F-18 contains a larger radar with more capability and improved functions, extra graphite composites, increased computer capacity, Sparrow medium-range air-to-air missile capability, and "accurate" (vs. YF-17's non-"accurate") attack avionics. The new F-404 engine (a derivative of the J-101) has the following changes: a 13 percent increase in airflow, improved component efficiencies, a 50°F increase in both maximum turbine inlet and maximum afterburner temperatures, increased maximum nozzle area ratio, increased bypass ratio, a 7 percent increase in weight, a lower stall margin, and a 5 percent increase in cost.

<sup>2</sup>A supplement to the protest was filed on 3 June 1975.

<sup>3</sup>The Code of Federal Regulations allows an "interested party" to protest the award (or proposed award) of a contract by or for a government agency whose accounts are subject to settlement by the GAO. 4 C.F.R. §20.1(a). During FY 1971, the GAO rendered 715 protest decisions, of which 496 (69.4 percent) concerned the Department of Defense or one of the services. The GAO claimed its authority to consider protests and issue decisions that are binding on procuring agencies derives from the settlement of public claims and accounts power granted in the Budget and Accounting Act of 1921, 31 U.S.C. §§71, 74.

that the Navy violated clear congressional directives, as well as its own ground rules for competition, by selecting the F-18.<sup>1</sup>

There were a few unsuccessful efforts to legislate alterations in the program<sup>2</sup> but in the end the Congress chose to await the resolution of the protest by the GAO. The General Accounting Office denied the protest of LTV on 30 September 1975 and held that the short-term sustaining engineering contracts to McDonnell Douglas (\$4.4 million) and General Electric (\$2 million) were legal.<sup>3</sup> The decision is outlined in the Appendix. Very briefly, with regard to the conference committee language conditioning funding on the selection of an ACF derivative, the decision held that disregard of such a non-statutory directive risked strained relations with Congress, but not legal sanction. The protest involved only the initial development contracts. The issue of full-scale development was untouched; responsibility for that decision still resided with the Congress.

The day after the GAO decision was handed down, the F-18 came under fire in the House. During debate on the FY 1976/1977 DoD Appropriation Bill, Rep. William Chappell (D-Fla.) offered an amendment to strike from the bill the \$58.2 million allotted for F-18 R&D and long-lead-time procurement (preserving the \$64.2 million appropriation for the engine development). A distillation of Rep. Chappell's introductory remarks reveals two basic arguments against continuing the F-18 development: its cost and its capability. In support of the first,

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<sup>1</sup>The entire substance of the protest, while deserving of careful attention and critical analysis, is tangential to the focus of this inquiry. A detailed outline of the issues raised, the opposing arguments, and the conclusions of the GAO is contained in the Appendix.

<sup>2</sup>The most notable of these were (1) a proposal by Sens. Lowell Weicker (R-Conn.) and Lawton Chiles (D-Fla.) to fund simultaneous development of the F-18 and a Navy derivative of the F-16, and (2) an amendment to the FY 1976/1977 DoD Appropriation Authorization Bill, offered by Sens. Proxmire, John Tower (R-Tex.), and Lloyd Bentsen (D-Tex.), to suspend F-18 funding until the GAO decision. This language was deleted in conference. House of Representatives, [FY 1976/1977 DoD Appropriation Authorization Bill, Conference Report], H. Rpt. No. 94-488, 94th Cong., 1st Sess., 18 September 1975, p. 45.

<sup>3</sup>55 Comp. Gen. 207 (1975). The text of the decision is printed in *Congressional Record*, 1 October 1975 (daily ed.), pp. H9397-H9405.

two points were made: (1) The Navy had described as equal cost alternatives a force of 224 F-14s, 202 A-7s, and 806 F-18s, and one composed of 744 F-14s and 450 A-7s, indicating F-14s and A-7s could be purchased at costs equal to the proposed F-18 buy without sacrificing numbers; and (2) there were hidden R&D costs in the F-18 program owing to the plans for three versions of varying configurations (fighter, attack, and reconnaissance).<sup>1</sup> In support of the second argument, Rep. Chappell said,

If we want the most capability for our money we should adopt this amendment and have the Navy come to us with its best alternative. It might yet be [an]other F-18. If so, I would support it. But let us go through the regular legislative process and get the best capability we can for the Navy and this country.

By "regular legislative process" he presumably was including an industry-wide design competition accompanied by appropriate congressional hearings.

A survey of the sentiments expressed by other supporters of the amendment includes the following:

1. The F-18 program lacked sufficient competition (F-18 is only a paper airplane; there are no flyable alternatives; can it be the best without a design competition?);<sup>2</sup>
2. The Conference Committee report was ignored (Navy should have returned to the Armed Services Committee rather than proceed with F-18; allowing the program to continue will give executive agencies carte blanche to violate specific directives);<sup>3</sup>
3. No hearings were ever held on the F-18 (Congress doesn't know enough about it);<sup>4</sup> and

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<sup>1</sup> *Congressional Record*, 1 October 1975 (daily ed.), pp. H9377-H9378.

<sup>2</sup> See speeches by Rep. J. Kenneth Robinson (R-Va.), *ibid.*, p. H9383, and Rep. Dale Milford (D-Tex.), *ibid.*, p. H9391.

<sup>3</sup> See speeches by Rep. Jack Edwards (R-Ala.), *ibid.*, p. H9384, Rep. George Mahon (D-Tex.), *ibid.*, p. H9385, and Rep. Milford, *ibid.*, p. H9390.

<sup>4</sup> See speech by Rep. Thomas J. Downey (D-N.Y.), *ibid.*, p. H9390.

4. The selection procedure was inequitable (all aircraft manufacturers did not have an equal opportunity to compete).<sup>1</sup>

As is often the case, few spoke in opposition to the amendment. Among the arguments advanced were (1) cancellation of the F-18 would result in an inexcusable time slippage,<sup>2</sup> and (2) the Navy properly refused to "adhere blindly" to the congressional directive and instead sought the best design available.<sup>3</sup> A vote was taken the same day and the amendment was rejected by a vote of 243-173.<sup>4</sup>

When the Senate considered the FY 1976/1977 DoD Appropriation Bill, the subject resurfaced. Senator Barry Goldwater (R-Ariz.) introduced an amendment similar to that of Rep. Chappell. Senator Goldwater seemed to object to the F-18 program from a different perspective:

My primary concern about the F-18 program is the way it came into existence. It is not an aircraft that was selected as a result of an industrywide competition. Rather, it is an aircraft that is about totally outside of what I consider to be normal or established procurement procedures.... I believe that through a proper competitive program, the relatively small cost of recompeting this aircraft will be more than offset by a total program cost that will be less than is now estimated for the F-18 program. Surely, we can do no less than to assure ourselves and, more importantly, the taxpayers, that the best fighter aircraft that industry can competitively provide is obtained.<sup>5</sup>

Sen. Goldwater was the only Senator to speak at length for the amendment. Opponents advanced three arguments, all centered on the time delay involved in a recompetition: (1) force modernization is required

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<sup>1</sup> See speeches by Rep. Mahon, *ibid.*, p. H9385, and Rep. Milford, *ibid.*, p. H9391.

<sup>2</sup> See speech by Rep. Robert L. F. Sikes (D-Fla.), *ibid.*, p. H9379.

<sup>3</sup> See speech by Rep. Silvio O. Conte (R-Mass.), *ibid.*, p. H9381.

<sup>4</sup> *Ibid.*, pp. H9407-H9408.

<sup>5</sup> *Congressional Record*, 13 November 1975 (daily ed.), pp. S2004, S2005.

now,<sup>1</sup> (2) recompetition would mean large cost escalation,<sup>2</sup> and (3) no design could be very much better than the F-18.<sup>3</sup> The amendment was defeated, 64-19, the day after this debate;<sup>4</sup> the F-18 Navy Air Combat Fighter had cleared a major obstacle.

There were two points in the NACF program at which the Congress had the specific option of making the NACF a conventional design competition. The first was in September 1974 when the Navy was directed to adapt the aircraft that was soon to be designated the Air Force's Air Combat Fighter. The basis for this decision to seek commonality is not difficult to identify. House Appropriations Committee Chairman George Mahon (D-Tex.) later said,

The objectives of the conferees were simple: By obtaining the maximum commonality in the development and production of Navy and Air Force lightweight fighters, significant cost savings could be purchased to meet the very significant Soviet threat because of the lower unit cost. The strong possibility of substantial foreign sales increased the attractiveness of the program.<sup>5</sup>

The second point came in late 1975 when the Congress voted down proposals to cancel the F-18 program and recompute the requirement. This decision was over a year later and consequently was influenced by a different set of factors, including (1) the Navy's strong, if sudden, support for the F-18, (2) the feeling that it was the best system industry could provide, (3) a general reluctance to cancel or restart ongoing programs, (4) satisfaction with the amount of competition and prototyping in the program's history (bolstered by the outcome of the LTV protest), and (5) concern for the effect of recompetition on the Navy force structure.

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<sup>1</sup> See speeches by Sens. John Glenn (D-Ohio) and Roman Hruska (R-Neb.), *ibid.*, pp. 2008-2009.

<sup>2</sup> See speech by Sen. Robert Dole (R-Kans.), *ibid.*, p. S20014.

<sup>3</sup> See speech by Sen. Howard Cannon (D-Nev.), *ibid.*, p. S20011.

<sup>4</sup> *Congressional Record*, 14 November 1975 (daily ed.), p. S20134.

<sup>5</sup> House Committee on Appropriations, Subcommittee on Department of Defense, FY 1976/1977 DoD Appropriations, *Hearings*, 94th Cong., 1st Sess., Part 9, p. 264.

#### THE TECHNICAL DATA PACKAGE PROCUREMENT REQUIREMENT

Common to proposed strategies for injecting price competition into weapon systems acquisition is the necessity to have built into the development contract a provision for governmental acquisition of rights in a specially defined data package. For example, one such strategy is directed licensing,<sup>1</sup> a working definition of which follows:

Briefly, the directed licensing concept consists of having the government obtain from a weapon system developer, at the time of issuance of the initial development contract, rights in data and an agreement to license whomever the government designates to produce the weapon system during any or all production runs, following initial production by the developers.<sup>2</sup>

Directed licensing also requires that the developer agree to provide the necessary technical assistance to get the new contractor into production, but the main feature is the transferability of the data package.

The FY 1976/1977 DoD Appropriation Authorization Bill as formulated in the House Armed Services Committee required (in Section 712) the Department of Defense to purchase all designs and data necessary to manufacture major weapon systems costing \$100,000,000 or more to develop or procure.<sup>3</sup>

<sup>1</sup>For a thorough analysis of the subject, see Gregory A. Carter, *Directed Licensing: An Evaluation of a Proposed Technique for Reducing the Procurement Cost of Aircraft*, The Rand Corporation, R-1604-PR, December 1974.

<sup>2</sup>*Ibid.*, p. 3. The Carter report is primarily concerned with the situation where there has actually been some production by the developer. That the technique can be used in other situations is acknowledged, however

<sup>3</sup>Section 712 of H.R. 6674 read: "Section 2386 of the title 10, United States code, is amended--

"(1) by striking out 'Funds' and inserting in lieu thereof '(a) Except as provided in subsection (b), funds'; and

"(2) by adding at the end thereof of the following new subsection: (b) (1) Except as provided in paragraph (3) of this subsection, funds appropriated for a military department available for the development and production (whether by domestic or foreign contractors) of any major weapon system shall be used for the acquisition of all manufacturing data relating to such system which is originated by the contractor

The Department of Defense was required in all cases to purchase all of the data and information required to maintain and modify these weapon systems, but the requirement regarding purchase of designs and data necessary to manufacture the system could be waived with the concurrence of both the House and Senate Armed Services Committees.

By way of explanation, the committee report stated:

The purpose of this section is to standardize the Department of Defense in its contractual relations. The Army always purchases manufacturing data; the Air Force always includes an option to buy this data in their contracts; and the Navy has no established policy.<sup>1</sup>

As for why the committee chose this policy to become uniform, the report contained the following:

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during such development or production.

"(2) Each contract entered into by any military department after the date of the enactment of this subsection for the development or production of any major weapon system shall contain provisions necessary to carry out the purpose of paragraph (1) of this subsection, including conditions under which the contractor agrees to waive any proprietary rights he may have with respect to any manufacturing data.

"(3) Any military department may, at any time after the initial development and testing of any major weapon system, request to waive the application of paragraph (2) of this subsection with respect to any manufacturing data which may be originated during the further development or the production of the system, except for such manufacturing data as may be necessary for the maintenance and later modification of such system. Before any military department exercises any waiver provided for in this paragraph, the Committee on Armed Services of the House of Representatives and the Senate must first be notified of the reasons for the waiver and each committee must concur therein.

"(4) As used in this subsection:

"(A) 'manufacturing data' means all data (including, but not limited to, necessary drawings, test data, reliability data, system acceptance methodology, and related computer applications) which is necessary to carry out the manufacture, maintenance, and modification of the major weapon system concerned; as is in a form sufficient to enable any other person or agency to produce, maintain, or modify such system.

"(B) 'major weapon system' means any weapon system the estimated cost for the development or production, or both, of which is not less than \$100,000,000."

<sup>1</sup>House Committee on Armed Services, *Report and Additional Separate, Minority, Supplemental Dissenting and Additional Views, FY 1976/1977 DoD Appropriation Authorization Bill, H. Rpt. No. 94-199, 94th Cong., 1st Sess., 10 May 1975, p. 92.*

The Committee's prime concern here is the ever-increasing cost of weapon systems. The present high rate of cost increase cannot be reduced nor revised without offering the greatest flexibility to the Services in procuring weapons. The Committee wants the Services always to have available the option to procure weapons from multiple sources. Further, the Committee believes that it is imperative that the Department always have the information required to independently modify and maintain their weapon systems.<sup>1</sup>

More details on the evolution of the provision are lacking. It originated in the House Armed Services Committee but did not come up in the hearings held on the bill. When the bill was debated on the floor of the House it received no attention.<sup>2</sup> The bill as passed by the Senate on 6 June 1975 did not contain the language of Section 712, and the debates featured no reference to it. In conference, the language was stricken from the final bill.<sup>3</sup> However, the conferees, driven by the Senate members' view that the House language was "a highly complicated matter with profound implications," directed the Department of Defense, with GAO participation, to conduct a study of the issue and report the results and recommendations for new policies and procedures in time for consideration in connection with the FY 1977 Authorization Bill.<sup>4</sup>

The study was undertaken by the Joint Logistics Commanders (JLCs) Task Group and was reported to Congress in February 1976 under the title of *Report of Ad Hoc Group on Study of Technical Data Packages*. The group concluded:

The present procedures delineated in DoD Instructions 5000.1 and 5010.12 and ASPR clauses as promulgated in service directives are adequate and provide a continuous, coherent line of progression to the individual procurement/buying offices.... These procedures provide the Department of Defense with the needed flexibility to obtain the information required to independently modify and maintain their weapon systems as desired by Congress.

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<sup>1</sup> *Ibid.*

<sup>2</sup> See *Congressional Record*, 15 May 1975 (daily ed.), pp. H4082-H4116; 19 May 1975 (daily ed.), pp. H4190-H4212; 20 May 1975 (daily ed.), pp. H4405-H4455. The bill passed, 332-64, on 20 May 1975.

<sup>3</sup> U.S. Congress, House of Representatives [FY 1976-1977 DoD Appropriation Authorization Bill, Conference Report], H. Rpt., 94-488, 94th Cong., 1st Sess., 18 September 1974, pp. 67-68.

<sup>4</sup> *Ibid.*

The policies and procedures of the services are uniform and consistent. Competition is practiced on total systems where circumstances dictate that the best interests of the government are served. In almost every instance subsystems or components, as a minimum, are produced competitively. With respect to technical data the policy is to procure minimum essential data consistent with its intended use. To require purchase of complete TDPs for all procurements over a fixed amount would be costly of itself and would not insure a competitive environment.... The existing legislation with respect to technical data acquisition is adequate and provides the DoD with the essential flexibility to make value judgments on a case by case basis thereby procuring military hardware at least cost to the government.<sup>1</sup>

It was recommended that no additional legislation with respect to acquisition of TDPs should be considered, that current data acquisition policies and procedures in the DoD should be retained. Following the submission of this report, the House of Representatives included a rewritten TDP provision (Section 705) in the FY 1977 DoD Appropriation Authorization Bill:

After September 30, 1976 all contracts for the development or procurement of major weapon systems entered into by the military departments shall include a deferred ordering clause permitting the procuring authority to purchase technical data packages, and computer software when required, or in the course of contract performance or for purposes of reprourement of major weapon systems or subsystems from competitive sources. Exceptions to the inclusion of the deferred ordering clause may be made by the procuring authority in appropriate cases but only after giving due notice to the Committees on Armed Services and Appropriations of the House and Senate and a full explanation of the reasons for the exception.

The revision was made in the House Armed Services Committee and, just as during the previous year, the subject of TDPs did not come up in floor debates.<sup>2</sup>

At this writing, action on the TDP Procurement Requirement is incomplete. It is likely that the Congress will retreat from the position

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<sup>1</sup>Report of Ad Hoc Group on Study of Technical Data Packages, February 1976, p. 30.

<sup>2</sup>See *Congressional Record*, 8 April 1976 (daily ed.), pp. 3066-3124; 9 April 1976 (daily ed.), pp. 3160-3200.

taken by the House Armed Services Committee in 1975; lack of a requirement for purchase of data packages reduces the probability that price competition will soon be introduced into the acquisition of major systems.

#### OTHER EFFORTS

The four cases discussed above are by no means the only ones that bear on the question of competitive source selection. Within the appropriations process, other relevant actions typically fall into three classes. One is the authorization or appropriation ceiling. Annually, there are proposals, usually in the form of amendments from the floor, to limit authorizations or appropriations to a dollar amount or a specified percentage of the previous year's figure. Sometimes, the scope of the ceiling's application will reveal policy preferences. An example is Section 403 of the FY 1970 DoD Appropriation Authorization Act, which put a 93 percent ceiling on IR&D expenditures but exempted competitively awarded contracts. There is also the recently popular interservice fly-off strategy, which finds Congress insisting, usually in conference report language, on a "fly-off" involving two existing weapon systems--e.g., the A-7D and A-10.<sup>1</sup> Finally, it is not unusual for Congress to take what is inherently a "half-way" measure--the passage of an additional reporting requirement that may reflect policy judgments.<sup>2</sup> The Proxmire "fly-before-you-buy" amendment is an example. Another is the provision in the Senate-passed version of the FY 1975 DoD Appropriation Authorization Bill that required the Department of Defense to report its reasons for bypassing the open bidding process on purchases involving \$1,000,000 or more. The provision was deleted in conference after

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<sup>1</sup> A related technique is to ask DoD to evaluate similar systems and imply that the result should be a choice from among them. For example, in January 1971, the House Appropriations Committee had the Pentagon conduct a comparison study of the A-X, the Harrier, and the Cheyenne. The Pentagon complied and recommended continuation of all three--not exactly the result for which the committee had hoped.

<sup>2</sup> In recent years, the number of DoD reports required by Congress has increased significantly. Between 1967 and 1972, the yearly total increased from 79 to 134. See A. H. Cohn, "Information Resources of Congress on Military Matters: Before and After ABN," paper presented at 1973 meeting of the American Political Science Association.

House conferees maintained that adequate information could be obtained without such a substantial additional reporting requirement.<sup>1</sup>

This report has focused on the defense appropriations process. Other relevant action is taken outside of this process, of course. An example is the bill creating the Office of Procurement Policy,<sup>2</sup> a body within the Office of Management and Budget charged with providing "overall" direction of procurement policy. The operation of this new office and its effect on division of acquisition policy responsibilities between the executive and legislative branches are important subjects for additional, future examination.

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<sup>1</sup> *Congressional Record*, 24 July 1974 (daily ed.), p. H-7001.

<sup>2</sup> Act of August 30, 1974, Public Law 93-400, 88 Stat. 796 (codified at 41 U.S.C. §401 *et seq.*).

III. SELECTED ISSUES IN COMPETITIVE SOURCE SELECTION:  
OBSERVATIONS ON CONGRESSIONAL PERSPECTIVES

POSITIVE CONSIDERATIONS

Congressional interest in competition is a product of the growing concern for improving the weapon system acquisition process and the focusing of this concern on the source selection process itself. This section sketches the factors and considerations that shape congressional support for the use of competition in weapon system procurement.

Perceived Direct Benefits

In theory, the major direct benefits of competition in this context are lower prices and greater technological achievement (a better product).<sup>1</sup> Different varieties of competition promise to yield these benefits to varying degrees. There is every indication that congressmen fully appreciate this fact, together with the importance of the size of the proposed buy and the degree of technical risk.<sup>2</sup>

A more interesting question involves what benefits are assumed to inhere in what acquisition strategies. For example, ever since the renewed emphasis on prototyping, the term "paper competition" has become pejorative. More important, a shift from paper rivalry to prototype rivalry is viewed as enhancing competition, both qualitatively and quantitatively. The reaction of Senator Philip Hart (D-Mich.) to the

<sup>1</sup> Staging a competition is not the only theoretical way to achieve either lower costs or a better product.

<sup>2</sup> On the effect of the learning curve, see the statements of Sen. Cannon (Senate Committee on Armed Services, Subcommittee on Research and Development, FY 1973 R.R. Appropriation Authorization, Hearings, 92d Cong., 2d Sess., p. 3588) and Sen. Symington (*ibid.*, pp. 1470-1471; Senate Committee on Armed Services, FY 1974 R.R. Appropriation Authorization, Hearings, 93d Cong., 1st Sess., pp. 1451-1452); on the importance of the degree of technical risk involved, see the statement of Sen. McIntyre (Senate Committee on Armed Services, Subcommittee on Research and Development, FY 1974 R.R. Appropriation Authorization, Hearings, 92d Cong., 2d Sess., p. 831).

idea of parallel undocumented development<sup>1</sup> is an example. One of the crucial elements of this strategy is deferral of the source selection decision until after evaluation of competing prototypes (which may be either in a missionized or non-missionized stage). Production of the winning prototype by its developer normally would follow. Assuming the selected prototype is chosen at least in part because of its design and performance, the competition is still properly termed rivalry. Secondary characteristics, such as the form of the competing designs (paper or prototype), can be used to describe the rivalry, and various benefits may accrue to one and not the other (e.g., further reduction of uncertainty, more exact cost estimates); but the nature of the competition (the selection criteria, price or price and non-price) is not changed. Senator Hart, however, proclaimed parallel undocumented development as a method of achieving "greater competition."<sup>2</sup> The statements that reflect this perspective reveal that the state or form of the competing proposals assume a greater significance in Congress's thinking about types and degrees of competition than it does in outside thinking about the subject.

An alternative and more interesting interpretation of this position is that the preference discerned is based not on the state of the proposal but rather on the point in the development process through which more than one contractor is maintained. Expressed in this way,

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<sup>1</sup>Parallel undocumented development has three elements: (1) it requires competitive engagement to be sustained through further, more substantive stages of development, (2) contractor selection would be based on demonstrated performance of hardware, and (3) most government-required documentation would be deferred until after the winning contractor is selected. Sen. Hart was introduced to the idea by Dean Ralph C. Nash of the National Law Center at George Washington University during hearings held before a subcommittee of the Senate Committee on the Judiciary in 1968. Nash based his concept on earlier work at Rand, to which he was a consultant. See Senate Committee on the Judiciary, Subcommittee on Antitrust and Monopoly, *Competition in Defense Procurement Hearings*, 90th Cong., 2d Sess.

<sup>2</sup>*Congressional Record*, 9 September 1969, pp. 24793-24797. Many examples of similar statements can be found in the recent debate on the F-18 program. *Congressional Record*, 1 October 1975 (daily ed.), pp. H9377-H9408; 13 November 1975 (daily ed.), pp. S20004-S20015; 14 November 1975 (daily ed.), pp. S20132-S20134. The preference for prototype rivalry over paper rivalry for competition reasons is unmistakable.

the possibility of the acceptance of a "carry-over" effect<sup>1</sup> arises. Among persons concerned with weapons acquisition policy, there appears to be a shared perception that if the source selection date is delayed long enough, so that the configuration of the system has been substantially established under "competitive pressures," the benefits of the rivalry in the design phase will "carry over" into the production of the system.

There is price competition when two or more firms are competing to sell identical (practically, if not literally) products. One application could be as a supplement to design rivalry. For instance, once a superior design is chosen from among competing proposals, solicitation of several producers, in addition to the designer, could follow for bids on production of the winning design. The result would be an environment conducive to price competition with the likelihood that competitive benefits (in the form of lower prices) would be realized in the production of the system, just as they theoretically were during the design of the system (in the form of technological innovations). The price competition arrangement described requires additional early investment.<sup>2</sup> The "carry-over" theory envisions comparable benefits without additional costs.

Congress seems to recognize and subscribe to the carry-over effect. Before the initiation of actual competitive prototyping efforts, the effect was a matter of conjecture among legislators. Senator Hart said:

[I]f two contractors were undertaking the design of a system, working in a competitive environment, building prototypes, knowing that only one would be awarded the ultimate contract for the manufacture of the system, I believe this would provide the strongest possible inducement to design a system that is *economical to manufacture* and to operate. I believe that this competition would be good for the taxpayers.<sup>3</sup> [Emphasis added.]

<sup>1</sup>This term was devised by Genevieve G. Baumbusch of The Rand Corporation.

<sup>2</sup>On the nature of this investment, see Carter, *Directed Licensing* (1974).

<sup>3</sup>Congressional Record, 9 September 1969, p. 24795.

Several years later, experience with the competitive prototyping programs apparently reinforced Congress's appreciation of the existence of the effect. This exchange took place during questioning about the cost control and estimation aspects of the A-X attack aircraft program:

Mr. CROMWELL [Charles Cromwell, Professional Staff Member]. One of the points emphasized in Colonel Hildebrant's statement was that you want to maintain cost competition between two contractors [Northrop and Fairchild Republic] all the way up to where you award a production contract. On the other hand, isn't a lot of your ultimate cost of producing an airplane built into it in the design phase? Both contractors in the A-X competition have designed what we are told are cheap and easy to build airplanes. Can't you take his [sic] design, as you currently know it, update it for his production proposal and have a really good handle on what the ultimate cost is going to be?

General GLASSER. Absolutely--and you are describing one of the great utilities of a prototype program.<sup>1</sup>

A discussion of the Army's UTTAS (Utility Tactical Transport) helicopter prototyping competition (between Sikorsky and Boeing Vertol), which is atypical in that it is to extend into the full-scale development phase, covered the same ground:

Senator SYMINGTON. As I understand, you have two experienced contractors...

Dr. FOSTER [Dr. John S. Foster, Jr., Director of Defense Research and Engineering]. Yes, sir.

Senator SYMINGTON [continuing]. That you are carrying through the full engineering development program.

Dr. FOSTER. You, Mr. Chairman, know, nothing that we have found is so effective, when it comes to making equipment work satisfactorily and better than we had estimated, than to have two competitors working head to head with hardware in the field and making the necessary changes in order to improve the situation. Now, in our view, it just takes more prototype helicopters than is the view of the members of the staff. It is simply a judgment matter.

Senator SYMINGTON. Does the hope of long-term savings due

<sup>1</sup>Senate Committee on Armed Services, Subcommittee on Research and Development, *Appropriation Authorization, Hearings*, 93d Cong., 2d Sess., p. 1559.

to price competition justify the expenditure of some \$150 million additional to carry two contractors through development?

Dr. FOSTER. Yes, sir.<sup>1</sup>

The terminology in the last two exchanges calls for some attention. In the first one, Mr. Cromwell referred to the maintenance of "cost competition." The similarity of the term to price competition is misleading since the situation Cromwell is describing is the classic case of rivalry, where both cost and performance determine the winner of the competition. In the second exchange, Senator Symington refers to "long-term savings due to price competition," exhibiting the same imprecision that Mr. Cromwell's statement did. However, Senator Symington's reference is more instructive since it discloses that the effects of price competition (primarily lower prices) are anticipated in the production phase (the "long-term") even when rivalry is staged "upstream" in the design, development, and initial production process.

It is important to note the relationship between the "carry-over" effect and DoD's assumption of "enduring competition." The existence of the former might be thought to justify belief in the latter. That is, if early rivalry does succeed in suppressing costs in the production phase, DoD's characterization as competitive procurement of systems long ago reduced to a sole source environment is not unreasonable. However, DoD's recognition of a "follow-on after design competition" category (sole source procurement from a contractor who won a design competition) and its characterization as competitive procurement<sup>2</sup> disregards the duration of the competition. Validation of the DoD approach requires the additional but unproved assumption that the "carry-over" effect exists no matter how much development occurs after the sole source is selected.

<sup>1</sup>Senate Committee on Armed Services, *1961-1962 Appropriation Authorization, Hearings*, 93d Cong., 1st Sess., p. 995.

<sup>2</sup>Of this type of procurement, Assistant Secretary of Defense (ISA) Arthur I. Mendolia stated: "While some systems were originally awarded on a competitive basis, follow-on quantities can generally be obtained economically from the single system prime contractor." Joint Economic Committee, Subcommittee on Priorities and Economy in Government, *The Acquisition of New Systems*, Hearings, p. 2711.

There is evidence that congressmen seem at home with the meaning of price competition when it arises in discussions of second sourcing (usually defined as having a second producer share production with the initial producer). Not only is the term used correctly, it is used with the conviction that it represents a good thing. When questioned about a sole source contract, a service witness will commonly remind the inquiring congressman of the possibility of subsequent consideration of additional sources. A recurring example is the TOW weapon system, for which a one-third reduction in unit cost is usually claimed.<sup>1</sup> Second sourcing in a competitive environment, where the "better" producer will win a larger share of the total buy of a system to be produced in large numbers, has been very well received. Examples include the AIM-9 Sidewinder and AIM-7F Sparrow missiles, and the Mk-48 torpedo. There has been less interest in the feasibility of second sourcing in larger programs, and the replies by the services have been uniformly negative. For instance:

Mr. FINE [Hyman Fine, Professional Staff Member]. What is your opinion concerning the attainment of the benefits of price competition by bidding follow-on procurement where the inventory requirement is large enough to warrant the second source?

Dr. LABERGE [Dr. Walter B. LaBerge, Assistant Secretary of the Air Force (R&D)]. I think personally it is a wise thing to do and I have seen it work effectively on several contracts in my prior position with the Naval Weapons Center. Again, the volume needs to be quite high to warrant this. It also needs to be a simple product. You can't item a second source [on an] airplane short of a wartime circumstance.<sup>2</sup>

<sup>1</sup>See, for example, the exchange between Senator Lloyd Bentsen (D-Tex.) and Dudley Clarke Mecum II, Assistant Secretary of the Army (ISI), in Senate Committee on Armed Services, *FY 1973 and 1974 Appropriation Authorization, Hearings*, 92d Cong., 2d Sess., pp. 1511-1513. Note that when the original TOW producer, Hughes, won out over the second source, Chrysler, the Army claimed a 42 percent savings. *Aspen Daily*, 30 November 1971. A 30 percent savings figure has also been used generally, without regard to a specific system. See testimony of Norman R. Augustine, Under Secretary of the Army, Senate Committee on Armed Services, Subcommittee on Research and Development, *FY 1973 and 1974 Appropriation Authorization, Hearings*, 93d Cong., 1st Sess., p. 1218.

<sup>2</sup>Senate Committee on Armed Services, Subcommittee on Research and Development, *FY 1973 and 1974 Appropriation Authorization, Hearings*, 93d Cong., 1st Sess., p. 2849. Mr. Fine asked the same question of an Army witness earlier and received a similar answer (*ibid.*, p. 1218).

Speculation about wider applications of price competition, at the beginning of production, for example, has not been evident.

As a general matter (with all other things being equal), given the choice between competitive and sole-source procurement, sentiment in Congress would favor competition. Although distaste for the sole-source idea may be part of the reason, it is certain that competition is viewed as having certain direct benefits--primarily lower prices and technologically better products. When the focus shifts to differences in modes of competition, there appears to be an assumption within the Congress that design competition (with reduction to a single source well in advance of production) can indeed insure lower production prices. If this is the prevailing view, it is optimistic because the operation of the "carry-over" effect is still open to question and qualification in the minds of those outside of Congress. Consistent with the belief in the effect, Congressional and DoD interest in price competition is found only in the context of second sourcing and not in the context of major systems for which design competitions are staged.

#### Perceived Indirect Benefits

Faith in the direct benefits of competition does not adequately explain the level of Congress's interest in the subject. It does not, for example, fully explain its strongest statement to date--the enactment of a competition requirement into law (International Fighter Aircraft program).<sup>1</sup> Competition for weapon system contracts must involve an additional, indirect benefit or attraction (indirect because it does not bear on the system that is the subject of the contract). This indirect benefit stems from the view that competition, in whatever form, is the functional equivalent of equity.

Characterization of non-competitive or sole source contracts as wasteful and costly appears on the surface to be an indictment of the conventional implications of monopolistic evils in the situation. To date, however, similar objections to initially rivalrous procurements that are reduced to a sole source situation very early in the process

<sup>1</sup>See pp. 14-14.

are difficult to find. Part of the explanation lies in the belief in the "carry-over" effect, discussed above. The balance lies in the belief that awarding very large and long-term contracts without competition appears to be unfair (to the rest of the industry); the staging of some type of competition creates the appearance of fairness.<sup>1</sup>

Two of the episodes examined in Sec. II contain suggestions of this phenomenon. For example, the IFA program had sole source beginnings. In retrospect, this course seems consonant with the character and purpose of the requirement. (The acquisition did not require competitive procurement.) Nevertheless, reaction to it was hostile (aggravated perhaps by the overall controversy of the program, because of its association with the war effort and with Vietnamization). The response was to take an unprecedented step: enactment of a requirement that "competition" for the contract award be conducted. That this was probably not entirely motivated by a concern to avoid the potential economic disadvantage of sole source procurement is supported by the absence of any expressed interest, either prospective or retrospective, in the competition itself. The built-in requirement is best explained as a largely successful effort to minimize opposition to a controversial program by precluding any charge of unfairness.

Similarly, when the subject of recompetition arose in debate on the F-18 program, one of the most prevalent supporting arguments was based on fairness. House Appropriations Committee Chairman Mahon said:

[LTV] does appear to have a point that if this Navy airplane was not to be a derivative of the F-16, then the protesting company plus everybody else, in fairness, apparently should have had the right to compete. This seems logical to me.<sup>2</sup>

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<sup>1</sup>This report does not purport to examine the reasons for the importance of fairness, if indeed they are capable of being articulated at all. That type of examination would undoubtedly begin with attention to the underlying influence of the traditional "dominance of the market" notion of capitalism and to the special nature of the finite, close-knit structure of the defense industry (particularly at the prime contractor level).

<sup>2</sup>House Committee on Appropriations, Subcommittee on Department of Defense, FY 1976/1977 DoD Appropriation, *Hearings*, 94th Cong., 1st Sess., Part 9, p. 296.

And, Senator Goldwater, proposing that the aircraft be recompeted, concluded:

Maybe the F-18 will be the best. I would wish to see some of these other companies that can build just as good an aircraft as Northrop or McDonnell Douglas have a go at this. This is my whole argument.<sup>1</sup>

Thus, support in Congress for acquisition strategies that accentuate and promote competition will not be exclusively a product of belief in the potential direct economic and technical benefits. Much of the attraction will lie in the appearance of evenhandedness and equity intrinsic in competitive procurement.

#### NEGATIVE CONSIDERATIONS

A series of factors militate against support of the use of competition. The analog of what was termed perceived direct benefits is an obvious factor. The characteristics of the acquisition may render competition for the contract award superfluous. For example, if the projected buy is small (e.g., SR-71, AWACS), or if the cost of development in relation to the cost of the whole system is very high (e.g., B-1),<sup>2</sup> extended competition involving maintenance of multiple sources may be undesirable. Apart from the situations where the theoretical direct benefits of competition will not accrue, benefits may not be recognized where they are in fact likely. This is the complement to optimistic attribution of advantages to a particular acquisition strategy--e.g., recognition of a "carry-over" effect in connection with design competition. This subsection is devoted to an examination of less obvious (and less direct) negative considerations.

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<sup>1</sup> *Congressional Record*, 13 November 1975 (daily ed.), p. S20012.

<sup>2</sup> The Air Force did stage a design competition for the B-1 airframe contract, but the proposals were company-funded. In November 1969, RFPs were issued to General Dynamics, Rockwell International (then North American Rockwell), and Boeing. (Lockheed was subsequently allowed to compete but did not submit a proposal.) Rockwell was awarded the contract in June 1970.

### Perceived Alternative Cost Reduction Strategies

The point was made earlier that there will at times be options that are more desirable from a cost standpoint than any form of competition. The most significant is the choice of improving or adapting an existing system rather than developing a new one. It can be argued that making this choice necessarily involves competition (between the new and existing systems) and is therefore not properly termed an alternative strategy. This is correct, particularly when the situation finds an extant system being considered along with newly proposed systems. Examples from the past include the IFA competition and the competition for the Navy's carrier-on board-delivery (COD) requirement (won by Lockheed's S-3A Viking). As the date for the production decision on the B-1 nears, there will be continued advocacy of modifying the B-52 or the FB-111 instead. The same issues were aired when the B-1 (then AMSA, Advanced Manned Strategic Aircraft) was first funded. In the middle 1960s this debate once resulted in no action being taken at all (when the YF-12A and F-106X were considered to fulfill the advanced interceptor requirement). There will be other situations in which the choice of modification or adaptation will be made *in lieu of* soliciting new proposals.

In recent years, the importance of foreign sales has meant that continuing attention is being paid to the desirability of interservice and intraservice/intersystem commonality, the objective being the reduction of the unit cost of systems offered for export.<sup>1</sup> Examples of this entering into discussions of a new system were the proposals to use modified F-14s or F-15s as the Navy's VFAX.<sup>2</sup> Reducing the unit cost of aircraft already in development or production is an aim that may be inconsistent with development of new systems, even when a competitive

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<sup>1</sup>A study of 35 major weapon systems by the Congressional Budget Office concluded that "on the average one dollar of [foreign military] sales results in fourteen cents in savings to the U.S., of which four cents represent R&D recoupments." See Congressional Budget Office, *Budgetary Cost Savings to the Department of Defense Resulting from Foreign Military Sales*, 24 March 1976, p. x.

<sup>2</sup>See Rep. Mahon's statement, p. 40.

source selection process is contemplated. It may inhibit competition by inhibiting new systems.

#### Organizational Constraints

With regard to acquisition strategies that involve extended design competition (e.g., through the full-scale development phase) or increased price competition, there is a different set of constraints on congressional support. One is the difficulty members of Congress face in "internalizing" the future benefits that make advanced competitive strategies involving greater initial expenditures attractive. Thus, although there is acceptance of the fact that increased expenditures in the early stages will result in savings overall, the strategy is not necessarily viewed as self-serving. Members of Congress (primarily in the House, of course) are keenly aware that their positions are secure for just the short run and that short-term costs are more visible (more marketable by opponents) at election time than unrealized long-term savings. Consequently, future savings are likely to be discounted in favor of savings in the present. The overly optimistic faith in Air Force/Navy commonality (and attendant competition tradeoff) evident in the NACF case is an illustration.

Adoption of advanced competitive strategies is to some extent discouraged by the evolution of defense spending into a tool of social and economic policy. System cost and performance and enemy threat are rarely the exclusive considerations when initiation or termination of a weapon system program is contemplated. The employment effects of the decision are also weighed carefully. The more important non-performance, non-price considerations become, the less relevant are acquisition strategies that seek to maximize design and price competition. It will be suggested below, for example, that this fact makes the introduction of price competition into major weapon systems acquisition unrealistic.

#### External Relationships

In the complex relationship of the military services and the Congress one facet stands out and bears rather heavily on any congressional

treatment of national security issues: the great deference paid to the services on questions dealing with weapon systems. Many people, including members of Congress, have advanced the hypothesis that on most matters of defense policy the Congress will defer to the military.<sup>1</sup>

A good illustration is the statement made by Rep. Elford A. Cederberg (R-Mich.) during the floor debate on an amendment to cancel the F-18 Navy Air Combat Fighter program. A principal consideration was whether the aircraft was needed as much as Navy witnesses had said or whether modification of other aircraft (F-14 or F-16) was a workable alternative. Rep. Cederberg made this point:

Now, there is not anybody on this floor that I know of that knows anything about the designing of an aircraft. I certainly do not. I am perfectly willing to leave this matter up to those in the Navy who have been living with this matter year after year.<sup>2</sup>

Both the House and the Senate did just that. The significance in the context of this study is that an inclination on the part of Congress to use more price competition or extended rivalry may be suppressed if confronted by service dedication to a single system (or contractor). Moreover, although Congress consistently accepts the delays implicit in various alternative acquisition strategies when the services do not seem to be pressing the point, it is also true that Congress is quite responsive when scheduling is a major concern of the military. It is likely that an opportunity for experimentation would be forgone if, for example, testimony by service witnesses stressed declining force levels, etc.

Quite apart from the influence of the military are the frank reservations within the Congress about the desirability of "real competition." Representative Otis Pike (D-N.Y.) has said:

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<sup>1</sup>See, e.g., Aspin, "The Defense Budget and Foreign Policy: The Role of the Congress" (1975), pp. 155-174; Fox, *Arming America* (1974), Chapter VII; Morton H. Halperin, *Bureaucratic Politics and Foreign Policy*, Brookings Institution, Washington, D.C., 1974, pp. 230-232, 257.

<sup>2</sup>*Congressional Record*, 1 October 1975 (daily ed.), p. H9386.

If we really try to make real competition in all our procurements, it is perfectly possible that if the competitors are honest one company is going to win them all. And I can see--I greatly believe in competitive procurement. But I also see an awful danger, too. Some companies are just plain better than others are. I don't know what we can do about it.<sup>1</sup>

There can be little doubt that the relationship of the Congress and the defense industry is a special one. This sentiment reflects a recognition of industry imperfection and can be traced to a protective concern for the industrial base. Carried to its extreme, both in the idea and its acceptance, the statement is antithetical to both design and price competition in their pure forms. It will be suggested below, however, that this reservation, whatever its prevalence, has less of an effect on the fact of competition than on its form.

#### FINAL DEFINITION AND POLICY IMPLICATIONS

An impetus for this inquiry was the ongoing discussion among students of systems acquisition policy of ways to "increase" competition for major systems and perhaps introduce price competition at the initial production stage of the acquisition process. From the perspective of the Congress, these approaches are difficult. It is clear that congressional approval of any particular use of competition will never be based *in toto* on a balancing of the *direct* costs and benefits. An effort has been made to identify the perceptions and considerations that do shape congressional attitudes toward acquisition strategies designed to inject "competition" into the source selection process. These considerations can be summarized as follows:

#### I. Positive

##### A. Direct benefits of competition

##### 1. Lower prices

(even when competition is limited to early design and development stages, the price effect is viewed as carrying over into production)

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<sup>1</sup>House Committee on Armed Services, *FY 1972 DoD Appropriation Authorization, Hearings*, 92d Cong., 1st Sess., p. 4446.

2. Technological excellence

- B. Indirect benefits of competition  
(e.g., the equating of competition in any form with the appearance of fairness or equity)

II. Negative

- A. Unsuitability of competition in some cases
- B. Alternative strategies or goals  
(e.g., intersystem or interservice commonality; international standardization)
- C. Organizational constraints
1. Inherent antipathy toward efforts that involve increased short-run expenditures as the condition for long-run cost benefits
  2. The evolution of defense spending into an important tool of social and economic policy
- D. External relationships
1. The tendency to defer to the military on many questions of weapons acquisition (coupled with the military's preference for new weapons as soon as possible)
  2. Misgivings about the possible "attrition effects" of "real competition" stemming from a protective concern for the defense industrial base

Which considerations predominate is partly a function of the date at which the decision is to be made. For example, threat perceptions change over time; and when the threat seems to be growing rapidly, there is less disposition to accept the delay inherent in competition. Also, reasons for bypassing competition differ according to the stage of development of the system at the time of the choice, as illustrated by the NACF episode.<sup>1</sup>

Evidence on the way these considerations are weighted and brought into play suggests that theoretical arguments for competitive source selection techniques simply do not comport with the realities of

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<sup>1</sup>In 1974, when the program was not yet underway, competition was by-passed because it was felt to be too costly. A year later, after development was begun, the primary reasons for by-passing competition were (1) the Navy's strong support for the existing program, (2) the feeling that a new competition would not result in a better aircraft, (3) reluctance to cancel ongoing programs, and (4) uneasiness about the effect of a delay on force structure.

Congress's role in the acquisition process. Such arguments underestimate congressional concern for the health of the defense industry and for the distributional effects of source selections. Testimony calling for reducing the number of American airframe manufacturers has not been well received, and there is expressed concern for the United States' so-called "one-and-a-half" industry capability in the production of large jet engines.<sup>1</sup> In light of this concern, the sentiment expressed in the statement by Rep. Otis Pike above<sup>2</sup> should not produce surprise. Rep. Pike observed that "real competition" entailed an "awful danger" and an apparently serious problem: what to do about the fact that some companies are just plain better than others. The answer has been to add another dimension to competition for major weapon systems:

Mr. FULBRIGHT. What about the recent contract for the [DD-963] destroyers?...Was there any competition in bidding for those ships or were the awards made on other grounds?

Mr. PROXMIRE. I guess political competition.<sup>3</sup>

Political competition, in which factors other than price and system design and performance help decide what is to be built, has been hypothesized for some time.<sup>4</sup> The following is a sample of non-price,

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<sup>1</sup>This refers to the fact that two companies, General Electric and the Pratt & Whitney Division of United Technologies (formerly United Aircraft), produce the overwhelming bulk of large propulsion units in the United States, and that Pratt & Whitney is partially based in Canada. General Electric builds the engines of the F-4, F-5, C-5, S-3, A-10, F-18, YC-14, and B-1, among others; Pratt & Whitney engines power the A-4, A-6, B-52, U-2, KC-135, C-141, F-111, SR-71, E-3A AWACS, F-14, F-15, F-16 and YC-15, among others. (Engines for the A-7D, P-3, and the E-2 are produced by the Detroit Diesel Allison Division of General Motors.) See House Committee on Armed Services, *FY 1972 DoD Appropriation Authorization, Hearings*, 92d Cong., 1st Sess., pp. 4432-4447; *Congressional Record*, 13 November 1975 (daily ed.), p. S20013.

<sup>2</sup>See p. 59.

<sup>3</sup>*Congressional Record*, 17 August 1970, p. 29292.

<sup>4</sup>One of the most interesting and controversial treatments of this subject is in an article by James R. Kurth entitled, "Why We Buy the Weapons We Do," *Foreign Policy*, No. 11, Summer 1973, pp. 33-56. Kurth offers two explanations of what he calls "American weapons policy." The major one is termed the "follow-on imperative": Since a large and

non-technical considerations that might influence source selection (and suggestions of *possible* occurrences):

1. Past performance of one of the contractors (e.g., C-141 and C-5A, both times Lockheed over Boeing?);
2. Locations of the contractors (e.g., F-111, General Dynamics over Boeing?);
3. Economic conditions of the contractors and their locales (e.g., A-10, Fairchild Republic over Northrop?).<sup>1</sup>

It is submitted that members of Congress are sensitive to this non-price, non-technical evaluation and that the Congress values the flexibility it provides. For instance, the SST was not handled as a defense program; Chairman Rivers provided some insight not only into how it would have been handled but also into the flexibility that the military committees know they have:

established aerospace production line is believed by defense policymakers to be a national resource, "at least latent pressure" is exerted on the Defense Department to award a new major contract to a production line when an old major contract is phasing out. The other explanation is the "bail-out imperative": The government awards contracts to corporations in deep financial trouble. Some of Kurth's supporting examples are open to question (for example, the follow-on imperative is not illustrated by the award of the F-15 contract to McDonnell Douglas when the ongoing F-4 program and the production line situations at the other competitors--North American Rockwell, Fairchild Hiller, and Northrop--are considered), and only one of his four predictions was correct. The considerations identified are undeniably important factors in source selection decisions; however, the word "imperative" is hardly suitable.

<sup>1</sup>Other competitions have simply proved unpredictable--e.g., the competition for the F-15 Eagle, which ended on 24 December 1969 with the selection of McDonnell Douglas. Early reports had Fairchild Hiller in the lead, with the North American Rockwell/Northrop team a "not very good second" and McDonnell Douglas last. *Aerospace Daily*, 10 March 1969. A day before the award was made, Standard & Poor's indicated that North American Rockwell was going to win. See *Aerospace Daily*, 7 January 1970. Five weeks before North American Rockwell won the B-1 competition, it was widely reported that General Dynamics was going to win, with Boeing second, and the eventual winner third. See *Aerospace Daily*, 30 April 1970.

You take an SST. I saw both of them. If I had been the one I would have selected the Lockheed version....*I think I would have given Boeing something else.*<sup>1</sup> [Emphasis added.]

And, Rep. Charles H. Wilson (D-Calif.) was well within the bounds of accepted practice when he called for award of the B-1 contract to North American Rockwell (a constituent) on the grounds that "all recent procurements [had] gone elsewhere."<sup>2</sup>

Political competition for contract awards results from the workings of constituent politics and two factors mentioned above: (1) use of peacetime defense spending as a tool of fiscal policy and social engineering, and (2) aversion to attrition of major defense contractors. Given its presence and force, existing approaches to various competitive procurement strategies should be reconsidered. At the very least, it should be acknowledged that textbook usages of such terms as "price competition" and "rivalry" are inadequate to describe the nature of the selection procedures actually in use.

It is on the question of flexibility that the most ambitious competitive strategies (those involving price competition) will *a fortiori* be discounted by the Congress. Congress has ensured that it will have regular and significant input into decisions during the lifetime of a weapon system by such measures as reduced use of no-year funding and institution of the double-tiered appropriation process. It is safe to say that there would be resistance to any procedure that appeared to lock in a course of conduct at the inauguration of a system. It is very possible then that price competition, which would close off non-price considerations, may not even be acceptable as it would diminish current flexibility and possibly result in the realization of the danger described by Rep. Pike. It may be that the utility of price competition strictly defined diminishes as the size of the system (and importance of the contract) increases. If so, it would help explain why the apparent understanding in Congress of the workings and advantages of

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<sup>1</sup>House Committee on Armed Services, FY 1970 DoD Appropriation Authorization, Hearings, 91st Cong., 1st Sess., p. 2354.

<sup>2</sup>Aerospace Daily, 23 March 1970.

competition seems distorted in the context of large systems (possible definition: too large for second sourcing).

One of the most important lessons to be learned is that present-day procurements bear little resemblance to the definitional concepts of price competition and rivalry because of the attention paid to distributional considerations. The hallmark of the modern approach--namely, flexibility--is highly valued since it insures that such non-price, non-technical considerations as a protective interest in the industrial base can contribute to source selection decisions. Therefore, a hard-sell of the net cost benefits of a more advanced strategy--e.g., the use of directed licensing to obtain price competition in initial production runs--will miss its mark if (1) it patently limits Congressional flexibility, or (2) it is not supplemented by appeals to considerations other than cost savings (e.g., fairness).

Appendix

SUMMARY OF THE GENERAL ACCOUNTING OFFICE'S DECISION  
IN LTV AEROSPACE CORPORATION'S PROTEST OF THE F-18 CONTRACT AWARD  
(30 September 1975)

I. INTRODUCTION

A. *Position of LTV Aerospace Corporation (LTV)*<sup>1</sup>

1. Navy selection of the F-18 violated the FY 1975 DOD Appropriation Act since the F-18 is not a "derivative" of the F-16 and not common with it.
2. At the very least, the selection of the F-18 must be deemed void as against public policy since the selection was contrary to the Conference Report that led to the passage of the act.
3. With respect to the competition itself, the two competitors, LTV and McDonnell Douglas, were not properly evaluated in the areas of commonality, engines, and cost.
4. The relief sought is initiation by the Navy of a new competition for the Navy Air Combat Fighter (NACF).

B. *Position of the Navy*

1. Denies generally all of LTV's allegations.
2. Selection of the F-18 complied with both the letter and spirit of the FY 1975 DOD Appropriation Act.
3. Both LTV and McDonnell Douglas were evaluated fairly and on the same basis.
4. The F-18 is the best design for the Navy's requirements.

II. TIMELINESS OF THE PROTEST

- A. The Comptroller General may consider any protest, even if not timely filed, where he determines that it raises issues significant to procurement practices or procedures. Section 20.2(b), 4 C.F.R. (1975).
- B. It is concluded that the issues presented are significant and thus timeliness of filing is not relevant.

<sup>1</sup>LTV was represented by the Washington, D.C., firm of Fried, Frank, Harris, Shriver and Kampleman. The protest is reprinted in Senate Committee on Government Operations, Subcommittee on Federal Spending Practices, Efficiency, and Open Government, *Major Systems Acquisition Reform, Hearings*, 94th Cong., 1st Sess., Part One, pp. 8-18.

### III. ISSUES PRESENTED

- A. Whether the F-18 selection was in violation of a "congressional directive" (raising questions regarding interpretation of a federal appropriations act and "congressional intent" as public policy).
- B. Whether the F-18 award resulted from improper and unfair competition.

### IV. LEGALITY OF THE CONTRACT AWARD

#### A. *Position of LTV*

- 1. An appropriation, particularly when in lump-sum form, must be read in light of its legislative history.
- 2. The legislative history of the Act in question includes the Conference Report, H. Rot. No. 93-1363, 93rd Congress, 2nd Session (1974).
- 3. The report explicitly stated that \$20,000,000 was being provided for an NACF, but that "adaptation of the selected Air Force [ACF] to be capable of carrier operations is the prerequisite for use of the funds provided" and that "future funding is to be contingent upon the capability of the Navy to produce a derivative of the selected Air Force [ACF] design."
- 4. Since the F-18 is not a derivative of the F-16, chosen by the Air Force, award of the F-18 contract involved the expenditure of funds in violation of the FY 1975 DOD Appropriation Act and is therefore invalid.

#### B. *Position of the Navy*

- 1. It is conceded that (a) the F-18 is not a derivative of the F-16, and (b) the language of the Conference Report precludes the expenditure of \$20,000,000 on anything other than a derivative of the F-16.
- 2. However, a lump sum appropriation that is clear and unambiguous on its face cannot be construed as incorporating restrictions that appear solely in the Conference Report.
- 3. And, although legislative history may indicate congressional intent, non-compliance with a provision not included in the law itself is not illegal per se.
- 4. Although there was no reprogramming in a formal sense, congressional approval for the deviation from the non-statutory guidance was otherwise obtained.

#### C. *Analysis by A.*

- 1. It is a fundamental principle that laws are to be construed in such a way as to give effect to the intent of the legislature.

2. One of the ways this intent can be determined is by resort to the statute's legislative history.
  3. There is a difference between utilizing legislative history for the purpose of illuminating the intent underlying language used in a statute and resorting to that history for the purpose of writing into the law what is not there.
  4. Where as here Congress merely appropriates lump-sum amounts without statutory restrictions, a clear inference arises that the intent is not to impose legally binding restrictions, regardless of restrictive language in non-statutory material.
  5. Thus, where a statute clearly authorizes the use of funds for the procurement of "military aircraft" without restriction, it must be construed to provide support for the validity of procuring any military aircraft.
  6. This does not mean agencies are free to ignore clearly expressed legislative history applicable to the use of appropriated funds. To do so risks strained relations with Congress, but not legal sanction.
- D. *Conclusion:* The Conference Committee statement relied upon by LTV constitutes a "directive" paralleling and complementing--but distinct from--the actual appropriation. Therefore the challenged contract award did not violate the FY 1975 DOD Appropriation Act and is thus not illegal.

#### V. PUBLIC POLICY CONSIDERATIONS

- A. *Position of LTV:* Public policy favors "the utilization of one basic aircraft technology and design to fulfill the needs of both the Navy and the Air Force for a lightweight ACF."
- B. *Conclusion:* Since (1) there were no statutory violations attending the challenged award, (2) the contract does not require illegal actions, (3) there was not a violation of moral standards, and (4) there is a strong presumption in favor of the validity of contracts, it would be improper to conclude that the contract award is void as contrary to public policy.

#### VI. REPROGRAMMING

- A. *Position of LTV:* Even if the Navy's actions were not contrary to statute or public policy, those actions cannot be upheld because the Navy did not comply with the applicable DoD Directive and Instruction on reprogramming.
- B. *Conclusion:* DoD directives, unlike laws and regulations, do not provide the CAO with a proper basis for determining the legality of expenditures.

## VII. THE COMPETITION

### A. Introduction

1. The RFP/RFO established performance and cost as the equally weighted primary criteria; commonality was the third most important factor. (Others included reliability and maintainability, development risk, lot 1 cost, etc.)
2. The general position of LTV is that it satisfied the criteria to a far greater extent than McDonnell Douglas and yet was not awarded the contract.

### B. Commonality

1. *Position of LTV:* The commonality criterion supports the Conference Report language and thus must be construed as requiring commonality with the ACF (F-16).
2. *Position of the Navy:*
  - a. It is conceded that the F-18 is not a derivative of the F-16.
  - b. However, the RFP/RFO sought design of a Navy-suitable lightweight fighter that would maximize commonality of the technology and hardware of both the LWF and ACF programs.
  - c. Inasmuch as the F-18 is a derivative of one of the LWF prototypes (YF-17), the selection did not totally sidestep the commonality criterion.
3. *Analysis and Conclusion by GAO*
  - a. The RFP/RFO uses commonality as a goal rather than as a mandatory feature.
  - b. Moreover, the context in which it was used refers to both the LWF and ACF programs.
  - c. Both LTV and McDonnell Douglas were evaluated fairly within that context.

### C. Engines

1. *Position of LTV*
  - a. The RFP/RFO listed four acceptable engines: J-101, F-100, F-101, and F-401.
  - b. The F-18 engine (F-404) was not in the exclusive listing (the LTV F-16 derivatives used the F-100).
2. *Position of the Navy*
  - a. The four engines listed were not the only engines acceptable. They were only the engines the Navy intended to furnish as Government Furnished Equipment.
  - b. At any rate, the F-18's F-404 engine represents only a minor modification to the J-101 engine, the primary change being one of nomenclature.

3. *Conclusion:* The F-404 engine is indeed a modified version of the J-101, and LTV was therefore in no way prejudiced by the engine selection.

D. *Cost*

1. *Position of LTV*

- a. The Navy's assessment of the costs of the competing designs was prejudicial to LTV because it increased LTV's estimate without increasing McDonnell Douglas's estimate.
- b. Nevertheless, the Navy selected the higher-priced proposal even though cost was one of two chief evaluation criteria.

2. *Analysis and Conclusion by GAO*

- a. Since the NACF contract was to be a cost-reimbursement contract, the Navy properly developed its own independent cost estimates.
- b. The same parametric pricing technique and escalation rates were applied to the LTV and McDonnell Douglas proposals, and thus no prejudice is apparent.
- c. Further, it was well within the Navy's discretion to award a negotiated contract on the basis of a proposal's technical superiority notwithstanding its higher cost.

E. *The Necessity to Re compete*

1. *Position of LTV:* Once the Navy determined that ACF derivatives were unsuitable, failure to resolicit the entire aerospace industry (naming Grumman, Lockheed, and Boeing) violated statutory and regulatory requirements of "maximum competition." 10 U.S.C. §2304(g); ASPR 3-101(B).
2. *Position of the Navy:* LTV has no standing to raise this issue since it participated in the competition and was not one of those allegedly excluded.
3. *Analysis and Conclusion by GAO*
  - a. What LTV is arguing is that both it and the rest of the industry should be given an opportunity to compete for the NACF unencumbered by any requirement to achieve commonality with a certain other aircraft (as McDonnell Douglas was allowed to do).
  - b. However, this assumes that the solicitation's commonality provision limited selection to an ACF derivative. Since this has been deemed an incorrect assumption, there is no basis for concluding that the Navy unduly restricted competition.

VIII. SCOPE OF THE DECISION

"It should be noted, however, that [denial of LTV's protest] does not mean that the Navy is free to proceed with full-scale development of the F-18. In reaching our conclusion, we have not considered the wisdom or cost effectiveness of the Navy's decision, nor have we examined the various alternatives available to the Navy. Our decision, therefore, does not encompass any broad policy questions that might be raised concerning the Navy selection. Rather, it concerns only the award of the short-term sustaining engineering contracts. Award of full-scale development contracts will depend upon congressional authorization of funds for that purpose."