ND-A11	3 980 SIFIED	ARMY RESUL NAY 8 APRO-	PERSON TS OF 1 1 81-63	VEL RESI	EARCH O	FFICE N OFPP CC	ASHING MPETIT	TON DC LON WOR	KSHOP H	ELD 12-	F/6 1 •13 H	5/5 ETC(U)	
	1 or 3 ^{AD A} 3000	1.16											
						24					,		

OFFICE OF FEDERAL PROCUREMENT POLICY

1000

AD A 1 1398

RESULTS OF THE JOINT DOD/OFPP COMPETITION WORKSHOP

HELD 12-13 MAY 1981 NEW EXECUTIVE OFFICE BUILDING WASHINGTON, D.C.

MAY 1981

DISTRIBUTION STATEMENT A Approved for public release; Distribution Unlimited 82 04 28 025 EXECUTIVE OFFICE OF THE PRESIDENT-OFFICE OF MANAGEMENT AND ENDOFT

AD NUMBER	PAPER COFY PRICE \$	4-26-82	DTIC ACCESSION NOTICE
1. REPORT IDENTIFYING INFORMATION			
A ORIGINATING AGENCY US Army Procurement Researc	REQUESTER:		
B REPORT TITLE AND OR NUMBER Results of the Joint DOD/OFPP C	 Full your mailing address on reverse of form. Complete items 1 and 2. 		
C MONITOR REPORT NUMBER	3. Attach form to reports mailed to DTIC.		
D PREPARED UNDER CONTRACT NUMBER	4. Fise unclassified information only. DTIC:		
2. DISTRIBUTION STATEMENT Approved for Public Release; [1. Assign AD Number, 2. Return to requester.		
	PREVIOUS FOIT		

. د د مود س

DTIC FORM 50

. .

- ----

......

1 . A

.

Acces NTIS DTIC Unans Just	GRA&I	
By P Dist Ava:	ex Ltr. on Eile ribution/ llability Codes	DTIC
Dist	Avail and/or Special	

.

RESULTS OF THE

JOINT

DEPARTMENT OF DEFENSE/OFFICE OF FEDERAL PROCUREMENT POLICY

COMPETITION WORKSHOP

May 12/13, 1981



design as	N THAT DEALEMENT A
1.	n set that at is ase;
	ben Haradage

PREFACE

I feel the Joint DOD/OFPP Competition Workshop was successful in drawing out the main issues today in the use of competition. The results will be useful in drafting effective policy and guiding the conduct of research. I thank all those who participated and look forward to a continuing dialogue.

R. J. Zuinkla

ROBERT F. TRIMBLE Acting Deputy Under Secretary (Acquisition Policy) Office of the Under Secretary of Defense (Research and Engineering)

This workshop brought together over fifty people currently concerned with the proper implementation of competition and gave them an opportunity to intensively discuss common problems. I am proud to endorse the results of the workshop and they will be used in the development of the new Federal Procurement System coverage on competition.

sule DONALD E. SOWLE

Administrator for Federal Procurement Policy Office of Management and Budget

TABLE OF CONTENTS

<u>P/</u>	<u>IGE</u>									
PREFACE	ii									
AFTER ACTION SUMMARY										
INDIVIDUAL PRESENTATION										
1. Robert Williams, US Army	11									
2. Captain William Washburne, US Navy	26									
3. John Kunsemiller, US Air Force	31									
4. Edward Lovett, Department of Energy	38									
5. John Daly, US Army	39									
6. William Williams, US Army	53									
7. John Hiller, RAND Corporation	59									
8. William Drinnon, Putnam, Hayes, & Bartlett, Inc	69									
9. Jacques Gansler, The Analytical Sciences Corp	80									
10. Paul Carrick, Institute for Defense Analyses	i 06									
11. Ralph Williams, US Coast Guard (DOT)	15									
12. Captain Walter Carlson, US Navy	19									
13. John Talley, US Air Force	56									
14. John Fargher, Department of Defense (DSMC)	170									
APPENDICES:										
Workshop Agenda										
Attendees										
Bibliography	85									

AFTER ACTION SUMMARY

BACKGROUND.

A Joint Department of Defense/Office of Federal Procurement Policy (DOD/OFPP) Workshop on Competition was held on 12 and 13 May 1981 at the Office of Federal Procurement Policy. Over 50 participants from the Department of Defense, civil agencies, and outside organizations attended.

The need for this forum was first recognized during the Ninth Annual DOD/FAI Acquisition Research Symposium held at Annapolis, Maryland, June 1980. After becoming aware of the proposed workshop, DOD and the Office of Federal Procurement Policy endorsed the ideas of the workshop and authorized its development and execution. The Army Procurement Research Office (APRO) was the executive activity for DOD, and the Federal Acquisition Institute was executive activity for civil agencies in conducting this workshop.

OBJECTIVES OF WORKSHOP.

Attendees of the workshop were operational managers, policymakers, and researchers from various Federal agencies and outside organizations who have done significant research in the area. The main purposes were to focus on recent experience in competitive procurements and to review recent research on competition in major systems acquisition, primarily. The workshop was also to promote discussion between operation managers and researchers seeking to advance effective competition. The specific objectives were to:

o. >>Gain mutual understanding of competition.

- o pDiscuss and interpret recent research results.
- o Exchange ideas on competition research and policy.

o *P*Consider future directions in research and policy.

SUMMARY OF WORKSHOP PRESENTATIONS AND DISCUSSION.

Mr. Sowle, Administrator-Designate, OFPP, and Mr. Trimble, Acting Deputy Under Secretary of Defense Research and Engineering (Acquisition Policy), delivered keynote addresses to the workshop. Mr. Sowle expressed the hope that results of the workshop would be helpful in developing the competition section of the New Federal Procurement System. He felt an important contribution of the workshop would be the proper articulation of this difficult subject to Congress.

Mr. Trimble saw the workshop as a forum for exploring new concepts and ideas for dealing with competition. He also viewed it as an opportunity to dispel some of the myths, espoused by those outside procurement, that the subject lacks attention.

After the keynote addresses, an introductory talk on basic issues of competition, including historical perspectives, potential advantages, and leading areas for research, was given by the Program Chairman (1). Particular emphasis was placed on the multifaceted nature of competition. Competition has different objectives and measures of effectiveness in different situations and is not universally accepted, for example, by industry buyers and in other countries. It was further pointed out that although competition on a macro or commodity level is important, the workshop would concentrate on micro issues, that is, competition on a program or contract.

The topic of the first session was competition planning. Speakers discussed types of competition, competition strategies, and barriers to competition (2, 3, 4). A recurring theme was the inadequacy of the Defense Acquisition Regulation categorization of competition and the lack of a

means to measure the effect of competition. Attendees stressed the importance of setting realistic objectives and articulating this realism to all interested parties. A range of techniques for effecting competition was presented (3). Barriers to competition, both factual and perceived, were recognized. Acquisition managers often perceive barriers to competition without assessing the marketplace (4).

A common point of contention was the role of the contracting officer and program manager (PM) in planning for competition. There was concern that current DOD initiatives would place the decision on competition with the PM. The consensus of the group was that the two should work as a team in a check and balance relationship.

Other areas of concern that arose in this session were:

• Affordability and competition - the need for resources to bring on competition suggests the trading off of programs, or in other words, affordability issues.

• The negotiation authority for the leader-follower technique exception 16 to DAR (10 OSC 2304.(a)(16)) (authority to negotiate to improve the mobilization base) is commonly used, but may not be the appropriate approach.

• Investment - intentions are one thing, but funding to develop a second source remains a serious obstacle.

• Secondary, subcontract, base support and breakout to competition we should also improve competition below the major system level.

• Competition status on programs - how do we tell how well we are doing?

 Mission vs. individual objectives - individuals may be more motivated by their own needs (e.g., promotion) than the need to take a risk to obtain potential benefits of competition.

The major portion of the workshop was spent on the competition decision itself (4-13). Operational managers stressed the strategies considered (e.g., leader-follower, use of technical data package (TDP), teaming) and the criteria used to make the decision on competition (5, 11, 12, 13). Cost comparisons and qualitative issues such as technological risks were featured (5, 12, 13). Generalizations as to the conditions needed for various strategies (e.g., validated TDP needed for TDP strategy, high volume for teaming) were made (6). Although competition was sought to save money, other objectives were also sought, such as increasing the mobilization base or leverage over a contractor.

Researchers described the data bases they had accumulated and the findings they had gained (6, 7, 8, 9, 10). While there has been considerable work, attendees agreed more could be done. Main areas discussed were:

• Incumbent prices reflecting learning curve progress (not last sole source bid price) should be used to calculate competitive savings (6, 8, 9).

• Learning curve shifts occur for prospective new sources (to reflect competitive pressure (6, 8, 9).

• Learning curve rotations may occur for prospective new sources (to reflect improved techniques used (8, 9).

• The importance of the effect of production rate on learning curves is still uncertain (7).

• The applicability of production learning curve concepts in competition on service contracts is now being researched (9).

• The use of a gross model, for example, a simple learning curve shift savings model, to calculate rough savings may be appropriate in order to test the feasibility of competition in procuring a system and an economic analysis to calculate the actual savings of competition on a system (8).

• The interaction of competition and multiyear procurement (savings, innovation, program control) is still unknown.

 Savings differ by type of procurement (major system buyout, secondary items, multiple repetitive awards).

• Second source learning behavior may differ because of commodity complexity.

In the last session the group attempted to summarize the views expressed during the workshop (14). In particular, it was agreed that competition could not be seen as universally "good" and that policy should be realistic in giving guidelines for the establishment of objectives for competition and in conditions for its use. Terms such as "full and free," "real," "meaningful," and "reasonable level of" competition were debated. Policy should address both technical and economic benefits with sufficient flexibility to deal with a variety of situations. It was generally felt that management must recognize that fostering effective competition requires committed resources up-front. The benefits and barriers to competition were again reviewed, as well as the means to measure benefits of competition.

Initiating competition should be the joint responsibility of the PM and the contracting officer. However, many suggested that because the PM emphasized system performance, competition may not be a primary concern to him.

Another theme revisited was the classification of competitive and noncompetitive procurements and the importance of giving a "true" report of competition to Congress and others. Not only should we determine the proper amount of competition, but we must code and record it correctly.

At the conclusion of the session research topics were solicited. Suggested studies included:

- The relationship of cost growth and competition, a net assessment.
- The causes and costs of turbulence in Government contracts.

• The need to focus on competition effects by categories--commodities and systems.

• The proper coding of competition.

To conclude the workshop, Mr. Sowle asked the attendees to extend the ideas back at their offices and to share what they had learned. He expressed satisfaction with the workshop method for exchanging views and suggested it might be useful for other topics in the future.

FUTURE POLICY AND RESEARCH.

The results of the workshop suggest that future policy and research on competition should feature the following topics:

• Definition and taxonomy - What is competition, and what are its different parts and its varied objectives or benefits sought?

 Classification, measurement, and coding - What is competitive and noncompetitive procurement?

• Goals and reporting - What is a good or reasonable level of competition and how should goals and results be communicated to Congress and others?

 Investment and affordability - How do we make policy commensurate with resources and needs?

• Savings - How do we calculate savings for different types of competition?

• Competition and market structure - What kind of policy is appropriate to effect competitive savings at the commodity or industry level?

• Barriers - How do we minimize psychological or non-rational barriers to competition in our decision-makers?

• Strategies - What strategies are appropriate for the varying conditions (e.g., complexity, marketplace) of a given procurement?

• Competition relationships - What is the relationship between competition and multiyear procurement, cost growth, and program turbulence? <u>COMPETITION IN TRANSITION</u>.

To the extent that collective inferences may be drawn from a session such as this, the following statements are submitted to represent the concensus of the participants in this meeting. First, competition is a dynamic force that when properly used is the best stimulus to arrest cost growth, generate optimal prices, and stimulate technological innovation. But, where marketplace forces or the factors of production (e.g., production quantities) do not inherently support competition, Government resources must be brought to bear in a timely fashion in order to secure the advantages of competition. In particular, money must be provided early in system life cycles to pave the way for competition.

Second, competition must be promoted and even nourished, but not mandated in an arbitrary manner. We should not assign quotas or goals in the forms of percentages or absolute dollars to the achievement of competition. Goals, such as for small business awards or EEO accomplishments, are simply not useful in dealing with competition for Government

contracts. In some years, the forces of the marketplace or the factors of production surrounding Federal Government acquisitions may permit considerably more or less competition than in other years. To establish arbitrary percentages or goals builds frustration and deters from the concerted managerial and operational effort that is required to secure meaningful competition under a given set of circumstances.

Third, competition is a highly complex and controversial force. In order to assure its sustenance and provide maximum benefits, continued research and operational experimentation must be applied throughout the Government procurement community. It is not enough to just talk about it or write about it, but actual investigations, examining past competitive efforts, trial procurements, and other innovative attempts must be used to expand competition beyond its present horizons. Without such effort, the marketplace forces and production constraints currently influencing governmental procurement may inhibit the expansion of competition beyond its present levels. We cannot continue to think of competition in the terms that our revolutionary forefathers did when they used it to expand the free enterprise system. Twentieth century and twenty-first century needs will require competition to secure the economies of free enterprise, but the competition we employ now and in the future will be substantially different from the competition used to buy the muskets, swords, and cannons of yesterday.

Finally, we need to get this message to the world beyond the procurement community. It is important that Congress, industry, and the public understand the need for competition as well as the requisites for achieving it and the forces which limit it.

USE OF THE WORKSHOP RESULTS.

In addition to wide distribution of this after-action report and the slides and dialogue accompanying the actual presentations, the results will be studied carefully by the task group formulating the competition input for the New Federal Procurement System. The results will also be provided to the Federal Acquisition Regulation Committee and the Defense Acquisition Regulation Committee for consideration and use. Additionally, this report and other material will be submitted to the acquisition schools at the Army Logistics Management Center and the Air Force Institute of Technology, where thousands of students are taught annually about the uses of competition in governmental procurement. The results will also be made available to contractors who teach specialized courses for Federal agencies in procurement. Finally, the research results will be made available to all activities that perform research for the Federal Government on competition to assist them in focusing future efforts on areas which have been identified as vital to the continued expansion of competition.

INDIVIDUAL PRESENTATIONS

THIS SECTION CONTAINS THE APPROXIMATE ACCOUNTS OF THE SCHEDULED TALKS GIVEN. THE ACCOUNTS VARY FROM GENERAL SLIDES TO FULL TEXTS, DEPENDING UPON THE FORMAT ACTUALLY USED BY THE AUTHORS. IN A FEW INSTANCES AUTHORS HAVE AUGMENTED THEIR ORIGINAL MATERIAL WITH INPUT FROM THE WORKSHOP DISCUSSION, BUT NO OUTSIDE MATERIAL WAS ADDED.

AN OVERVIEW

APPLICATION, RESEARCH, AND POLICY

COMPETITION

JOINT DOD/OFPP WORKSHOP ON

1. Robert F. Williams, US Army

WORKSHOP ADMINISTRATION

- MINIMUM ADMINISTRATION AND STRUCTURE WITH A "PACING" AGENDA
- COFFEE/DONUTS SELF HELP
- NO EVENING OR LUNCHEON ACTIVITY

- WORKSHOP FORMAT
- PREPARED TALKS WITH SPONTANEOUS DISCUSSION
- SESSION CHAIRMEN LEAD DISCUSSION
- SHOULD AVOID COMPETITIVE-SENSITIVE AND/OR CLASSIFIED MATERIAL

COMPETITION WORKSHOP

- OBJECTIVES
- GAIN MUTUAL UNDERSTANDING OF COMPETITION
- •• GIVE RESEARCH STATUS
- EXCHANGE IDEAS ON COMPETITION RESEARCH AND POLICY
- SPECULATE ON FUTURE DIRECTIONS IN RESEARCH AND POLICY

COMPETITION

- DEFINITION:RIVALRY BETWEEN TWO OR MORE ENTERPRISESTO SECURE PATRONAGE OF PROSPECTIVE BUYERS(DICTIONARY)POLICY:ALL PROCUREMENTS, WHETHER BY FORMAL
- CY: ALL PROCUREMENTS, WHETHER BY FORMAL ADVERTISEMENT OR NEGOTIATION, SHALL BE MADE ON A COMPETITIVE BASIS TO THE MAXIMUM PRACTICABLE EXTENT (DAR 1-301)
- REALITY: RELATIVELY LITTLE COMPETITION IN TERMS OF DOLLARS (36%) AND ACTIONS (38%) (DOD STATISTICS)

BACKGROUND

- COMPETITION FAVORED BY US FROM VERY BEGINNING
- YET BY 1890's BIG BUSINESS HAD THWARTED MAJOR COMPETITION
- SINCE THAT TIME GOVERNMENT HAS LEGISLATED AGAINST ANTI-COMPETITIVE PRACTICES --SHERMAN ACT, CLAYTON ACT, FTC ACT
- FEDERAL LAW HAS FILTERED DOWN TO DAR 1-301
- COMPETITION SEEN AS A NATIONAL BENEFICIAL CONCEPT, HAS CONSIDERABLE MYSTIQUE
- YET DOD AND OTHER AGENCIES ARE HAVING TROUBLE IMPLEMENTING COMPETITION POLICY TO LARGE EXTENT

POTENTIAL ADVANIAGES OF COMPETITION

INCREASED LEVERAGE

LOWER COST

IMPROVED TECHNOLOGY

IMPROVED QUALITY

16

INCREASED TECHNOLOGY BASE/SYSTEM ALTERNATIVES MORE EFFICIENT PRODUCTION

REMOVE INEFFICIENT FIRMS

FACILITATION OF HIGH AND STABLE EMPLOYMENT

RELAXATION OF GOVT VIGILANCE/CONTROL

PROMOTION OF FREE ENTERPRISE SYSTEM

INITIAL OBSERVATIONS

- COMPETITION NOT AN ABSOLUTE
- •• DIFFERS IN EFFECTIVENESS IN DIFFERENT SITUATIONS
 - •• DIFFERENT OBJECTIVES IN DIFFERENT SITUATIONS
- NOT NECESSARILY FAVORED BY INDUSTRY BUYERS AND IN OTHER COUNTRIES
- CONSEQUENTLY COMPETITION RESEARCHERS AND POLICY MAKERS HAVE
 TO CONSIDER COMPETITION AS AN ACQUISITION TOOL (IN ADDITION TO NATIONAL POLICY)

- AREAS FOR CONSIDERATION
- COMPETITION OVER THE LIFE CYCLE
- COMPETITION BEHAVIOR
- PROGRAM AND MARKET STRUCTURE COMPETITION
- COMPETITION PLANNING
- COMPETITION DECISION ANALYSIS
- COMPETITION POLICY DEVELOPMENT

TYPES OF COMPETITION

LIFE CYCLE	OBJECTIVES OF COMPETITION	POTENTIAL BARRIERS TO COMPETITION	CRITERIA FOR COMPETI- TIVE DECISION	TECHNIQUES
Alternative con- cept evaluation	Increase innovation/creativity and develop alternative concepts; Reduce risks	Marketplace	Innovation/creativity gain vs. resources used	Individual R&D contracts on generic problem
Advanced develop- ment (competitive validation)	Validate feasible approaches to system and prepare for produc- tion competition	Proprietary data Resources Marketplace	Innovation/creativity gain & preparation for production competition vs. resources used	Proposal com- petition; Compe titive prototype; parallel devel.
Engineering develop- ment (full scale development)	Ensure best approach to system & prepare for production compe- tition	Proprietary data Resources Marketplace	Innovation/creativity gain & preparation for production competition vs. resources used	Competitive prototype; pro- posal compe- titions; Teams
Production (low rate, initial, sub- sequent)	To gain competitive savings and increase the mobilization base	Proprietary data Start up costs Quantity Tech. data pkg. Sources Time etc.	Competitive savings (i.e., price difference) vs. investment, risk on schedule & quality	Straight compe- tition (for- mal ad) Leader-follower Licensing Generation of competition form, fit & function

18

Secondary items

Services

ADP

0ther

COMPETITION PLAN

- SYSTEM DESCRIPTION
- COMPETITION STRATEGY
- •• COMPETITION IN EACH PHASE OF LIFE
- DETAILED PLAN FOR COMPETITION IN PHASE
 - CONCEPT COMPETITION

CONDITIONS FOR COMPETITION ACTIONS FOR THIS AND SUBSEQUENT COMPETITION ANALYSIS OF FEASIBILITY AND DESIRABILITY SPECIFIC COMPETITIVE APPROACH

- ADVANCED DEVELOPMENT (SAME FORMAT)
- ENGINEERING DEVELOPMENT (SAME FORMAT)
- •• PRODUCTION (SAME FORMAT)

COMPETITION DECISION ANALYSIS

- APRO 709 REPORTS, IDA, RAND, LMI, ETC.
- COST SAVINGS
- •• LEARNING CURVE SLOPE CHANGE AND SHIFT
- PRODUCTION RATES
- QUANTITY :
- •• LEVEL OF FUNDING
- BARRIERS
- •• INVESTMENT
 - •• FUNDING
- QUANTITY 2
- DATA :
 - •• ETC.
- EFFECT ON
- •• INVESTMENT
- SCHEDULE :
- - QUALITY

MOBILIZATION BASE

2

POLITICAL FACTORS

2

OTHER

:

- 2

MICRO AND MACRO

COMPET I TI ON

PROGRAM/CONTRACT (MICRO): AFFECTING ONE PROGRAM

LIFE CYCLE PHASE

OBJECTIVES

BARRIERS/ADVANTAGES

TECHNIQUES

BEHAVIOR

MARKET STRUCTURE (MACRO): AFFECTING ONE COMMODITY

GOVT SHARE OF MARKET

CONCENTRATION

MONOPSONY



COMPETITION PROMOTION AND AVOIDANCE BY BUYER AND SELLER AND OTHERS

1. COMPETITION IN THE INDUSTRIAL BUYING PROCESS



2. COMPETITION IN THE GOV'T BUYING PROCESS



ORGANIZATIONAL FACTORS INFLUENCING COMPETITION

PROBLEM

SHOULD HQ IMPOSE THE SAME COMPETITION QUOTAS ON EACH ORGANIZATION UNDER IT? SHOULD THE TARGETS VARY BY THE CHARACTERISTICS OF THE INDIVIDUAL ORGANIZATIONS?

ONE SOLUTION

FIND OUT WHAT ORGANIZATIONAL FACTORS SEEM TO INFLUENCE THE DEGREE OF COMPETITION.

	\$ % Compe- tition	Action % Compe- tition	Com Index	plexity Av. Sys. Siz	Na Con Numbe	ture of itractor	Degree of Centralization (High, med. low)	eh
Command A								
Div l								
Div 2								
Ċommand B								
Div 1					1			
Div 2								
etc.								

OUTPUT

A RELATIONSHIP DEPICTING RELATIVE FACTOR IMPORTANCE:

• COMP = A + B (COMP INDEX) + C (NO, OF KRS) + ETC.

 ORGS WITH A HIGH DEGREE OF COMPETITION TEND TO HAVE COMMODITIES WITH CHARACTERISTIC X, ORGANIZATION WITH CHARACTERISTIC Y, PERSONNEL WITH CHARACTERISTIC Z, CONTRACTORS WITH CHARACTERISTIC W; ETC.



and and a second of a second second

and the second sec

2. Captain William Washburne, US Navy

. . . .

I HAVE BEEN ASKED TO INTRODUCE OUR DISCUSSION ON TYPES OF COMPETITION.

I CERTAINLY BELIEVE A DISCUSSION OF COMPETITION IS TIMELY. WE APPEAR TO BE ON THE VERGE OF SEEING A SIGNIFICANT INCREASE IN DEFENSE SPENDING - CERTAINLY IN THE NAVY. THERE IS NO DOUBT THAT THE EXPENDITURE OF THESE ADDITIONAL SUMS IS GOING TO RECEIVE VERY CLOSE SCRUTINY FROM A NUMBER OF QUARTERS. WE WILL HAVE A VIRTUAL MANDATE TO SPEND THESE DOLLARS WISELY. UNFORTUNATELY, THERE IS A TENDENCY FOR MANY TO ALWAYS EQUATE "WISELY" WITH "COMPETITIVELY." I THINK WE ARE ALREADY STARTING TO SEE THE WORD COMPETITION CREEP INTO PRINT MORE FREQUENTLY IN CONNECTION WITH RECENT BUDGET ACTIVITY.

ALTHOUGH WE WOULD PROBABLY ALL AGREE THAT COMPETITION IN GENERAL IS IN FACT GOOD, COMPETITION AS IT PERTAINS TO DEFENSE CONTRACTING, LIKE MANY FACETS OF THE ACQUISITION PROCESS, IS NOT GENERALLY VERY WELL UNDERSTOOD OUTSIDE OF THE ACQUISITION COMMUNITY. THERE IS A STRONG TENDENCY BY THE PUBLIC AT LARGE, THE FOURTH ESTATE AND IN FACT MANY, IF NOT MOST, OF OUR CONGRESSMEN TO EQUATE COMPETITION TO "INVITATION FOR BID" AND "FORMAL ADVERTISING." ANYTHING OTHER THAN FORMAL ADVERTISING IS TREATED AS NONCOMPETITION AND THEREFORE BAD AND AT LEAST TWENTY-FIVE PERCENT MORE EXPENSIVE.

SOME OF THE CONTROVERSY SURROUNDING COMPETITION IS FUELED BY CONGRESSIONAL PARTIALITY TO CONTRACTING BY PUBLIC ADVERTISEMENT.

THEY HAVE GONE ON RECORD CONSISTENTLY AS FAVORING THIS METHOD OF PROCUREMENT -- A TECHNIQUE IN WHICH THE RULES OF THE GAME ARE WELL-KNOWN, AUTOMATICALLY APPLIED, PUBLICLY VERIFIABLE, AND CONDUCIVE TO WIDE BIDDER PARTICIPATION. SINCE THE COMPETITORS IN FORMALLY ADVERTISED ACQUISITIONS ARE PRICE RANKED, AND THE AWARD, GENERALLY GIVEN TO THE LOWEST PRICE -- FORMAL ADVERTISE-MENT IS AN EASILY UNDERSTOOD PROCESS THAT DOES IN FACT TAKE ADVANTAGE OF COMPETITION. I BELIEVE THIS IDENTIFICATION OF FORMAL ADVERTISING WITH COMPETITION HAS UNFAIRLY STIGMATISED THE USE OF NEGOTIATION EVEN THOUGH NEGGTIATION MAY TAKE ADVANTAGE OF COMPETITION TO THE SAME EXTENT. A NOW 20 YEAR OLD STATEMENT OF ONE OF THE SUBCOMMITTEES OF THE HOUSE ARMED SERVICES COMMITTEE GOES SOMETHING LIKE THIS:

"WE CONDEMN EXCESSIVE USE OF NEGOTIATION. WE CONDEMN IT AS A BREEDING PLACE FOR SUSPICION AND FRAUD. WE CONDEMN IT AS A SHIELD FOR MISCHIEF."

I DON'T BELIEVE THAT VIEW HAS CHANGED MUCH OVER THE PAST 20 YEARS. IN NEGOTIATED ACQUISITIONS, PRICE AND TECHNICAL FACTORS MUST BE SORTED OUT, COMPARED AMONG THE COMPETING OFFERORS, FREQUENTLY CHANGED AS A RESULT OF DISCUSSIONS SHAKEN DOWN INTO A FINAL CONTRACT BETWEEN THE GOVERNMENT AND THE CHOSEN SOURCE. THE PROBLEM IS THAT THE FINAL DECISION IS NOT ALWAYS UNDERSTOOD OR EASILY EXPLAINABLE TO THOSE NOT INVOLVED IN THE EVALUATION PROCESS. CONSEQUENTLY, PEOPLE THAT VIEW THE NEGOTIATION PROCESS FROM OUTSIDE -- EVEN IF THEY RECOGNIZE THAT IT IS OFTEN COMPETITIVE --ARE SUSPICIOUS -- THEY ARE SKEPTICAL OF OUR ABILITY TO RENDER SOUND IMPARTIAL JUDGMENTS.

OUR APPROACH TO COMPETITION OF COURSE WILL VARY DEPENDING ON THE COMMODITY SOUGHT AND THE TYPE OF CONTRACT CHOSEN TO ACQUIRE THE COMMODITY. AS NOTED EARLIER, IN FORMALLY ADVERTISED ACQUISITIONS, COMPETITION IS DEMONSTRATED BY PRICE RANKING, AFTER DETERMINING THAT WHAT THE GOVERNMENT WANTS IS BEING OFFERED, AND AWARD IS MADE TO THE LOWEST PRICED CONTRACTOR.

IN NEGOTIATED FIXED PRICE COMPETITIONS, WE USUALLY DO NOT RELY ON THE PRICES INITIALLY SUBMITTED BY COMPETITORS. THE COMPARABILITY BETWEEN INITIAL OFFERS GENERALLY IS INSUFFICIENT TO JUDGE THE RELATIVE MERITS ON THE BASIS OF PRICE. DISCUSSIONS WITH OFFERORS RESULT IN ENTERING INTO A FIXED PRICE CONTRACT BASED ON FACTORS OTHER THAN PRICE. HOWEVER, PRICE GENERALLY WEIGHS HEAVILY IN THE GOVERNMENT'S FINAL DECISION.

IN COMPETITIVE NEGOTIATIONS INVOLVING COST-TYPE CONTRACTS, OFFERORS SUBMIT ESTIMATES RATHER THAN FIXED PRICES. THE FACT THAT A COST TYPE APPROACH IS CONTEMPLATED INDICATES THE PRIMARY INTEREST OF THE GOVERNMENT IS FOCUSED ON RELATIVE TECHNICAL COMPETENCE RATHER THAN PRICE. THIS DISTINCTION FORMS THE BASIS OF THE TWO MAJOR TYPES OF COMPETITION AVAILABLE TO THE GOVERNMENT -- PRICE AND TECHNICAL.

PRICE COMPETITION IS USED IN A WIDE VARIETY OF SITUATIONS. IT CAN BE SIMPLY THE PRICE OF THE "INSTANT" CONTRACT -- THAT WOULD CERTAINLY BE TRUE OF A FORMALLY ADVERTISED REQUIREMENT. A MORE SUBJECTIVE TYPE OF "PRICE" COMPETITION INVOLVES THE EVALUATION OF PROPOSALS ON A "LIFE CYCLE COST" BASIS. ANY COMPETITION

WILL INVOLVE BOTH PRICE AND TECHNICAL AT LEAST TO SOME EXTENT. OTHER FACTORS ALSO ENTER INTO MOST COMPETITIONS -- MANAGEMENT, PAST PERFORMANCE, ETC.

OMB CIRCULAR A-109 DICTATES MAKING THE MAXIMUM USE OF COMPETITION AT EACH PHASE OF THE DEVELOPMENT OF A NEW WEAPON SYSTEM WHERE ECONOMICALLY JUSTIFIED. THE USE OF PARALLEL DEVELOPMENT CONTRACTS AWARDED TO COMPETING CONTRACTORS WITH EVENTUAL SELECTIONS TO NARROW DOWN THE FIELD AS THE PROGRAM MATURES IS A FORM OF TECHNICAL COMPETITION LEADING TO PRICE COMPETITION DURING PRODUCTION. UNDER A-109 THE TYPE OF COMPETITION WILL VARY WITH THE ACQUISITION PHASE.

TYPE OF COMPETITION PRELIMINARY DESIGN COMPETITION ENGINEERING DESIGN COMPETITION FULL SCALE DEVELOPMENT & T&E PRODUCTION PRICE COMPETITION

A-109 ACQUISITION PHASE

SYSTEM CONCEPTUAL DESIGN COMPETITION EXPLORATION OF ALTERNATIVE SYSTEMS COMPETITION DEMONSTRATIONS PRODUCTION

THE FIRST THREE PHASES ARE PRIMARILY TECHNICAL COMPETITIONS WHERE EVALUATION FACTORS WOULD CONCENTRATE ON INNOVATIVE CONCEPTS. MAIN DESIGN FEATURES AND EVENTUALLY QUALITATIVE FEATURES. THE FOURTH WOULD BE MOSTLY PRICE COMPETITION WHERE THE MAIN DIFFERENCE IN ALTERNATIVE OFFERS IS COST TO PRODUCE AND HOPEFULLY LIFE CYCLE COST. IN GENERAL, THERE IS LESS EMPHASIS ON COMPETITION IN A-109 AS YOU MOVE TOWARD PRODUCTION.

THERE IS ANOTHER TYPE OF COMPETITION I WOULD LIKE TO MENTION --IT'S CALLED "FOLLOW-ON AFTER INITIAL PRICE OR TECHNICAL COMPETITION."

AT THE NAVAL ELECTRONIC SYSTEMS COMMAND ABOUT 25% OF THE DOLLARS I OBLIGATE ARE INITIAL COMPETITION. I DO ANOTHER 40% OR SO THAT IS FOLLOW-ON AFTER AN INITIAL COMPETITION. THOSE FOLLOW-ON AWARDS MAKE JUST AS MUCH BUSINESS SENSE AS THE INITIAL COMPETITION --BUT OUR SYSTEM DOESN'T GIVE ME MUCH CREDIT FOR THEM. FRANKLY, I HAVE TROUBLE DISCERNING ANY REAL DIFFERENCE BETWEEN A COMPETITIVE DEVELOPMENT THAT ENDS WITH A FIVE YEAR MULTI-YEAR PRODUCTION CONTRACT AND A SIMILAR DEVELOPMENT THAT RESULTS IN A SERIES OF SINGLE YEAR PRODUCTION CONTRACTS . . . YET EACH YEAR OF THE MULTI-YEAR IS RECORDED AS INITIAL COMPETITION WHILE THE SINGLE YEAR CONTRACTS ARE LABELED AS FOLLOW-ON. ALTHOUGH WE DUTIFULLY REPORT OUR "FOLLOW-ON" AFTER INITIAL COMPETITION FIGURES TO THE OSD DATA BASE -- WE NEVER SEEM TO GET ANY REAL CREDIT FOR THIS CATEGORY OF COMPETITION.

TO SUMMARIZE -- IN GENERAL COMPETITION IS BASICALLY PRICE OR TECHNICAL -- WITH THE EMPHASIS ON TECHNICAL EARLY IN A PROGRAM LIFE AND A SHIFT TO PRICE AS YOU APPROACH THE PRODUCTION PHASE. FOLLOW-ON SOLE SOURCE CONTRACTS THAT OCCUR AFTER AN INITIAL COMPETITION ARE AN EXAMPLE OF AN AREA THAT NEEDS EMPHASIS. PERHAPS ITS TIME TO EXAMINE OUR REGULATIONS ON HOW WE CATEGORIZE AND DEFINE COMPETITION TO SEE IF WE CAN DO A BETTER JOB OF REPORTING AND TAKING CREDIT FOR THE COMPETITION THAT DOES OCCUR IN OUR ACQUISITIONS.

ONE THING THAT WE COULD DO COLLECTIVELY IS TO SIMPLY DO A BETTER JOB EXPLAINING JUST WHAT WE MEAN BY COMPETITION -- THAT IT CAN OCCUR OUTSIDE OF THE FORMAL ADVERTISING PROCESS, THAT IT MAY BE ON PRICE OR TECHNICAL MERIT, AND THAT IT ISN'T ALWAYS PRACTICABLE.
3. John Kunsemiller, US Air Force

My topic is Competition Strategies - You've heard about types of competition.

It is the law and policy of the United States Government to seek maximum competition in its acquisitions. Thus, we are obligated to begin from the premise that competition will take place in all cases unless it falls within a statutory exception. It is also the obligation of Government purchasing agencies to take "steps to foster competitive conditions for subsequent procurements..." (DAR 3-101(d)). Moreover, the Comptroller General has consistently held that the sure way to test the effectiveness of competition is to issue the IFB or RFP and see who bids.

Studies generally have concluded that competition is a good thing and more competition would be better yet. But how--considering reality. For more than 20 years, the DOD has attempted in various ways to increase the role of competition in the weapons acquisition process. That's the purpose of this workshop to examine the "how of competition." Competition Strategy!

OFPP joined with OMB Circular A-109 which advocates "Competitive exploration of alternative system design concepts." Competition later in the acquisition cycle is also mentioned, and is advocated "whenever economically beneficial."

Competition, although a mundane business subject within the glory of technical innovation--pushing the frontiers of technology, is an important topic within Air Force Systems Command. And it is easier to do early in the acquisition cycle. If you haven't planned for it as a part of the production decision (which follows) it will be extremely difficult to do. Competition leads to technology advances, lower prices, and better quality. Having said this, it would seem all of our contracts should be competed. However, as a practical matter, this is not practical, especially in our weapon system contracts. Once a contractor has devoted several years and the Government spent many millions of dollars for the design, development and production of a weapon system, it is time consuming and expensive (and may even be disastrous) to interject competition - a new source, untried and unproven. Therefore, in the process of planning for effective competition of a major acquisition hardware or services, we must consider complex questions that rarely lend themselves to simple yes or no answers. But planning must start early whatever the strategy to be used. The factors that require consideration are often difficult to sort out and frequently point to the validity of contradictory conclusions. The purpose of this workshop is to examine some of these factors in terms of demonstrating whether or not competition is likely to be effective or bring about a clear and predictable benefit.

We have learned over the years, continuing with the developer after an initial competition is a conservative and usual, not an unusual, approach. A contractor we are comfortable with is the norm for a number of very valid reasons. Reporting wise, these are called "Follow-on to competition." Is our reporting properly defined?

Several types of competition that may be employed when acquiring weapon systems:

- Concept Formulation
- Demonstration and Validation Phase

- Full-Scale Development Phase, Competition
- For Production

As a system moves through the acquisition cycle, the application of competition changes in two major ways: The benefits sought from competition change, as does the perceived ratio of costs incurred to benefits obtained - the A-109 "when economically beneficial." Thus an analysis of the role of competition in weapon system acquisition must examine individually at least these four distinct acquisition phases and plan for implementing competition in a particular phase from the beginning of the requirement.

Competition strategy covers use of the following approaches in a planned systematic application.

- Normal competitive solicitation or basis of price or technical competition using a technical data package.
 - Major Systems
 - Production
 - Subsystem/components
- Competitive parallel development and a competitive fly-off
- Developing or extending a second source (e.g., The loser from competitive parallel development).
 - Leader/follower
 - Teaming
 - Breakout of components
 - Direct licensing
 - Form, fit and function
 - Educational buy
- Multiyear as a part of the competitive strategy

An area that has proved successful is parallel development and competitive fly-off. This approach was used for the B-52 weapon system trainer. Two contractors (Boeing and Singer) were competitively selected to design and build a B-52 weapon system trainer and then demonstrate the system. After the demonstration, a selection was made between the two for the production effort. Singer Company won the competition and was awarded the production contract in April 1980. Again, we feel this resulted in a better price plus a better design. Over the years, this will provide the Air Force a very cost effective system, savings in flying hours on the B-52 and savings in fuel. Effective competition occurs when you can:

- Keep two contractors in the program until the design is set and all decisions about the production schedule have been made.
- Help to set the design while competitive pressure still could be focused on the contractors, thus encouraging their best design efforts.

Too often the competition ends before the risks are resolved and the production contracts are fully set, with major design changes (and their associated cost increases) still to be expected. The price benefits expected from the competition may thus be lost.

BOTTOM LINE

No additional management incentive is needed to encourage active competition during the concept formulation and the demonstration and validation phases of a new weapon system. Managers seem quite willing to employ competition among firms prior to the beginning of full-scale development, but managers generally are reluctant to establish competition during production. Consider price competition during the production phase! The problems and disincentives loom relatively large and the introduction of competition may significantly complicate program management tasks in a variety of ways.

Competition in the production phase is usually viewed as a means of reducing cost to the buyer, although other benefits (e.g. broaden the base) are possible and sometimes sought. The introduction of competition into an on-going production program appears risky to most program managers and where there is no offsetting benefit, it is not usually done. On complex systems involving expensive tooling or facilities, the benefits cannot offset this cost.

Although it is difficult to break away from the original producer, there have been a few times that we have interjected competition. There were two recent fuze programs that were competed after the first low rate initial production contracts. Although in both cases the same contractor that developed the fuze and had the low rate initial production, won the competition, we realized a considerable cost savings because of the competition. We have also learned that it is dangerous to compete a system right after development. There are just too many problems that develop during the first production run. This is why we came up with low-rate initial production. This allows us to work out the production problems during a low rate production before all of the production tooling has been bought. It also allows a small number of units to go to the operation units. This approach can generally be used only for those items where there is a large outyear production run and the tooling does not represent too large of an investment.

REPROCUREMENT DATA Technical Data Package (TDP)

The TDP is defined as a technical description of an item adequate for use in procurement. This description defines the required design configuration and assures adequacy of item performance. TDP is predominantly a design description which has evolved out of the R&D cycle and is intended for use in the production of the item. A qualified second source should be able to use the TDP in manufacturing an almost identical copy of the item made by the developer.

A validated data package is essential. We have more problems over this than any other factor. The TDP must accurately describe a system or component which can be produced.

CONTRACTOR TEAM ARRANGEMENTS

Contractor team arrangements are described in Section 4-117 of the DAR. A contractor team is an arrangement (1) where two or more companies form a partnership or joint venture to act as a potential prime contractor or (2) where a potential prime contractor agrees with one or more other companies to act as his subcontractor(s) under a specific Government acquisition. Teaming is considered appropriate for major systems contracts for the purpose of providing multiple sources and later production competition. This has some advantages.

a. Problems in later qualifying second sources are reduced since at least two contractors are involved in (some portion) design and initial production.

b. The design and development talents of at least two firms will address a technical problem which increases the opportunity for successful and innovative designs.

LEADER/FOLLOWER (L/F)

The Leader/Follower (L/F) method is an acquisition technique under which the developer or other producer of an item or system (the leader company) furnishes manufacturing assistance and know-how or otherwise enables a follower company to become a source of supply for the item or system (DAR 4-701). There are two primary reasons for creating second sources to produce military hardware--broadening the industrial base and achievement of cost savings. Three procedures (on viewgraph) are available for implementing the L/F technique (DAR 4-703).

a. Award of a prime contract for supplies to an established source (leader) who is obligated to subcontract a part of the quantity to a specified or competitively selected subcontractor (follower).

b. Award of a prime contract for a part of the total requirements for supplies to the leader company. In turn, the prime contract also obligates the leader company to provide technical assistance to the follower who has a direct contract with the Government for the remaining portion of the total requirements.

c. Award of a prime contract for the total quantity of supplies to the follower company. The prime contract obligates the follower company to subcontract for technical assistance with the leader company.

COMPONENT BREAKOUT

Component breakout is the process of dividing an end item into its component parts so that the components may be bought directly from a manufacturer rather than from the end item prime contractor. The term "component" includes subsystems, assemblies, subassemblies and repair parts. Breakout can take place in two ways.

a. The competitive purchase of an item which was previously purchased noncompetitively from the prime contractor.

b. The direct noncompetitive purchase from the item manufacturer or vendor following previous purchases of the same item from the prime contractor.

DIRECTED LICENSING

Directed licensing method consists of the use of a special provision (1) as part of a contract between the Government and developer or sole producer of an item or system, or (2) as a separate agreement between the developer or sole producer and another potential producer whereby the developer or sole producer agrees to grant authoritative permission to another source for the production of the item or system. The developer would agree to provide a data package and such technical assistance as may be required to get the new contractor into production. The development contractor would be compensated for his efforts by fees and royalties agreed upon at the time of initial commitment. Licensing opportunities are more apparent at the subsystem or component level.

> FORM, FIT AND FUNCTION "Chinese Copy" or Reverse Engineering

Risks are inherent in using an unproven TDP for the first time in production. The form, fit and function (F3) method is the description of military equipment by performance characteristics. The equipment described in terms of output, function and operation. It is best used at the subsystem or component level. Advantages are:

a. Increased competition can be expected. A variety of technical approaches may result in a product giving the desired function.

b. The responsibility for meeting performance is placed squarely upon the contractor.

The overriding disadvantage of the F3 description relates to logistic implications. The likelihood is that, over time, a number of different items will be purchased, all of which conforms to the functional description. Standardization and interchangeability will be adversely affected. May take time and dollars to duplicate and do qualification testing.

EDUCATIONAL BUY

An educational buy is a contract to provide a firm the opportunity to learn how to manufacture limited production quantities of equipment in accordance with a Government TDP. The purpose of the method is to generate a competitive second source for an item. The second source contractor is usually selected as a result of competition, although the source can be directed by the Government. Its use may be limited, e.g., it may not be feasible to use the method by itself for second sourcing complex items. Pros and cons are as follows:

- The educational buy can be a good method of enhancing competition.
- The use of the method to develop a second source is time-consuming and may be expensive due to such things as First Article Qualification Testing, etc.

I would like to take the next few minutes to cover a few other areas where we are competing at the systems level. The first in second sourcing. We currently have two contractors producing 30mm ammunition for the GAU-8/A gun system used in the A-10 aircraft. General Electric builds the gun and was responsible for the ammunition. They competed the ammunition between Aerojet and Honeywell. In FY 1977, we broke the ammunition away from the gun and contracted directly with Aerojet and Honeywell. Since then, we compete each year the relative percentages of the total buy. Anytime the need for keeping two contractors producing 30mm ammunition goes away, we are in a position to compete all or some portion of the remaining production.

MULTIYEAR CONTRACTING

While competition does provide benefits, competing a one year production effort is not that beneficial. Multiyear contracting (DAR 1-322) is a method of acquiring DOD planned requirements for up to a five-year period without having funds available for the total program quantity at time of award. It was not specifically established to promote competition. But it must be emphasized that the method has an especially salutary effect on competition. The high volume production over a long production cycle offered by the multiyear method is a very real inducement to potential defense contractors. Systems Command is pushing legislation to relax the rules on multiyear contracting. If the rules are relaxed, we hope to compete several hardware efforts on a multiyear basis thereby increasing the benefits of competition. We recently competed an award for six electronic systems over a three year period where six bids were received. We estimated the savings of awarding the contract on a multiyear basis versus a single year basis to be about six percent. We feel that when the rules are relaxed, we will have more flexibility and can realize greater savings.

MAJOR O&M "SERVICES" COMPETITION

So far, I have talked about hardware. Another area that is difficult to compete is the operation and maintenance of Government Test/Operational facilities. Under such things as the Service Contract Act (SCA), specified minimum manning or skills mix, we must consider - what's left to compete? Once a contractor has established him.Jelf as a good performer, both the contractor and Government personnel become comfortable with each other, it's hard to change. This is especially true if the facility has diverse functions and is complex. It may be difficult to find other contractors that have all of the required skills to operate such a facility. At the Arnold Engineering Development Center in Tennessee we faced this problem and decided to break the effort into three smaller areas of effort. Offerors could bid on one, two or all of the efforts. As it turned out we now have three separate contractors doing the O&M at Arnold. While this may have created more interfaces, it did interject competition and we feel, resulted in three very good and cost effective contracts.

In summary, competition has a potential to produce many significant benefits, such as:

- Improved product quality.
- Lower unit costs.

- Faster rates of learning by the manufacturer.
- Technology process.
- Industrial productivity.
- Enlarged industrial base for surge and mobilization.
- Equitable process in awarding the contract.

Yet it is not enough simply to have faith that the competitive process will lower prices by some amount. A credible forecast of that amount is needed in order to judge whether gross savings are likely to be sufficiently greater than the costs of opening additional sources of supply to justify both the costs and the risks (of performance problems and delayed delivery) associated with competitive reprocurement. Savings uncertainty is a critical element. I hope later speakers can show us a better way to determine and prove savings. Realized savings (or losses) on past competitive reprocurements cannot really be measured, too many variables. Also, expected benefits (to be achieved several years hence) on prospective competitive reprocurements cannot be estimated with any confidence for the same reasons. Nevertheless, although the benefits are not easily measured, most managers are comfortable with this process and are convinced that such competition produces a "better" product because it encourages each competitor to use his best people and to work very hard.

Whether competition is likely to be implemented to a greater extent depends, in part, upon how closely the anticipated benefits correlate with the fundamental objectives and perceptions of the acquisition managers. For example, does competition help a system to be deployed faster, minimize technical risks, develop a wider political base, ease financial and administrative problems, or speed the advance of technology? If so, the non-quantifiable savings make the difference.

There are many disincentives and rationalization but it is the law of the land. As professionals we must:

- Comply with the law.
- Avoid past mistakes excessive leverage/destructive competition.
- Emphasize technical risk and support considerations.
- Balance technical and business considerations.
- Plan early, in order to compete effectively.

4. Edward Lovett, Department of Energy

BARRIERS TO COMPETITION

- . Three types of barriers
 - .. Factual
 - •• Self imposed
 - •• Psychological
- All three are real barriers, all three have the same result a noncompetitive procurement.
- All three interact. A psychological barrier will manifest its self as a factual barrier.
- Some barriers lessen the degree of competition, other eliminate it altogether.
- Factual barriers include:
 - 1. Patent rights, copyrights, secret processes.
 - 2. Control of basic raw materials
 - 3. Unique, elaborate special tooling or equipment.
 - 4. High start up costs.
 - 5. Inadequate production quantities.
 - 6. The economic climate.
 - 7. Inadequate TDP.
 - 8. Critical delivery schedule.
 - 9. Predominant experts.
 - 10. Exclusive prior experience.
- Self imposed barriers include:
 - 1. 8(a) program.
 - 2. Buy_indian act.
 - 3. Small business set asides.
- Psychological barriers
 - 1. Lack of control over program.
 - 2. Lack of staff to handle one contractor so how can I handle two.
 - 3. The path of least resistence.
 - 4. Competition requires a front end investment in time and money without and demonstratable advantages.
 - 5. He's the best man for the job.
- . Conclusion future not bright for increasing competition.
 - •• Civil Agencies having budgets cut funds for competition will be one of the first to go.
 - •• DOD under pressure to increase readiness to meet shorter IOC dates cut out time for competition.
 - •• To increase competition we must be able to show short term and long run advantages.



MLRS SECOND SOURCE ROCKET PROCUREMENT STUDY

JOHN P. DALY SYSTEMS ANALYSIS OFC US ARMY MISSILE COMMAND REDSTONE ARSENAL, AL



PURPOSE

TO EXAMINE ALTERNATIVE SECOND SOURCE ROCKET PROCUREMENT STRATEGIES TO IDENTIFY THAT WHICH MEETS PROGRAM OBJECTIVES AT LOWEST COST

MLRS MATURATION/PRODUCTION MASTER SCHEDULE BASELINE PROGRAM





ACQUISITION OPTIONS

- SOLE SOURCE
- TDP COPY

- COMPETE AFTER PRODUCTION TDP AVAIL ("TDP-TRADITIONAL") 1
- COMPETE SOON AS POSSIBLE ("TDP-LEADER/FOLLOWER") I
- FREEDOM OF DESIGN (FORM/FIT/FUNCTION)
- DESIGNATED TO BOEING ("FOD-DESIGNATED") ł
- COMPETITIVE ("FOD-COMPETITIVE")



ISSUES

:

- PROGRAM AND CONTRACTUAL
- TECHNICAL AND OPERATIONAL
- ECONOMIC



APPLICABLE MICOM ACQUISITION POLICIES

- COMPETITION FOR PRODUCTION WILL NOT OCCUR PRIOR TO **GOVERNMENT ASSUMPTION OF FORMAL CONFIGURATION** CONTROL
- FULLY DEMONSTRATED DURING ENGINEERING DEVELOPMENT THE GOVERNMENT WILL ASSUME CONFIGURATION CONTROL AFTER THE TDP HAS BEEN PROVEN IN PRODUCTION, OR PRODUCIBILITY OF HARDWARE TO THE TDP HAS BEEN

44

OF THE SYSTEM. BREAKOUT DECISIONS WILL SO RECOGNIZE. MAINTAIN SYSTEM RESPONSIBILITY THROUGHOUT THE LIFE THE SYSTEM DEVELOPER OR "PRIME" CONTRACTOR MUST





PRIME CONTRACTOR COOPERATION REQUIRED

- TDP-TRADITIONAL
- ASSIST SECOND SOURCE IF PROBLEMS DEVELOP IN BUILDING TO TDP
 - PROVIDE ALGORITHM ADJUSTMENT FOR MINOR BALLISTICS VARIATION (IF REQ'D)
- TDP-LEADER/FOLLOWER
- SELECT SECOND SOURCE WITH GOV'T CONCURRENCE
- **TRANSFER PRELIMINARY TDP TO SECOND SGURCE**
- PROVIDE ALL ENGINEERING CHANGES TO SECOND SOURCE
- TRANSFER MANUFACTURING KNOW-HOW TO SECOND SOURCE
 - WARRANTY SECOND SOURCE HARDWARE
- PROVIDE ALGORITHM ADJUSTMENT FOR MINOR BALLISTICS VARIATION (IF REQ'D)
- FREEDOM OF DESIGN OPTIONS
- PROVIDE INTERFACE CONTROL DRAWINGS/SPECIFICATIONS **TO SECOND SOURCE** l
 - **ASSIST SECOND SOURCE IN DEVELOPING NEW BALLISTIC** ALGORITHM/FCS CHANGES



CONCLUSIONS – PROGRAM AND CONTRACTUAL ANALYSIS

ISSUE

ACQUISITION POLICY

MOU IMPACTS

47

CONFIGURATION MGT/CONTROL

PRIME CONTRACTOR IMPACTS

WARRANTY

INDUSTRIAL BASE EXPANSION

PREFERRED COMPETITIVE OPTION

TDP-TRADITIONAL

TDP-TRADITIONAL

TDP OPTIONS

TDP-TRADITIONAL, HIGH RATES

TDP OPTIONS

ANY, WITH SPLIT BUYS

DOMINANCE – TDP–TRADITIONAL, HIGH RATE



CONCLUSIONS – TECHNICAL AND OPERATIONAL ANALYSIS

ISSUE	PREFERRED COMPETITIVE OPTION
TECHNICAL RISK	TDP OPTIONS
IMPACTS ON FCS SOFTWARE	TDP OPTIONS
IMPACTS ON LOGISTICS	TDP OPTIONS
IMPACTS ON OPERATIONS/TRAINING	TDP OPTIONS
TDP VALIDATION/TECHNOLOGY TRANSFER	TDP-LEADER/FOLLOWER
OPERATIONAL DEPLOYMENT RATE	ANY WITH HIGH RATE
DOMINANCE – TDP LDR/FOL, HIG	H RATE



CONCLUSIONS – ECONOMIC ANALYSIS

ISSUE

- OPT STRATEGY FOR 190K
- OPT STRATEGY FOR 360K

49

PREFERRED ACQUISITION STRATEGY

SOLE SOURCE, 6000/MO

TDP-LEADER/FOLLOWER 6000/MO (LO/HI)

FOR HIGH QTY, TDP LDR/FOL, HIGH RATE (LO/HI) DOMINANCE - FOR LOW QTY, SOLE SOURCE, HIGH RATE I



DOMINANT COMPETITIVE STRATEGIES

ISSUE

50

PROGRAM AND CONTRACTUAL

TECHNICAL AND OPERATIONAL

ECONOMIC

PREFERRED STRATEGY

TDP-TRADITIONAL, HIGH RATE

TDP-LDR/FOL, HIGH RATE

LOW QTY: NONE (SOLE SOURCE, HIGH RATE) HIGH QTY: TDP-LDR/FOL, HIGH RATE (LO/HI)



CONCLUSIONS

- **IF THE PLANNED PROCUREMENT IS REDUCED TO 190.000 ROCKETS, A SECOND SOURCE IS NOT ECONOMICALLY** JUSTIFIED
- FOR PLANNED PROCUREMENTS IN EXCESS OF 300–400K **ROCKETS, A TDP SECOND SOURCE IS PREFERRED**

- TDP-LEADER/FOLLOWER MINIMIZES COST AND **TECH TRANSFER PROB** ł
- **TDP-TRADITIONAL MINIMIZES MOU AND PRIME** CONTRACTOR IMPACTS 1
- IN GENERAL, HIGH PRODUCTION RATES MINIMIZE TOTAL COSTS
- LO/ HI RATE OPTIONS CAN SAVE \$15M \$30M BUT DELAY ROCKET FIELDING BY 6 – 12 MONTHS



STUDY GROUP RECOMMENDATIONS

- DO NOT BRING IN SECOND SOURCE UNLESS PROJECTED TOTAL PROCUREMENT EXCEEDS ABOUT 300,000 ROCKETS
- IF PROJECTED PROCUREMENT JUSTIFIES SECOND SOURCE, **RECOMMEND:**
- TDP-TRADITIONAL APPROACH
- PROCUREMENT AT 6000/MO
- FUTURE STUDIES SHOULD ADDRESS POTENTIAL SAVING DUE TO MULTI-YEAR PROCUREMENT FOR SELECTED STRATEGY

APRO REPORTS ON PRODUCTION COMPETITION

COMPLETED

۲	APRO 709-3, DETERMINING AND FORECASTING SAVINGS FROM COMPETING PREVIOUSLY	~	
	SOLE SOURCE/NONCOMPETITIVE CONTRACTS	0CT	78
•	APRO 928 (SPECIAL REPORT), AN ANALYSIS OF ACQUISITION ALTERNATIVES FOR		2
	THE US ARMY'S GENERAL SUPPORT ROCKET SYSTEM	AUG	29
•	APRO 807, FORECASTING SAVINGS FROM REPETITIVE COMPETITION WITH MULTIPLE		1
	AWARDS	NON	5
•	APRO P-5, SOLE SOURCE AND COMPETITIVE PRICE TRENDS IN SPARE PARTS		ו
	ACQUISITION	JAN 8	E
	IN PROCESS		

FEB 81 JUL 81 APRO 905 (DRAFT), GUIDELINES FOR THE APPLICATION OF COMPETITION APRO 81-06 (RESEARCH IN PROGRESS), COMPETITION MODELING

APRO 709-3

FROM COMPETING PREVIOUSLY SOLE SOURCE/NONCOMPETITIVE CONTRACTS OCT 78 DETERMINING AND FORECASTING SAVINGS

- INVESTIGATION OF 16 MISSILE AND ELECTRONIC ACQUISITIONS
- ACQUISITIONS ORIGINALLY SOLE SOURCE, THEN COMPETITIVE BUYOUTS
- STUDY SEPARATED COMPETITIVE SAVINGS INTO REDUCTIONS DUE TO CONTRACTOR LEARNING

SAVINGS DUE TO EFFECTS OF COMPETITION

OBJECTIVES

DETERMINE SAVINGS FROM COMPETITION DEVELOP SAVINGS METHODOLOGIES FOR COMPETITION

CONCLUSIONS

FORECASTING SAVINGS METHODOLOGY DEVELOPED - INCLUDES REGRESSION AND QUALITATIVE AVERAGE GROSS SAVINGS AFTER COMPETITION EQUALED 13.7% ESTIMATED SAVINGS METHODOLOGY DEVELOPED AVERAGE NET SAVINGS EQUALED 10.8% ANALYSIS

APRO 807 FORECASTING SAVINGS FROM REPETITIVE COMPETITION WITH MULTIPLE AWARDS NOV 79

- INVESTIGATION OF AMMUNITION CONTRACTS
- UNIQUE CHARACTERISTICS OF AMMUNITION COMPETITION
- STUDY OBJECTIVE
- PROVIDE DECISION MAKERS TOOL TO ASSIST IN MAKING SAVINGS ESTIMATES
- FINDINGS AND CONCLUSIONS

FORECASTING METHODOLOGY DEVELOPED - INCLUDES ECONOMIC AND QUALITATIVE AVERAGE COMPETITIVE SAVINGS WERE 7.1% SAVINGS METHODOLOGY DEVELOPED FACTORS

APRO P-5

SOLE SOURCE AND COMPETITIVE PRICE TRENDS IN SPARE PARTS ACQUISITION JAN 81

- INVESTIGATION OF BREAKOUT ITEMS FOR PRIMARILY ARMY AVIATION SYSTEMS
- MAKES USE OF NONPARAMETRIC STATISTICAL TESTS
- RESEARCH QUESTIONS

DOES COMPETITIVE PROCUREMENT REFLECT A STEEPER EXPERIENCE CURVE THAN SOLE SOURCE PROCUREMENT?

WHAT PERCENTAGE SAVINGS IS REALIZED ON FIRST COMPETITIVE BUY?

FINDINGS

SOLE SOURCE AND COMPETITIVE LEARNING CURVE SLOPES ESSENTIALLY EQUAL WITH COMPETITIVE SLOPES SLIGHTLY STEEPER

MEDIAN COMPETITIVE SAVINGS ON FIRST COMPETITIVE BUY EQUALED 24.3%

APRO 905 GUIDELINES FOR THE APPLICATION OF COMPETITION

OBJECTIVES

TO DEVELOP A PRIMER ON COMPETITION

TO SYNTHESIZE FINDINGS FROM PREVIOUS COMPETITION STUDIES

TO PROVIDE GUIDELINES ON ACQUISITION STRATEGY DEVELOPMENT

REPORT CONTENT

DETAILED TREATMENT OF SECOND SOURCING METHODS (TDP-FORM, FIT, FUNCTION-LEADER/ (FUNDS, QUANTITIES, COMPLEXITY, FACILITY COSTS, ECONOMIC CLIMATE, ETC) FOLLOWER-EDUCATIONAL BUY-LICENSING-TEAMING-BREAKOUT) DISCUSSION OF QUALITATIVE FACTORS

CONCLUSIONS

MATRIX INTERRELATIONSHIP OF METHODS AND FACTORS

TDP REMAINS DOMINANT METHOD EARLY PLANNING IMPERATIVE FUNDS MUST BE PROVIDED FOR SECOND SOURCING

APRO 81-06 COMPETITION MODELING

OBJECTIVES

TO DEVELOP A CASE STUDY ON COMPETITION PLANNING FOR A HYPOTHETICAL SYSTEM TO PROVIDE A SCENARIO FOR DISCUSSION OF COMPETITION STRATEGY DEVELOPMENT

STUDY APPROACH

REVIEW COMPLETED COMPETITION STUDIES USE MLRS STUDY AS BASIS FOR CASE EXAMINE STRATEGIES OF OTHER PROGRAMS EMPHASIZE COMPETITION PLANNING AND SECOND SOURCING ANALYSIS

 John Hiller, RAND Corporation



.

SELECTED RAND STUDIES

- O FACTORS AFFECTING THE USE OF COMPETITION IN MEAPON SYSTEM ACQUISITION (R-2706-DR&E, FEBRUARY 1981)
- O ACQUISITION POLICY EFFECTIVENESS: DOD EXPERIENCE IN THE 1970'S (R-25L6-DR&E, OCTOBER 1979)
- 0 COMPETITION IN THE ACQUISITION OF MAJOR MEAPON SYSTEMS: LEGISLATIVE PERSPECTIVES (R-2058-PR, NOVEMBER 1976)

OBJECTIVES OF RECENT MORK (R-2706-DR&E)

- IDENTIFY FACTORS LEADING TO USE OR REJECTION OF COMPETITION 0
- O REVIEW YORK ON QUANTITATIVE EFFECTS OF COMPETITION
- SUGGEST HOW DOD MIGHT STIMULATE MORE EFFECTIVE COMPETITION IN MAJOR ACOUISITION PROGRAMS 0

DATA PASE

- O MANAGEMENT CASE STUDIES OF:
- AH 64 HELICOPTER
- LWF/F-16 Aircraft
- HARPOON MISSILE
- MAVERICK MISSILE

- SPARROW MISSILE
 - F-18 Aircraft
- M-198 HOWITZER
- Advanced Self Frotection Jammer (ASPJ)
- O QUANTITATIVE STUDIES BY:
- ARMY PROCUREMENT RESEARCH ORGANIZATION
- INSTITUTE FOR DEFENSE ANALYSES
- U.S. ARMY ELECTRONICS COMMAND

POTCNTIAL BENEFITS OF COMPETITION

- O IMPROVED PRODUCT QUALITY
- O LOWER UNIT COSTS
- O FASTER LEARNING RATES BY MANUFACTURERS
- O GREATER TECHNOLOGICAL PROGRESS
- O ENHANCED INDUSTRIAL PRODUCTIVITY
- O ENLARGED SURGE AND MOBILIZATION CAPACITY
- O MORE ENUITABLE PROCESS OF AWARDING ACQUISITION CONTRACTS

ŀ

- COMPETITIVE REPROCUREMENT

- COMPONENT AND SUBSYSTEM BREAK-OUT
- ONE-TIME BUY-OUT

64

POTENTIAL APPLICATIONS OF COMPETITION

\$ty

- DESIGN, PRICE, PERFORMANCE COMPETITION

.

- LEADER--FOLLOWER
- DIRECTED LICENSING

- FUSION--FISSION

CONCLUSIONS: QUANTITATIVE RESEARCH

- CONSIDERABLE PROGRESS HAS BEEN MADE, BUT NUMEROUS FACTORS STILL MEED TO BE CONSIDERED: 0
- RATE OF PRODUCTION
- CAPITAL INVESTMENT
- PRODUCT MIX OF FIRM
- CAPITAL UTILIZATION RATE AND BUSINESS CONDITIONS
- CONTRACT FORM
- MANUFACTURING TECHNOLOGY
- O CURRENT DATA NOT ADEQUATE TO SUPPORT EXTENSIVE ANALYSES

CONCLUSIONS: PRIOR TO FSD

- 0 INVESTMENTS FOR COMPETITION ARE SMALL
- O BENEFITS MIDELY PERCEIVED, THOUGH QUANTITATIVE EVIDENCE IS LACKING
- O COMPETITION GENERALLY APPLIED
- O LITTLE OR NO ADDITIONAL INCENTIVE NEEDED TO ENCOURAGE COMPETITION DURING CONCEPT FORMULATION, DEMONSTRATION AND VALIDATION PHASES
CONCLUSIONS: PRODUCTION

- O INVESTMENTS ARE LARGE AND IMMEDIATE; POTENTIAL BENEFITS ARE DISTANT AND UNCERTAIN
- o Program Schedule Lengthens and Management Complexity Increases
- PROGRAM MANAGERS OFTEN DOUBT EVIDENCE FROM OTHER PROGRAMS, APPLICABILITY OF COMPETITION TO THEIR PROGRAM, AND SUPPORT OF HIGHER LEVELS 0
- O QUANTITATIVE LITERATURE DOES NOT PROVIDE STRONG, USEFUL INFORMATION ON BENEFITS OF COMPETITION, OR GUIDANCE ON ITS APPLICATION

and the second sec

CONCLUSIONS: PRODUCTION (CONT'D)

- O TO ENCOURAGE COMPETITION, MANAGERS NEED:
- EVIDENCE THAT IT WILL PAY OFF FINANCIALLY
- PRACTICAL GUIDANCE ON HOW TO CHOOSE CANDIDATES AND MOW TO STRUCTURE THE COMPETITION
- SUPPORT FOR FRONT-END FUNDING, WITH A LONG-TERM COMMITMENT TO THAT FUNDING
- O DOD MUST DEVELOP CRITERIA FOR SELECTIVE APPLICATION OF COMPETITION, BUT TO DO SO IT SHOULD DEVELOP MORE EFFECTIVE METHODOLOGIES

.

8. William Drinnon, Putnam, Hayes, and Bartlett, Inc. PUTNAM, HAYES & BARTLETT, INC.

:

COMPETITION STUDIES

,

Bill Drinnon 19 May 1981

---- PUTNAM, HAYES & BARTLETT, INC. -

OVERVIEW

• Who we are

• What we do

• Description of our methodology

• Lessons learned from our work

----- PUTNAM, HAYES & BARTLETT. INC. -

PUTNAM, HAYES & BARTLETT, INC.

- Founded: 1976
- Purpose: Provide economic analysis of governmentbusiness problems
- Offices: Cambridge, Massachusetts Washington, D.C.
- Current Major Product Areas:
 - Corporate Strategies Litigation Support
 - Public Policy Defense

- PUTNAM, HAYES & BARTLETT, INC. -



- Establish technical feasibility
 - Status of the Technical Data Package
 - Existence of proprietary data and processes
 - Degree of manufacturing complexity
 - Availability of sources

- PUTNAM, HAYES & BARTLETT, INC. -

- Review program issues:
 - Administrative lead time
 - Production lead time
 - Configuration management
 - Prime support required

- PUTNAM, HAYES & BARTLETT, INC.

:

•	Perf	orm detailed economic analysis:
	-	Establish expected cost of sole source procurement
	-	Estimate additional <u>non-recurring</u> costs of competition:
		New facilities construction
		Special test equipment for second source
		Special tooling for second source
		Additional system engineering and program management personnel for second source
		Prime contractor support contracts
		Production qualification testing
		Additional government program management personnel
	-	Estimate <u>recurring</u> costs of competitive sources:
		Increased cost of learning buys at second source
		Increased costs due to learning loss from split buys
		Increased costs due to rate effects
		Decreased costs due to effects of competition
	-	Consider impact of facility amortization agreements
	-	Consider impact of multinational production agreements

- PUTNAM, HAYES & BARTLETT. INC. -

• E	Evaluate	alternative	competitive	options
-----	----------	-------------	-------------	---------

- Competition of the existing design
 - -- Use of Technical Data Package (TDP)
 - -- Use of Leader/Follower technique
 - --- Use of Licensing
- Competition of alternative design
 - -- Form, Fit, Function
- Develop detailed implementation plans

- PUTNAM, HAYES & BARTLETT, INC. -

LESSONS LEARNED

- Government needs to know the weapon system:
 - To thwart obstructionism
 - To identify feasible options
- Analysis needs to rest on sound conceptual framework:
 - Appropriate learning curve model
 - Valid parametric estimates of competition's effects
 - Consideration of rate effects based on:
 - -- Parametric analysis
 - -- Microeconomic analysis on program basis
 - Detailed understanding of firm's accounting system

- PUTNAM, HAYES & BARTLETT, INC.

LESSONS LEARNED (continued)

- Be careful with facility amortization agreements:
 - Upfront savings costly later
 - First source surge capacity versus second source
- Prepare for early production competition
 - Obtain agreements before picking producer
 - Avoid first producer peak
 - Split fiscal year buys (e.g., 1st FY83 buy noncompetitive, 2nd FY83 buy competitive)

- PUTNAM, HAYES & BARTLETT. INC. -

LESSONS LEARNED (continued)

•	Government	can	obtain	first	producer's	cooperation:
---	------------	-----	--------	-------	------------	--------------

- Government can offer things of value:
 - -- Role in source selection
 - -- Production share guarantees
 - -- Configuration management
 - -- Design responsibilities
 - -- Logistics support role
 - -- Investment amortization agreements
 - Government has array of contract clauses available:
 - -- Progress payments
 - -- Award fees
 - -- First source guarantees of second source production
- Government monitoring required
- Multinational production agreements can restrict competitive options.
- Beware of buy outs.

- PUTNAM, HAYES & BARTLETT. INC. -

9. Jacques Gansler, The Analytical Sciences Corporation



COMPETITION ANALYSES



: . •

OVERVIEW

- POTENTIAL SAVINGS DUE TO COMPETITION
- COMPETITION AND MULTI-YEAR CONTRACTING
- COMPETITION FOR SERVICE CONTRACTS
- SUMMARY



THEORETICAL FRAMEWORK SHIFT & ROTATION





KEY FACTORS THAT IMPACT ON POTENTIAL SAVINGS

- INITIAL COST IMPROVEMENT RATE
- PRODUCTION QUANTITY AND RATE
- TIMING OF COMPETITIVE AWARDS





THE COST IMPROVEMENT AND PRODUCTION RATE SURFACE













MODEL PARAMETERS FOR TACTICAL MISSILE DATA

Data	First Unit Cost	Sole Source Cost Improvement Curve Slope	Production Rate Curve Slope	Optimum Lot Size	Comp. Shift	etitive Rotation	Quantity Produced Prior to Competition	"Optimal" Cost Improvement Curve Slope
Sparrow (1st Source)	415,336	.846	.985	1,250	4.3%	8.1%	1,625	.833
Sparrow (2nd Source)	450,186	.874	.923	1,250	-0.4%	13.2%	505	.849
Bullpup	53,416	.823	1.004	7,950	12.6%	11.8%	7,520	.800
TOW	5,297	166.	1.007	6,000	15.5%	35.0%	15,750	.926
Sidevinder	16,021	1.047	.819	4,150	16.3%	34.7%	11,285	.982



MODEL PARAMETERS FOR MILITARY ELECTRONICS DATA

:

a "Optimum Curve Slope	.848	.832	.729	.816	.806	.846	.882	.891
Opti m uu Lot Size	140	2 633	2 1425	2635	950	2 100	325	2358
Rate Curve Slope	.960	746.	.888	.946	.975	.877	.967	1.015
Sole-Source Cost-Imp Curve Slope	.922	.880	. 754	.874	.860	.883	-957	.967
First Unit Cost	16,876	36,143	429,970	31,293	20,786	244,790	14,528	13,181
Data Source	AERNO 60-6402 Electronic Control Amplifier	.TD-204 Cable Combiner	TD-660 Multiplexer	TD-202 Radio Combiner	MD-522 Modulator- Demodulator	ASW-27 Avionics	AN/APM-123 Transponder Test Unit	TD-352 Multiplexer

TASC





8	
\mathbf{k}	
2	20
δ	Ш
Ō	Ō
B	O.
	え
Z	
	R
Щ	5
2	5
	C
	\mathbf{H}
۲ Δ	Z
Σ	Щ
Ō	2
Ŷ	Z
7	Ó
D	Ř
ž	
7	2
Ш́.	┝━━
Ш	N.
3	Ö
	0
W.	Щ
	\geq
X	
Y	
2	D
	Ξ
Ш.	Ō
	Ŭ
び て	-
X	

DATA	SAMPLE SIZE	CORRELAT 10N Coefficient	T-VALUE/ LEVEL OF SIGNIFICANCE	F-VALUE/ Level of Significance
TACTICAL	ъ	. 995	16.9/.001	285/.05
MILITARY Electronics	œ		14.4/.001	207/.05
BOTH	13	.972	13,8/,001	189/.05

TAGG



AD-A1	13 980 SSIFIED	ARMY RESUL MAY 8 APRO-	PERSON TS OF 1 1 81-63	NEL RESI	EARCH ON DOD/	FFICE (OFPP C	ASHING MPETIT	TON DC LON WOR	қзнор н	ELD 12-	F/6 1 13 H	5/5 ETC(U)	
	2 of 3 ^{AD} 3980												ţ.
	.	i											
		の日		:		:				:	1.1		







AREAS OF ANALYSIS FOR PROPER IMPLEMENTATION AND MULTH-YEAR CONTRACTING OF COMBINED COMPETITION

- TIMING AND LENGTH OF MULTI-YEAR CONTRACTS TO MAXIMIZE BENEFITS OF COMPETITION AND MULTI-YEAR CONTRACTING
- INNOVATIVE CONTROL OF DESIGN CHANGES
- FUNDING PROFILE TO BALANCE GOVERNMENT AND CONTRACTOR RISKS.







COST IMPROVEMENT FORCES ON SERVICE CONTRACTS





FACTORS WHICH IMPACT SAVINGS FOR SERVICE CONTRACTS

- NATURE OF THE SERVICE
- COST-PERFORMANCE TRADEOFFS
- COST IMPROVEMENT CURVE EFFECTS
- FREQUENCY OF THE COMPETITION.

CONCLUSION

- THE POTENTIAL BENEFITS DUE TO COMPETITION ARE DETERMINED BY UNIQUE PROGRAM CHARACTERISTICS
- COMPETITION IS IMPLEMENTED AT THE PROGRAM MANAGEMENT LEVEL
- IN ORDER TO MAXIMIZE THE BENEFITS OF COMPETITION, PLANNING AND IMPLEMENTATION SHOULD BE TAILORED FOR EACH PROGRAM.

TASC

10. Mr. Paul Carrick, Institute for Defense Analyses

COMPETITION IN THE

GAU 8/A SYSTEM

GAU-8/A 30mm AMMUNITION PROGRAM HISTORY

DATE OR TIME PERIOD		1966-1970	1970-1973		1971 - 1973	JUNE 1973	JUNE 1973	AUGUST 1973-MARCH 1974	MARCH 1974	NOVEMBER 1974	JANUARY 1976	JANUARY 1978
PROGRAM EVENT	AIRCRAFT, GUN & AMMUNITION VS MISSILE	CONCEPT FORMULATION	SOURCE SELECTION - COMPETITIVE PROTOTYPE PHASE	AIRCRAFT (NORTHRUP VS FAIRCHILD)	GUN - AMMUNITION PROTOTYPE Competition (Ge & Aoc VS Ford & HW)	WINNERS SELECTED FOR FULL SCALE Development (Fairchild, Ge, Aoc)	DSARC N	SECOND SOURCE COMPETITION FOR 30 mm RD (HW VS AVCO)	HONEYWELL WINS & STARTS FSD	DSARC HI A	DSARC III'B	A-10 IOC

5-5-81-1
SIGNIFICANT TECHNICAL DEVELOPMENTS IN THE GAU-8/A 30mm ROUNDS ACQUISITION

- --- ADOPTION OF AN ALUMINUM CARTRIDGE CASE FOR WEIGHT REDUCTION
- USE OF DEPLETED URANIUM (DU) AS PENETRATOR FOR THE ARMOR PIERCING ROUND
- -- Creation of a U.S. du processing, forming, and fabrication production capabilities

102

- USE OF PLASTIC ROTATING BANDS
- USAF ADOPTION OF A BREAK-IN PROGRAM FOR GFM ITEMS;

PRIMER

IGNITER

HEI EXPLOSIVE MIX

HEI FUZE



6-19-5-9

5-5-81-10

NO INTERCHANGE OF DESIGN CHANGES BETWEEN CONTRACTORS

- EXTENSIVE USE OF EXISTING AMMO PRODUCTION MOBILIZATION BASE, GOCO AND COCO

USAF HAS FUNDED \$40 M (MOSTLY DIPEC) IN FACILITY INVESTMENT FOR THE TWO BUYERS AND CERTAIN OF THEIR SUBCONTRACTORS. THE TWO CONTRACTORS HAVE INVESTED OVER \$20 M

FREEDOM OF DESIGN (TDP FOR FORM-FIT AND FUNCTION ONLY)

104

PROCUREMENTS MADE UNDER EXCEPTION 16

EACH CONTRACTOR FACILITIZED TO 60% OF ANNUAL MOBILIZATION PRODUCTION REQUIREMENTS

(i.e., 500 K ROUNDS/MONTH)

SIGNIFICANT USAF/CONTRACTOR COMPETITIVE GROUND RULES

SUMMARY OF GAU-8/A AMMUNITION ACQUISITION PROGRAMS

	BUDGET/I (THEN	EXPENDITURES YEAR \$ M) ^a		BMUN	ier of Rounds Acqu (All Types) ^b	JRED
FISCAL YEAR	AMMUNITION	GFM	TOTAL	AOC	HW	TOTAL
1971-1972 ^c	1	l	\$£	153,000	-	153,000
1973-1974	1	I	đ	212,000	I	212,000
1975 ^d	\$ 12.5	\$ 3.2	15.7	467,500	106,000	573,500
1976	43.4	~	43.4	836,000	550,000	1,386,000
1101	116.5	~	116.5	3,234,600	2,308,400	5,543,000
1978	117.3	~	117.3	3,563,000	4,535,000	8,098,000
1979	152.2	~	152.2	6,063,128	3,403,223	9,466,351
1980	51.1	6.3	157.4	6,087,742	4,783,226	10,870,968
1981	105.5	12.6	118.1	4,020,782	3,159,186	7,179,968
1982	104.1	12.4	116.5	4,020,782	3,159,186	7,179,968
1983	109.5	13.1	122.6	CONTR	ACTS NOT YET AWA	RDED
1984	111.4	13.3	124.7	CONTR	ACTS NOT YET AWA	RDED
1985	120.3	14.4	134.7	CONTR	ACTS NOT YET AWA	RDED

^a USAF, Acquisition Plan #80-1-329A, D&F Summary Sheet.

^b USAF: ASD, letter of February 8, 1980: Price Memorandum.

^c Aerojet Ordnance Company, GAU-8/A Ammunition Program History.

d Cost of government furnished materials is included in the ammunition value for 1976-1979.

6-18-2-9

.

GAU-8/A SPLIT AWARD METHODOLOGY ONLY TWO BIDDERS

MAXIMUM EXCURSION IN SPLIT AWARD OF 65%-35%

PRICE SUBMISSION REQUIREMENTS: PRICES ESTIMATED FOR 35%, 50% AND 65% OF THE TOTAL BUY

- The three BIDS must lie on a logarithmic price curve

BUYER CALCULATES AN AVERAGE ADJUSTED CONTRACTOR BID (ACB)

 $ACB^{+} = \frac{ACB_{35} + ACB_{50} + ACB_{65}}{ACB^{+}}$

•

PERCENTAGE ALLOCATION OF TOTAL BUY QUANTITY DETERMINED BY MAGNITUDE OF THE ACB* DIFFERENCE

- 11.5%-12% PRICE DIFFERENCE \sim 65%-35% SPLIT

- 0%-0.5% PRICE DIFFERENCE \sim 50%-50% SPLIT

- FOR A GREATER THAN 12% PRICE DIFFERENCE, GOVERNMENT MAY REQUEST SUBMISSION OF DD633 **COST/PRICE DATA**

*Adjusted for GFE and royalties payable for previously accepted value engineering changes. 5-5-81-4





GAU-8/A ACQUISITION HISTORY:

PERCENT OF TOTAL SPLIT AWARD PROCUREMENT TO EACH CONTRACTOR

FISCAL YEAR OF Competition	AOC'S % SHARE		HW'S % SHARE
Q	09	40	(ON SUBCONTRACT TO GE)
1	28	42	(AF ASSUMES MANAGEMENT)
8	44	20	
6	64	36	DETERMINED BY A
10 (3-VEAR	20	44	LOGARITHMIC SPLIT
	56	44	AWARD METHODOLOGY
32 VEAR	26	44	

Source: USAF: ASD, Letter of 8 February 1980; USAF, A-10 Document No. K-102.

5-5-81-8

:

GAU-8/A AMMUNITION PRICE-QUANTITY PROCUREMENT DATA AND ESTIMATED PROGRESS FUNCTION FOR THE AEROJET ORDNANCE COMPANY

	LEAST SQUARES EQUAT	0N: C _n =\$1182.50 _n 0.3 R ² =0.93	129 (S= 79.6 percent)	
FISCAL YEAR	CONTRACT QUANTITY (THOUSANDS OF ROUNDS)	ACTUAL ^a Average Price (19 73 Dolla rs)	ESTIMATED AVERAGE PRICE	TYPE OF Contract
1975	467.5	\$19.13	\$20.22	FPI
1976	836	13.72	13.01	Æ
1977	2,860	7.21	8.99	Ē
1978	4,534	5.60	6.74	FP
1979	7,063	4.38	5.79	Ð
1980	6,088	4.63	4.73	FP-MULTI-YEAR
1981	4,021	4.61	4.37	FP-MULTI-YEAR
1982	4,021	4.66	4.26	FP-MULTI-YEAR
^B Prices adjusted for chance	pes in GFM and CFM, 1980-191	2.		

Source: USAF: AFSC, Price Memorandum letter of February 8, 1980. 5-5-81-15

GAU-8/A PRICE-QUANTITY PROCUREMENT DATA AND THE ESTIMATED PROGRESS FUNCTION FOR THE HONEYWELL CORPORATION

	LEAST SQUARES EQU	ATION: C _n = \$931 _n - 0.32 R ² = 0.921	(S = 80 percent)	
FISCAL YEAR	CONTRACT CONTRACT QUANTITY (THOUSANDS OF ROUNDS)	ACTUAL ^a Average Price (1973 Dollars)	ESTIMATED AVERAGE PRICE	- TYPE OF CONTRACT
1976	550	\$23.86	\$16.96	ld-J
1977	1,832	8.98	9.91	EPI
1978	3,563	5.86	7.74	£
1979	3,803	5.62	6.06	£
1980	4,748	5.30	5.22	FP-MULTI-YEAR
1981	3,159	5.11	4.66	FP-MULTI-YEAR
1982	3,159	5.09	4.38	FP-MULTI-YEAR
rices adjusted for cha	inge in GFM to CFM, 1980-198			

Source: USAF: AFSC, Price Memorandum letter of February 8, 1980.

SIGNIFICANT ASPECTS OF CONTRACTOR PERFORMANCE

THERE HAS BEEN A 75% REDUCTION IN AVERAGE UNIT COST BETWEEN 1975 AND THE CURRENT MULTI-YEAR BUY (MEASURED IN 1973 DOLLARS)

DTC GOALS WERE DELETED FROM CONTRACTS IN 1978, BUT (IN 1973 DOLLARS) **CONTRACTOR PERFORMANCE HAS EXCEEDED THE GOALS**

ACHIEVED	\$3.00	4.00	6.30
INITIAL DTC GOALS	\$ 5.50	7.30	\$11.80
TYPE OF ROUND	đ	HEI	API

THE SOURCES OF UNIT COST REDUCTION

VARIATIONS IN PRODUCT DESIGN HAVE NOT BEEN AN IMPORTANT SOURCE OF SAVINGS:

- ONLY 5 VALUE ENGINEERING CHANGES TO DATE

- 82 CHANGE ORDERS FOR AOC AND 50 FOR HW

- OVER 50% OF DESIGN CHANGES INITIATED AT USAF REQUEST

NO SIGNIFICANT CONTRACTOR INVESTMENT IN NEW PRODUCTION EQUIPMENT

CONCLUDE: MAJOR SOURCES OF COST REDUCTION DUE TO MANY SMALL IMPROVEMENTS IN SCHEDULING, MATERIAL HANDLING, EMPLOYEE LEARNING

SIGNIFICANT FACTORS IN EXPLAINING COST REDUCTION:

/

AOC RELIED UPON VERTICAL INTEGRATION TO DEVELOP SOURCES OF SUPPLY:

- ACQUIRED DU PROCESSING AND FABRICATION FACILITIES
- CONSTRUCTED ITS OWN LAP FACILITY
- 55% OF UNIT COST IS FOR SUBCONTRACTED ITEMS

HW RELIED UPON SUBCONTRACTORS TO CREATE A PRODUCTION TEAM:

- EXTENSIVE USE OF GOVERNMENT OWNED FACILITIES AND EQUIPMENT
- 55% OF UNIT COST IS FOR SUBCONTRACTED ITEMS; IT WAS AS HIGH AS 70%

AOC HAS A SUBCONTRACTOR "BUY OUT" WITH THE FIRST COMPETITION; HW WAITED UNTIL THE MULTI-YEAR PROCUREMENT TO HAVE A BUY OUT

COMPARATIVE COSTS OF SMALL CALIBER AMMUNITION

1

BUSHMASTER 25 mm CARTRIDGE (HARDWARE COST ONLY; FISCA	YEAR 1980 BUY) ³
	COST/ROUND
APDS ROUND	\$44.31
HEI	36.93
TP	26.10
PHALANX 20 mm CARTRIDGE (FISCAL YEAR 1980 BUY) ^b	15.00
ARRCOM MANAGED ROUNDS ^C	
20 mm CARTRIDGE TP LKD M220	4.774
25 mm CARTRIDGE HEI-T XM792	47.273
30 mm CARTRIDGE HEDP M789 (ADEN/DEFA)	55.676
GAU-8/A ROUNDS (AVERAGE PRICES, FISCAL YEAR 1980 BUY) ^d	
API	14.70
HEI	12.00
. d1	7.70
Sources: a name a manual and a manual a	

..... DAMA, Ammurition Procurement Office.

^b Navy Phalanx Project Office.

^C Mr. Jim Spangler, ARRCOM.

d USAF: AFSC, Price Memorandum of February 8, 1980.

11. Ralph Williams, US Coast Guard

SHORT RANGE RECOVERY (SRR) HELICOPTER MANAGEMENT/PROCUREMENT_CONSIDERATIONS

- 1. MAINTAIN EXISTING HELICOPTERS
 - HH-52A PRODUCTION (1963/68) 170 AIRCRAFT 99 PROCURED BY C.G.
 - AT PRESENT 25 COMMERCIAL IN OPERATION
 - EXCESSIVE COST FOR SPARE PARTS
 - EXCESSIVE LEAD TIME FOR SPARES
 - FLIGHT CONTROLS/DYNAMIC COMPONENTS DESIGNED IN LATE 1940's
 - C.G. AIRCRAFT ATTRITION RATE 1 PER YEAR (CRASH DAMAGE)
 - FUNDED FOR 10 HELO'S FOR SUPPORT FISHERIES CONSERVATION ACT (1978)
- 2. MIXED SRR FLEET

SAME PROBLEMS OUTLINED IN 1 TOGETHER WITH:

- C.G. LIMITED RESOURCES
- DUPLICATION OF TRAINING
- DUPLICATION OF SPARES
- DUPLICATION OF GROUND SUPPORT
- DUPLICATION OF DEPOT REPAIR FACILITIES
- 3. <u>PROCUREMENT OF DOD HELICOPTER</u> DOD INVENTORY --
 - EXCESSIVE WEIGHT FOR C.G. SHIPS
 - LIMITED RANGE OF OPERATION
- 4. <u>DEVELOP NEW SYSTEM</u>

LIMITED RESOURCES

- EXCESSIVE DEVELOPMENT/PRODUCTION COST (SPREAD OVER ONLY 90 A.C.)
- TIME DELAY 5 YEARS TO PRODUCTION

5. IN PRODUCTION COMMERCIAL SYSTEM

RESEARCH REVEALED AT LEAST 4 IN PRODUCTION AIRCRAFT THAT APPEARED TO MEET OUR OPERATIONAL NEEDS. COMMERCIAL MODELS USED TO SUPPORT OFFSHORE OIL PRODUCTION PERFORMED FUNCTIONS SIMILAR TO THOSE REQUIRED BY C.G. THIS ALTERNATIVE REPRE-SENTED THE LOWEST TECHNICAL AND COST RISK. THE EXPECTED WIDE COMMERCIAL APPLICATION DECREASED THE RISK OF A SHORT ECONOMIC SERVICE LIFE WITH ASSURANCE THAT ADEQUATE SPARES AND SUPPORT WOULD BE AVAILABLE TO COVER THE SERVICE LIFE OF THE SRR. BENEFITS WERE:

- FLY BEFORE BUY
- HIGH COMMERCIAL BASE/LOW COST
- LOGISTICS SUPPORT
- PRESENT DAY TECHNOLOGY
- FAA CERTIFIED

6. METHOD OF PROCUREMENT SELECTED

COMPETITIVE PROCUREMENT OF A COMMERCIAL AIRCRAFT MODIFIED TO MEET C.G. NEEDS -- MULTI-YEAR (5 YEAR) CONTRACT COVERING THE TOTAL C.G. REQUIREMENT FROM ONE MANUFACTURER.

SPECIFICATION DEVELOPMENT

SHORT RANGE RECOVERY (SRR) SYSTEM

- MISSION NEEDS
 - SEARCH AND RESCUE
 - ENFORCEMENT OF LAWS AND TREATIES
 - AIDS TO NAVIGATION
 - COMMERCIAL VESSEL SAFETY
 - PORT SAFETY AND SECURITY
 - ICE OPERATIONS
 - MILITARY OPERATIONS
- TWIN ENGINE DUE TO OFFSHORE ENVIRONMENT
- MINIMUM CRUISE SPEED OF 100 KNOTS
- RANGE OF 400 N.M. WITH RADIUS OF ACTION:
 - 150 MILES FROM OPERATING BASE
 - REMAIN ON SCENE FOR 30 MINUTES
 - RETURN TO BASE WITH FUEL RESERVE OF 20 MINUTES
- PASSENGER CAPACITY OF 6
- 600 POUND RESCUE HOISE
- CARGO SLING OF 2000 POUNDS CAPACITY
- AVIONICS PACKAGE TO PROVIDE NAVIGATION, COMMUNICATION AND DETECTION CAPABILITIES
- GROSS WEIGHT LIMIT OF 10,000 POUNDS

THE ABOVE MINIMUM PERFORMANCE CHARACTERISTICS WERE USED AS THE FOUNDATION OF THE TECHNICAL SPECIFICATIONS/DESCRIPTIONS USED IN THE RFP.

USING THE MINIMUM MISSION PERFORMANCE CHARACTERISTICS, THE C.G. DEVELOPED DETAILED SPECIFICATIONS.

THE RFP DRAFT SPECIFICATION (9 VOLS.) WAS ISSUED FOR INDUSTRY COMMENT WITH SPECIFICATIONS ADJUSTED AS A RESULT OF THE COMMENTS RECEIVED.

THE RFP REQUIRED A DETAILED TECHNICAL PROPOSAL WHICH. ON PAPER. DEMONSTRATED COMPLIANCE WITH THE SPECIFICATIONS.

AS A PART OF THE EVALUATION PROGRESS, THE C.G. CONDUCTED A FLIGHT EVALUATION OF THE PARENT AIRCRAFT PROPOSED TO CONFIRM POTENTIAL COMPLIANCE WITH THE GOVT SPEC/CONTRACTOR PROPOSAL.

THE CONTRACTOR WAS REQUIRED TO PROVIDE DETAILED SPECIFICATIONS/ DRAWINGS ON C.G. MODIFICATIONS TO COMMERCIAL AIRCRAFT.

RFP EVALUATION CRITERIA PROVIDED FOR SELECTION OF BEST TECHNICAL AIRCRAFT.

RIGHTS TO ALL TECH DATA PREDETERMINED.



NAVY AND AIR FORCE COMMONALITY



TECHNOLOGY CATEGORIES



UNCLASSIFIED

ELECTRONIC WARFARE TECHNICAL DEVELOPMENTS CHARACTERIZED BY

- INTELLIGENCE DEPENDENCE
- TIME VARYING REQUIREMENTS
- GOVERNMENT THREAT SIMULATIONS
- SUBSYSTEM OF MAJOR WEAPON SYSTEMS
 - CHALLENGING FORM/FIT/POWER/COOLING
 - VERY HIGH TECHNOLOGY
- COMPONENT DEVELOPMENTS
- REAL TIME DIGITAL SYSTEM CONTROL
 - REAL TIME DATA PROCESSING
 - HIGH PRODUCTION RATES

UNCLASSIFIED.

UNCLASSIFIED



DEVELOPING COMPETITION

CASE FOR GFE

REDUCED

- R&D COST
- ACQUISITION COST
- SUPPORT EQUIPMENT COST
 - SPARES COST
 - MANPOWER

INCREASED

- WEAPON SYSTEM INTEGRATION
- INTERFACES







GFE CANDIDATES

HIGH UNIT COST

- LARGE PRODUCTION RUNS
- LITTLE WEAPON SYSTEM INTEGRATION
- COMPLEX COMMON SUPPORT
- REPAIRABLES vs CONSUMABLES

UNCLASSIFIED

PROGRAM STRUCTURING

MISSION NEED

ACQUISITION STRATEGY

- PROGRAM CONSIDERATIONS
- TECHNICAL CONSIDERATIONS
 - BUSINESS CONSIDERATIONS

UNCLASSIFIED



YTITNAUD

TECHNICAL CONSIDERATIONS

- **TECHNICAL ASSESSMENT**
- INDUSTRY
 GOVERNMENT LABORATORIES
- **RELIABILITY/MAINTAINABILITY**
- SOFTWARE
- PERFORMANCE/FORM FACTOR/R&M TRADEOFFS
 - **RISK ASSESSMENT**
- CRITICAL COMPONENT DEVELOPMENT
 - ECM TECHNIQUES
- ADM FABRICATION/TEST
 - **COST CONTROL**

SPECIFICATIONS

TECHNOLOGY ADVANCES

- TRAVELING WAVE TUBES
- POWER SUPPLIES
- MICROWAVE INTEGRATED CIRCUITS
- MICROPROCESSORS
- PULSE TRAIN TRACKERS
- DIGITALLY TUNED OSCILLATORS

UNCLASSIFIED

UNCLASSIFIED

COMPETITION

CONSTRAIN SIZE

DESIGN TO COST

COST CONTAINMENT

- FUNCTIONAL MODULARITY
- REDUCE 'HIGH COST COMPONENTS
- **USE DIGITAL CIRCUITRY**
- IMPROVE RELIABILITY



BUSINESS CONSIDERATIONS

- MARKET ANALYSIS
- PROGRAM COST PROJECTIONS
- INDUSTRIAL BASE
- PRODUCTION CAPACITY
- INCENTIVES
- SOURCE SELECTION CRITERIA
- PROGRAM FLEXIBILITY
- COST CONTROL

UNCLASSIFIED

PROSPECTIVE SOURCES

COMPANIES WITH AIRBORNE ACTIVE/PASSIVE DECM EXPERIENCE:

RAYTHEON (GOLETA)/KURAS-ALTERMAN MOTOROLA GENERAL ELECTRIC ★ WESTINGHOUSE **A NORTHROP A** SANDERS **★** HUGHES *KLORAL* ×AIL

OTHER INTERESTED COMPANIES:

DALMO VICTOR GENERAL INSTRUMENTS **TEXAS INSTRUMENTS ATD/ITEK** IBM

★ TASKER

ASPJ COMPETITORS

UNCLASSIFIED

ASPJ ACQUISITION STRATEGY

- DESIGN COMPETITION
- RISK REDUCTION PROVISIONS
- HIGH INITIAL PRODUCTION RATE
- SUSTAINED COMPETITION IN PRODUCTION

UNCLASSIFIED
COMPETITION DOES....

- VITALIZE THE INDUSTRIAL BASE
 - **FOCUS TECHNICAL TALENT**
- FACILITATE TECHNICAL CHANGE
- FOSTER THE "ILITIES"
- PUT TEETH IN DESIGN-TO-COST
- LOWER PRODUCTION COST
- MODERATE PRODUCTION RISK
- REDUCE GOVERNMENT SURVEILLANCE

UNCLASSIFIED



FULL SCALE DEVELOPMENT PROGRAM

PHASE I

- DESIGN COMPETITION
- CRITICAL ITEM DEMONSTRATION
- RISK ASSESSMENT

• PHASE II

- FABRICATION OF ASPJ HARDWARE
- QUALIFICATION TESTS
- TAAF
- RELIABILITY / MAINTAINABILITY DEMONSTRATION
- DETAILED WEAPON SYSTEM INTEGRATION
 - TEST AND EVALUATION





MULTIPLE SHORT TERM CONTRACTS

ADVANTAGES

MAXIMIZES INDUSTRIAL INVOLVEMENT

ALLOWS RELEASE OF INTELLIGENCE DATA

DEMONSTRATES GOVERNMENT COMMITMENT

NARROWS THE FIELD FOR SOURCE SELECTION MAINTAINS COMPETITIVE ENVIRONMENT

ALLOWS FOR TWO WAY EXCHANGE OF TECHNICAL DATA

STRUCTURE TRADEOFFS

NUMBER OF CONTRACTS

INDIVIDUAL CONTRACT COST

CONTRACT TERM

DISADVANTAGES

BUREAUCRATIC LEAD TIME
 SOURCE SELECTION BURDEN

COMPETITIVE ADVANTAGE



ASPJ TEAM CONSIDERATIONS

GOVERNMENT CONCERN

INDUSTRY CAPABILITY TO MEET DELIVERIES ON SOLE SOURCE BASIS

GOVERNMENT OBJECTIVES

- MAINTAIN ADEQUATE INDUSTRIAL BASE
- HIGH INITIAL PRODUCTION RATE
- COMPETITION IN PRODUCTION

POSSIBLE CONTRACTOR CONCERNS

- REVEALS PROPRIETARY TECHNOLOGICAL INFORMATION
 - BURDEN RATE INCREASES R&D COSTS

UNCLASSIFIED

ASPJ TEAMING CONSIDERATIONS

- **TWO-CONTRACTOR TEAMING** ARRANGEMENT
- 2. LEADER-FOLLOWER (LEARNER) ARRANGEMENT

UNCLASSIFIED

LEADER-FOLLOWER ARRANGEMENT

- SINGLE CONTRACTOR PROPOSALS
- WINNER COMPLETES EDM PHASE
- WINNER's PILOT LINE CONFIRMS DESIGN
- GOVERNMENT LETS LEARNER CONTRACT (TOKEN BUY)
- FOLLOWER BUILDS TO WINNER DESIGN
- COMPETITION AFTER FIRST PRODUCTION BUY

UNCLASSIFIED

.

PRIMARY-ALTERNATE ARRANGEMENT

- QUOTE INDEPENDENTLY FOR EDM PHASE
- GOVERNMENT SELECTS TWO IN PARALLEL FOR EDM DESIGN
- CDR (OR OTHER EVENTS) ESTABLISHES WINNER
- GOVERNMENT SELECTS ALTERNATE
- PRIME BRIEFS ALTERNATE
- ALTERNATE QUOTES TO PRIME
- BOTH SHARE PRODUCTION AWARDS (COMPETITIVE SPLIT)

UNCLASSIFIED

TWO CONTRACTOR TEAMING ARRANGEMENT COMPETITIVE TEAMING

- TEAM FORMED BY INDUSTRY COMPANIONS
- SINGLE ENTITY PROPOSAL
- MUTUALLY SUPPORTING
- TWO TEAMS COMPETE TO SELECTION EVENT



COMPETITIVE TEAMING

TEAMING ADVANTAGES

IMPROVED SYSTEM

- SYNERGISTIC DEVELOPMENT
- WIDER RANGE OF AVAILABLE TECHNOLOGIES

LOWER DEVELOPMENT RISK

- BROADER BASE
- BETTER DESIGN REVIEW

MIN COST TO ACHIEVE FULLY QUALIFIED PRODUCTION COMPETITION

COOPERATIVE DEVELOPMENT

TEAMING BY EQUALLY COMPETENT CONTRACTORS

NO A PRIORI DESIGN DIVISION

JOINT ENGR. TEAM SY STEM DESIGN

- BASED ON PREVIOUS DESIGN AND TEST DATA
- (EXISTING SYSTEMS, LWLC, DMJ, AND IR&D PROGRAMS)
 - ARBITRATION PROCEDURES/MANAGEMENT REVIEW
 - PROPOSAL STUDY/OPTIONS

EQUALIZED DESIGN RESPONSIBILITY ASSIGNMENT

- DIVISION BY RELATED EXPERIENCE
 DIVISION BY DEVELOPMENT COST
 DIVISION BY TECHNOLOGY LEVEL

BALANCE FACTOR: LARGE PERCENTAGE OF "NEUTRAL" AREAS

ACHIEVING MUTUAL MANUFACTURING CAPABILITY

JOINT SYSTEM DESIGN

DESIGN TO COMMON MFR STANDARDS

- COMPATIBLE MFR BASE
- UPGRADING WHERE NEEDED

SPLIT EDM FABR. IN CRITICAL AREAS SPLIT EDM SYSTEM ASSEMBLY AND TEST

COST REDUCTIONS

	SM SM
DESIGN COMPETITION	20
PRODUCTION COMPETITION	320
QUANTITY	325
FUNCTIONAL MODULARITY	200
RELIABILITY	272
SUPPORT ΕQUIP	70
	1,257.0

UNCLASSIFIED

SUMMARY

• LOW RISK

OPERATIONALLY EFFECTIVE

COST EFFECTIVE

HIGH VOLUME PRODUCTION

WIDE INDUSTRIAL INVOLVEMENT

COMPETITION

TAILORED ACQUISITION STRATEGY

UNCLASSIFIED

IN THE ALR-67/69 UPDATE PROGRAM

COMPETITION

. .

CAPABILITY - 1984

IMPROVED SENSITIVITY

INSTANTANEOUS FREQUENCY MEASUREMENT

DECREASE RESPONSE TIME

OPERATE IN DENSE THREAT ENVIRONMENT

DETECT ADDITIONAL THREATS

NEEDS

..\$700 MILLION SOLE SOURCE

. PROBLEM

..LACK OF DATA

SOLE SOURCE

.. AN/ALR 69 (AIR FORCE)

...AN/ALR 67 (NAVY).

.USE EXISTING HARDWARE

158

FACTORS

FIRST METHOD

..DELIVER 1ST PRODUCTION - MAR 89 878 IRST ARTICLE DELIVERY - JUN ..GOVERNMENT REVIEW - SEPT PRODUCTION DRAWINGS **JUL 85** APR 83 83 PROGRAM BOUGHT OUT PROTOTYPE AWARD - MAY. 81 COMPETITIVE ACQUISITION - COMPLETE TESTING -PRODUCTION AWARD - MAY . GOVERNMENT REVIEW - JAN 85 **PRODUCTION TURN-ON** .AWARD JAN 86 .DELIVERY FIRST **PROBLEM:**

SECOND METHOD

PROTOTYPE AWARD - MAY 81

.SELECT 2ND SOURCES - AUG 81

..OBSERVE

PROBLEM - SELECTION OF SOURCES

TOTAL PROGRAM - 85% COMPETITIVE

1984 FOLLOW - ON PRODUCTION • COMPETITIVE

1983 INITIAL PRODUCTION • SOLE SOURCE • • 43% SECOND SOURCES

161

SECOND SOURCES

CONCEPT

PROTOTYPE

PROTOTYPE

- 8 SETS FLIGHT HARDWARE
 6 SETS OF MATERIAL
- SECOND SOURCING
 SOLICIT
 EVALUATE
 PREPARE SUBCONTRACTS

PHOTOTYPE TEST ING

- INTEGRATION
- INTEGRATION OCT 82 QUALIFICATION NOV 82 FLIGHT JAN 83

PRODUCTION DECISION - APR 83

SECOND SOURCING

EVENT	DATE
INDUSTRY BRIEFING PREPROPOSAL INVITATION INDUSTRY BRIEFING COMPILE SOURCE LIST PRERARE SOLICITATIONS REVIEW SOLICITATIONS ISSUE SOLICITATIONS ISSUE SOLICITATIONS RECEIVE QUOTATIONS RECEIVE QUOTATIONS RECEIVE QUOTATIONS RECEIVE QUOTATIONS RECEIVE QUOTATIONS REVIEW EVALUATION RESULTS SELECT SECOND SOURCES REVIEW SUBCONTRACTS	APR JUN JUL JAN FEB MAR MAR MAR MAR MAR MAR MAR MAR MAR MAR

1

* GOVERNMENT ACTIONS

INITIAL PRODUCTION

AWARD - MAY 83

• SUBCONTRACT (43%)

• • MAY 83

SUPPORT

SECOND SOURCES

• 4 SETS MATERIAL

PROTOTYPE UNIT

INTERMEDIATE TEST STATION

A CONTRACT OF ANY

DELIVERY

	22 Z2 N
	0 18 18
	S 18
0 ~ 1	11 11
NOV 2	ر 14 و
5	ر 12 7
~ ~	ΣΩν
ч Ч	А ∞ г⁄
×	8 ~ 4
1984 FEB 1	1985 J F 5 6 2 3
PROTOTYPE CONTRACTOR: SECOND SOURCE:	PHOTOTYPE Contractor: Second Source:

0 % %

INTEGRATION - FEB 84 PCA/FCA - MAR 84

TESTING

FOLLOW-ON PRODUCTION

ssue request for pf	ROPOSAL	MAR 84
WWARD - 1, 125 EACH	(EST)	AUG 84
XERCISE OPTION		
• FIRST - 737 EA	(EST)	AUG 85
• SECOND - 200 EA	(EST)	AUG 86
• THIRD - 120 EA	(EST)	AUG 87
• Fourth - 63 EA	(EST)	AUG 88

METHOD

COMPETITIVE

- SOURCES

 SECOND SOURCES
 PROTOTYPE CONTRACTOR

TYPE CONTRACT

INITIAL AWARD WITH PROCED OPTIONS

EVENTS

PROTOTYPE AWARD	DATE
 SOLICITATION PREPARED* 	DEC 8
 HARDWARE FABRICATED 	JUL 8
SOLICITATION ISSUED *	JUL
 UPDATED DRAWING PACKAGE * 	DEC
 PRODUCTION DECISION 	APR 8
 SUBCONTRACTS REVIEWED * 	MAY
INITIAL PRODUCTION AWARD	MAY
 SUBCONTRACTS AWARDED * 	MAY
 DELIVERY START 	FEB 84
 DELIVERY START * 	MAR
OLLOW-ON PRODUCTION	
 SOLICIT 	MAR
 AWARD 	AUG

* SECOND SOURCE EFFORT

HOW TO IMPROVE COMPETITION

- PURPOSE TO SHARE VIEWS AND DIRECTIONS ON CONCEPTS
- OBJECTIVE GAIN MUTUAL UNDERSTANDING OF COMPETITION
- USG IS HAVING MANY TROUBLES IN FOSTERING COMPETITION I REALITY I
- MACRO-LEVEL POLICY VS MICRO-LEVEL IMPLEMENTATION

BOTTOM LINE - COMPETITION IS AN EFFECTIVE ACQUISITION TOOL WHAT IS REASONABLY EXPECTED AS COMPETITION GOALS?

14. John Fargher, Department of Defense

WHAT IS MEANT BY COMPETITION?

- PRICE OF INSTANT CONTRACT
- LIFE CYCLE COST
- DTUPC
- PERFORMANCE (TECHNICAL)
- PAST CONTRACTOR PERFORMANCE
- DELIVERY SCHEDULE/EXPERTS/EXCLUSIVE HIGHLY SPECIALIZED EXPERIENCE

WHAT CAN BE DONE TO MAINTAIN COMPETITION INTO PRODUCTION?

BARRIERS TO COMPETITION

- SPECIALIZED FACILITIES, EQUIPMENT AND PERSONNEL
- LEGAL

(3A + EEO + WOMEN-OWNED BUSINESS + LABOR SURPLUS + ETC.

= HIGH OVERHEAD + PROFIT LIMITATIONS)

- PHYCHOLOGICAL (REWARD SYSTEM TO PM, KO, ETC.)
- FISCAL (SHORTAGE OF UP-FRONT MONEY + MANPOWER CONSTRAINTS
- TOTAL WEAPONS SYSTEM RESPONSIBILITY (TWSR)

BENEFITS OF COMPETITION NOT WELL UNDERSTOOD NOR DOCUMENTED

DETERMINING AND FORECASTING SAVINGS FOR COMPETITION

- DATA BASE AVAILABLE FOR MISSILES, ELECTRONICS AMMUNITION, BREAK-OUT OF AVIATION ITEMS (USA) ı
- SAVINGS METHODOLOGIES HAVE BEEN DEVELOPED
- PRIMER DEVELOPED ON COMPETITION PROVIDING GUIDELINES ON ACQUISITION STRATEGY DEVELOPMENT ı
- SENSITIVE TO PRODUCTION RATE CHANGES, BUSINESS CONDITIONS & PRODUCT MIXES ı
- FRONT END INVESTMENTS ARE LARGE AND BENEFITS UNCERTAIN
IS INDUSTRY AND GOVERNMENT STRUCTURED PROPERLY FOR COMPETITION?

- SPLIT SOURCES/DUAL SOURCES
 - SECOND SOURCES
- TEAMING (DAR 4-117)
- ASSOCIATE CONTRACTORS
- BREAK-OUT
- BREAKDOWN OF TASKS (02M)
- ENGINEERING/TECHNICAL SUPPORT FOR VALIDATING TDP's
- GOVERNMENT ASSUMING TOTAL SYSTEM PERFORMANCE RESPONSIBILITY (TSPR)
- p31

- LENDER/FOLLOWER (DAR 4-703)
 - EDUCATIONAL BUYS
- LICENSED PRODUCTION
 - 2
- COMMERCIAL BUYS (ADCP)
- INTERNATIONAL PROGRAMS
- FUSION/FISSION

ACQUISITION STRATEGIES

- DEVELOPMENT OF A SECOND SOURCE (MLRS)
- TEAMING (ASPJ)
- PRODUCTION COMPETITION OF PERFORMANCE SPECS (GAU-8 AMMO AND SHORT RANGE RECOVERY HELICOPTER) ī
- P³I COMPETITION (ALR 67/69)

:

• !

MEASUREMENT & CLASSIFICATION OF WHAT IS COMPETITION, INCLUDING REPORTING

COMPETITION OPTION SHOULD CONSIDER ALL ECONOMIC FACTORS

APPENDICES

AGENDA

ATTENDEES

BIBLIOGRAPHY

DOD/OFPP COMPETITION WORKSHOP AGENDA MAY 12-13, 1981

1st Day, May 12, 1981

INTRODUCTORY TALKS

- 0900 OPENING REMARKS
- 0930 OVERVIEW AND ADMINISTRATION (R. WILLIAMS, ARMY)

(MR. TRIMBLE/MR. SOWLE)

- 1000 DISCUSSION
- 1030 COFFEE

<u>COMPETITION PLANNING</u> (M. LABOVITZ, DOT (USCG) - CHAIRMAN)

- 1100 TYPES OF COMPETITION-CONCEPT/ (CAPT W. WASHBURNE, NAVY) DESIGN/PRICE
- 1115 COMPETITION STRATEGIES-PROTO- (J. KUNSEMILLER, AIR FORCE) TYPES/TDP/LEADER-FOLLOWER/ETC.
- 1130 BARRIERS TO COMPETITION-UNCER- (E. LOVETT, DOE) TAINTY/INVESTMENT/TIME/ MARKETPLACE/OTHER
- 1145 DISCUSSION
- 1230 LUNCH

THE COMPETITION DECISION (P. ARVIS, ARMY - CHAIRMAN)

- 1330 MULTIPLE LAUNCH ROCKET (J. DALY, ARMY) SYSTEM (MLRS) EXPERIENCE
- 1400 APRO STUDIES (W. WILLIAMS, ARMY)
- 1430 DISCUSSION
- 1515 COFFEE
- 1530 RAND STUDIES (J. HILLER)
- 1600 PUTNAM, HAYES, BARTLETT (W. DRINNON) STUDIES
- 1630 DISCUSSION
- 177 1730 - SESSION CLOSING

FINAL

2D DAY, MAY 13, 1981

OFFICIAN ODENTHE

. .

SESSION OP	ENING	
0900	- OVERVIEW AND ADMINISTRATION	(J. SPAGNOLA, FAI)
THE COMPET	ITION DECISION (CONT'D)	
0915	- TASC STUDIES	(J. GANSLER)
0945	- IDA STUDIES	(P, CARRICK)
1015	- SHORT RANGE RECOVERY HELICOPTER EXPERIENCE	(R. WILLIAMS, COAST GUARD)
1045	- COFFEE	
1100	 ADVANCED TACTICAL AIRCRAFT PROJECTION SYSTEMS (ATAPS) EXPERIENCE 	(CAPT W. CARLSON, NAVY)
1130	- ALR 67/69 RADAR MODIFICATION EXPERIENCE	(J. TALLEY, USAF)
1200	- DISCUSSION	
1230	- LUNCH	
OPEN DISCU	<u>SSION</u> (J. FARGHER, DSMC - CHAIRMAN)	
1330	 AREAS FOR DISCUSSION (PROBLEMS, OPPORTUNITIES) 	
CLOSING AD	DRESS	
1500	- RESEARCH AND POLICY AGENDA	(MR. SOWLE/MR. TRIMBLE)
1530	- CLOSE	

178

LIST OF ATTENDEES

LIST OF ATTENDEES

Wayne M. Allen Director of Cost Analysis Office of the Comptroller of the Army The Pentagon Washington, DC 20310

Thomas Anderson Chief, Program Support Office Procurement & Assistance Management Department of Energy Washington, DC 20585

William Armstrong US Army Missile Command ATTN: DRSMI Redstone Arsenal, AL 35898

Paul F. Arvis Director US Army Procurement Research Office Fort Lee, VA 23801 AUTOVON 687-1136/3300 Commercial (804) 734-1136/3300

Norman Audi Procurement Analyst Dept. of Health & Human Services Office of Grants & Procurement Room 513D 200 Independence Ave., SW Washington, DC 20201 Commercial (202) 245-8870

Joseph Augusta Director Center for Naval Acquisition Research Naval Material Command ATTN: NMAT OADI Washington, DC 20360

T. H. Bell
Office of Under Secretary of Defense for Research and Engineering (Acquisition Policy)
The Pentagon
Washington, DC 20307

Robert Bontempo GAO Evaluator General Accounting Office ATTN: PLRD/GP, Room 6073 441 G St., NW Washington, DC 20548

Richard Brannon Defense Communication Agency Cost and Logistics Analysis Division Code 690 Washington, DC 20305

Captain Walter Carlson Project Manager, ATAPS Naval Air Systems Command Washington, DC 20361 AUTOVON 222-5480

Paul Carrick Institute for Defense Analyses 400 Army-Navy Drive Arlington, VA 22202

William Coleman Office of Federal Procurement Policy (OMB) 726 Jackson Place, NW Washington, DC 20503

Larry Cox The Analytic Sciences Corporation 1700 N. Moore St., Suite 1220 Arlington, VA 22209

Robert P. Craven Deputy Director, Procurement Management Div. NASA HQ 600 Indepéndence Ave., SW Washington, DC 20546

John Daly Systems Analysis Office Building 5250, Room B-200 US Army Missile Command Redstone Arsenal, AL 35898 AUTOVON 746-2866 John Dammeyer Chief, Procurement Policy Division Office of Acquisition and Grants Management Department of Commerce O/S 14th and Constitution Ave., NW Washington, DC 20230 Commercial (202) 377-4348

Robert N. Donatuti Director, Missile Weapon System Purchase Division Naval Air Systems Command Code AIR-216 Washington, DC 20361 AUTOVON 222-1712

William Drinnon Putnam, Hayes, and Bartlett Suite 303 2828 Pennsylvania, NW Washington, DC 20007

Craig Durkin Director, Policy & Evaluation Division Department of Housing & Urban Development 451 7th St., SW Room B133 711 Building Washington, DC 20410

John Fargher Defense Systems Management College ATTN: DSMC-DRI-R Fort Belvoir, VA 22060

William Ferguson
Deputy Assistant Administrator for
 Acquisition Policy
General Services Administration
Room 6004
18th & F St., NW
Washington, DC 20405
Commercial (202) 566-1043

Herb Fisher Director, Contract Placement and Administration Office of Under Secretary of Defense for Research and Engineering (Acquisition Policy) The Pentagon Washington, DC 20307

Ralph French Chairman, Procurement Committee HQ Air Force Logistics Command ATTN: AFLC/PMC Wright-Patterson AFB, OH 45433 Jacques Gansler (2nd Day) The Analytical Sciences Corporation 1700 N. Moore St. Suite 1220 Arlington, VA 22209 Major Robert Golden Deputy Director Air Force Business Research Management Center Building 125, Area B Wright-Patterson AFB, OH 45433 Robert Hall Group Director Procurement and System Acquisition Division General Accounting Office Room 2713 475 L'enfant Plaza Washington, DC 20260 Commercial (202) 245-5397 John Hiller The RAND Corporation 2100 M St., NW Washington, DC 20037 William Hunter Director Federal Acquisition Institute 726 Jackson Place, NW Washington, DC 20503 Eugene E. Jackson Small Business Administration 1441 L St., NW Washington, DC 20416 John Jury US Army Materiel Development and Readiness Command ATTN: DRCPP-SP 5001 Eisenhower Avenue Alexandria, VA 22333

Nancy Kerlin Procurement Analyst Code HM-1 NASA HQ 600 Independence Ave., SW Washington, DC 20546

Mr. Ira Kemp Associate Director, Contracting and Acquisition Policy HQ USAF/RDC Room 4C251 The Pentagon Washington, DC 20330

John H. Kunsemiller Chairman, Contract Review Committee HQ AFSC/PMC Andrews Air Force Base Washington, DC 20334

M.Z. Labovitz Assistant Chief of Procurement Division US Coast Guard Headquarters 2100 Second St., SW Washington, DC 20593 Commercial (202) 426-1433

Captain Donald Ledwig HQ Naval Material Command Room 568 Crystal Plaza #5 Washington, DC 20360

Edward T. Lovett Procurement Analyst Department of Energy Mail Stop 400 RB 400 lst St., NW Washington, DC 20585 Commercial (202) 252-8188

John Manns Procurement Analyst Procurement Division Office of Operations & Finance US Department of Agriculture Room 1575, South Building 14th & Independence Ave., SW Washington, DC 20250 Commercial (202) 447-7527 Paul Martin (1st day) The Analytical Sciences Corporation 1700 N. Moore St. Suite 1220 Arlington, VA 22209

William E. Mathis Deputy Administrator Office of Federal Procurement Policy 726 Jackson Place, NW Washington, DC 20503

Mr. Richard Moye Acquisition Policy and Plans Division DCNM for Acquisition Headquarters Naval Material Command MAT 08C31 Room 568, Crystal Plaza #5 Washington, DC 20360

George Ostrowski President Business Management Research Associates, Inc. Crystal Mall One Suite 708 1911 Jefferson Davis Highway Arlington, VA 22202

Willie Price Contracts and Grants Specialist Department of Education Office of Procurement & Assistant Management Room 5082 7th and D St., SW Washington, DC 20202

Arthur Rossi Department of the Navy Naval Sea Systems Command Code SEA-0255 Washington, DC 20362

Gregory D. Rothwell Department of the Interior 18th & E St., NW Washington, DC 20240

Peggy Sanders Regional Office Building #3 400 Maryland Ave., SW Room 5082 Washington, DC 20202 Commercial (202) 245-1766 James Scanlon Sterling Institute (RDC) 1010 Wisconsin Ave., NW Washington, DC 20007 Charles H. Smith US Army Procurement Research Office Fort Lee, VA 23801 AUTOVON 687-1148/1404 Commercial (804) 734-1148/1404 Mr. W. L. Smith Deputy Contract Placement Division Directorate of Contracting & Acquisition Policy HQ, USAF/RDCL The Pentagon Washington, DC 20330 Don Sowle Administrator Designate Office of Procurement Policy (OMB) 726 Jackson Place, NW Room 9013 Washington, DC 20503 Joe Spagnola Acting Assistant Director Research Federal Acquisition Institute (OMB/OFPP) Executive Office of the President 726 Jackson Place, NW Washington, DC 20503 Colonel Frank Szustak Office of the Assistant Secretary of the

Army (Research, Development and Acquisition) Deputy for Procurement Policy Room 2E661 The Pentagon Washington, DC 20301 Mr. John Talley ALR 67/69 RADAR ATTN: WRALC-P Warner-Robbins AFB, GA 31098 Kevin Tansey GAO Evaluator General Accounting Office ATTN: PLRD/GP, Room 6064B 441 G St., NW Washington, DC 20548 Harry Tayloe Logistics Management Institute 4701 Sangamore Road Washington, DC 20016 Robert Trimble Acting Deputy Under Secretary of Defense for Research and Engineering (Acquisition Policy) Room 3E144 The Pentagon Washington, DC 20307 CAPT William Washburne Deputy Commander Contracts Division Naval Electronics Systems Command 2511 Jefferson Davis Highway Code ELEX-02 Washington, DC 20360 Ralph Williams Commandant (GSCP-3/CGHQ64) US Coast Guard Headquarters 2100 2d St., SW Washington, DC 20593 Robert Williams Chief, Test and Evaluation Group US Army Procurement Research Office Fort Lee, VA 23801 AUTOVON 687-1404/1148 Commercial (804) 734-1404/1148 William Williams US Army Procurement Research Office Fort Lee, VA 23801 AUTOVON 687-4381/1395 Commercial (804) 734-4381/1395

Dan Wilson Office of Federal Procurement Policy (OMB) 726 Jackson Place, NW Room 9013 Washington, DC 20503

Sidney Wolin General Accounting Office 441 G St., NW ATTN: PLRD Washington, DC 20548

Bob Woytko Procurement Adivsor 1M048 Forrestal Building Washington, DC 20585

•

BIBLIOGRAPHY

WORKSHOP BIBLIOGRAPHY

- Amihud, Yokor, ed., <u>Bidding and Auctioning for Procurement and Allocation</u>, New York University Press, 1976.
- Archibald, K. ^a et al. <u>Factors Affecting the Use of Competition in Weapon</u> <u>System Acquisition</u>. Santa Monica, CA: The RAND Corporation, February 1981.
- Baldwin, William L. <u>The Impact of Department of Defense Procurement on</u> <u>Competition in Commercial Markets: Case Studies of the Electronics and</u> <u>Helicopter Industries</u>, report prepared for the Federal Trade Commission, December 1980.
- Brannon, R. C. et al. Forecasting Savings from Repetitive Competition with <u>Multiple Awards</u>, APRO 807, (LD 44047A).* Fort Lee, VA: Army Procurement Research Office, November 1979.
- Carter, G. A. <u>Directed Licensing: An Evaluation of a Proposed Technique</u> for <u>Reducing the Procurement Cost of Aircraft, R-1604-PR (LD 33693A)</u>. Santa Monica, CA: The RAND Corporation, December 1974.
- Case, James H., <u>Economics and the Competitive Process</u>, New York University Press, 1979.
- Comptroller General of the United States. <u>Evaluation of Two Proposed</u> <u>Methods for Enhancing Competition in Weapons Systems Procurement</u>, B-39995, Report to the Congress, Washington, DC: General Accounting Office, July 1969.
- Daly, George G., Howard P. Gates and James A Schuttinga, <u>The Effect of</u> <u>Price Competition on Weapon System Acquisition Costs</u> (LD 46284A), Arlington, VA: Institute for Defense Analyses, September 1979.
- Dembrowski, Bruce and Paul Martin, <u>Cost Effectiveness of Sole Source Con-</u> <u>tracting for Non-Personal Engineering Support of Flight Simulators</u>, TR-3436 (LD 48698A), Arlington, VA: The Analytic Sciences Corporation, November 1980.
- Department of the Army, <u>MLRS Second Source Rocket Acquisition Study</u> (FOR OFFICIAL USE ONLY). Redstone Arsenal, AL: System Planning and Evaluation Division, Analysis and Evaluation Directorate, US Army Missile Command, December 1980.
- Department of Defense, <u>Enchancement of Competition in the Department of</u> <u>Defense</u>, Study for the Office of the Under Secretary of Defense (Research and Engineering), Arlington, VA: Don Sowle Associates, Inc., May 1980.

. <u>The Impact of OMB Circular A-109 on Competition</u>, Fort McNair, Washington, DC: National Defense University, Industrial College of the Armed Forces, June 1980. Dews, Edmund et al. <u>Acquisition Policy Effectiveness: Department of</u> <u>Defense Experience in the 1970's</u>, R-2516, Report prepared for the Under Secretary of Defense for Research and Engineering, Santa Monica, CA: The RAND Corporation, October 1979.

Drinnon, J. W., and J. S. Gansler, "Predicting the Costs and Benefits of Competitive Production Sources," <u>Proceedings of the Ninth Annual DOD/FAI</u> <u>Acquisition Research Symposium</u>, 1980.

Drinnon, J. W., and J. R. Hiller, <u>Predicting the Costs and Benefits of</u> <u>Competitive Production Sources</u>, The Analytical Sciences Corporation, December 1979.

- Engelbrecht-Wiggans, R., "Auction and Bidding Models: A Survey," Management Science, 26 February 1980.
- Fox, J. R., <u>Arming America: How the U.S. Buys Weapons</u>, 5th Printing. Cambridge, MA: Harvard University Press, 1974.
- Gansler, Jacques S., <u>The Defense Industry</u>, Cambridge, MA: The Massachusetts Institute of Technology Press, 1980.
- Gates, H. P., et al. <u>Electronics-X: A Study of Military Electronics with</u> <u>Particular Reference to Cost and Reliability</u>, Vol I and II (LD 32860A and LD 32860B), Arlington, VA: Institute for Defense Analyses, January 1974.
- Griffiths, Kenneth D. and Robert F. Williams, <u>Transmission of Procurement</u> <u>Technical Requirements in the Competitive Reprocurement of Military Design</u> <u>Equipment</u>, PRO-005-1 (LD 23774A). Fort Lee, VA: US Army Procurement Research Office, June 1971.

Hall, G. R., and R. E. Johnson, <u>Competition in the Procurement of Military</u> <u>Hard Goods</u>, P-3796 and P-3796-1 (LD 18464), Santa Monica, CA: The RAND Corporation, March 1968 and June 1968.

Johnson, R.E., <u>Technology Licensing in Defense Procurement: A Proposal</u> (LD 19693), Santa Monica, CA: The RAND Corporation, November 1968.

Knittle, Duane D., and Robert F. Williams, <u>Acquisition Strategy Development</u>, APRO 904, Fort Lee, VA: US Army Procurement Research Office, February 1981.

Lewis, Robert W., Dr., <u>Managing Competitive Procurement</u>, (LD 26530), St. Louis, MO: Directorate of Systems and Cost Analysis, US Army Aviation Systems Command, June 1971.

Logistics Management Institute, <u>Analysis of Extent of Competitive Procure-</u> ment by DOD Prime Contractors (LD 09460), Washington, DC: Logistics Management Institute, January 1964.

_____. End Item/Subsystem Competitive Decision Analysis (LD 09138), Washington, DC: Logistics Management Institute, July 1963.



Lovett, Edward T. and Monte G. Norton, <u>Determining and Forecasting Savings</u> <u>From Competing Previously Sole Source/Noncompetitive Contracts</u>, APRO 709-3, (LD 42936C), Fort Lee, VA: US Army Procurement Research Office, October, 1978.

Muller, J. A., "Competitive Missile Procurement," <u>The Army Logistician</u> (LD 28327), November-December 1972.

National Academy of Sciences, <u>The Effectiveness of the Army Technical Data</u> <u>Package in Technology Transfer for Procurement</u>, Washington, DC: National Academy of Sciences, August 1975.

Nelson, Rosemary E., <u>Leader/Follower Second Sourcing Strategy as Implemented</u> by the Joint Cruise Missile Project Office (LD 48048A), Monterey, CA: Naval Postgraduate School, September 1980.

Olson, Alan E. et al, <u>A Cost-Benefit Analysis of Competitive Versus Sole</u> <u>Source Procurement of Aircraft Replenishment Spare Parts</u> (LD 30740), Wright-Patterson Air Force Base, OH: Air Force Institute of Technology, January 1974.

Parry, Dennis S., <u>Second Sourcing in the Acquisition of Major Weapon</u> Systems (LD 44514A), Monterey, CA: Naval Postgraduate School, June 1979.

Pelzer, Jay L., <u>Proposed Allocation Technique for a Two-Contractor Procure-</u> <u>ment</u> (LD 45151A), Wright-Patterson Air Force Base, OH: Air Force Institute of Technology, May 1979.

Rich, M. D., <u>Competition in the Acquisition of Major Weapon Systems:</u> <u>Legislative Perspectives</u>, R-2058-PR (LD 39569A), Santa Monica, CA: The RAND Corporation, November 1976.

Sellers, Benjamin R., <u>Competition in the Acquisition of Major Weapon Systems</u> (LD 45216A), Monterey, CA: Naval Postgraduate School, September 1979.

Smith, C. H., <u>An Analysis of Acquisition Alternatives for the US Army's</u> <u>General Support Rocket System</u>, APRO 928, (LD 44677A), Fort Lee, VA: US Army Procurement Research Office, August 1979.

. <u>The Effect of Production Rate on Weapon System Cost</u>, Research Paper P-2 (LD 48591A), Fort Lee, VA: US Army Procurement Research Office, November 1980.

Smith, C. H., and C. M. Lowe, Jr., <u>Sole Source and Competitive Price Trends</u> in <u>Spare Parts Acquisition</u>, Research Paper P-5, (LD 48582A), Fort Lee, VA: US Army Procurement Research Office, January 1981.

Solinsky, Kenneth S., <u>A Procurement Strategy for Achieving Effective</u> <u>Competition While Preserving an Industrial Mobilization Base</u>, Ft. Belvoir, VA: Night Vision and Electro-Optics Laboratory, US Army Electronics R&D Command, undated. Dews, Edmund et al. <u>Acquisition Policy Effectiveness: Department of</u> <u>Defense Experience in the 1970's</u>, R-2516, Report prepared for the Under Secretary of Defense for Research and Engineering, Santa Monica, CA: The RAND Corporation, October 1979.

Drinnon, J. W., and J. S. Gansler, "Predicting the Costs and Benefits of Competitive Production Sources," <u>Proceedings of the Ninth Annual DOD/FAI</u> <u>Acquisition Research Symposium</u>, 1980.

Drinnon, J. W., and J. R. Hiller, <u>Predicting the Costs and Benefits of</u> <u>Competitive Production Sources</u>, The Analytical Sciences Corporation, December 1979.

Engelbrecht-Wiggans, R., "Auction and Bidding Models: A Survey," <u>Management Science</u>, 26 February 1980.

Fox, J. R., <u>Arming America: How the U.S. Buys Weapons</u>, 5th Printing. Cambridge, MA: Harvard University Press, 1974.

Gansler, Jacques S., <u>The Defense Industry</u>, Cambridge, MA: The Massachusetts Institute of Technology Press, 1980.

Gates, H. P., et al. <u>Electronics-X: A Study of Military Electronics with</u> <u>Particular Reference to Cost and Reliability</u>, Vol I and II (LD 32860A and LD 32860B), Arlington, VA: Institute for Defense Analyses, January 1974.

Griffiths, Kenneth D. and Robert F. Williams, <u>Transmission of Procurement</u> <u>Technical Requirements in the Competitive Reprocurement of Military Design</u> <u>Equipment</u>, PRO-005-1 (LD 23774A). Fort Lee, VA: US Army Procurement Research Office, June 1971.

Hall, G. R., and R. E. Johnson, <u>Competition in the Procurement of Military</u> <u>Hard Goods</u>, P-3796 and P-3796-1 (LD 18464), Santa Monica, CA: The RAND Corporation, March 1968 and June 1968.

Johnson, R.E., <u>Technology Licensing in Defense Procurement: A Proposal</u> (LD 19693), Santa Monica, CA: The RAND Corporation, November 1968.

Knittle, Duane D., and Robert F. Williams, <u>Acquisition Strategy Development</u>, APRO 904, Fort Lee, VA: US Army Procurement Research Office, February 1981.

Lewis, Robert W., Dr., <u>Managing Competitive Procurement</u>, (LD 26530), St. Louis, MO: Directorate of Systems and Cost Analysis, US Army Aviation Systems Command, June 1971.

Logistics Management Institute, <u>Analysis of Extent of Competitive Procure-</u> <u>ment by DOD Prime Contractors</u> (LD 09460), Washington, DC: Logistics Management Institute, January 1964.

_____. End Item/Subsystem Competitive Decision Analysis (LD 09138), Washington, DC: Logistics Management Institute, July 1963.

Sparks, George F., <u>Direct Licensing in Major Weapon Systems Acquisition</u> (LD 48113A), Monterey, CA: Naval Postgraduate School, September 1980.

- Stark, Robert M., and M. H. Rothkoff, "Competitive Bidding: A Comprehensive Bibliography," Operations_<u>Research</u>, 27, March-April 1979.
- Thompson, Charles W. N., and Albert H. Rubenstein, <u>The Leader/Follower</u> <u>Concept in Acquisition</u> (LD 46303A), Evanston, IL: International Applied Science and Technology Associates, Inc. (IASTA), November 1979.
- Thompson, R. H., Major General. "Breakout," <u>The Army Logistician</u>, November-December 1979.
- US House of Representatives, <u>The Ailing Defense Industrial Base: Unready</u> <u>for Crisis</u>, Report of the Defense Industrial Base Panel of the Committee on Armed Services, Washington, DC: House of Representatives, Ninety-Sixth Congress, December 31, 1980.

. Extent of Price Competition in Department of Defense Contracting, Report to the Committee on Appropriations, Washington, DC: House of Representatives, February 1980.

- US Small Business Administration, <u>Government Competition</u>: <u>A Threat to</u> <u>Small Business</u>, Report of the SBA Advocacy Task Group on Government Competition with Small Business, Washington, DC: US Small Business Administration, March 1980.
- White, Richard P. and Myron G. Myers, <u>Competition in DOD Acquisition</u> (LD45320A), Washington, DC: Logistics Management Institute, May 1979.
- Zusman, Morris, et al, <u>A Quantitive Examination of Cost-Quantity Relation-</u> ships, <u>Competition during Reprocurement</u>, and <u>Military Versus Commercial</u> <u>Prices for Three Types of Vehicles</u>, Vol. I and II (LD 31891A and LD 31891B), Arlington, VA: Institute for Defense Analyses, March 1974.

*LD numbers are identification numbers assigned by the Defense Logistics Studies Information Exchange, USALMC, Fort Lee, VA 23801; Commercial (804) 734-4255/3130; AUTOVON 687-4255/3130.