INSPECTOR GENERAL
DEPARTMENT OF DEFENSE
400 ARMY NAVY DRIVE
ARLINGTON, VIRGINIA 22202-2884

Report
No. 91-061

March 14, 1991

MEMORANDUM FOR UNDER SECRETARY OF DEFENSE FOR ACQUISITION
ASSISTANT SECRETARY OF THE AIR FORCE (FINANCIAL MANAGEMENT AND COMPTROLLER)

SUBJECT: Quick-Reaction Report on Component Breakout of the Advanced Medium Range Air-to-Air Missile Program (Project No. 0AS-0072.01)

Introduction

This is our final report on Component Breakout of the Advanced Medium Range Air-to-Air Missile (AMRAAM) program for your information and use. Comments on a draft of this report were considered in preparing this final report. During our audit of the AMRAAM program, we found that the program office was not studying the potential for purchasing components and providing them to the prime contractors as Government-furnished equipment (GFE). This report is being issued as part of an overall audit of the AMRAAM program, which is examining configuration management, weapon system integration, contracting, integrated logistics support planning, program stability, and applicable internal controls. Supplying components as GFE is known as component breakout, which avoids prime contractors applying a markup on components that they acquire. Our review of nine components showed that the designs and manufacturing processes of the components were sufficiently stable for component breakout, and that an estimated savings of $312.0 million could be achieved during the remaining missile procurement without unduly increasing program risk if the components were provided as GFE. The program office needs to conduct an in-depth component breakout study of the nine components. Also, 26 other components with annual acquisition costs of over $1.0 million may be suitable for component breakout and should be evaluated by the Air Force. Breakout of these components could result in savings of an additional $240.2 million. This report is being provided to alert management that component breakout needs to be discussed at the Defense Acquisition Board meeting scheduled for April 1991. This Defense Acquisition Board meeting will evaluate the affordability and readiness of the AMRAAM and decide whether the AMRAAM should proceed from low-rate to full-rate production.

Background

The Air Force is developing and procuring the AMRAAM for Air Force and Navy use. The AMRAAM has been in low-rate initial

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production since 1986. According to the Air Force, the AMRAAM design and manufacturing process is sufficiently mature to warrant a decision to enter into full-rate production. The Air Force plans to seek a full-rate production decision from the Office of the Secretary of Defense in April 1991. If a full-rate production decision is approved, full-rate production will begin in missile production lot 5. The Air Force has initiated action to obtain proposals for production lot 5. Lot 6 and subsequent production lots will be awarded beginning in FY 1992. The missiles are produced under a dual source acquisition strategy with two prime contractors: Hughes Aircraft Company, Missile Systems Group; and Raytheon Company, Missile Systems Division. Competitive procurement is planned after the full-rate production decision with the lower cost contractor being awarded the larger share of the planned production lot. The missile is comprised of numerous components that are obtained from subcontractors and assembled by the prime contractors. The Air Force plans to procure 15,616 AMRAAM's through the late 1990's, of which 2,409 are already on contract with the prime contractors.

DoD policy is to break out components whenever it is anticipated that prime contracts will be awarded without adequate price competition; substantial net cost avoidances can be achieved; and the component breakout decision does not jeopardize quality, reliability, performance, or timely delivery of the system. The Defense Federal Acquisition Regulation Supplement (DFARS), subpart 217.7202, identifies candidates for breakout as components that have an annual acquisition cost of at least $1.0 million. Subpart 217.7202 further requires program managers to identify potential breakout candidates and to make and document breakout reviews.

On August 9, 1990, the Deputy Secretary of Defense directed that program managers perform component breakout reviews as part of their system acquisition strategies. In addition, the Deputy Secretary directed the Secretaries of the Military Departments to have program managers complete component breakout reviews as a required step in acquisition strategies and to ensure that program managers have the resources and expertise to perform adequate component breakout analyses.

Prior Audit Coverage

Air Force Audit Agency Report Project No. 3040291, "Acquisition Management of the Advanced Medium Range Air-To-Air Missile," October 22, 1984, identified eight components with breakout potential from which over $17.8 million in gross savings could be realized from AMRAAM procurements planned during FY's 1987 through 1989. The report recommended that the AMRAAM program office implement a component breakout program for the

AMRAAM. The AMRAAM program office agreed with the recommendation and stated that it planned to investigate the feasibility of establishing a component breakout program for the AMRAAM. In a follow-up audit report issued on December 30, 1988, the Air Force Audit Agency concluded that the AMRAAM program office had formulated an AMRAAM component breakout plan, and the plan would be implemented when the Air Force assumes formal control of the missile baseline.

Discussion

The AMRAAM program office had not initiated a comprehensive component breakout evaluation, as recommended by the Air Force Audit Agency in 1984 and directed by the Deputy Secretary of Defense in August 1990. We reviewed nine missile components that met the DFARS criteria for component breakout and that were being supplied by the same manufacturer to both prime contractors. Our review included site visits to the component manufacturer to evaluate component design stability, evaluate the manufacturer's delivery history in relation to contract requirements, review the frequency and nature of components being returned because of defects, and determine the efforts required of prime contractors before assembling supplied components into the missile assembly. In addition, we interviewed resident Government quality assurance representatives to determine the quality of components being manufactured and to obtain their opinion on whether the components were candidates for component breakout. In seeking a full-rate production decision, the Air Force has determined that the AMRAAM meets all operational requirements, is producible within acceptable cost and schedule risks, and is operationally supportable. Our review determined that all nine components could be supplied to the prime contractors as GFE during full-rate production because the components will have a stable design, component reliability will be high, and the resultant savings should be substantial (although the Air Force will have additional management cost). Details of the nine components are provided in Enclosure 1.

Component Design. All nine components will have a stabilized design when the missiles reach full-rate production. Although five of the components are included in the AMRAAM producibility enhancement program, the enhancement changes will be incorporated when full-rate production begins.

Component Reliability. Although three components were experiencing high return rates from the prime contractors, these return rates either were associated with early production problems or were associated with a claimed defect that could not be duplicated by the component manufacturer. Changes to manufacturing techniques have been made that should resolve

problems associated with the early production problems, and the unconfirmed defects were later attributed to improper testing methods or testing equipment at the prime contractors. Government quality assurance representatives at the component manufacturers claimed that the components could be furnished as GFE.

Prime Contractor Value Added. Upon receipt of the components from the manufacturer, the prime contractor only examines and tests the components before their assembly into the missile because the components are enclosed units. If components are believed to be defective during the examination or testing, the prime contractor returns the component to the manufacturer for analysis and repair.

Estimated Savings From Component Breakout. Component breakout savings could be substantial because Hughes Aircraft Company and Raytheon Company will add an estimated * percent to the cost of components acquired from component manufacturers for production lot 6 and subsequent lots. This *-percent markup is comprised of material handling costs, general and administrative expenses, cost of money, and profit. The cost of contractor personnel used to award and administer component contracts, and the cost of providing related engineering support are not included in the markup factor because these costs are spread in different labor pools in the contractors' accounting systems.

Recommendations

1. We recommend that the Program Director for the Advanced Medium Range Air-to-Air Missile program:

a. Conduct a breakout evaluation in accordance with Defense Federal Acquisition Regulation Supplement, subpart 217.7202, by December 1991. The breakout evaluation should address the reduction in prime contractor personnel costs to determine the cost-effectiveness of component breakout.

b. Break out components if the breakout evaluation shows that breakout will result in net savings without unduly increasing program risk.

2. We recommend that the Under Secretary of Defense for Acquisition direct in the Milestone IIIB acquisition decision memorandum that the Advanced Medium Range Air-to-Air Missile program office present a detailed component breakout study in a program review in sufficient time to break out components in production lot 6.

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* Company confidential information has been removed from this report.

Management Comments

The Air Force Deputy Chief, Weapons Division, Tactical Programs Directorate, Assistant Secretary (Acquisition), nonconcurred with draft Recommendation 1.a. to conduct a component breakout evaluation before the next Defense Acquisition Board decision and concurred with Recommendation 1.b. to break out components if the evaluation shows net savings without unduly increasing program risk. The Deputy Chief agreed that component breakout, at the appropriate time, should result in savings. He stated that a component breakout assessment conducted in September 1989 concluded, as now, that such an action is premature. The Deputy Chief stated that experience dictates that each component should demonstrate the maturity of production processes, performance, and reliability before the Government accepts responsibility for supplying a component as GFE. The Deputy Chief stated that an estimated liability cost of $ * million per month for each contractor would be experienced if a delay in prime contractor production was attributed to a GFE item. The Deputy Chief also took exception to the projected savings in the draft report stating that the savings did not include cost reductions from learning curve, improvements in component design, and the effect of future competition at the prime contractor level. The Deputy Chief stated the Air Force estimated the component breakout savings. In developing these savings, the Air Force adjusted the *-percent markup to 31 percent. The reduction was made because costs associated with material handling costs would be incurred whether components were furnished by prime contractor or through GFE. As a result, the Air Force estimated a component breakout savings of $180.0 million versus our draft report value of $358.0 million for production lots 6 through 10. The complete text of the comments is in Enclosure 4.

The Director, Acquisition Policy and Program Integration, Office of the Under Secretary of Defense for Acquisition, agreed that a component breakout study for the AMRAAM should be conducted but did not believe that it could be done by the Milestone IIIB decision. He stated that component breakout should result in program cost savings, but that it is premature to take such action. The complete text of the comments is in Enclosure 5.

Audit Response to Management Comments

We visited the AMRAAM program office to review the 1989 component breakout assessment, to evaluate the basis of the potential $5.0 million cost claim for delay of schedule, and to review the methodology the Air Force used in estimating cost savings from component breakout.

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* Company confidential information has been removed from this report.

The AMRAAM program office could not provide documentation of the 1989 component breakout assessment that would identify the comprehensiveness or nature of its evaluation. The limited documentation available identified five components with low to medium risk for breakout in production lots 4 or 5. Our Quick-Reaction Report identified four of these five components as candidates for component breakout. The component breakout assessment also identified five other components addressed in our report as component breakout candidates for production lots 6 and 7. Therefore, we believe that this component breakout assessment supports our position that the nine components should be broken out in production lot 6.

The Air Force's position that each contractor could potentially claim a $* million per month production delay cost because of late delivery of GFE components is unsupported. The statement is based on a Hughes Aircraft Company claim that was not audited. The program office dismissed the basis of the contractor's claim. The risk of these components causing contractor production delays is low because the designs are stable and the component manufacture process is mature. Our discussions with on-site Government representatives at the component manufacturers support this conclusion.

We examined the methodology the Air Force used to calculate potential component breakout savings of $180.0 million for nine components. We found that the Air Force used learning curves, anticipated competition savings, and cost reductions from production processes and design changes. We believe that this methodology may be more representative of potential savings. Our draft report used the production lot 3 unit cost, an unadjusted markup factor of * percent, and a savings factor of 25 percent. Therefore, we have revised our projected savings for production lots 6 through 10 from $358.0 million to $180.0 million and our total missile procurement savings from $508.0 million to $312.0 million. As a result, Enclosures 2 and 3 of this report were adjusted to show component breakout savings using the Air Force's methodology. However, the projected savings do not include costs of awarding contracts, contract administration, and engineering support that would be eliminated when the Air Force performs these functions under the component breakout program. Although the Air Force was unable to estimate the value of these personnel costs, we believe it to be substantial because of the application of contractor overhead cost, cost of money, and profit. We have requested that the Defense Contract Audit Agency assist in determining these additional savings.

The Air Force stated that experience dictates that each component should demonstrate maturity process, performance, and

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* Company confidential information has been removed from this report.

reliability before the Government supplies the component as GFE. We agree with the Air Force's statement and our report discusses problems experienced in early production and later efforts to improve the missile's design and reliability. As stated in the Air Force's response, all changes will be incorporated in production lot 5, and our report recommends component breakout for production lot 6. However, this should not be an issue against component breakout because testing of these improvements should have already demonstrated proof of design and reliability before being approved for production. If these improvements have not demonstrated stable component design and improved missile reliability, the program office should not be seeking a full-rate production decision.

Although the Director, Acquisition Policy and Program Integration, agreed with the intent of Recommendation 2., the comments disagreed with the timing of the component breakout study. In response to the draft report, the Director did not state whether a component breakout study would be required after the Milestone IIIB decision.

The AMRAAM Deputy Program Director stated that a component breakout study can be done by the end of 1991. On the basis of the Air Force and the Under Secretary of Defense for Acquisition comments, we have revised Recommendation 1.a. to require a component breakout study by December 1991 and Recommendation 2. to direct that the component breakout study be presented in an Office of the Under Secretary of Defense for Acquisition program review in sufficient time to break out components in the contract for production lot 6. Therefore, we request that the Air Force and the Under Secretary of Defense for Acquisition provide comments to the revised recommendations in response to the final report. These comments should indicate planned corrective actions and completion dates.

As a result of the Air Force's comments, we have also revised our estimate of the potential monetary benefits identified in Enclosure 6. Therefore, we request that the Air Force also provide comments on the estimated monetary benefits. Potential monetary benefits are subject to mediation in the event of nonconcurrence or failure to comment.

DoD Directive 7650.3 requires that all audit recommendations be resolved promptly. Final comments on the unresolved issues in this report must be provided to us within 15 days of the date of this report.

This report contains data that the prime contractors may consider proprietary and as such should be safeguarded in accordance with DoD Instruction 5400.7R.

The courtesies extended to the staff during the audit are appreciated. If you have any questions on this audit, please contact Mr. Gordon Nielsen at (703) 614-6221 (AUTOVON 224-6221) or Mr. Roger Florence at (703) 693-0489 (AUTOVON 223-0489). Enclosure 7 lists the activities visited during this audit. A list of the audit team members is in Enclosure 8. Copies of this report are being provided to the activities listed in Enclosure 9.

Robert J. Lieberman
Assistant Inspector General
for Auditing

Enclosure

cc:
Secretary of the Navy
Secretary of the Air Force

CANDIDATES FOR COMPONENT BREAKOUT

Component

Radio Frequency Processor

Data Link Radio
Frequency Processor

Watkins-Johnson Company has produced these two components for the Advanced Medium Range Air-to-Air Missile (AMRAAM) since full-scale development began in 1978 and is producing the components for incorporation into production lot 3. Deliveries are about 1 year ahead of the prime contractor's production, and production of both components has been extended to avoid personnel layoffs. The returns for the radio frequency processor were about 5 percent for production lot 2 and * percent for production lot 3. Return rates for the data link have been less than * percent for production lots 2 and 3. Design changes have been made to increase the components' performance and to reduce the number of parts in the components. According to the manufacturer, all of the design changes are planned for incorporation into production lot 4.

Component

Microwave Assembly

Radio Frequency Head

M/A-COM has been producing these two components since full-scale development began in 1979. Although delivery of these components to the prime contractors has been behind the contractual requirement, the prime contractors have not been affected because they are also behind in delivery. The production lot 2 return rates for the microwave assembly and the radio frequency head were * and * percent, respectively. M/A-COM has begun production lot 3 and has made several deliveries for this production lot. M/A-COM personnel said that all component design changes will be made before full-rate production of the AMRAAM begins (planned for production lot 5) and will probably be incorporated during production lot 4.

* Company confidential information has been removed from this report.

CANDIDATES FOR COMPONENT BREAKOUT (continued)

Component

Inertial Reference Unit

Dynamically Tuned Gyro

Northrop Corporation has been producing these two components since 1979. Initial deliveries of both components were behind schedule because of test equipment problems, vendor quality problems, or specification changes due to the F-15 vibration requirements. Late delivery of the inertial reference unit has not affected missile deliveries by either prime contractor. However, late deliveries of the dynamically tuned gyro have affected missile deliveries by Hughes Aircraft Company. These delays are associated with early production and test equipment problems and will be resolved as production continues. Production lot 3 for the inertial reference unit is on schedule. The production lot 2 return rate for the inertial reference unit and the dynamically tuned gyro was * and * percent, respectively. Design changes are being made to the inertial reference unit, and all changes will be incorporated at the time of full-rate production (production lot 5). There are no planned design changes for the dynamically tuned gyro.

Component

Rocket Motor

Hercules Incorporated has been producing the AMRAAM rocket motor since 1981. Hercules Incorporated is behind in rocket motor deliveries; however, management efforts have been taken to improve deliveries. Production lot 2 deliveries are planned for completion in January 1991 with lot 3 deliveries to begin in the summer of 1991. Hercules Incorporated recalled the rocket motors supplied in the low-rate initial production lots because of a blast tube problem. The recall rate for production lots 1 and 2 were * and * percent, respectively. Manufacturing techniques and testing procedures have been established to preclude this problem. No rocket motors have been returned to Hercules Incorporated by either prime contractor since corrective actions were incorporated during production lot 2. Design changes to the rocket motor are being made, and all changes will be incorporated at the time of AMRAAM full-rate production (planned for production lot 5). Hercules Incorporated is already providing motors as Government-furnished equipment (GFE) for the Sidewinder and High Speed Anti-Radiation Missiles.

* Company confidential information has been removed from this report.

CANDIDATES FOR COMPONENT BREAKOUT (continued)

Component

Warhead

Chamberlain Corporation has been producing the warhead since 1984. Chamberlain Corporation produced warheads for low-rate initial production lots 1 and 2. Cracks were found in the production lots 1 and 2 warheads. As a result, * production lot 1 warheads had to be discarded, and another * production lots 1 and 2 warheads had to be refurbished. The discarding of the * warheads and the refurbishing of the * other warheads resulted in late warhead deliveries by Chamberlain. A 3-month employee strike during 1990 was another cause of the late deliveries. Design and manufacturing changes have been adopted, and new testing procedures have identified that warheads in production are not cracked.

Component

Radome

Corning Glass Works has been producing radomes for the AMRAAM since 1979 and is the only producer of the radome. During the production period, Corning experienced no radome returns from either of the prime contractors. There are no design changes anticipated for the radome. Corning has been able to meet the required delivery schedules, and where late deliveries have occurred, they were attributed to additional requirements, not the manufacturing process.

* Company confidential information has been removed from this report.

POTENTIAL SAVINGS OF COMPONENT BREAKOUT [1/] [2/]

(Dollar in millions and in then-year)

Component	Savings for Production Lots 6 through 10	Savings for the Total Missiles [3/]
Radio Frequency Processor	$ 28.5	$49.3
Data Link Radio Frequency Processor	4.7	8.2
Microwave Assembly	22.9	38.6
Radio Frequency Head	14.0	24.0
Inertial Reference Unit	45.4	81.4
Dynamically Tuned Gyro	9.1	15.8
Rocket Motor	42.2	72.4
Warhead	7.8	13.2
Radome	5.4	9.1
Total	$180.0	$312.0

[1/] The Air Force component breakout methodology was used in determining savings. This methodology estimated future component cost for the nine components based on experience in prior production lots adjusted for an estimated markup factor of * percent, anticipated savings from production learning, competition, and cost reductions from new production processes and design changes incorporated before lot 6 production. The estimated unit cost for each year was then multiplied by the planned number of units to be acquired and the Office of the Secretary of Defense's inflation index to determine the estimated component cost in then-year dollars.

[2/] The savings shown do not reflect the affect of reductions in contract award, contract administration, and engineering support personnel eliminated when the functions are performed by the Air Force. The Air Force would have to consider these additional costs in the component breakout evaluation.

[3/] The total missile components upon which savings are projected does not include spare parts acquisition to support the missiles during their life cycle. Therefore, total savings would be greater than presented in this table.

* Company confidential information has been removed from this report.

ADDITIONAL COMPONENT BREAKOUT CANDIDATES MEETING THE DEFENSE ACQUISITION SUPPLEMENT COST CRITERIA

Component	Part Number	Average Unit Cost 1/*	Estimated Savings (in millions) 2/
Safe Arm Device	3819700		$ 12.5
Wiring Harness	3820460		4.8
Terminal Seeker Support Structure	3823370		6.7
Chassis Electrical Equipment	3823445		5.5
Converter, High Voltage A-5	3823525		26.3
Terminal Detection Device Antenna Assembly	3824370		4.8
Forward Fuselage	3824375		5.3
Aft Fuselage	3824865		19.5
Cable Assembly	3847502		4.8
Voltage Control Oscillator	653594		12.5
Channel Select Converter	653595		10.3
Microcircuit Hybrid Mode Select 2	653605		7.2
Power Hybrid	653615		7.8
Brushless Direct Current Motor	653618		4.4
Mixer Amplifier Microcircuit	654137		6.9
Harness Cover	654241		24.3
Microcircuit Multiplier	657782		4.6
Radio Frequency Power Divider Gate Switch	657783		4.8
Multiplier Microcircuit	657784		5.4
Microcircuit	657785		7.3
Radio Frequency Multiplier	657787		4.8
Oscillator Multiplier	657803		23.6
Radio Frequency Microcircuit Amplifier	657820		6.9
Cathode Rectifier	657903		6.6
Aft Cable Assembly	7001970		6.4
Electronics Unit Housing	7006006		6.2
Total Projected Savings			$240.2

1/ Average unit cost is the average of the prices quoted in the lot 3 price proposals from Hughes Aircraft Company and Raytheon Company for each component. Because of operational commitments, the Air Force would not provide the estimated unit price to show the results of learning curve for FY's 1992 through 1999.

2/ For the above calculations, the markup factor of * percent was used. Total estimated savings for breakout of these 26 components was determined by multiplying each component unit cost by the markup factor of * percent to derive a markup unit cost. The markup unit cost was then multiplied by each year's planned missile procurement for FY's 1992 through 1999. Then, this value was multiplied by the savings factor of 25 percent based on Defense Federal Acquisition Regulation Supplement No. 6 for the DoD Spare Parts Breakout Program. This value was then adjusted for the Office of the Secretary of Defense's inflation index to estimate component estimated savings in then-year dollars.

* Company confidential information has been removed from this report.

ENCLOSURE 3

DEPARTMENT OF THE AIR FORCE
WASHINGTON DC 20330-1000

OFFICE OF THE ASSISTANT SECRETARY

29 JAN 1991

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING
OFFICE OF THE INSPECTOR GENERAL
DEPARTMENT OF DEFENSE

SUBJECT: Draft Quick-Reaction Report on Component Breakout of the Advanced Medium Range Air-to-Air Missile Program (Project No. OAS-0072.01), Jan 8, 1991 - INFORMATION MEMORANDUM

This is in reply to your memorandum for Assistant Secretary of the Air Force (Financial Management and Comptroller) requesting comments on the findings and recommendations made in subject report.

The Air Force agrees that component breakout, at the appropriate time, should result in program cost savings. As recently as September 1989 the Advanced Medium Range Air-to-Air Missile (AMRAAM) Joint Service Program Office (JSPO) conducted a component breakout assessment. The conclusion then, as now, was that such action is premature. Numerous deficiencies in the subject draft report invalidate the conclusion that the program is ready for component breakout at this time. Comments on the report are in the following paragraphs.

Air Force comments on findings follow.

Finding: Component Design. Components will have stable design when missiles reach full-rate production.
Response: Seven of the nine components recommended for breakout are included in the AMRAAM Producibility Enhancement Program (APREP). They are all planned to be incorporated into production no later than Lot V (FY 91). Experience dictates that each component should demonstrate maturity of production processes and performance before the government accepts full responsibility for it by making it Government Furnished Equipment (GFE). In other words, missiles incorporating the component should be accepted before making it a GFE item.

Finding: Component Reliability. Changes to manufacturing techniques have been made that should resolve problems associated with three components that experienced high return rated during early production.

Response: Reliability problems experienced in testing of Lot I missiles identified the need for corrective actions affecting many components, including those identified in your report. Flight testing identified a more severe F-15 fuselage station environment that has necessitated some design and specification changes to the component level. This effort will be completed in 6 months. In addition both prime contractors and the Air Force are working with suppliers to increase component reliability through better control of manufacturing and inspection processes. Air Force does not have the technical expertise to provide this assistance alone. As stated above, proof of manufacturing and reliability maturity are necessary before an item should be made GFE.

Finding: Prime Contractor Value Added. Prime contractor / examines and tests the components before assembling them into the missile and returns any defective units to the manufacturer for analysis and repair.
Response: Prime contractor actions would be essentially the same if the item is GFE except it would be returned to the government if defective. It would be government responsibility to get it fixed and provide the prime contractor a replacement item without delaying the schedule and becoming liable for extra costs (at an estimated $ * million per month for each contractor).

Finding: Estimated Savings From Component Breakout. The potential savings from FY 92 thru the balance of the program for the nine primary components are $508.0 million and an additional $210.4 million if 26 additional items meet criteria for breakout.
Response: The methodology used to estimate the cost savings was reviewed by the JSPO and the following discrepancies were noted: 1) the FY 89 component costs were used as costs in FY 92 thru FY 96, 2) cost reductions due to learning, introduction of APREP, and competition were not considered, 3) the wrap factor (* percent) used is not realistic based on information in the FY 89 contract proposals. Items manufactured by Raytheon which are not subject to the markup were erroneously included in the savings estimate.

Air Force comments on Recommendations follow.

Recommendation: The AMRAAM Program Director conduct a breakout evaluation in accordance with Defense Federal Acquisition Regulation Supplement, subpart 217.7202, before the next Defense Acquisition Board decision (low rate of full-rate production).

* Company confidential information has been removed from this report.

Response: Non-concur. A breakout evaluation at this time is premature. Proof of manufacturing and reliability maturity should be demonstrated through delivery of missiles with the final component configuration before a breakout decision is made.

Recommendation: Breakout components if the evaluation shows that breakout will result in net savings without unduly increasing program risk.

Response: Concur. The timing of the decision is the only point of disagreement. Critical factors which the Program Director must consider include availability of resources to support additional contractual actions, potential impact on prime contractor schedule, impact on warranty and total system performance responsibilities that presently reside with the prime contractors, and impact on the APREP acquisition strategy which is presently estimated to save $1.5 billion.

Recommendation: That the USD(A) require the Air Force to present a component breakout study at the next DAB production milestone review.

Response: Component breakout evaluation at this time is premature.

Air Force comments on Potential Monetary benefits follow.

Response: Non-concur with the estimated monetary benefits. For comparative purposes only the AMRAAM JSPO has estimated savings for the nine identified components for the period FY 92-FY 96, using the latest available quantity profile (as of Jan 15, 1991) and the JSPO recommended model. This estimate is included at attachment 1.

1 Attachment
JSPO Component Savings Estimate

SERGIO A. DELHOYO, Colonel, USAF
Deputy Chief, Weapons Division
Tactical Programs Directorate
Assistant Secretary (Acquisition)

JSPO COMPONENT SAVINGS ESTIMATE

Costs stated in BY84$
Latest PB quantity profile, as of Jan 15, 1991
Prime wrap savings calculated for FY 92 thru FY 96 (Lot 6-10)
* competitive savings taken
Only first nine part numbers in report considered
JSPO model used for calculations

	HUGHES	RAYTHEON	TOTAL
Quantity	*	*	*
RF Processor			
DL Processor			
Microwave Assembly			
RF Head			
Inert Ref Unit			
Dyn Tuned Gyro			
Rocket Motor			
Warhead			
Radome			
Totals BY84$	86.3	32.6	118.9
Total TY$	130.5	49.5	180.0

Differences in JSPO Estimate and IG Report:
JSPO takes learning and rate reductions
JSPO takes benefits of APREP into account
JSPO takes benefits of Competition into account
JSPO used latest FY 92 thru FY 96 quantity profile
JSPO takes inflation into account
JSPO uses a composite wrap savings factor of * (Hughes) and * (Raytheon) versus * in the IG Report

* Company confidential information has been removed from this report.

OFFICE OF THE UNDER SECRETARY OF DEFENSE
WASHINGTON, DC 20301

February 11, 1991

ACQUISITION
AP&PI/ASM

MEMORANDUM FOR ASSISTANT INSPECTOR GENERAL FOR AUDITING

SUBJECT: Draft Quick-Reaction Report on Component Breakout of the Advanced Medium Range Air-to-Air Missile Program (Project No. OAS-0072.01 - January 8, 1991)

DoDIG Recommendation No. 2 of subject report provided that the Under Secretary of Defense for Acquisition should require that a component breakout study be presented to the Defense Acquisition Board (DAB) during the next production decision (low-rate or full-rate production) in determining the system's cost and affordability. We agree that a component breakout study should be conducted on the AMRAAM program, but we are not sure this can be done by the Milestone IIIB scheduled for April 1991.

Section 5-A of draft DoDI 5000.2 contains direction to the Program Manager to discuss component breakout plans in the Acquisition Strategy Report required for each milestone decision review. The Program Manager is directed to the FAR and DFARS parts which contain detailed component breakout analysis requirements. Section D-4 of DoD 5000.2M expands the direction to the Program Manager to both major components and subsystems and requires discussion of the rationale and supporting documentation for the acquisition approach proposed to the milestone decision authority.

While the instruction will be effective immediately upon signing, new DAB documentation which requires significant preparation time will not become mandatory until six months later. We would not expect a complete component breakout analysis for Milestone IIIB in the April 1991 timeframe. We agree with the Air Force that component breakout, at the appropriate time, should result in program cost savings, but that such action now is premature.

John D. Christie
Director, Acquisition Policy
and Program Integration

Cy to:
Air Force Acquisition Executive

ENCLOSURE 5

SUMMARY OF POTENTIAL MONETARY AND OTHER BENEFITS RESULTING FROM AUDIT

Recommendation Reference	Description of Benefit	Amount and/or Type of Benefit
1.a.	Compliance with Defense Federal Acquisition Regulation Supplement, subpart 217.7202.	Nonmonetary.
1.b.	Economy and efficiency. Cost avoidance benefits resulting from breaking out the Advanced Medium Range Air-to-Air Missile components.	Better use of $180 million 1/ 2/ for FY's 1992 through 1996.
2.	Internal control to ensure that program managers perform component breakout reviews.	Nonmonetary.

1/ The total amount of cost avoidance savings is based upon breakout of the nine components that we identified as suitable for component breakout.

2/ Appropriation data (then-year dollars in millions):

Appropriation	FY 1992	FY 1993	FY 1994	FY 1995	FY 1996	TOTAL
Missile Procurement, Air Force	$ 25.0	$ 31.2	$ 29.6	$ 32.5	$ 29.2	$147.5
Weapons Procurement, Navy	$ 5.0	$ 4.8	$ 7.4	$ 7.5	$ 7.8	$ 32.5
TOTAL	$ 30.0	$ 36.0	$ 37.0	$ 40.0	$ 37.0	$180.0

ACTIVITIES VISITED OR CONTACTED

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition, Washington, DC

Department of the Navy

Naval Air Systems Command, Washington, DC

Department of the Air Force

Program Director, Advanced Medium Range Air-to-Air Missile Program, Eglin Air Force Base, FL

Defense Plant Representative Offices

Chamberlain Corporation, Waterloo, IA
Corning Glass Works, Canton, NY
Hercules Incorporated, McGregor, TX
Hughes Aircraft Company, Missile Systems Group, Tucson, AZ
M/A-COM, Lowell, MA
Northrop Corporation, Norwood, MA
Raytheon Company, Missile Systems Division, Burlington, MA
Watkins-Johnson Company, Palo Alto, CA

Defense Contractors

Chamberlain Corporation, Waterloo, IA
Corning Glass Works, Canton, NY
Hercules Incorporated, McGregor, TX
Hughes Aircraft Company, Missile Systems Group, Tucson, AZ
M/A-COM, Lowell, MA
Northrop Corporation, Norwood, MA
Raytheon Company, Missile Systems Division, Bedford, MA
Watkins-Johnson Company, Palo Alto, CA

AUDIT TEAM MEMBERS

Donald E. Reed, Director, Acquisition Management Directorate
Gordon P. Nielsen, Program Director
Roger Florence, Project Manager
Michael E. Niedringhaus, Auditor
Kenneth M. Teore, Auditor
Thomas J. Winter, Auditor

FINAL REPORT DISTRIBUTION

Office of the Secretary of Defense

Under Secretary of Defense for Acquisition
Comptroller of the Department of Defense

Department of the Navy

Secretary of the Navy
Auditor General, Naval Audit Service
Commander, Naval Air Systems Command

Department of the Air Force

Secretary of the Air Force
Assistant Secretary of the Air Force (Financial Management and Comptroller)
Air Force Audit Agency
Program Director, Advanced Medium Range Air-to-Air Missile Program

Defense Agency

Director, Defense Logistics Agency
Director, Defense Contract Audit Agency

Non-DoD Activities

Office of Management and Budget
U.S. General Accounting Office, NSIAD Technical Information Center

Congressional Committees:

Senate Subcommittee on Defense, Committee on Appropriations
Senate Committee on Armed Services
Senate Committee on Governmental Affairs
Senate Ranking Minority Member, Committee on Armed Services
House Committee on Appropriations
House Subcommittee on Defense, Committee on Appropriations
House Ranking Minority Member, Committee on Appropriations
House Committee on Armed Services
House Committee on Government Operations
House Subcommittee on Legislation and National Security, Committee on Government Operations