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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

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STATEMENT OF
DONALD E. DAY, SENIOR ASSOCIATE DIRECTOR
MISSION ANALYSIS AND SYSTEMS ACQUISITION DIVISION
BEFORE THE
SUBCOMMITTEE ON DEFENSE
HOUSE APPROPRIATIONS COMMITTEE

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Mr. Chairman and Members of the Committee:

We are pleased to be here today to discuss the cost estimates for the B-1B aircraft program. As you know, the Air Force's program cost estimate was reviewed independently by a team from the Air Force and a team from the Office of the Secretary of Defense in late 1981. The independent reviewers also prepared estimates of their own but the Air Force and Department of Defense were reluctant to give us access to the details of those estimates, and not until May 1982 were we provided information and comparisons from the independent analyses.

Mr. Robert Murphy from our Cincinnati Regional Office will give a briefing on the details of the cost estimates in just a moment, but first, I would like to emphasize two points. One, these independent estimates are not new--the results were available to the Deputy Secretary of Defense before he issued a directive on November 4, 1981, concerning management of the B-1B program. Second, despite the controversy surrounding the estimated cost of the B-1B, we think the Air Force and Office of the Secretary of Defense are making a concerted effort to acquire the B-1B program within its estimated cost baseline of \$20.5 billion (fiscal year 1981 dollars).

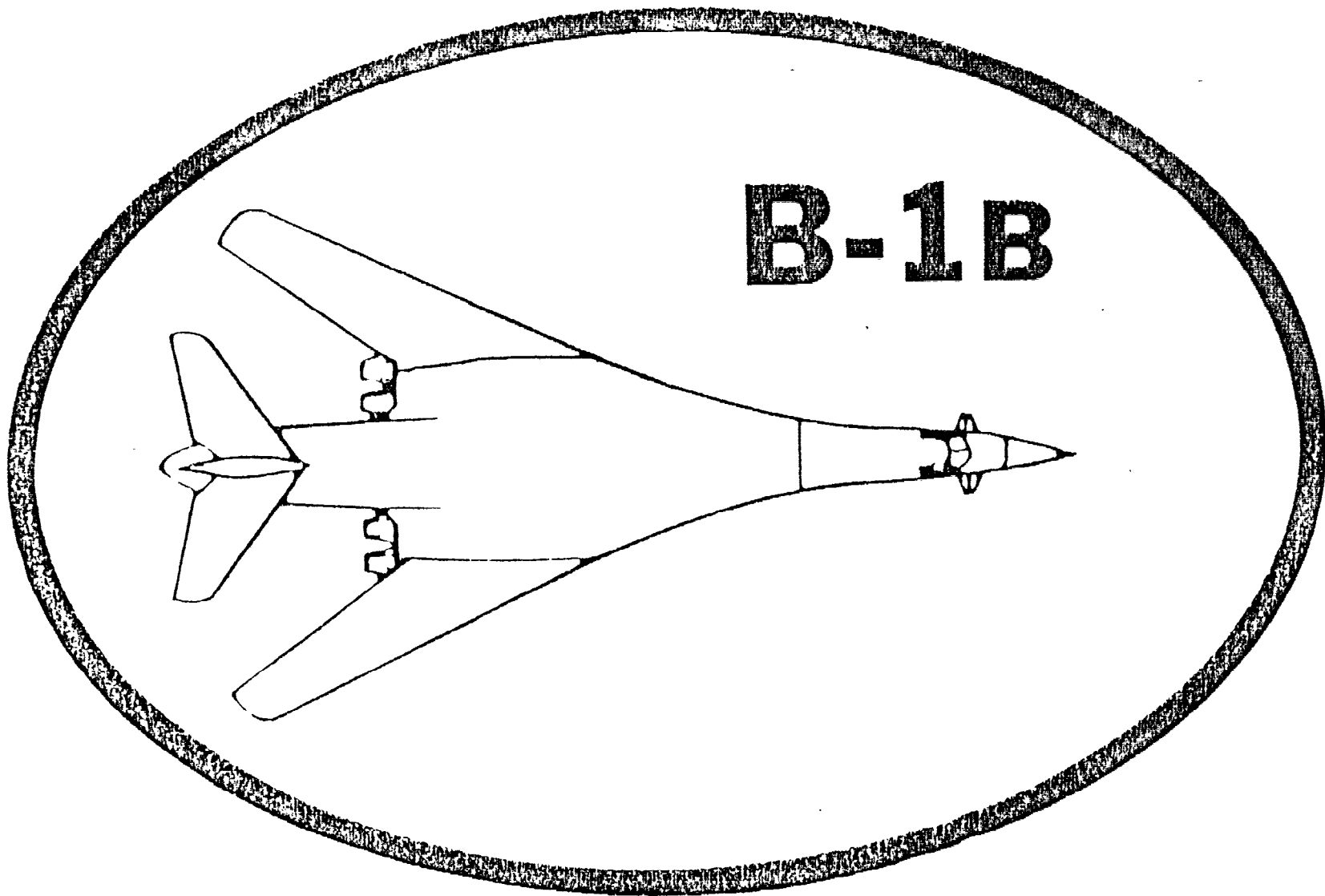
The independent estimating teams generally dealt with (1) the adequacy of the baseline estimate as proposed, (2) the exclusion of certain necessary program costs from the baseline, and (3) the cost associated with potential future growth in the program.

Both the Air Force and OSD independent teams surfaced concerns about the \$20.5 billion baseline estimate, indicating that certain assumptions leading to that baseline estimate were optimistic. Air Force officials responsible for managing the B-1B program believe their baseline estimate is justified by experience with the earlier B-1A program. Our briefing compares the estimates and provides certain information about the cost issues.

Since October 1981, an important concern to us has been the exclusion of certain program costs from the B-1B baseline. Those costs, such as acquisition of simulators, certain engineering programs for the engines, acquisition of equipment needed to provide the Air Force an in-house depot maintenance capability, etc., could add up to over \$1.4 billion. We believe excluding these costs from the B-1B baseline provides poor visibility of the B-1B program acquisition cost as well as annual funding requests. We believe OSD and Air Force guidance on establishing program baselines needs to be improved to provide uniformity in establishing baselines and reporting them to the Congress.

With these few introductory remarks, I would now like to turn the briefing over to Mr. Murphy. Please feel free to ask questions as we go.

COMPARISON OF B-1B COST ESTIMATES



JULY 22, 1982

A BRIEFING BY THE STAFF OF
THE GENERAL ACCOUNTING OFFICE

BRIEFING OUTLINE

- BACKGROUND
- OVERVIEW OF B-1B COST ESTIMATES
- GUIDANCE FOR BASELINE COST ESTIMATES
- SUMMARY COMPARISON OF ESTIMATES
- DISCUSSION OF SPO, AIR FORCE INDEPENDENT, AND OSD INDEPENDENT ESTIMATES
- OBSERVATIONS

BACKGROUND

(ALL DOLLARS ARE FISCAL YEAR 1981)

--FY 81 DEFENSE AUTHORIZATION ACT - \$300 MILLION FOR RESEARCH, DEVELOPMENT, TEST AND EVALUATION

" * * * VIGOROUSLY PURSUE FULL-SCALE ENGINEERING DEVELOPMENT OF A STRATEGIC MULTI-ROLE BOMBER * * * TO ACHIEVE AN INITIAL OPERATIONAL CAPABILITY NOT LATER THAN 1987."

--JOINT OSD/AIR FORCE BOMBER ALTERNATIVES STUDY

*AF RECOMMENDATION--100 B-1 VARIANTS--\$19.7 BILLION COST BASELINE
*1986 IOC

--INDEPENDENT COST ESTIMATE - AIR FORCE

--PRESIDENT'S ANNOUNCEMENT - OCTOBER 2, 1981

*100 B-1 VARIANTS - INCLUDING ALCM AND LF/VLF

--OSD REPORT ON B-1B COST

--DEPUTY SECRETARY OF DEFENSE MEMORANDUM - \$20.5 BILLION BASELINE

--PRESIDENTIAL CERTIFICATION THAT \$20.5 BILLION IS FEASIBLE

OVERVIEW OF B-1B COST ESTIMATES
(ALL DOLLARS ARE FISCAL YEAR 1981)

--B-1B SPO ESTIMATE

*20.5 BILLION BASELINE

--AIR FORCE INDEPENDENT ESTIMATE

*\$21.01 BILLION BASELINE

*\$1,453 BILLION IDENTIFIED AS APPROPRIATE ADDITIONS TO SPO BASELINE

*ABOUT \$1.1 BILLION IN OTHER POTENTIAL COSTS IF PROGRAM SCOPE IS EXPANDED

--OSD INDEPENDENT ESTIMATE

*RISK ANALYSIS INDICATED SPO BASELINE COST MAY BE EXCEEDED BY \$4.74 BILLION (TO \$25.27 BILLION)

*\$1,433 BILLION IDENTIFIED AS APPROPRIATE ADDITIONS TO SPO BASELINE

*\$.474 BILLION IN POTENTIAL COSTS IF PROGRAM SCOPE IS EXPANDED

--MORE DETAILED COMPARISON LATER

GUIDANCE FOR BASELINE COST ESTIMATES

--DODI 5000.33 - "PROVIDE A FOUNDATION FOR WEAPON/SUPPORT SYSTEM COST COMMUNICATION AMONG CONGRESS, THE DEPARTMENT OF DEFENSE, AND INDUSTRY."

*PROGRAM ACQUISITION COSTS INCLUDE DEVELOPMENT, PROCUREMENT AND CONSTRUCTION COSTS. HOWEVER, SOME COST ITEMS MAY BE EXCLUDED FROM THE ESTIMATE WHEN FUNDED BY A SEPARATE BUDGET LINE ITEM.

--AFSCR 550-18 - "THE PROGRAM MANAGER'S BEST ESTIMATE OF THE COST TO ACCOMPLISH THE EFFORT DESCRIBED IN CURRENT PROGRAM DIRECTION."

*THE BASELINE ESTIMATE IS TO INCLUDE ALL DIRECTED EFFORT FOR WHICH THE PROGRAM OFFICE HAS MANAGEMENT RESPONSIBILITY, REGARDLESS OF THE SOURCE OF FUNDS.

--DODI 7000.3 - PROVIDES "STANDARDIZED FORMAT AND INSTRUCTIONS...FOR SUMMARY REPORTING OF TECHNICAL, SCHEDULE, QUANTITY, AND COST INFORMATION CONCERNING MAJOR DEFENSE SYSTEMS."

*PROGRAM ACQUISITION COST DEFINED AS THE DEVELOPMENT, PROCUREMENT, AND CONSTRUCTION COST TO ACQUIRE A MAJOR DEFENSE SYSTEM.

SUMMARY COMPARISON OF ESTIMATES
(IN BILLIONS OF FISCAL YEAR 1981 DOLLARS)

<u>COST CATEGORY</u>	<u>SPO</u>	<u>AIR FORCE INDEPENDENT ESTIMATE</u>	<u>OSD INDEPENDENT ESTIMATE</u>
"BASELINE"			
AIRFRAME	\$ 9.885	\$11.258	\$11.285
ENGINE	1.770	1.885	1.800
AVIONICS	2.885	3.165	3.515
SYSTEM TEST	.535	.253	.535
ECO/MANAGEMENT RESERVE	.700	.800	1.162
NONRECURRING PRODUCTION	1.500	1.500	1.500
SUPPORT EQUIPMENT	1.800	1.075	2.588
OTHER PROGRAM COSTS	.355	.314	.355
INITIAL SPARES	1.100	1.100	1.730
MULTI-YEAR PROCUREMENT	(.800)	(.900)	-0-
ALOM AND LF/VLF	.800	.563 A/	.800
"BASELINE" TOTAL	<u>\$20.530</u>	<u>\$21.013</u>	<u>\$25.270 B/</u>
<u>IDENTIFIED ADDITIONS TO BASELINE</u>			
SIMULATORS	-0-	.340	.300 c/
CEI/CIP	-0-	.187	.150 c/
ORGANIC DEPOT CAPABILITY	-0-	.237	.400
MISC. (FIRST DESTINATION TRANSP, OTHER)	-0-	.020	.100
INTERIM CONTRACTOR SUPPORT	-0-	.034	.263
FACILITIES IMPROVEMENT (CONTRACTOR PRODUCTION)	-0-	.068	.070 c/
RETROFIT COSTS	-0-	.567	-0-
MANUFACTURING TECHNOLOGY	-0-	-0-	.150 c/
BASELINE ADDITIONS TOTAL		\$ 1.453	\$ 1.433
TOTAL RECOMMENDED BASELINE	<u>\$20.530</u>	<u>\$22.466</u>	<u>\$26.703</u>

SEE FOOTNOTES ON CHART 6

FOOTNOTES TO CHART 5

- A/ THE AIR FORCE TEAM ESTIMATED THE COST FOR ONLY AN EXTERNAL ALCM CAPABILITY.
- B/ ALTHOUGH THE OSD REPORT DID NOT INCLUDE A "BASELINE" ESTIMATE OF \$25.27 BILLION, ITS ASSESSMENT OF POTENTIAL ADDED COSTS DUE TO RISK, WHEN ADDED TO THE SPO BASELINE, TOTALS \$25.27 BILLION.
- C/ ALTHOUGH NOT INCLUDED IN THE SPO BASELINE, THESE ITEMS ARE IDENTIFIED AS RELATED PROGRAMS ON THE B-1B SAR.

SUMMARY COMPARISON OF COST ESTIMATES
IN BILLIONS OF FISCAL YEAR 1981
AND THEN YEAR DOLLARS

DESCRIPTION	SPO	AIR FORCE INDEPENDENT ESTIMATE	OSD INDEPENDENT ESTIMATE
"BASELINE" PROGRAM -FISCAL YEAR 1981 DOLLARS	<u>\$20.53</u>	<u>\$21.01</u>	<u>\$25.27</u>
"BASELINE" PROGRAM -THEN YEAR DOLLARS	<u>\$29.23</u>	<u>\$28.45</u>	<u>*</u>
ESCALATION INDICES AS OF:	MAY 1982	SEPTEMBER 1981	

*THE OSD ESTIMATING TEAM REVIEWED THE B-IB COSTS ONLY IN TERMS OF FISCAL YEAR 1981 DOLLARS.

DEPUTY SECRETARY OF DEFENSE MEMORANDUM 11/04/81
(ALL DOLLARS ARE FISCAL YEAR 1981)

REVIEWED AIR FORCE AND OSD ESTIMATES OF B-1B ACQUISITION COST, TO ENSURE THE PROGRAM DOES NOT EXCEED \$20.5 BILLION, THE FOLLOWING STEPS ARE TO BE TAKEN:

- NO CHANGES IN THE PROGRAM OR MAJOR CONFIGURATION CHANGES WITHOUT PRIOR APPROVAL OF DEPUTY SECRETARY OF DEFENSE
- CONTROL THE DESIGN TO NOT EXCEED THE 6 PERCENT ENGINEERING CHANGE ORDER (ECO) BUDGET
- FUND SIMULATORS UNDER A SEPARATE PROGRAM ELEMENT
- PROVIDE AN AIR FORCE DEPOT MAINTENANCE CAPABILITY WITHIN THE \$1.8 BILLION PROJECTED FOR SUPPORT EQUIPMENT
- FUND INTERIM CONTRACTOR SUPPORT IF NEEDED UNDER A SEPARATE PROGRAM ELEMENT UNTIL AIR FORCE CAPABILITY IS AVAILABLE
- PROCEED WITH A VIGOROUS MULTI-YEAR CONTRACTING PROGRAM TO ACHIEVE \$800 MILLION IN SAVINGS
- FUND MANUFACTURING TECHNOLOGY PROGRAM, ENGINEERING COMPONENT IMPROVEMENT PROGRAM, AND FACILITY IMPROVEMENTS FROM GENERAL AIR FORCE FUNDS PROVIDED FOR THESE PURPOSES

POTENTIAL COSTS IF PROGRAM IS EXPANDED
(IN BILLIONS OF FISCAL YEAR 1981 DOLLARS)

ITEM ^Δ	COST ESTIMATE		
	SPO	AIR FORCE INDEPENDENT ESTIMATE	OSD INDEPENDENT ESTIMATE
AFT BAY ENLARGEMENT	\$ -0-	.623	\$ -0-
FATIGUE TEST ARTICLE	.120	.071	.070
ADDITIONAL FLIGHT TESTING	-0-	.104	.104
FORWARD LOOKING INFRARED	.140	.097	.125
LOW BAND TRANSMIT	.070	.014	No ESTIMATE
COMMUNICATIONS COUNTERMEASURES	.210	.092	No ESTIMATE
CAT D/PAL CD	.080	.066	.065
ELECTROMAGNETIC PULSE TESTING	.024	.008	No ESTIMATE
AVIONICS STANDARDS	.145	(.004) .110	.110
TOTAL	\$.789	\$1.071-1.185	\$.474

Δ/THERE ARE NO CURRENT APPROVED PLANS TO INCORPORATE THESE ITEMS IN THE B-1B. THE AFT BAY ENLARGEMENT TO ACCOMMODATE CRUISE MISSILES AND CAT D/PAL CD INCORPORATION HAVE BEEN REJECTED BY OSD. THE REMAINING ITEMS REPRESENT POTENTIAL COSTS TO THE CURRENT PROGRAM, OR FUTURE COSTS TO PROVIDE ADDITIONAL CAPABILITIES.

LEARNING CURVES

(FY 81 \$)

AIRFRAME

	<u>LOT I (1 AIRCRAFT)</u>		<u>LOT II (7 AIRCRAFT)</u>		<u>LOT III-V</u>
	<u>HOURS</u>	<u>COST</u>	<u>HOURS</u>	<u>COST</u>	
SPO ESTIMATE	2.034M	\$64.7M	7.751M	\$246.5M	?
ACTUAL NEGOTIATED	2.077M	\$61.0M	9.126M	\$259.2M	?

AVIONICS

	<u>LOT I - II</u>	<u>LOT III - V</u>
SPO ESTIMATE	\$748.0M	?
ACTUAL NEGOTIATED	\$749.0M	?

--THE AIRFRAME AND AVIONICS LEARNING CURVES ARE MORE OPTIMISTIC THAN ACHIEVED ON OTHER PROGRAMS.

--THE AIR FORCE TESTIFIED THAT SIMILAR LEARNING CURVES USED BY ROCKWELL WERE "UNDULY OPTIMISTIC".

CONSTRAINED FLIGHT TEST PROGRAM

- ROCKWELL PROPOSED 1,300 HOURS FOR FLIGHT TESTS.
- 1000 HOURS NEGOTIATED.
- DESCRIBED BY THE B-1B PROGRAM MANAGER AS "A SEVERELY
CONSTRAINED FLIGHT TEST PROGRAM".

- OT&E OBJECTIVES NOT SATISFIED BY THE COMBINED DT&E/IOT&E
WILL BE ADDRESSED DURING FOT&E. FOT&E IS TO BE FUNDED
BY SAC.

- USDR&E AND AF OFFICIALS SAID 1000 HOUR FLIGHT TEST PROGRAM PROVIDES
ALL THE ESSENTIAL TESTING REQUIRED BEFORE IOC.

AIR FORCE INDEPENDENT
ASSESSMENT OF FLIGHT TEST PROGRAM

"A PROGRAM OF 1,000 HOURS OF DEVELOPMENTAL FLIGHT TESTING WILL PROVIDE A MINIMAL AMOUNT OF DATA TO SUPPORT A VALID IOC. THIS PROGRAM IS SUCCESS ORIENTED AND HAS A RELATIVELY HIGH DEGREE OF RISK AND ONLY LIMITED PHYSICAL AND FUNCTIONAL WEAPON CERTIFICATION WILL BE ACCOMPLISHED. FULL NUCLEAR CERTIFICATION WILL NOT BE COMPLETE, AND NO CLIMATE TESTS WILL BE DONE.

A PROGRAM OF 1,300 - 1,400 HOURS WOULD REDUCE RISK TO A MEDIUM LEVEL AND SHOULD PROVIDE THE NECESSARY TESTING AND RESULTANT DATA TO VERIFY THE AIRCRAFT CAPABILITY FOR MOST OF THE FLIGHT ENVELOPE, WEAPONS, AND NUCLEAR CERTIFICATION. THIS LEVEL OF TESTING ALSO IS JUDGED REASONABLE FROM A SCHEDULE CONSIDERATION AS IT ALLOWS FOR REALISTIC FLYING HOUR RATES FOR EACH OF THE THREE TEST AIRCRAFT. IT ALSO TERMINATES AT IOC WITH ALL SCHEDULED TESTING COMPLETE."

LIMITED ECO BUDGET

--REDUCED TO \$700 MILLION FROM INITIAL ESTIMATE OF \$1.1 BILLION.

--ONLY MINIMUM ESSENTIAL CHANGES ALLOWED.

--AREA OF CONCERN TO AIR FORCE LOGISTICS COMMAND.

--USDR&E AND AF OFFICIALS SAY THEY BELIEVE \$700 MILLION IS ENTIRELY SUFFICIENT.

MULTI-YEAR PROCUREMENT CRITERIA

APPROVAL OF MYP FOR THE B-1B MAY REQUIRE A WAIVER TO CURRENT OSD POLICY. THE CRITERIA FOR SELECTING MYP CANDIDATES, AND A COMPARISON OF THE B-1B PROGRAM TO THIS CRITERIA, IS SHOWN BELOW.

CRITERIAB-1B STATUS

1. BENEFIT TO THE GOVERNMENT - SHOULD YIELD SUBSTANTIAL SAVINGS.

\$800 MILLION SAVINGS. HOWEVER, PRESENT VALUE DISCOUNTING NOT CONSIDERED.

2. STABLE CONFIGURATION - RDT&E COMPLETED; TECHNICALLY MATURE.

MYP APPROVED 3 YEARS BEFORE RDT&E IS COMPLETE; 1 1/2 YEARS BEFORE DELIVERY OF FIRST PRODUCTION AIRCRAFT; INITIAL FLIGHT TESTS BARELY BEGUN; 1 YEAR BEFORE START OF AVIONICS FLIGHT TESTS.^{1/}

3. REASONABLE ASSURANCE THAT COST SAVINGS ARE REALISTIC.

SAVINGS ARE BASED ON JUDGEMENTAL ASSUMPTIONS, RATHER THAN FIRM CONTRACTOR PROPOSALS OR NEGOTIATED PRICES.^{2/}

4. STABLE REQUIREMENT AND FUNDING.

NO REASON TO QUESTION.

^{1/}AIR FORCE OFFICIALS BELIEVE THE B-1B WILL OFFER A STABLE CONFIGURATION AND BE TECHNICALLY MATURE AT THE TIME MYP CONTRACTS ARE AWARDED BECAUSE OF THE PRIOR AIRFRAME AND ENGINE DEVELOPMENT AND TESTING DURING THE B-1A PROGRAM, AND BECAUSE THE B-1B AVIONICS ARE PARTIALLY COMMON WITH THE B-52 AND F-16.

^{2/}CONTRACTOR PROPOSALS WILL BE RECEIVED ABOUT DECEMBER 1982.

COSTS INCLUDED AT LEAST PARTIALLY IN OTHER WEAPON
SYSTEM BASELINE ESTIMATES BUT EXCLUDED FROM
THE B-1B BASELINE

<u>COST ELEMENT</u>	<u>SOME COSTS (NOT NECESSARILY ALL) INCLUDED IN WEAPON SYSTEM'S BASELINE ESTIMATE</u>		
	<u>F-15</u>	<u>F-16</u>	<u>A-10</u>
CONTINUING ENGINEERING DEVELOPMENT	YES	NO	YES
ENGINE COMPONENT IMPROVEMENT PROGRAM	YES	NO	YES
INTERIM CONTRACTOR SUPPORT	YES	YES	YES
PRODUCTION FACILITIES IMPROVEMENT	YES	NO	YES
SIMULATOR DEVELOPMENT AND PRODUCTION	YES	YES	YES
DEVELOPMENT OF DEPOT SUPPORT CAPABILITY (NON-ENGINE) ^{1/}	YES	YES	YES
FIRST DESTINATION TRANSPORTATION ^{1/}	YES	YES (RDT&E) ONLY)	YES

^{1/}NOT INITIALLY PART OF THE \$20.5 BILLION BASELINE, BUT SUBSEQUENTLY DIRECTED TO BE INCLUDED.

AIR FORCE SYSTEMS COMMAND (AFSC) MESSAGE
DATED SEPTEMBER 11, 1981

"THIS HEADQUARTERS AGREES THAT, IN ACCORDANCE WITH APPLICABLE AFSC DIRECTIVES, B-1B AIRCREW TRAINING DEVICE DEVELOPMENT AND PRODUCTION SHOULD BE MANAGED BY THE SIMULATOR SPO REGARDLESS OF THE FUNDING SCHEME. HOWEVER, A SEPARATE PROGRAM ELEMENT FOR B-1B AIRCREW TRAINING DEVICES IS COUNTER TO THE TENETS OF THE PLANNING, PROGRAMMING, AND BUDGETING SYSTEM IN WHICH ALL THE COMPONENTS OF WEAPON SYSTEM ARE ACCUMULATED IN A SINGLE PROGRAM ELEMENT FOR MANAGEMENT VISIBILITY. A CONSENSUS OF SENIOR AIR STAFF LEADERS AT MEETING ON 10 SEP 81 APPEARS TO SUPPORT THE APPROACH OF AIRCREW TRAINING DEVICE PROJECTS WITHIN THE B-1B DEVELOPMENT AND PRODUCTION PROGRAM ELEMENTS CONTINGENT UPON ADDED FUNDING FOR THIS PURPOSE."

OBSERVATIONS

--OBSERVATIONS

- *B-1B BASELINE COST ESTIMATE APPROVED BY THE DEPUTY SECRETARY OF DEFENSE EXCLUDES COST ELEMENTS THAT WILL BE INCURRED AND ARE USUALLY INCLUDED IN A PROGRAM ESTIMATE. DURING ACQUISITION OF THE B-1B, OVER A BILLION DOLLARS WILL BE FUNDED IN PROGRAM ELEMENTS NOT IDENTIFIED SPECIFICALLY WITH THE B-1B BASELINE ESTIMATE.
- *GUIDELINES ON WHAT SHOULD BE IN THE BASELINE ARE UNCLEAR. OTHER WEAPON SYSTEMS HAVE ALSO EXCLUDED CERTAIN DIRECTLY RELATED ACQUISITION COSTS FROM THEIR ESTIMATE.
- *EXCLUDING PROGRAM ACQUISITION COSTS FROM THE BASELINE PROVIDES POOR VISIBILITY OF ANNUAL REQUESTS FOR FUNDS AS WELL AS TOTAL PROGRAM COSTS,

ALCM	AIR LAUNCHED CRUISE MISSILE
CAT D/PAL CD	CATEGORY D PERMISSIVE ACTION LINK/COMMAND DISABLE
CEC	CONTINUING ENGINEERING DEVELOPMENT
CIP	COMPONENT IMPROVEMENT PROGRAM
DT&E	DEVELOPMENT, TEST, AND EVALUATION
ECO	ENGINEERING CHANGE ORDER
EMP	ELECTROMAGNETIC PULSE
FLIR	FORWARD LOOKING INFRARED
FOT&E	FOLLOW-ON OPERATIONAL TEST AND EVALUATION
IOC	INITIAL OPERATIONAL CAPABILITY
IOT&E	INITIAL OPERATIONAL TEST AND EVALUATION
LF/VLF	LOW FREQUENCY/VERY LOW FREQUENCY
MANTECH	MANUFACTURING TECHNOLOGY
MYP	MULTIYEAR PROCUREMENT
OSD	OFFICE OF THE SECRETARY OF DEFENSE
OT&E	OPERATIONAL TEST AND EVALUATION
RDT&E	RESEARCH, DEVELOPMENT, TEST AND EVALUATION
SAC	STRATEGIC AIR COMMAND
SPO	SYSTEM PROGRAM OFFICE