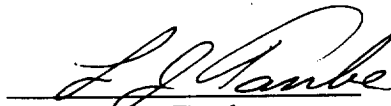


This document is submitted in compliance with NAS9-12100

SD 72-SH-0003

B-70 AIRCRAFT STUDY  
FINAL REPORT  
Volume I

April 1972



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## INTRODUCTION

In accordance with the requirements of Contract NAS9-12100 dated July 15, 1971, North American Rockwell Corporation submits the Phase II Report for the B-70 Aircraft Study. This report consists of four volumes of B-70 cost, schedule and technical data, a management summary document, and a magnetic tape of the program cost data constructed to the NASA prescribed format.

Previous studies have provided the NASA with historical data on the Apollo CSM and the Saturn S-II Programs. Consistency and commonality of data organization and cost data definitions have been maintained as far as possible to provide a common base for the correlation and analysis of the data generated by these three studies.

To derive the maximum benefit from the learning experienced on the previous studies, the members of the B-70 Team were selected primarily from the Apollo CSM Study Team. L. J. Taube was the Program Manager, and J. E. Hauver the Study Leader. Responsible for the collection and analysis of the technical and schedule data presented in this report were V. T. Johnson and O. Djuvstad, respectively. Cost data was the responsibility of J. E. Hauver.

Supporting the data collection and analysis tasks were many individuals from the NR Los Angeles Division (LAD). This Division was the prime B-70 contractor and supplied all the records and reports utilized to develop the study data. Key individuals at the Los Angeles Division were: W. A. Spivak, R. H. Kemp, B. G. Peterson, W. A. Snyder, R. C. Coakley, R. D. Davison, and F. W. Beers.

The B-70 Aircraft Study was conducted in two phases. Submittal of the Phase I Report (SD71-189) on September 24, 1971, concluded the initial phase of the contract. This report contained the results of an in-house investigation to determine the availability, applicability and extent of B-70 historical data to support the study objectives. This document became the Phase II Study Plan.

Phase II objective was to provide the B-70 aircraft data in accordance with the approved Study Plan. Several minor modifications to the original plan have been made as the result of the Phase II effort. These modifications have been reviewed and approved by the NASA Technical Monitor. This document is the B-70 Aircraft Study Final Report.

Technical and schedule data for the Structures Subsystem and program level cost data was provided the NASA on January 6, 1972. This data was considered preliminary and should be replaced with the Final Report data.

The Final Report is organized into four volumes. Volume I contains the Data Location Matrix, Work Breakdown Structure, cost definitions and the B-70 Program level summary data. Volume II provides cost, schedule and technical data for Work Breakdown Structure level 4 items, i.e., Air Vehicle, Program Technical Support, Major Airframe Mating, Flight Test, GSE, Spares, Special Test Equipment, Tooling and Other. Volumes III and IV contain all cost, schedule and technical information on the aircraft subsystems.

SECTION I DATA LOCATION MATRIX

This section of the Final Report contains the Data Location Matrix which provides a summary of the major cost, schedule and technical items provided in the report. The matrix is organized into two parts. Part I contains the location of the major B-70 program level data items and Part II contains the location of the major data items contained within the subsystems. Data can be located beginning on the page and in the volume indicated. The volume number is designated by an upper case "Roman" numeral followed by the page number.

Part I B-70 Program Summary Data

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Program Abstract - brief narrative overview of the major program milestones and contractual history.	I-29
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1.2.5 Engine Inlet Fwd.Cooling	III-360				
1.2.6 W/S Air Gap Filter/Drying	III-364				
1.2.7 Engine Extract.Air Sys.	III-367				
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1.6.3 Flt. Augmentation Control	IV-152				
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WBS Level	Technical Description & Character	State-of-the Art & % Dev. Analysis	Technical Drivers	Schedule/ Milestones	Cost
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1.7.3 Crew Station Accom.	IV-268				
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1.7.5 Aft Escape Hatch	IV-278				
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1.8 Alighting and Arresting	IV-373	IV-412	IV-408	IV-417	IV-426
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1.10.4 Flight Director Computer	IV-564				
1.10.5 Ground Tests					



WBS Level	Technical Description & Character	State-of-the Art & % Dev. Analysis	Technical Drivers	Schedule/ Milestones	Cost
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2.20 Design Support					II-166
2.21 Other R&D Testing					II-168
2.22 Program Management					II-174
2.23 Logistics Support					II-184
2.24 Weapon System					II-193
3.0 Major Airframe Mating	II-237			II-249	II-239
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4.41.3 Instrumentation	II-438				II-448
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5.50 GSE Basic					II-503
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WBS Level	Technical Description & Character II-581	State-of-the Art & % Dev. Analysis	Technical Drivers	Schedule/Milestones	Cost
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6.60 Spares Basic					II-584
6.61 Spares Overhaul & Repair					
7.0 Special Test Equipment					II-603
8.0 Tooling					
8.80 Dimensional Tooling					II-611
8.81 Contract Supplemental Tooling					II-613
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9.91 Training					II-675
9.92 Publications					II-675
9.93 Photographic Photo Lab					II-676
9.94 Reliability					II-676
9.95 Producibility					II-676
9.96 Computing					II-676
9.97 Photo Template Lab					II-676
9.98 Termination Costs					II-676



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## SECTION II WORK BREAKDOWN STRUCTURE

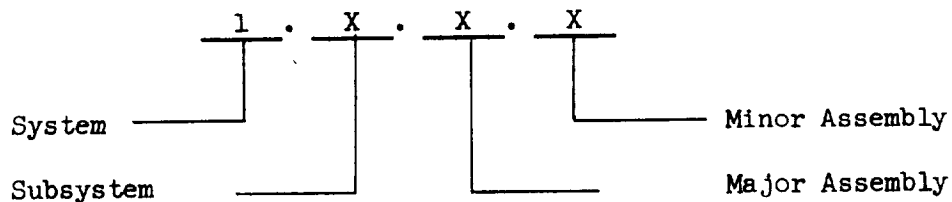
The development of a Work Breakdown Structure (WBS) was a prime objective of Phase I. The WBS had to be designed to accommodate cost, schedule and technical data related to the B-70 aircraft subsystems and provide a logical grouping of other program elements not directly related to the subsystems. The Work Breakdown Structure developed for this study is contained in Exhibit 1, page I-19 and I-20.

To maintain consistency of terminology with the previous Apollo CSM and Saturn S-II studies and to place the B-70 WBS levels at the corresponding levels of the NASA WBS framework, the following WBS level designations have been made:

<u>NASA WBS Level</u>	<u>Description</u>	<u>NR WBS Level</u>
3	Program	1
4	System	2
5	Subsystem	3
6	Major Assembly	4
7	Minor Assembly	5
8	Components	6
9	Piece Parts	7

In all cases, where WBS levels are discussed, the NASA level number and corresponding description will be used.

As an aid to the accumulation and organization of the study data, a modified decimal coding system has been developed. This coding scheme provides a digit denotation for each level 4 through 9 item with the levels segregated by a decimal point. For example:





The WBS (Exhibit 1, page I-19 and I-20) contains the codes assigned to each level 4, and 5 item. Volumes II, III and IV of the Final Report are organized to be consistent with the WBS.

The following paragraphs contain the definition of each level 4 WBS item. Individual sections of Volumes II, III and IV will provide a thorough definition of the level 5 items and discuss the cost, schedule and technical data located at each WBS level.

## II-1 Level 4 Definitions

### 1.0 Air Vehicle (Volume II, Page II-1 )

This WBS level 4 item contains all costs associated with the:

- a) engineering and development testing required to develop vehicle and subsystem design criteria and performance specifications. (WBS 1.0, 1.1 through 1.11).
- b) design, manufacture and test of all models, mockups and simulators. (WBS 1.1 - 1.11)
- c) design, develop, manufacture, procure and ground test all air vehicle #1 and 2 subsystems. (WBS 1.1 through 1.11)
- d) partially design, develop, manufacture, procure and ground test Air Vehicle #3 subsystems exclusive of the Bomb and Navigation System. (WBS 1.1 - 1.11)
- e) fabricate subsystem provisions, systems installation, manufacturing and flight test checkout and preflight operations (WBS 1.12) for Air Vehicles #1 and 2.
- f) modification and rework as the result of the flight test program but exclusive of major air vehicle repair due to accidents. (WBS 1.1 - 1.11)
- g) North American Rockwell in-house costs associated with the technical integration and installation of Government Furnished Equipment (GFE). See Page I-16 for a list of GFE items.

Specifically excluded from this WBS item are:

- a) engineering effort associated with the Weapon Systems (WBS 2.24).
- b) procurement of Weapon System components (WBS 2.24).
- c) program management activities (WBS 2.23).
- d) flight test activities after first flight of Air Vehicle #1 and 2 (WBS 4.41).

- e) major airframe mating activities including the tank sealing and wing joining problems (WBS 3.0).

Cost data is presented within this WBS item by Element of Cost (EOC) and Subdivision of Work (SDW). Section III of this volume contains the definitions of the EOC's and SDW's.

Schedule and technical data is presented to enable the user to evaluate, analyze and compare the cost data with other programs and/or subsystems. Data presented include:

- a) technical description of all level 5 and 6 items
- b) technical drivers influencing subsystem development
- c) technical characteristics
- d) Subsystem state-of-the-art ratings
- e) percent subsystem developed compared to a production article
- f) development summary
- g) schedule design/programmatic impacts
- h) subcontractor cost summaries and discussion.

Volume III and IV contain all subsystem cost, schedule and technical data. The volumes are arranged by subsystem WBS number (level 5). Individual subsystems should be consulted for detail definitions and contents.

#### 2.0 Program Technical Support (Volume II, Page II-130 )

This WBS element contains five level 5 items (2.20 through 2.24). WBS 2.20 Design Support and WBS 2.21 Other R&D Testing are presented as information only. No study cost data is provided for these items. Costs associated with 2.0 is the summation of data contained in 2.22, 2.23 and 2.24. A description of all five items in this element is presented below.

#### 2.20 Design Support (Volume II, Page II-166 )

This WBS item is utilized to display, as information only, a matrix of the Engineering groups and disciplines designated on the WBS as "Design Support". This matrix provides the user with the ability to isolate and remove from 1.0 Air Vehicle and subsystems (WBS 1.1 through 1.11) those costs associated with design support.

## 2.21 Other R&D Testing (Volume II, Page II-168 )

The WBS item is utilized to display, as information only, a matrix of the Engineering labs and model shop designated on the WBS as "Other R&D Testing". This matrix provides the user with the ability to isolate and remove from the air vehicle (WBS 1.0) and the subsystems (WBS 1.1 through 1.11) those costs associated with R&D testing activities.

## 2.22 Program Management (Volume II, Page II-174 )

This WBS item is comprised of costs required for the following functions:

- a) control of program costs and technical accomplishments.
- b) operational, maintenance and functional configuration analysis.
- c) support personnel to associate contractors and subcontractors engineering representatives.
- d) final preparation of reports and data for presentation to the customer.

Engineering groups supporting this WBS item are: Data Control; Operation Planning; R&D Project Administration; Proposal and Procurement Control; Design Illustrations; Mechanical & Propulsion Administration; Operations Administration; Engineering Administration; R&D Programming; Advanced Projects and B-70 Project Group.

## 2.23 Logistics Support (Volume II, Page II-184 )

This WBS item contains the costs associated with the:

- a) labor required to perform packaging studies
- b) design and development of the maintenance concept, support operation analysis, and maintenance program necessary to sustain the end product
- c) development of product performance reporting system.
- d) analysis of product performance data collected from test operations
- e) analysis, determination and delineation of individual tasks, expressed in terms of methods, equipment, facilities and personnel, required to maintain the end product.



f) field service

2.24 Weapon System (Volume II, Page II-193 )

This WBS item includes the engineering analysis, design, development, development testing, production and procurement of any components, assemblies or subsystems related to the weapon system as defined in the original Weapon System 110A program requirements. The weapon system was deleted as a vehicle subsystem when the program was redirected to a single prototype aircraft program in late 1959. The weapon system was reinstated on Ship #3 but was subsequently cancelled when Ship #3 was eliminated in early 1964.

3.0 Major Airframe Mating (Volume II, Page II-237 )

Cost associated with this WBS item contain the manufacturing and flight test support personnel involved in joining the major airframe section of Vehicles #1 and 2. Problems associated with this effort, primarily on Ship #1, include sealing of the fuel tanks and joining of the wings. Costs related to these problems are contained in this item. System installation, checkout and preflight activities occurred during this period and are excluded from this item (See WBS 1.12). Consult Volume II, Page II-237 for a detail discussion of the major airframe mating activities.

4.0 Flight Test Program (Volume II, Page II-251 )

This WBS item contains all flight operations costs for Vehicles #1 and 2 after the initial flight. Engineering, logistic, quality control and manufacturing support personnel are included in this WBS block. Costs of final operations and preflight activities (WBS 4.40) are not included as they cannot be segregated from the installation and checkout costs. Final operations and preflight costs are displayed in WBS 1.12. Included in this item are flight operations, air vehicle maintenance, instrumentation effort after first flight, post flight evaluation and major air vehicle repair as the result of malfunction or accidents.

5.0 Ground Support Equipment (Volume II, Page II-487 )

This WBS item contains the effort associated with the design, development, production and/or procurement and maintenance of manufacturing and flight test Ground Support Equipment.

6.0 Spares (Volume II, Page II-581 )

This WBS item includes the cost required to fabricate and/or procure spare parts. It also includes the preparation and maintenance of data necessary for the acquisition, control, storage, release from storage and repair of materials, parts and equipment designated by con-

tract as spares. Specifically excluded are those articles fabrication for Ship #3 but utilized as spare parts when ship #3 was cancelled.

7.0 - Special Test Equipment (Volume II, Page II-603 )

Included in this WBS item are the tasks required to design, fabricate and/or procure special test equipment utilized by Engineering, Manufacturing, Quality Control and Plant Engineering.

8.0 - Tooling (Volume II, Page II-611 )

This item contains those costs required to design, fabricate and/or procure in-house dimensional tooling, supplemental tooling and handling equipment. It excludes tools provided by a subcontractor during the performance of the subcontract but includes in-house tooling provided, in some cases, to a supplier.

9.0 - Other (Volume II, Page II-675 )

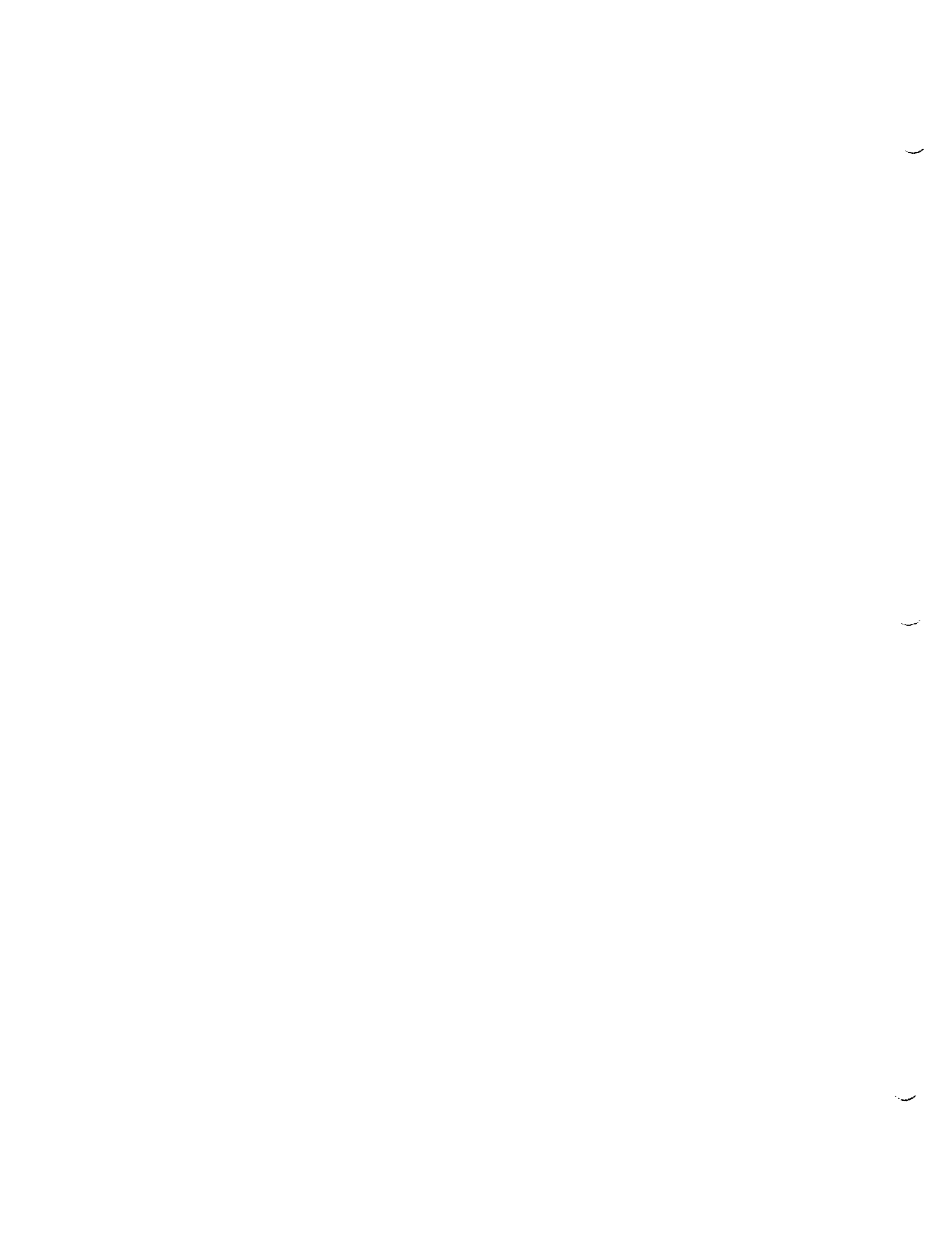
This item includes all other activities and tasks not associated with any other element of the WBS. It includes such tasks as preproduction and manufacturing, training program, publications, reliability, producibility and termination costs. Volume II, Page II-675 provides a detail description of those items assigned to this WBS element.

II-2 Government Furnished Equipment

Listed below are those items identified as Government Furnished Equipment in the Air Vehicle Specification Document.

<u>WBS Number</u>	<u>Description</u>
<b>Propulsion Subsystem</b>	
1.3.1	YJ-93-GE Engines
1.3.7.1	RPM Gages
1.3.7.2	EGT Gages
<b>Secondary Power Subsystem</b>	
1.4.1.4.2	Pressure Gages
1.4.1.4.3	Pressure Sensors
1.4.5.1.2	Emergency Generator
1.4.5.1.3	Voltage Regulator
1.4.5.1.6	Battery
<b>Personnel Accommodations &amp; Escape Subsystem</b>	
1.7.1	Personnel Equipment
1.7.2.1	Converters
1.7.2.2	Check Valves
1.7.2.5	Quick Disconnects.
1.7.2.8	Capsule O <sub>2</sub> Cylinder
1.7.2.9	O <sub>2</sub> Pressure Regulator

<u>WBS Number</u>	<u>Description</u>
1.7.2.12.1	Quantity Indicator
1.7.2.12.2	Mode Switch
1.7.3.2	Fire Extinguisher Cylinder
1.7.3.3	Relief Container
1.7.4.5	Survival Equipment
<b>Mission and Traffic Control Subsystem</b>	
1.9.1.1.1	Receiver/Transmitter
1.9.1.1.2	Control Unit
1.9.1.1.3	Antenna Selector Unit
1.9.1.1.6	RF Transmission Line Switch
1.9.1.2.2	Communications Control
1.9.1.2.3	Ground Intercom Control
1.9.2.1.1	Glide Slope Receiver
1.9.2.1.2	Localizer Receiver
1.9.2.1.3	Control Assembly
1.9.2.1.5	Marker Beacon Receiver
1.9.2.2.1	Receiver/Transmitter
1.9.2.2.2	Control Indicator Assembly
1.9.2.2.3	Antenna Selector Unit
1.9.2.2.6	RF Transmission Line Switch
1.9.3.1	Receiver/Transmitter
1.9.3.2	IFF Control Assembly
1.9.3.4	Antenna Lobing Switch
<b>Flight Indication Subsystem</b>	
1.10.2.1	Horizontal Situation Indicator
1.10.2.2	Attitude Director Indicator
1.10.2.4	Standby Gyro
1.10.3.1.1	Pitot Static Tube
1.10.3.1.3	Pneumatic Lines
1.10.3.1.4	Electrical Heater
1.10.3.6	Airspeed/Mach/Safe Speed Indicator
1.10.3.6.5	Amplifier
1.10.3.7	Altitude/Vertical Speed Indicator
1.10.3.7.5	Amplifier
1.10.3.9	Standby Altimeter Indicator
1.10.3.10	Clock
1.10.4	Flight Director Computer







# FOLDOUT FRAME

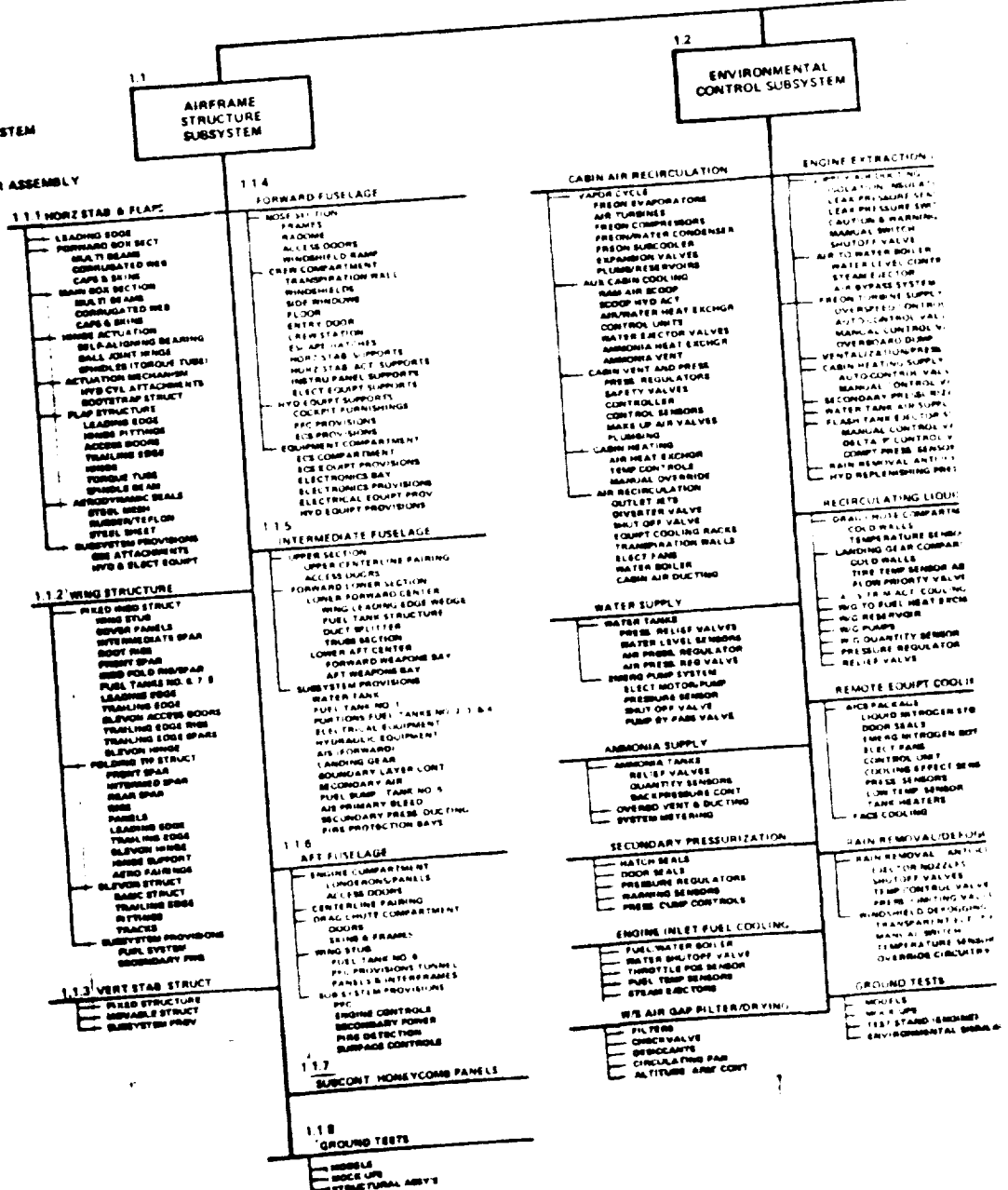
WBS LEVEL

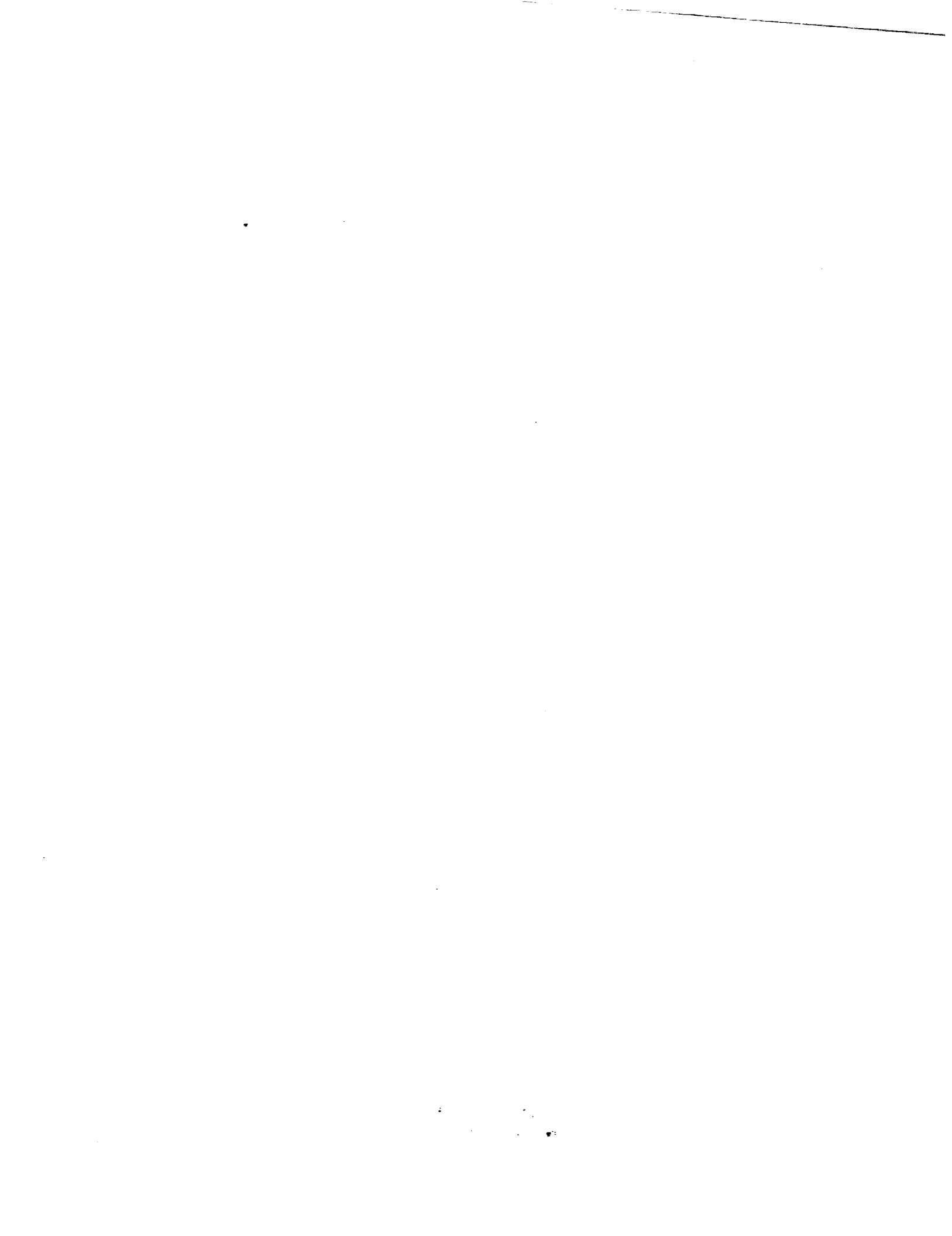
3 PROGRAM

4 SYSTEM

5 SUBSYSTEM

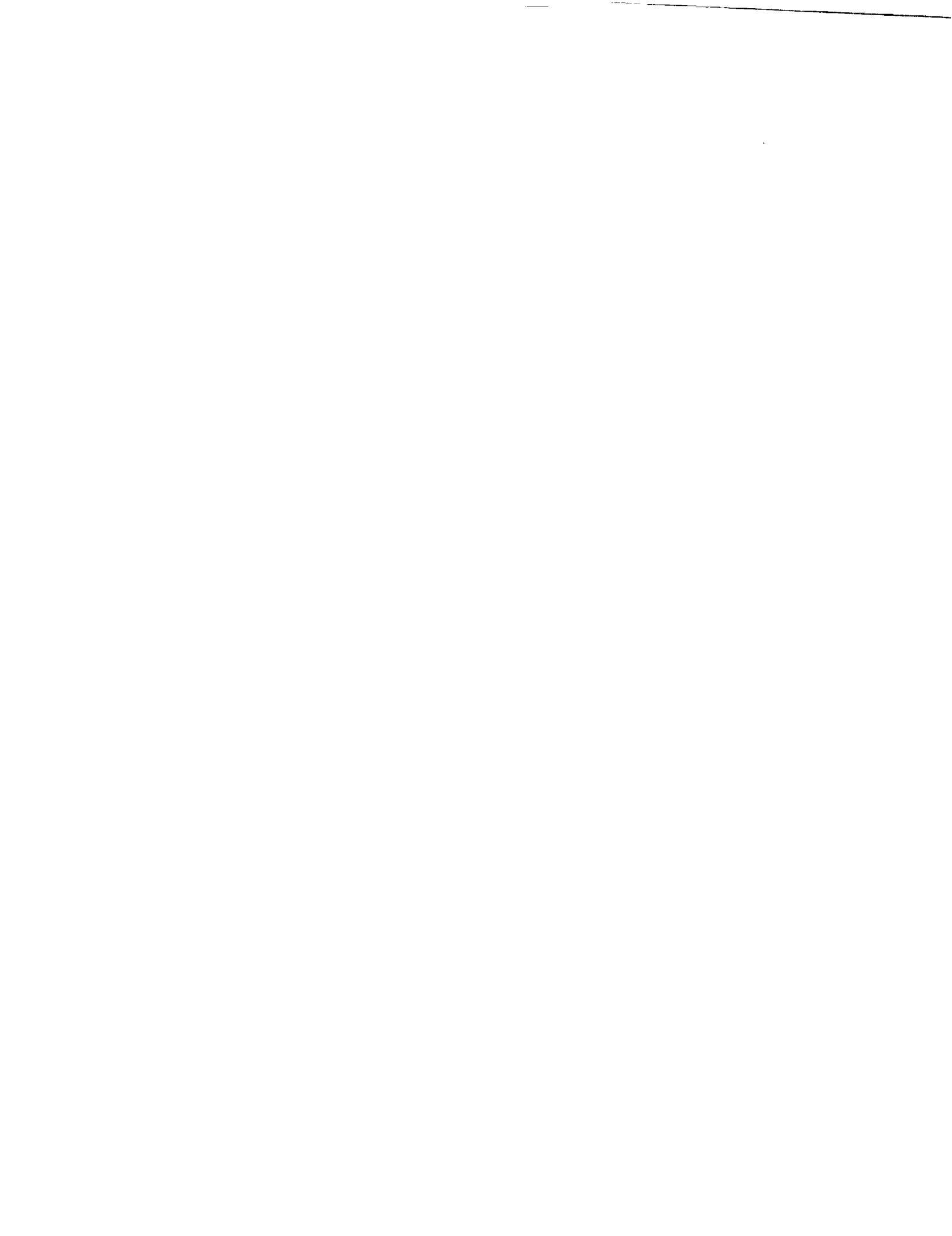
6 MAJOR ASSEMBLY









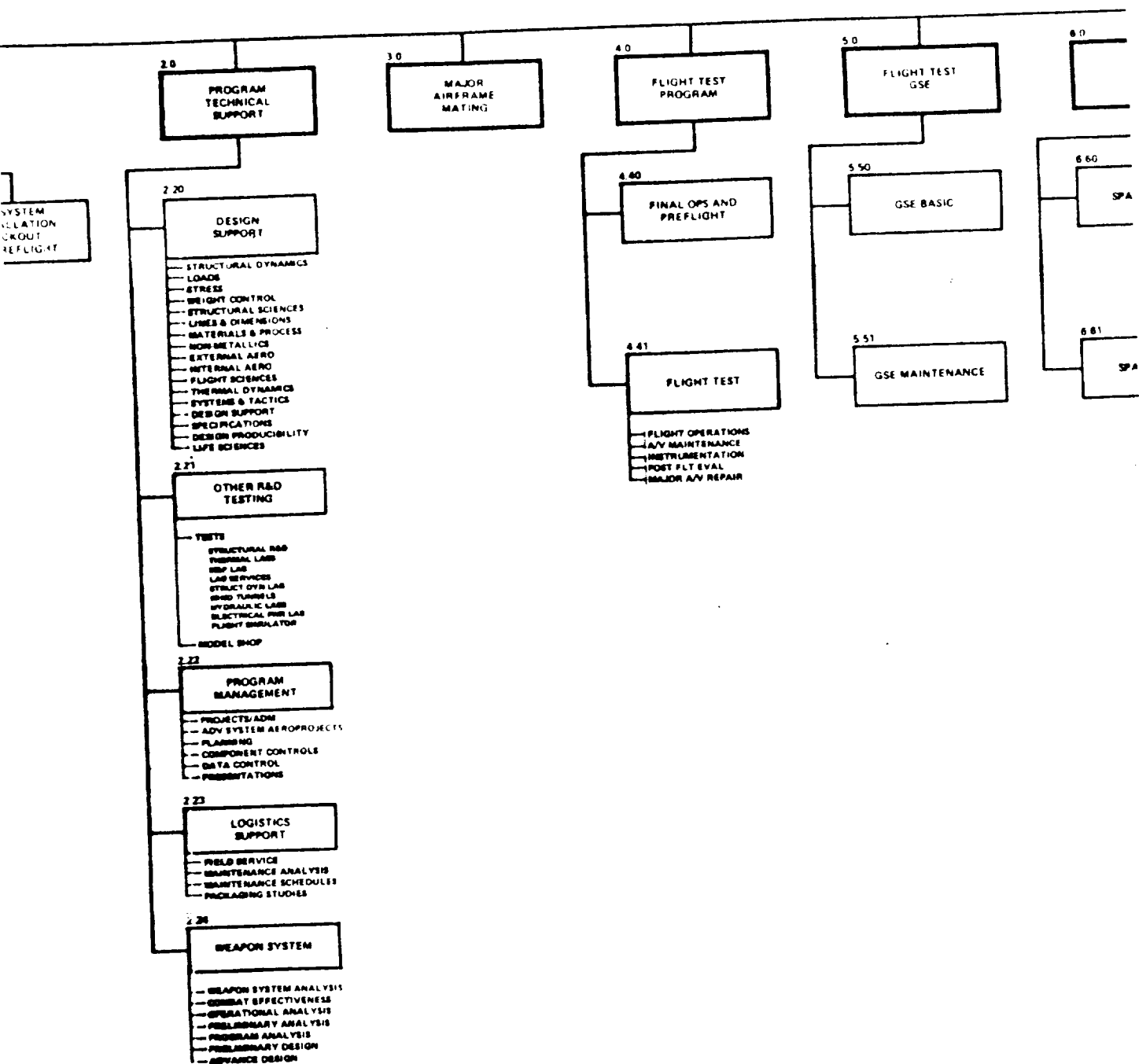






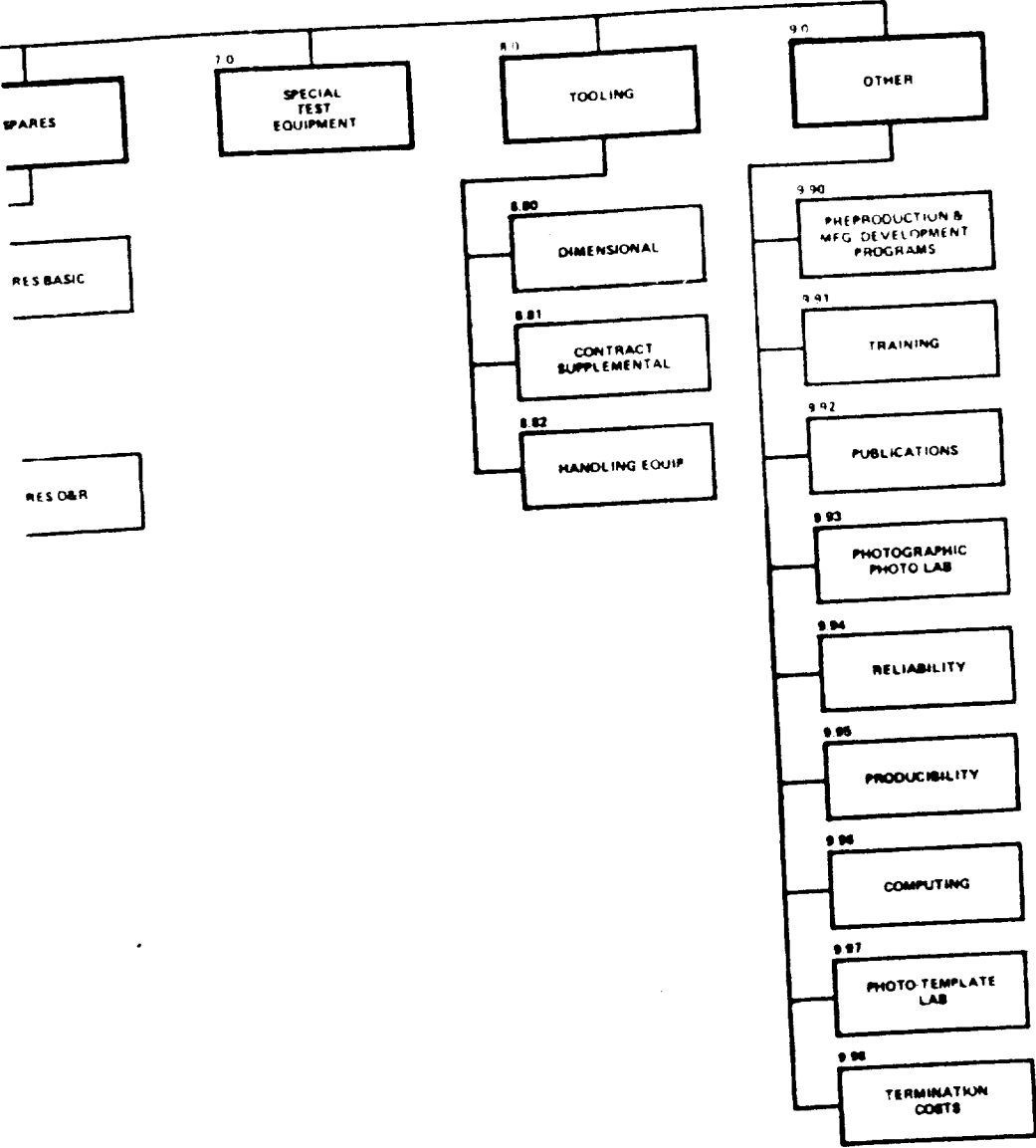












B-70 WORK BREAKDOWN STRUCTURE  
 NASA CONTRACT NAS-12148  
 PREPARED BY  
 NORTH AMERICAN ROCKWELL SPACE DIVISION  
 B-70 STUDY TEAM  
 APRIL 1972

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EXHIBIT 1  
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THE UNIVERSITY OF CHICAGO

## SECTION III COST DATA ORGANIZATION AND DEFINITION

III-1 General

The primary objective of the cost data contained in this document is to provide the user with a time-phased history of the North American Rockwell recorded costs for each item of the Work Breakdown Structure where cost data can be obtained. Complete cost data has been presented for each level 5 subsystem, and for each level 6 major assembly within the Airframe Structure (WBS 1.1).

Recorded cost data has been generated primarily from the Los Angeles Division 514 Cost Accumulation Statements. Financial ledger records, manufacturing and engineering departmental records, and subcontractor cost reports have been utilized to provide greater visibility in restructuring the cost data into the approved study formats. Methods and procedures for this restructuring were presented in the Phase I Report (SD71-189 dated September 24, 1971). Minor variations to these procedures have occurred during the conduct of Phase II activities. These variations have been reviewed and approved by the NASA Technical Monitor.

The cost data has been time-phased to enable the analysis and correlation of this data to the schedule milestone and technical data contained in the report. Time-phasing has been on six-month centers with March and September selected as the cut-off months. September is the end of the NR fiscal year and March represents the fiscal year mid-point. All time-phased cost data is presented in rate (decum) form. Costs reported at September are the cumulative costs from April through September. Costs reported at March are the cumulative costs from October through March.

March of 1958 is the initial time period of the study. Data recorded at this month reflects NR expenditures from contract award (December 1957) to the end of March. Time-phased cost detail continues until September of 1966, which encompasses the point at which the program objective of sustained Mach 3 flight was achieved. Preliminary study and design effort prior to the contract award in December 1957 and the Air Force and NASA flight research programs beginning in late 1966 are excluded from the time-phased cost detail. The Program Abstract beginning on page I-29 of this volume should be consulted for details of the pre-award and post evaluation time periods.

The cost data has been structured and reported to be consistent with NASA document MFOO2M, the Apollo CSM and Saturn S-II Studies. Data assigned to each WBS item is catalogued by Subdivision of Work (SDW). Within each SDW all costs are reported by Elements of Cost (EOC). The Subdivisions of Work utilized for this study are:

Design/Engineering

Production

Tooling and STE

Test/QC

Other

The Elements of Cost are:

Design/Engineering Hours  
Labor Dollars  
Burden Dollars

Shop Support Hours  
Labor Dollars  
Burden Dollars

Production Hours  
Labor Dollars  
Burden Dollars

Tooling and STE Hours  
Labor Dollars  
Burden Dollars

Planning Hours  
Labor Dollars  
Burden Dollars

Test/QC Hours  
Labor Dollars  
Burden Dollars

Engineering Material  
Manufacturing Material  
Tooling and STE Material  
Subcontract  
Material Procurement Cost

Other Cost Dollars  
Wind Tunnel

General and Administrative Expense  
IDWA

### III-2 Subdivision of Work

The Subdivisions of Work are designed to present the cost data at a level which would identify its functional relationship. The assessment and identification of costs to a particular Subdivision of Work were based on the accounting definition of the Elements of Cost in relation to the contractual Statements of Work. The definitions of the Subdivisions of Work are:

### Design/Engineering

Costs classified in this SDW represent the effort associated with the study, analysis, design, development, evaluation and redesign of specific elements of the WBS. This includes the preparation of specifications, drawings, parts lists, wiring diagrams, technical coordination between engineering and manufacturing, vendor coordination data reduction, report preparation, determination of specification and requirements for reliability, maintainability and quality control.

### Production

Included in this SDW are the costs for fabrication, processing and sub-assembly, final assembly, line inspection, planning, rework, modification, experimental production and installation of parts and equipment of all hardware items produced under this contract whether deliverable or not. Specifically excluded is the production of the test hardware and the models and mockups utilized in the development program. Cost associated with these items is included in the Test/QC SDW. Included in the Production SDW are those costs associated with the designation and implementation of the necessary controls to ensure that a manufacturing process meets prescribed standards, and the establishment of acceptable quality level and statistical methods for determining performance of manufacturing processes.

### Tooling and STE

This SDW contains cost associated with the planning, design, fabrication, assembly, inspection, installation, modification, maintenance and rework of all tools, dies, jigs, fixtures, gauges, handling equipment, work platforms and manufacturing special test equipment. Included are costs for determining tool requirements, tool engineering, maintaining tool records, scheduling and controlling all tool orders, programming and preparation of tapes for numerically controlled machine parts, preparation of templates and patterns and start-up and closeout costs incurred in the production operations.

### Test/QC

The costs displayed in this SDW are associated with the performance of (1) tests on all components, assemblies, subsystems and systems to determine operational characteristics and compatibility with the overall system and its intended operational/nonoperational environments (such tests include design feasibility, design verification, reliability, etc.), (2) tests on parts, systems and integrated systems to verify they are unconditionally operationally suitable for their intended use (these tests are conducted on hardware or final designs that have been produced, inspected and assembled by established methods); (3) tests performed by two or more contractors to substantiate the feasibility, development, qualification, or acceptance of interface and/or interface system compatibility; (4) test planning and scheduling, data reduction and report preparation; (5) fabricating all models, mockups, breadboards,

simulators, etc., utilized by Engineering in the development program. The Shop Support Element of Cost within this SDW contains all of this production effort.

#### Other

This SDW contains only those costs identified as subcontractor termination costs. All data in this SDW can be located in WBS 9.98.

### III-3 Elements of Cost

The Elements of Cost contained in this study to further define the cost data are those used in a typical accounting system and consist of direct and indirect charges. The direct costs are those that can be readily and practically identified to a particular project or task. The indirect costs are those that cannot be readily identified to a contract and are therefore pooled and applied as a rate to the direct hours and/or dollars. These costs consist of indirect labor (Financial, Purchasing, Security, Contracts and Pricing) occupancy costs, depreciation and similar costs that are not directly associable to a contract. The definition of all Elements of Cost utilized in this study are as follows:

#### Design/Engineering Direct Labor Hours and Dollars

The costs displayed in this EOC are the direct hours and dollars classified by the Division accounting structure as constituting the base over which the Engineering burden pool is distributed. Examples of types of effort classified in this EOC are: Design Engineering, Reliability, PERT, Logistics Engineering, Facilities Engineering, Quality Assurance Engineering, Laboratory and Test Technicians, Drafting, GSE Design, Project Management and Associate Contract Administration. Overtime premiums and shift premiums are included.

#### Engineering Burden Hours and Dollars

This EOC includes all engineering overhead costs which cannot be readily identified with individual projects, systems or tasks. It is applied to all direct labor hours generated in the Design/Engineering. Examples of types of costs included in this burden pool are: Fringe benefits, such as employee vacations, sick leave, holiday pay, conventions, seminars, retirement, and savings plans; secretarial personnel, support personnel, supplies, depreciation, rentals, taxes, insurance and occupancy costs.

#### Production Direct Labor Hours and Dollars

This EOC contains the cost for those types of effort required to fabricate and assemble all hardware (except developmental items) associated with the B-70 Program including Ground Support Equipment and Spares. Types of effort include: preproduction, fabrication and assembly, rework and replacement, and packing and crating. Overtime premiums and shift premiums are included.

#### Shop Support Direct Labor Hours and Dollars

Costs in this EOC reflect the same types of effort described in the Production EOC. Effort accumulated against this EOC is in support of Engineering for the production of models, mockups, simulators, and experimental hardware of all types. Overtime premiums and shift premiums are included.

#### Planning Direct Labor Hours and Dollars

Included in this EOC are all direct hours and dollars associates with the Planning effort in support of Production, Shop Support, Tooling, and STE. Overtime premiums and shift premiums are included.

#### Tooling and STE Direct Labor Hours and Dollars

Costs identified to this EOC include the direct hours and dollars associated with the design, fabrication and assembly of contract supplemental tooling, special test equipment, dimensional tooling and handling equipment.

#### Test/QC Direct Labor Hours and Dollars

The costs displayed in this EOC are classified as the test and quality control effort necessary to support the inspection of manufactured equipment and tooling, perform systems and component quality verification tests, procurement quality control, QC lab, and support to combined systems and vehicle checkout. Test and quality control costs displayed as an EOC under the Design/Engineering, Tooling and STE, and Production SDW's are associated with the inspection function. The balance of the costs are shown under the Test/QC SDW. Overtime premiums and shift premiums are included.

#### Manufacturing Burden

This EOC included all manufacturing overhead costs which cannot be readily identified with individual projects, systems, or tasks. The burden is distributed over all direct labor hours generated by the Production, Shop Support, Planning, Tooling and STE, and Test/QC Elements of Cost. Examples of the types of costs included in this burden pool are: fringe benefits such as employee vacations, sick leave, holiday pay, conventions, seminars, retirement, and savings plans; secretarial personnel, supplies, depreciation, rentals, taxes, insurance and occupancy costs.

#### Engineering Material

Included in this EOC is the cost for raw materials and purchased parts that are required to support the research and development effort.



### Manufacturing Material

This EOC includes the cost of raw materials and purchased parts, other than subcontracted items, that are required to support the production effort of this contract.

### Tooling and STE Material

The cost of raw materials, purchased tooling and purchased parts, other than subcontracted items, that are required to support the tooling and special test equipment effort are included in this element of cost.

### Subcontracting

The costs associated with the major and minor subcontractor effort and various small miscellaneous subcontractor effort are included in this Element of Cost. Identification of the supplier's engineering, production, tooling and testing effort is provided by the Subdivision of Work. All supplier costs are associated to these SDW's utilizing the same definitions, as far as possible, as the in-house costs. See the previous section for SDW definitions.

### Material Procurement Costs

This EOC includes all in-house material overhead costs for procurement, receiving inspection, warehousing and in-plant handling of material and subcontract purchases. These costs are distributed over all direct material and subcontract purchased dollars.

### Other Costs

This EOC includes the costs accumulated for travel expense, subsistence, and air fares of all direct classified personnel on this program; the cost of automatic computation support (Data Processing), supplier's claims, and payroll expense applicable to offsite effort.

### General and Administrative Expense

The costs displayed under this EOC include the general and administrative expenses which are incurred in the direction of the contract as a whole as contrasted with the burden expenses of engineering, manufacturing and material. This burden is applied as a percent of the total work-in-process dollars (direct and indirect costs) generated by the contract. Included in the G&A pool are such items as: wages and salaries of personnel in those departments whose effort is in support of all in-house contracts, supplies and expenses, indirect employee benefits, proposal expense, welfare and recreation expense, depreciation, taxes, insurance, cafeteria and vending operations, executive offices allocations including allowable research costs, telephone and telegraph, and equipment rentals.



### IDWA (Interdivisional Work Authorizations)

IDWA's are issued to the supporting divisions of North American Rockwell to capitalize on their many and varied talents and skills. This EOC has been established to collect the recorded costs of the tasks transferred to these other divisions. The costs are segregated into engineering, production, tooling and testing and are assigned to the WBS item they support.

#### III-4 Non-Recurring/Recurring

All cost data contained in this report are classified as non-recurring costs. The B-70 program did not reach production status as only two complete aircraft were constructed. These two aircraft were utilized as major test hardware. By Air Force direction the vehicles were classified as research vehicles to demonstrate design, fabrication and technical feasibility of long range Mach 3 flights at high altitudes. As the result of this Air Force direction both vehicles were utilized as manufacturing training aids, with Air Vehicle No. 1 used as a functional mockup and a static test article.



## SECTION IV PROGRAM SUMMARY DATA

IV-1 Program Abstract

The Air Force established a requirement for a Mach 3 advanced strategic bomber in early 1954. This bomber was to replace the aging B-52. The program was designated WS110-A. The Air Force, NASA and several Air Frame contractors had performed conceptual studies of this weapon system for several years prior to the publication of the requirements.

In July, 1955, the Air Force requested competitive bids for Weapon System 110-A. Study contracts were awarded in November, 1955 to North American Aviation and Boeing Aircraft Companies for the preliminary design effort of the Weapon System. Government funded value of these contracts were approximately \$10 million each. At the same time IBM was awarded a similar contract for preliminary design of the Bombing/Navigation System.

The Air Force selected North American Aviation as Weapon System Manager in January 1958 and work began on Phase I of the Weapon System development. This effort included development engineering and testing, performance specification development, selection of major subcontractors and a mockup inspection in March 1959. The initial program called for first flight by July 1962, and the first operational wing (45 A/V) by December 1965. In January 1958, the Air Force accelerated the program with first flight by January 1962 and first operational wing (65 A/V) by September 1964. In October 1958, the Air Force revised this schedule with a stretch out after first flight and the first operational wing (62 A/V) by September 1965. In October 1959, the Air Force again went to an austere program though deletion of high cost simulators, design simplifications, soft tooling, and discontinuance of intensive honeycomb brazing and welding development effort. Under this program, the first operational wing was scheduled for December 1965, with first flight still planned for January 1962.

By December 1959, basic solutions to major technical problems had been resolved and engineering drawings were being prepared. Development was well advanced and considerable development hardware was in existence. In December 1959, the B-70 program was redirected from a 62 aircraft program with full qualification to a single air vehicle (XB-70) and minimum effort airworthiness test program. The IBM B/N System effort was transferred to an Air Force contract and continued at a reduced rate. The defensive subsystems and the Mission and Traffic Control subsystem contracts were terminated and subcontracted airframe work at Boeing, Lockheed and Chance-Vought was withdrawn.

On September 19, 1960, North American Aviation was advised to proceed with the Design, Development, Fabrication and Test of one XB-70 prototype and 11 YB-70 aircraft. This would include development of all major systems needed for an operational Mach 3 bomber.

Six months later the program was redirected again to a prototype development program consisting of three aircraft. The major objectives of this program were to design, fabricate, and demonstrate the technical feasibility of a high altitude, long range, Mach 3 type vehicle and to demonstrate the operation of an integrated prototype bombing navigation system on the 3rd air vehicle. Air Vehicle Number 3 was cancelled in March of 1964 and with it went the objective to demonstrate the operation of an integrated bombing navigation system.

The first air vehicle was rolled out on May 11, 1964. First flight occurred on September 21, and by October 24 four flights totaling 5 hours and 2 minutes had been accomplished and Mach 1.42 had been reached. The second XB-70 was rolled out on May 29, 1965 and flew on July 17 reaching Mach 1.4 and 40,000 feet. Air Vehicle number 2 completed the demonstration of the program objectives on May 19, 1966 when it flew in excess of Mach 3 for 33 minutes.

The flight test phase to demonstrate the program objectives ended in late July 1966. At this point NAA entered into two contracts with the Air Force and NASA to use Air Vehicle Number 1 as a test bed. Under these contracts NAA maintained the aircraft and provided modifications as required for the conduct of these test programs. These tests were concluded in February of 1969 when the remaining air vehicle was flown to Dayton, Ohio and placed in the museum at Wright Patterson Air Force Base.

#### B-70 Contract Summary

North American Aviation conducted preliminary design studies on a SAC bomber under Air Force Contract AF33(616)-2367. Recorded costs against this contract were \$246,550 when the contract was completed in February 1956. Two additional Pre-Phase I contracts were awarded North American. AF33(600)-31801 covered the period from March of 1956 through June of 1957. Total expenditures charged against this contract were \$7,465,066. July 1957, through Weapon System 110-A contract award in December 1957 was covered under Air Force contract AF(33)600-36118. \$1,757,389 were recorded against this contract. Prior to the Weapon System 110-A contract award the Air Force had awarded North American \$9,469,005 in study contracts.

The Phase I contract designating NAA as Weapon System Contractor was signed in January 1958 and formalized the first portion of the development period. This contract, AF33(600)-36599 was to provide design engineering mockups and the development of performance specifications. Concurrently General Electric was selected as an associate contractor for the propulsion system. IBM, which had been developing a bomb-navigation system under a separate prime Air Force contract, became a subcontractor to North American. The contract was definitized in August to cover the period from January 1958 through February 1959 at an estimated cost and fee of \$74,675,149. This period was subsequently extended to include time-lags in some minor areas of development. Cumulative recorded costs, exclusive of fee, were \$63,653,608.



Phase II of the program encompassed major subsystem development and the fabrication and flight test of a complete weapon system prototype. Contract AF33(600)-38669 was established for this phase with an initial negotiated value of \$120,498,828. This included cost and fee to cover subsystem development from March through December of 1959 and the airframe development from March through July of 1959. The definitive contract was signed in April 1959.

The second part of Phase II was initiated in July 1959 under a letter contract designated as Supplemental Agreement #2 to Contract AF33(600)-38669. This letter contract provided for continuation of the development activities covered by the definitive contract. The total program was redirected on December 2, 1959 to the fabrication and flight testing of a single XB-70 prototype. This redirection occurred prior to the definitization of Supplemental Agreement #2.

The program, as redirected, was definitized as Supplemental Agreement #2 in May of 1960 for a total estimated cost and fixed fee of \$180,193,324 covering the development and fabrication effort of a single XB-70 prototype through June of 1961. Total negotiated price of parts 1 and 2 under AF33(600)-38669 was \$300,692,152 exclusive of changes. Total recorded costs against this contract were \$310,908,713 which excludes fee.

As the result of congressional studies during mid-1960, a letter contract for the YB-70 weapon system development program was signed in September, 1960. This contract was designated as AF33(600)-42058, and amounted to a reinstatement of a full weapon system development program. The contract was to provide for the fabrication of 11 YB-70 systems in addition to the current requirement of 1 XB-70. However, before this contract could be definitized, it was redirected on March 31, 1961 to a three ship XB-70 prototype air vehicle program.

AF33(600)-42058 was definitized on December 19, 1961 at a total estimated cost and fee of \$449,350,125. This price included the funds expended for the YB-70 development under the letter contract and the production and delivery of three XB-70 configured aircraft. By May of 1963, the total estimated cost for the delivery of the three aircraft had grown to \$604.2M, exclusive of spares and ground support equipment.

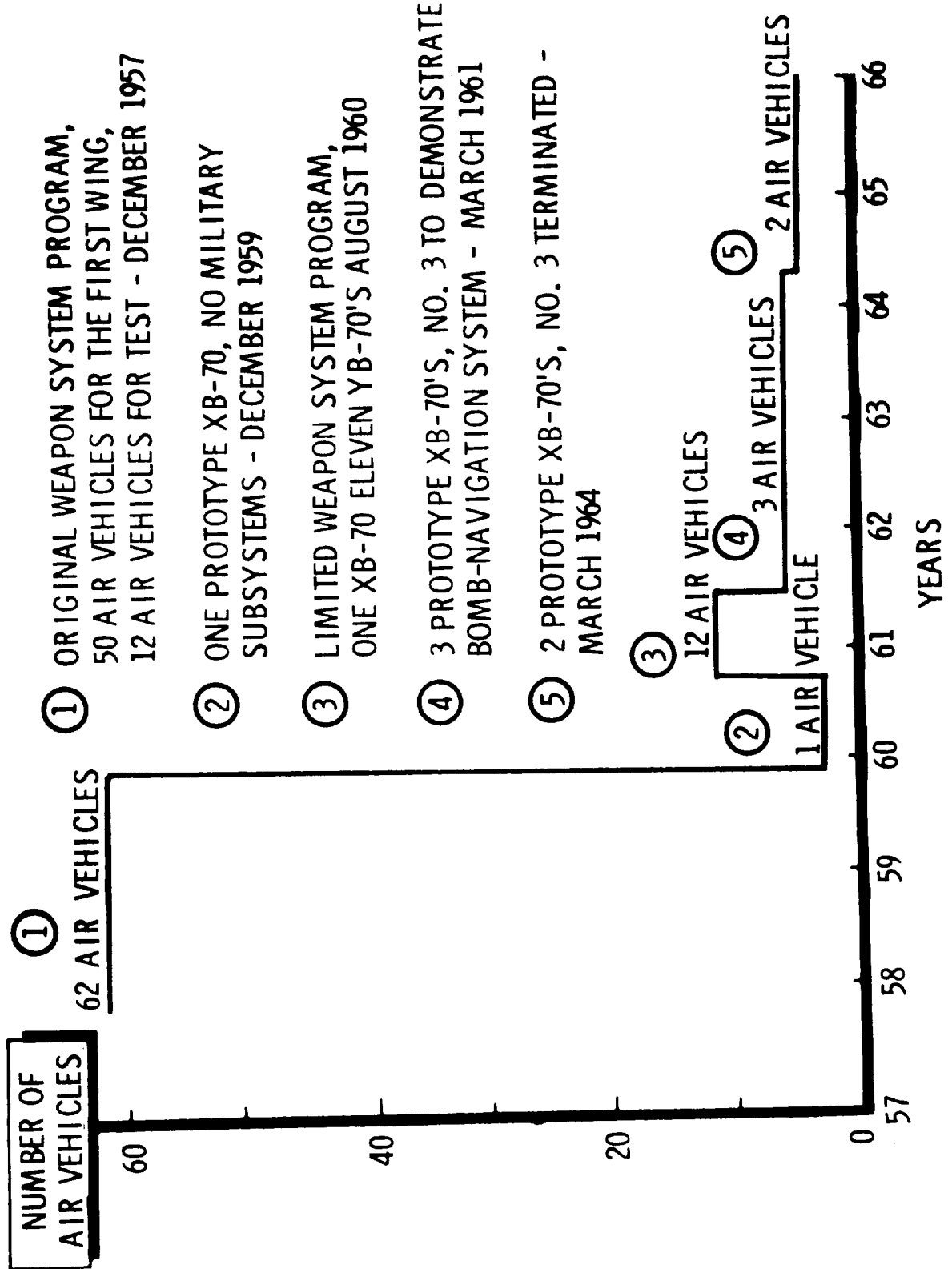
AF33(600)-42058 was reduced to a two prototype XB-70 program with the termination of Air Vehicle #3 in March, 1964. The contract value was reduced approximately 43 million dollars as a result of this cancellation. Recorded costs cumulated against this contract amounted to \$622,528,806 (exclusive of fee) including ground support equipment and spares.

The flight test portion of the XB-70 development program was procured under a cost plus incentive fee contract negotiated in mid 1964. This contract, AF33(657)-12395, had a target cost of \$36,839,883, target fee of \$2,758,561 with a 85/15 cost sharing arrangement. The performance aspects of the flight test program called for the demonstration of sustained

Mach 3 flight capability for 30 minutes and 180 flight hours over 22.5 aircraft operational months. (Refer to Volume II page II-251 for details of this program). Total recorded costs charged to this contract amounted to \$36,078,605, exclusive of fee. (Total flight test costs reported in this study are \$39,253,050 which includes support effort not associated directly with the flight test contract).

The B-70 aircraft study includes all costs generated under the Phase I and Phase II Air Force contracts and the basic flight test contract, AF33(657)-12395. Several additional research contracts were awarded to North American after completion of the basic flight test contract in June 1964. AF33(657)-15871 was initiated in mid-1966 with the first flight under the contract on November 3, 1966. A technical discussion of this program is included in Volume II page II-5. Total recorded costs were \$12,376,012. A second program, NAS4-1175, sponsored by the NASA for investigation into the control of structural dynamics was begun in early 1967. A technical description of this program is provided in Volume II page II-5. Total North American expenditures recorded against this contract were \$13,115,765.

# XB-70 PROGRAM HISTORY



- ① ORIGINAL WEAPON SYSTEM PROGRAM, 50 AIR VEHICLES FOR THE FIRST WING, 12 AIR VEHICLES FOR TEST - DECEMBER 1957
- ② ONE PROTOTYPE XB-70, NO MILITARY SUBSYSTEMS - DECEMBER 1959
- ③ LIMITED WEAPON SYSTEM PROGRAM, ONE XB-70 ELEVEN YB-70'S AUGUST 1960
- ④ 3 PROTOTYPE XB-70'S, NO. 3 TO DEMONSTRATE BOMB-NAVIGATION SYSTEM - MARCH 1961
- ⑤ 2 PROTOTYPE XB-70'S, NO. 3 TERMINATED - MARCH 1964



IV-2 Program of Significant Events 1954

October Headquarters, United States Air Force, published a General Operational Requirement for an Intercontinental Bombardment Weapon System Piloted Bomber. This bomber was to be partially chemical fueled, was to replace the B-52, and was to be active in the Strategic Air Command inventory in the general time period of 1965 to 1975. The Air Force, NACA, and selected air-frame contractors had studied this weapon system for at least two years before publication of the formal requirement. A subsequent study requirement, issued by ARDC, identified the project as "Weapon System 110A" and established 1963 as the target date for the first wing of 30 operational air vehicles.

1955

April The 110A Weapon System Project Office (WSPO) was formed as part of the Bombardment Aircraft Division, Directorate of System Management, Detachment No. 1, Headquarters ARDC at Wright Patterson Air Force Base. The WSPO presented a series of briefings to Headquarters AMC, Headquarters SAC, Headquarters ARDC, USAF Air Staff, USAF Air Council, and the Department of Defense outlining its proposed program for the WS 110A development and delivery.

July Subsequent to the Deputy Chief of Staff direction of 21 June to proceed with the Weapon System 110A development, a joint ARDC/AMC Source Selection Board proposed a list of six eligible contractors for program development. Of these six contractors, only North American Aviation and the Boeing Airplane Company chose to submit proposals and both companies were awarded Phase I contracts.

1956

April At this time a preliminary design proposal was submitted in support of a scheduled mock-up review in November 1957, first flight in March 1960 and equipage of the first SAC wing by December 1963.

October As a result of various Air Force reviews, which took place in July and September, Headquarters USAF directed that Phase I development of Weapon System 110A be discontinued and that North American and Boeing be permitted to continue their studies only on a reduced research and development basis. This decision was based on the fact that the proposals included factors such as air vehicle gross weight of 750,000 pounds and would require tremendous floating wing panels. Further technical direction was provided to both contractors for further study.





1957

- July Both contractors submitted study reports outlining their findings based on the revised technical direction and presented briefings to Headquarters ARDC, AMC, SAC and USAF. On August 30, 1957 Headquarters USAF directed the initiation of a 45-day competitive design period to be culminated with onsite inspections of the contractors' facilities by a source selection board evaluation group. The onsite reviews occurred at North American & Boeing in October and November respectively.
- November The review team captains from ARDC, AMC and SAC reported their findings to the respective commanders at Wright Patterson Air Force Base who in turn submitted separate sealed recommendations to the Secretary of the Air Council.
- December On the 23rd, Headquarters USAF announced that North American had been selected as Weapon System 110A contractor and had been awarded a phase I contract. Concurrently, ARDC and AMC were directed to determine the degree to which the program could be accelerated in an effort to equip the first SAC wing at the earliest possible date.

1958

- May Pending resolution of air vehicle configuration considerations with the Air Force, all effort on the full scale mockup was stopped. Alternate plans for static and fatigue testing based on revised funding levels were also in preparation.
- July On 3 July, the Strategic Air Command selected the name Valkyrie for the B-70 after holding a contest in which more than 20,000 entries were submitted by pilots and airmen throughout the world.
- August Contract AF33(600)-36599 for D.E.I. and mockup was definitized for a total price of \$74,675,149, and covered the period from January 1958 - February 1959.
- September General Electric conducted the initial run on a J-93 series engine.
- October Air Force Directive, wire 15780LA, dated 10-17-58 added one additional air vehicle to the program for fatigue testing.
- November Hamilton Standard was selected as subcontractor for the Environmental Control System.



**December** The second phase of the program, system and subsystem development, began with the issuance of Letter Contract AF33(600)-38669 which was subsequently definitized in April 1959 with a total price of \$120.5 M.

1959

**February** The full scale air vehicle mockup was completed on 9 February 1959 as scheduled.

**March** On 11 March 1959, the B-70 Weapon System Development Engineering Inspection (DEI) was completed at the Los Angeles Plant. The basic objectives of the DEI were to allow Air Force representatives the following:

1. The opportunity to review in detail the Weapon System contractors interpretation of and compliance with technical requirements called for in the contract performance specifications.
2. The opportunity to evaluate the plans and physical mockup articles to determine accomplishment of the objectives with respect to design performance.
3. The opportunity to review all aspects of maintenance and inspection functions, safety, ease of operation, and producibility.

During the DEI, 761 Requests for Alteration were written, of which 381 were considered category 1 to be accomplished as a part of the current contractual requirements.

**April** The B-70 Weapon System mockup review was completed on 4 April. The mockup review differed from the DEI in that it presented the operational characteristics/suitability of the configuration and the general arrangement of the operational article presented, rather than detailed system analysis and theory. Thirty-five of a total 50 RFA's written were issued as category 1 changes.

**June** Initial acceptance of the -70 configuration was received from the Air Force on 8 June. The major changes imposed by this configuration were: (1) the forward fuselage was shortened by approximately 30 inches, (2) the upper intermediate fuselage tank section was refaired to hold approximately 16,000 additional pounds of fuel, and (3) the engines were moved forward and the aft fuselage shortened by approximately five inches.



October Major cost reduction exercises were being conducted in consideration of Fiscal 1960-1961 budgets. As part of this study it was planned that the spare engine requirements would be reduced, eliminate the fatigue article, reduce test air vehicles from 12 to 10, and make the static article a flight vehicle to be tested at Wright Patterson rather than Palmdale.

December Air Force wire LMSA 033, dated 2 December 1959, redirected the Weapon System 110A (B-70) to a single vehicle prototype development program with objectives of demonstrating the technical feasibility of a B-70 type aircraft design, demonstrate functional operation of a prototype bombing-navigation system, and preservation of option for developing a B-70 weapon system. A minimum effort airworthiness test program was directed, the IBM bombing-navigation system effort was transferred to an Air Force contract and continued at a reduced rate, defensive subsystems and Mission/Traffic Control subsystem contracts were terminated and sub-contracted airframe work at Boeing, Lockheed and Chance-Vought was withdrawn. Total personnel utilization was reduced from approximately 20,000 to 7,000.

1960

January Air Force approval was received on commencing "pre-award negotiations" with subcontractors for; two wing panels and three wing tip wedges to Aeronca, wing leading edge-elevons-seven upper fuselage bulkheads to Rohr, and a section of the upper fuselage to AVCO.

May On the 1st of May, fabrication of the first details in support of Air Vehicle No. 1 went in-work.

July The second DEI on the B-70 program was completed on July 22nd in support of the following objectives:

1. Review current status and establish changes necessary to achieve better balance in scheduled expenditures.
2. Devise a plan of action for a weapon system within the Fiscal 1961 funding limitations.

The information and data generated in support of and during this DEI proved beneficial in technical and financial planning for the 11 air vehicle YB-70 program subsequently announced.

August Initial Air Vehicle No. 1 subassembly began on 5 August.

1960

September General Orders were issued on 21 September, redirecting the XB-70 to Plan W-27R authorizing the manufacture and flight testing of 11 YB-70's in addition to the 1 XB-70.

December A major program milestone was completed by releasing the last of 11, 202 basic engineering drawings required to build the first prototype XB-70. These drawings represented a total of more than six million engineering manhours, including almost 10,000 hours of wind tunnel testing.

1961

February Eleven teams of representatives from five major operating functions of NAA Los Angeles Division visited B-70 subcontractors as a part of a concentrated cost reduction program. Cost reviews were conducted at 19 subcontractor plants resulting in the elimination or postponement of some tooling, facility items, aerospace ground equipment and spares not immediately needed, simplified design and manufacturing methods and reduced supplier estimates.

March From the President's Budget Message:

"The acquired missile capability programmed by this message also makes unnecessary and economically unjustifiable the development of the B-70 Mach 3 manned bomber as a full weapon system at this time. The B-70 would not become available in operational numbers until well beyond 1965. By that time we expect to have a large number of intercontinental ballistic missiles, fully tested and in place, as well as a substantial manned bomber force mostly equipped with air to ground missiles. In view of the extremely high cost of the B-70 system, its lesser survivability as a ground base system and its greater vulnerability in the air compared to missiles, its capabilities as a second strike system do not appear to have sufficient advantages over a much less expensive missile, or even a B-52 or successor bomber equipped with Skybolt, to justify a request in FY 1962 for \$358 M.

We recognize, however, that there are still uncertainties with respect to the operational characteristics of our planned missile force. We also recognize that there are certain advantages inherent in a controlled force of manned bombers. To preserve the option of developing this manned bomber weapon system, if we should later determine such a system is required, I recommend that the B-70 program be carried forward essentially to explore the problem of flying at three times the speed of sound with an airframe potentially useful as a bomber, with the

1961

March

From the President's Budget Message - Continued:

development of a small number of prototype aircraft and related bomb-navigation systems. We should also explore the possibility of developing a manned bomber system specifically designed to operate in an environment in which both sides have large ICBM forces.

Even on this more limited basis, the B-70 project will cost 1.3 billion before it is completed in 1967. Approximately \$800 million has already been provided, \$220 million is now requested for 1962 -- \$138 million less than the amount included in the January budget -- and the balance will be required in subsequent years. The total development program which I am recommending will cost \$1.4 billion less than that previously planned."

The above resulted in Air Force direction to reduce the B-70 program to a prototype development consisting of three aircraft. Manpower was once more reduced and a new austere look was taken to keep costs as low as possible. Five major subcontractors were terminated and 21 others were instructed to stop that portion of their work that would no longer be required, or were otherwise redirected. In addition to the major subcontractors, 168 minor subcontractors were terminated and 30 others were partially terminated. Intensive internal programs were initiated to achieve the established technological goals at minimal cost. This was evidenced by a substantial reduction in systems testing requirements, judicious design changes and reduced tooling requirements.

May

A design change was made to eliminate the auxiliary door air inlet system. The function of this system was to furnish an additional supply of air to the engines in order to increase the air vehicle performance in all types of weather conditions, to allow heavier payloads, and allow takeoff from shorter runways. This requirement was not considered mandatory for a development vehicle and effected a significant cost saving.

October

The North American Los Angeles Division organizational structure, which was based on a functional concept, came under scrutiny of the AF and DOD because of the success of project oriented organization in the missile program where quick reaction and technical achievement were the major objectives. At the request of the Air Force, the B-70 Division was created as an autonomous group.

## 1961

December A special investigation team was formed to research and develop a new fuel tank sealing process to eliminate leakage problems that were being experienced. Viton polymer base sealant was developed as was the use of the nickel plating in this application.

## 1962

March The first major fuselage assembly (aft fuselage section) was completed and delivered to Palmdale on 18 March in support of major section mating.

April The first Air Vehicle No. 1 YJ-93 engine was delivered at Palmdale by the Air Force on 6 April.

May In order to stay within Fiscal Year '62 funding limitations, Air Vehicle No. 2 major assembly in-work dates were set over from six to ten weeks.

June A management decision was made on 19 June to cancel requirements for the subcontracted Air Induction Control System Controllers. This action necessitated removal of some A/V installed components and release of an alternate design in support of a manual system.

August Lateral instability was discovered during operation of the flight control simulator. Subsequent study led to the decision to add 5° dihedral to the Air Vehicle 2 and 3 wings and to add a lateral bob-weight assembly to Air Vehicle No. 1.

## 1963

January The C-121 flight test bed program for the prototype bombing-navigation system was completed 3 January. The unit delivery for Air Vehicle No. 3 was scheduled for March 1964. (See subsequent entry regarding cancellation of this A/V.) The objectives of this program were the functional demonstration of equipment and integrated systems operation, measurements of navigation and bombing mode accuracies, and the identification of fixes required for a successful XB-70 operation. During this flight program, 45 equipment flights were made totaling 185 flight hours.

May The decision was made to not install the air induction control system (AICS) in Air Vehicle No. 1 for first flight as this system was not required at flight speeds below Mach 1.4. The control valves were locked and hydraulic systems were ported to hold the movable portions of the inlet in proper fixed positions.

1963

- June As a resultant from the initial integrated propulsion tests at the Santa Susana Test Facility, a design change was issued to replace all of the hardline auxiliary drive system bays hydraulic mountings to cushion supports. This action eliminated leakage problems associated with vibrations being experienced.
- September Subsequent to a very comprehensive program situation analysis conducted with Brig. Gen. F.J. Ascani, B-70 SPO, a series of meetings were held over a two day period with a Defense Advisory Group. Detailed discussions and committee meetings were conducted in reviewing the status of the program, projected funding and proposed plans.
- December NAA received a Contract Change from Wright Patterson AFB (Systems Engineering Group) to install the SST instrumentation on Air Vehicle No. 2 rather than Air Vehicle No. 3 which had been previously programmed.

1964

- March On 5 March, Secretary of Defense McNamara announced that the XB-70 program was reduced by the Government from three aircraft to two. Stop work orders were issued on all Air Vehicle No. 3 effort. At this point in time, only 98 honeycomb panels of a total requirement of 1,286 had been delivered in support of A/V #3 and minimal subassembly effort had been accomplished on the Air Vehicle.
- April On 24 April, the electron beam welding on the left hand wing lower moldline was completed and sold off which completed Air Vehicle No. 1 structure.
- May "Roll-out" of the first XB-70 occurred at 9:15 a.m. on 11 May 1964. The ceremony was covered by press, radio, television and was attended by: Major General R. Ruegg and Brigadier General F.J. Ascani, heading a group of 50 B-70 SPO personnel; Colonel T. Bishop and three officers from SAC; Brigadier General A. Low, Mr. C. Covington and two others from the DOD; four members from the California delegation to the House of Representatives; approximately 67 subcontractor VIP's and 40 NAA executives.
- September On 21 September, the initial XB-70A flight was made from Palmdale to Edwards Air Force Base with a duration of 1 hour and 10 minutes. Due to a failure in the retraction of the main landing gear, the planned speed of Mach 1.1 was not reached and the maximum speed was held to approximately 254 KIAS. The air vehicle was taken to approximately 16,000 feet where low speed maneuvers were successfully checked out. Although both

## 1964

- September aft tires on the left hand bogie blew out on landing, the air vehicle remained under control at all times and proceeded straight down the runway.
- October Flight No. 4 completed the planned evaluation for initial flights, in that a Mach number of 1.42 and altitude of 46,000 feet were accomplished. The maximum indicated speed was 446 KIAS. Subsequent to this flight, the No. 1 XB-70A went into layup on 24 October for a series of proof loading tests on the movable surfaces aimed at preparing the air vehicle for its progression towards the Mach 2 and Mach 3 flights.

## 1965

- January The Phase II Proof Tests were completed utilizing Air Vehicle No. 1 as the test article. Various structural components primarily involved in the propulsion and flight control of the air vehicle were statically proof loaded and operationally tested under simulated flight loads.
- May On 29 May, No. 2 XB-70A rollout was conducted and transferred to pre-flight operations.
- Significant inflight structural damage was experienced during the 12th flight of Air Vehicle No. 1. Sections of wing apex skin and leading edge became detached, entered the right hand engine air intake duct, and resulted in an emergency landing on the Edwards Air Force Base lake bed with only 4 engines in operation.
- July On 17 July, the No. 2 XB-70A made its initial flight for a duration of 1 hour 13 minutes, reached an altitude of 42,000 feet and a speed of Mach 1.41.

## 1966

- January Seven flights, five with A/V No. 1 and two with A/V No. 2 were accomplished during this month and 14:01 hours were logged. The highlight of the month's activities was the successive Mach 3 flights (#17 & #18) of A/V No. 2. During Flight No. 17, A/V No. 2 attained Mach 3 for the first time and repeated the performance during Flight No. 18, nine days later. For the first time two flights in one day were accomplished, one with each air vehicle on 3 January. On 11 January A/V No. 1 accomplished two flights with a turnaround of less than 5 hours. Flight No. 30 on A/V No. 1 was conducted on 6 Jan, and lasted 3:40 hours, the longest flight in the program.



1966

- May** The XB-70's design objective of sustained 2,000 mile-per-hour flight was demonstrated 19 May when Air Vehicle No. 2 cruised 33 minutes above Mach No. 3. Weighing 531,000 pounds at take-off, the airplane reached its speed objective over Rock Springs, Wyoming. During the next half hour, it covered more than 1,000 miles, passing over Wyoming, Colorado, Utah, Arizona, and California. During the final half of the run the airplane was continuously turning in a 15-degree bank. Stability and control were excellent throughout the high-speed run and no problems were encountered in maintaining speed in the turn. The total flight lasted just under 2 hours, including nearly  $1\frac{1}{4}$  hours at speeds in excess of Mach No. 2.0.
- June** At 0926 on 8 June, XB-70 No. 2, piloted by Mr. White of North American Aviation and Major Cross, USAF, was involved in a mid-air collision with a NASA F-104, piloted by Mr. Walker. Both aircraft crashed resulting in fatal injuries to Major Cross and Mr. Walker. Mr. White ejected successfully, sustaining injuries to his back and arm. The accident occurred approximately 45 miles east of Edwards Air Force Base, while the aircraft were flying formation at an altitude of 25,000 feet at a speed of Mach 0.78.
- August** The initial phase of the XB-70 flight test program was concluded in the early portion of this month. The program was conducted under the provisions of Contract No. AF33(657)-12395, which began with first flight on 21 September 1964 and ended with the completion of 22.5 aircraft operation months on 6 August 1966. The XB-70's design objective of Mach 3 flight above 70,000 feet was clearly demonstrated during the program with 10 flights conducted at this speed between 14 October 1965 and 6 June 1966. During this same month letter Contract AF33(657)-15871 was received to conduct support for a USAF/NASA joint XB-70 flight test program.

1967

- January** A flight research program sponsored jointly by NASA and USAF for sonic boom measurements was completed in late January. This program was initiated in Nov 1966 with the primary purpose of determining the proper method of combining the theoretical sonic boom intensity due to lift and due to volume for the far field case.
- April** A second flight research program was initiated with the 61st flight on Air Vehicle No. 1. This program was an investigation into the control of structural dynamics, was sponsored by NASA and conducted throughout the remainder of the program.

1969

**February**

On 4 February, the XB-70 (Air Vehicle No. 1) made its final flight from Edwards Air Force Base to Wright Patterson Air Force Base where the aircraft was placed in the Air Force Museum.



## NARRATIVE SUMMARY -

Schedule No. and  
Date of Issuance

Chronology of Change

C-1  
January 1958

The initial B-70 Weapon System master schedule in support of Contract AF33(600)-36599. This plan programmed a total requirement of 65 air vehicles, a fatigue test article and a static test article. First flight was scheduled for December 1961 and the first Strategic Air Command Wing delivered by August 1964. This plan was based on a 100% design release in December 1960.

R-2  
March 1959

This schedule was issued in response to an Air Force directive to stretch out the program after first flight resulting in a first Air Wing delivery of August 1965. In addition, first flight was slipped out one month to January 1962 and the fatigue test completion was delayed approximately six months. This schedule maintained the 100% design release in December 1960.

W-15  
December 1959

Air Force Wire LMSA-033, dated December 2, 1959 redirected the program to the design and manufacture of one prototype air vehicle and led to the issuance of Plan W-15. This schedule provided an eleven-month set over for first flight which accommodated a stretch out of manufacturing time spans allowing multiple assembly operations to be performed in one tool. This schedule also considered the optimum buildup of personnel in support of a one-ship program. Under this plan the prototype vehicle was to be fabricated/assembled at the Los Angeles plant and flown to Edwards Air Force Base on first flight in December 1962 for subsequent testing.

W-15D  
April 1960

Continued schedule exercises in support of Fiscal Year '60-'61 budget considerations led to the issuance of Plan W-15D. This plan maintained the one vehicle program with first flight in December 1962, even though the in-work dates for major assembly operations had been set over and in turn reducing the allowable spans for installations and ramp operations.

W-27R  
September 1960

This schedule was issued in response to Air Force direction to proceed with the design, development, fabrication and test of one XB-70 and 11 YB-70 prototype aircraft, including development of all the major systems needed for an operational Mach 3 bomber. The XB-70 first flight date of December 1962 was maintained with a YB-70 first flight scheduled for June 1963. In addition, a static test article was scheduled for completion immediately following YB-70 number 1.

W-27R Revised  
December 1960

Revisions to the YB-70 Program Plan resultant from the AF/NAA review in November 1960 required a reissuance of W-27R to incorporate the following changes:

1. Add four months of influence coefficients testing to the static test article.
2. Extend static testing from 19 to 21 months.
3. Set over static test resolve and incorporate points four months.
4. Set over completion and acceptance of YB-70 number 3 by one month.
5. Add air load survey program.
6. Set over airframe and propulsion resolve and incorporation points one month.
7. Revised air vehicle deliveries (maintained Dec. '62 XB-70 first flight).

Planning in support of this schedule reflected air vehicle major assembly manufacturing at Palmdale rather than Los Angeles.

61-4-1

National budget limitations resulted in Air Force direction to reduce the program to a three-prototype vehicle plan and issuance of 61-4-1. The full scale static test article and air loads survey program were also deleted. With the exception of fewer honeycomb panels, the configuration of Prototype 2 was to be the same as Prototype 1, and Prototype 3 changes were basically those required to include provisions for a prototype Bomb-Nav system. Multiple cost reduction changes; i.e., increased core foil thickness, reduction of chem milling, and change from honeycomb panel to sheet metal where possible were included. The three - prototype program maintained the first flight date of December 1962 and subsequent No. 2 and No. 3 prototype flights on nine-month intervals.

Internal Plans

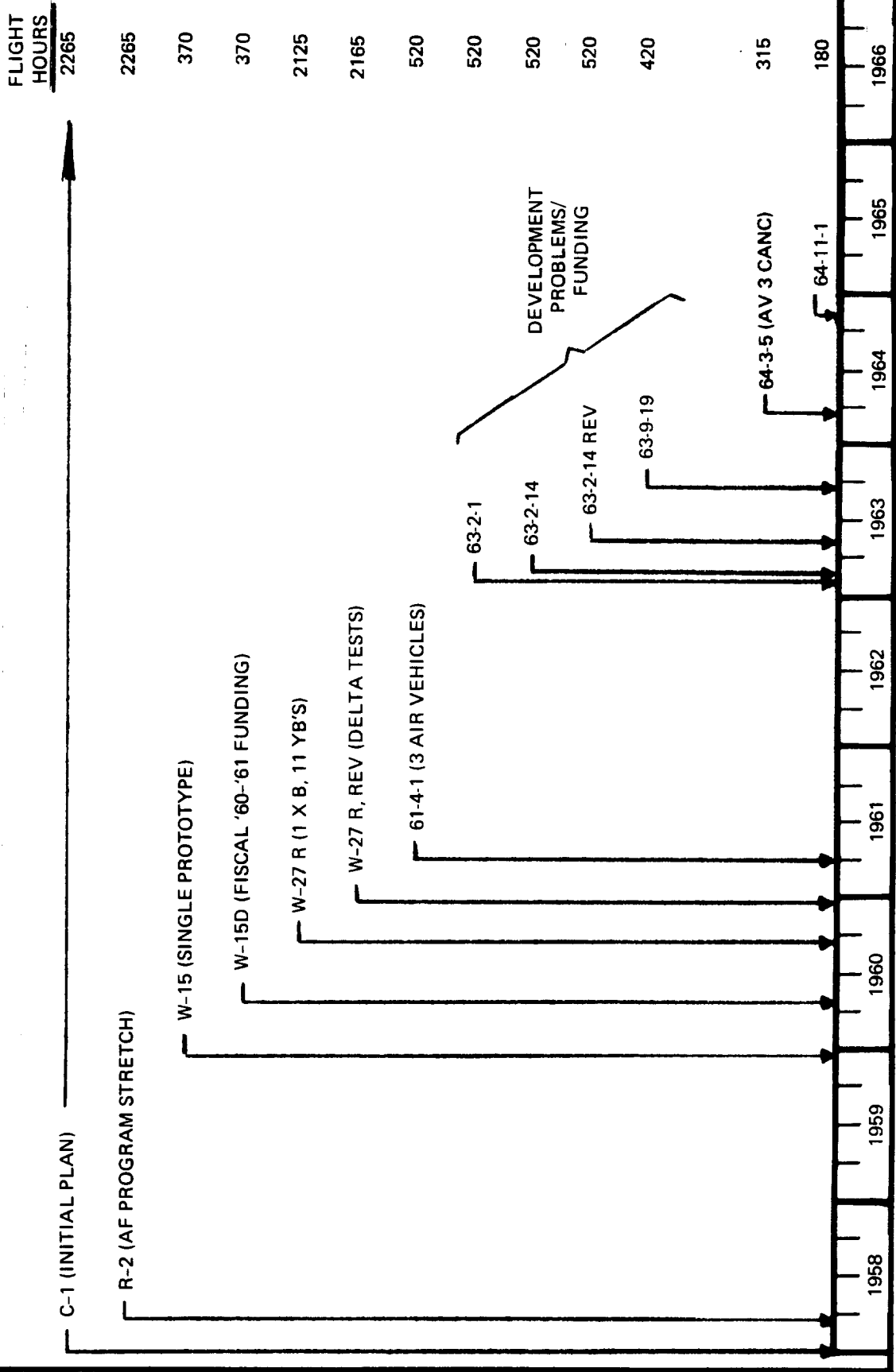
In July of 1962, it became evident that a significant first flight schedule slip could be expected due to existing funding limitations. By November of this same year the Secretary of Air Force had been informed that a delay in first flight would be experienced due to this lack of funds and manufacturing problems. By January of 1963, the under funding had reached a point where it was necessary to curtail all effort on air vehicles 2 and 3 in preference to air vehicle 1. Multiple internal plans were issued during this period to achieve the most efficient programming of total resources available. Subsequently, additional funding was negotiated in February 1963; effort was resumed on air vehicles 2 and 3, and the next program master schedule was issued.

63-2-1

The program was redirected to this plan which was based on the 61-4-1 requirements but delayed air vehicles 1, 2, and 3 completions by 6, 7, and 9 months, respectively. A plan of action was issued in conjunction with this schedule listing funding allocations for each element of the B-70 Division to be used in the preparation of necessary changes in effort on the program.

- 63-2-14 As a result from functional departments review of the plan of action issued with Plan 63-2-1 and in response to Customer direction, the 63-2-14 schedule was issued on 8 March 1963. The Air Force had requested that all effort be reprogrammed on a schedule that would provide the greatest overall program economy. This reprogramming resulted in setting over air vehicle #1 completion one month, no change to air vehicle #2, and an acceleration of approximately  $3\frac{1}{2}$  months in the completion of air vehicle #3.
- 63-2-14, Rev.  
5-10-63 Subsequent to the issuance of the basic 63-2-14 schedule, delays in air vehicle #1 completions (see WBS 3.0, Major Airframe Mating, for further detail) necessitated a revision in the master schedule. Special schedules dealing with air vehicle #1 fuel tanks sealing and wing joining were issued in conjunction with the revised master schedule. No changes were made at this time to the air vehicles #2 and #3 planning.
- 63-9-19 By this point in time the magnitude of problems in air vehicle #1 joining had been resolved and it had been agreed to with the customer that a major structural change incorporating  $5^{\circ}$  wing dihedral on air vehicles #2 and #3 would be accomplished. A situation analysis was conducted with the Air Force SPO where the program status and resources were reviewed. This review resulted in publication of the 63-9-19 schedule which set over air vehicle 1, 2, and 3 completions by 7,  $6\frac{1}{2}$ , and 3 months, respectively.
- 64-3-5 On 5 March 1964, Secretary of Defense McNamara announced the cancellation of the XB-70B (AV #3). At this point in time the air vehicle #1 wing to fuselage final weld operations had been started and the remaining air vehicle operations were clearly defined. In view of the aforementioned circumstances, air vehicle #2 status and program economics, the master schedule was revised to (1) reflect the air vehicle #3 cancellation, (2) revise the air vehicle #1 and #2 'out-of-door' and first flight dates.
- 64-11-1 Subject plan reflected the actuals on air vehicle #1 as of November 1964 and shifted air vehicle #2 out another five months.

# MAJOR PROGRAM SCHEDULE ISSUANCES

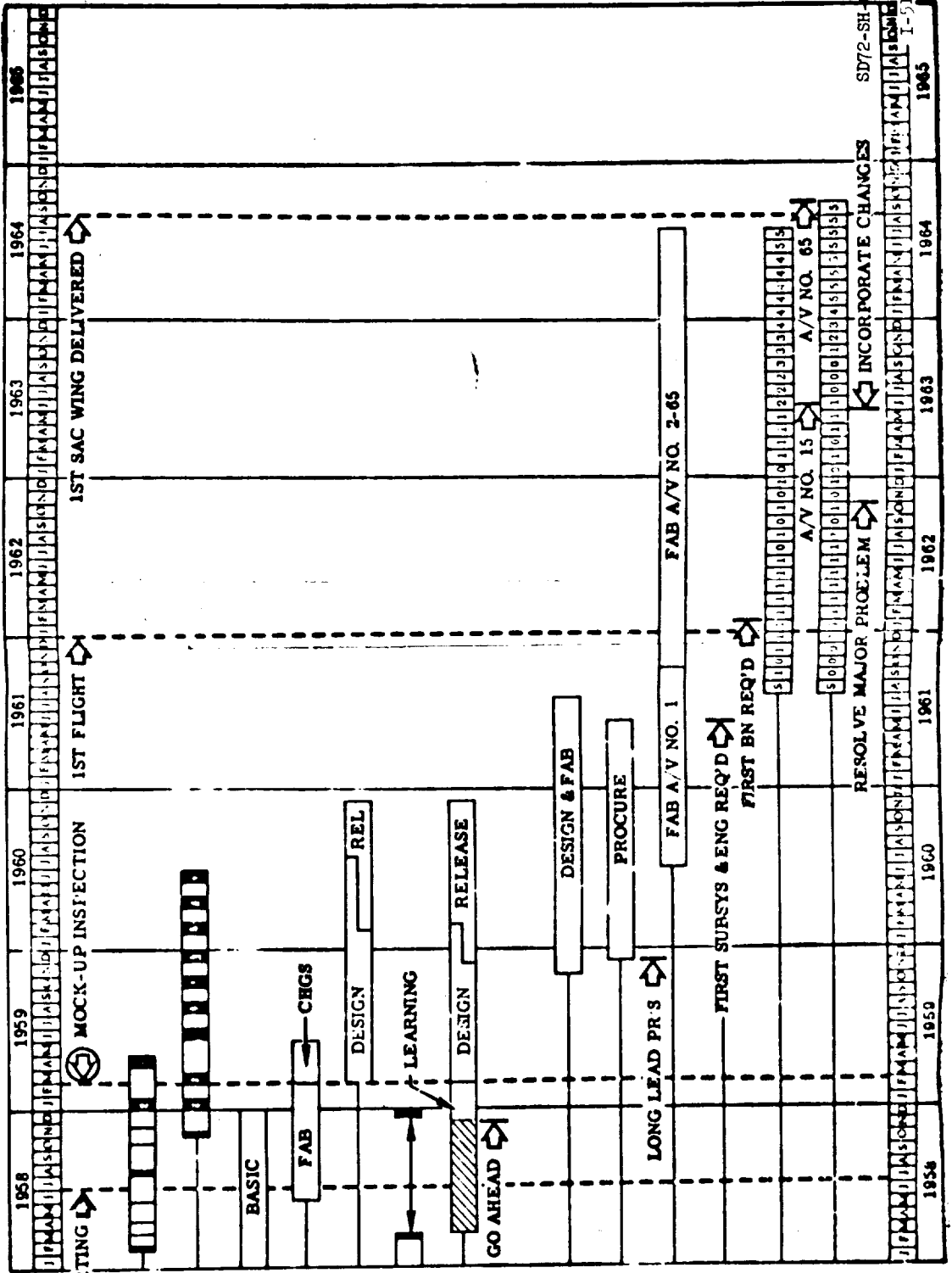




**B-70 WS**

**MASTER PHASING SCHEDULE (C-1)**

1 JANUARY 1958



SD72-SH-0003  
I-51, 52

- ENGINEERING
- WIND TUNNEL
- ADVANCED SMALL FORCE MODEL
- FINAL TRISONIC FORCE MODEL
- CONFIGURATION
- MOCKUP
- DETAIL DESIGN
- SELECT SUBCONTRACTORS (EQUIPMENT)
- SELECT SUBCONTRACTORS (STRUCTURE)
- MANUFACTURING
- TOOLING
- MATERIAL PROCUREMENT
- FABRICATION
- SUBSYSTEMS REQUIRED
- COMPLETIONS
- ACCEPTANCES



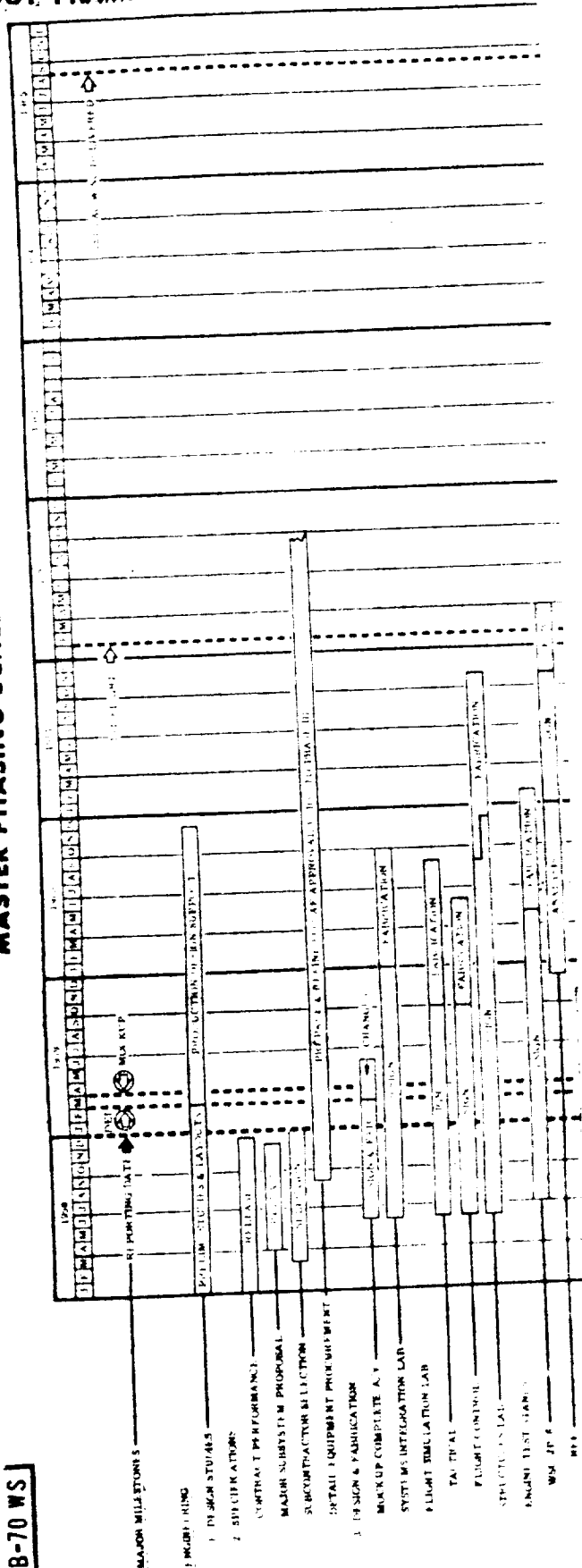








MASTER PHASING SCHEDULE (R-2)

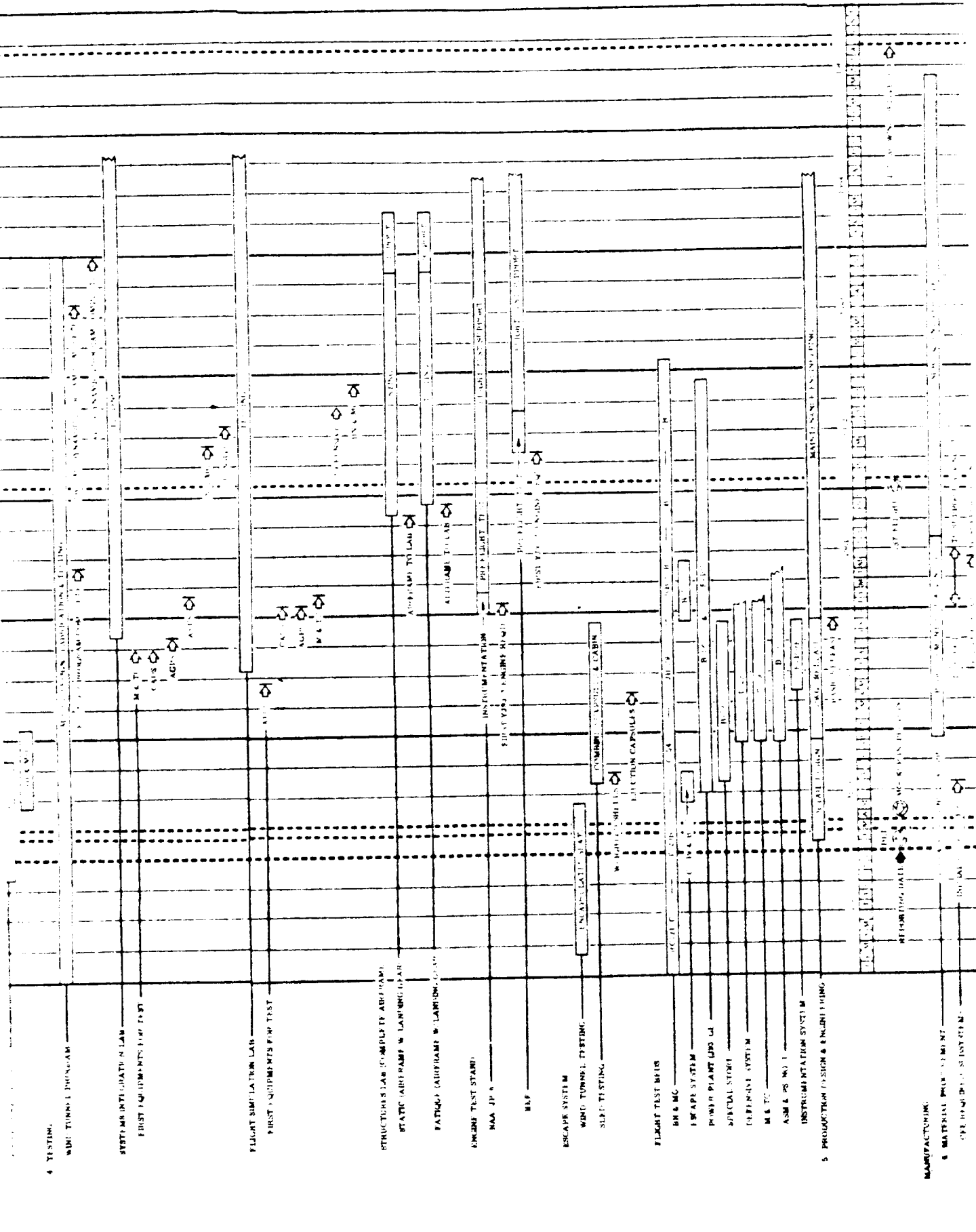


B-70 WS

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4. TESTING

WIND TUNNEL DUCING

SYSTEMS INTEGRATION LAB

FIRST EQUIPMENTS FOR TEST

FLIGHT SIMULATION LAB

FIRST EQUIPMENTS FOR TEST

STRUCTURAL LAB (SAMPLES BY AIRFRAME)  
STATIC AIRFRAME W/ LANDING GEAR

PATROL AIRFRAME W/ LANDING GEAR

ENGINE TEST STAND

NAA JP-8

MFP

ESCAPE SYSTEM

WIND TUNNEL TESTING

SLIP TESTING

FLIGHT TEST BAY

BN & MC

ESCAPE SYSTEM

POWER PLANT UPS (L)

SUPPLIERS

DEFENSIVE SYSTEM

M & TC

ARM & PS (N) I

INSTRUMENTATION SYSTEM

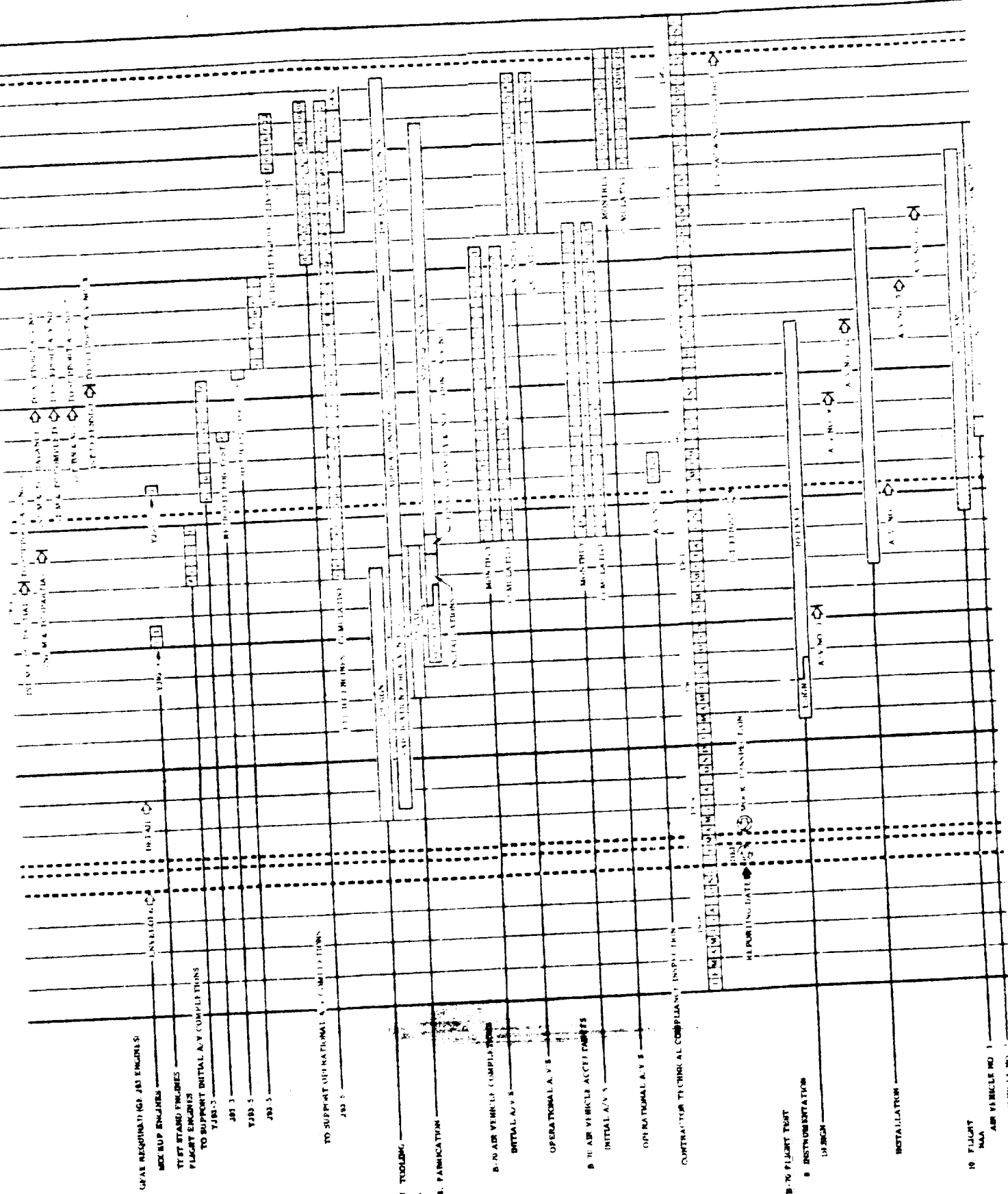
5. PRODUCTION DESIGN & ENGINEERING

MANUFACTURING

6. MATERIAL PROCESSING

7. PRODUCTION SUPPORT SYSTEM



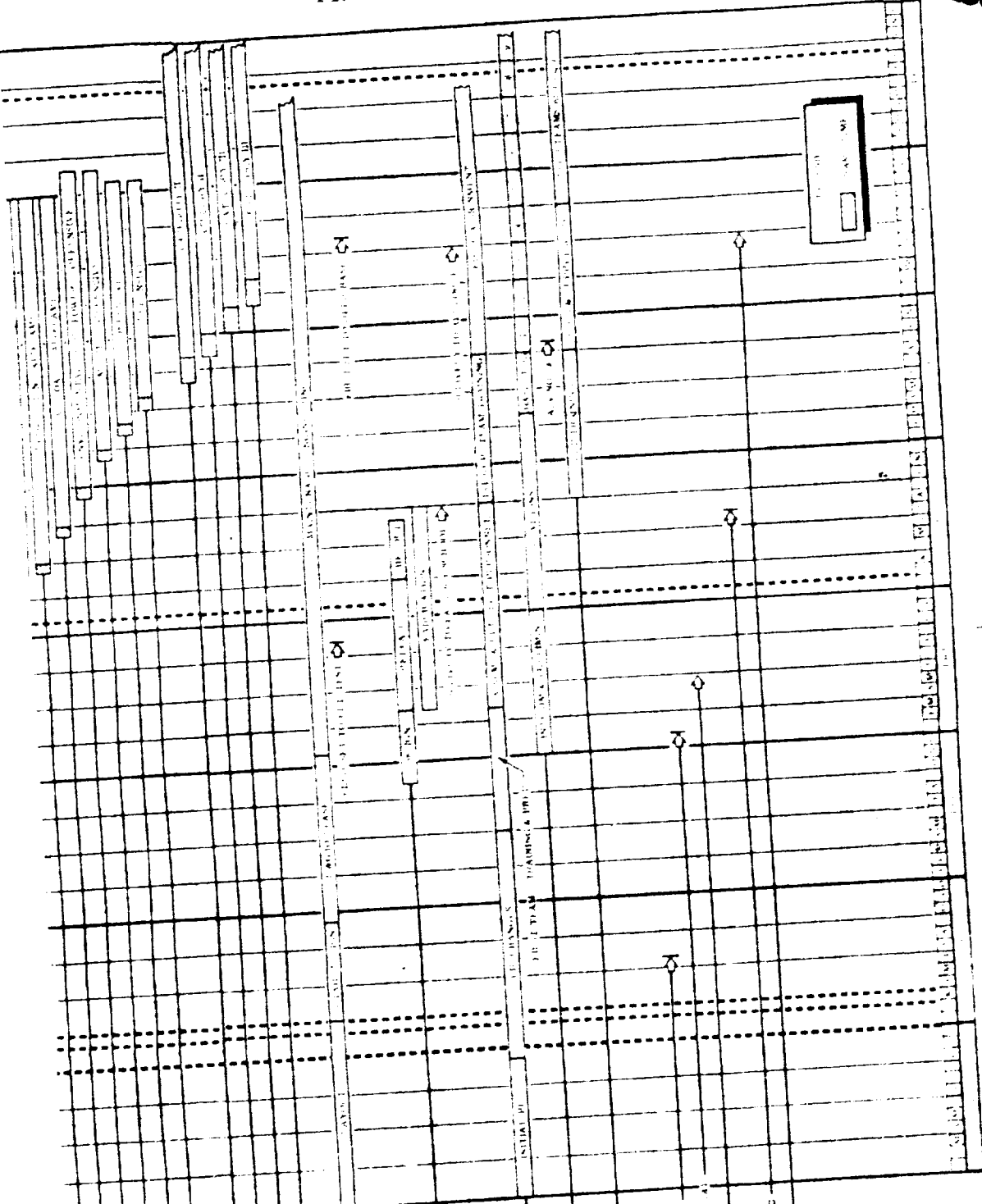


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OLDOUT FRAME

4c



- AIR VEHICLE NO. 3
- AIR VEHICLE NO. 4
- AIR VEHICLE NO. 5
- AIR VEHICLE NO. 6
- AIR VEHICLE NO. 7
- AIR VEHICLE NO. 8
- AIR VEHICLE NO. 9
- AIR VEHICLE NO. 10
- AIR VEHICLE NO. 11
- AIR VEHICLE NO. 12
- SUPPORT
- 11. GROUND SUPPORT EQUIPMENT
- 12. TRAINING EQUIPMENT
- 13. PERSONNEL
- 14. PUBLICATIONS
- 15. TECHNICAL GROUPS
- 16. SEAPS
- 17. MATERIALS
- 18. OFFICE MANUFACTURING
- 19. TEST SUPPORT LABOR SERVICE
- 20. FIRST AID
- 21. OPERATIONAL A.V.R.
- 22. RELEASE TO MANUFACTURING
- 23. FIRST OFFICE

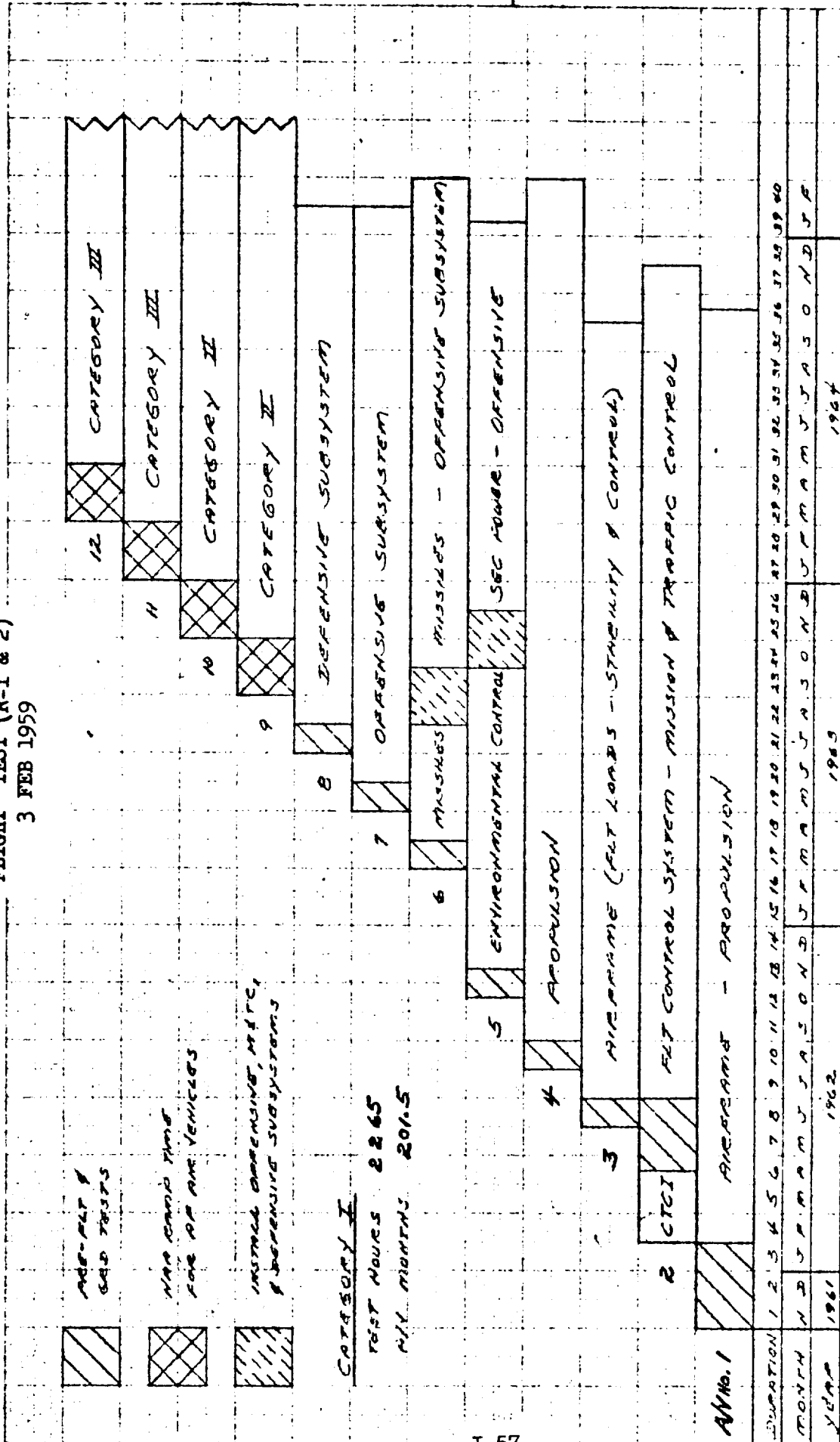
I-55,56

SD72-SH-0003

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FLIGHT TEST (R-1 & 2)  
3 FEB 1959



AIR-FLT & GAD TESTS  
 WAP CAMP TIME FOR AIR VEHICLES  
 INSTALL ORNAMENTS, MISC. & DEFENSIVE SUBSYSTEMS

CATEGORY I  
 TEST HOURS 2265  
 M/Y MONTHS 201.5

CATEGORY II  
 DEFENSIVE SUBSYSTEM  
 MISSILES  
 MISSILES - OFFENSIVE SUBSYSTEM

CATEGORY III  
 AIRFRAME (FLT LOADS - STABILITY & CONTROL)  
 FLT CONTROL SYSTEM - MISSION & TRAFFIC CONTROL  
 AIRFRAME - PROPULSION

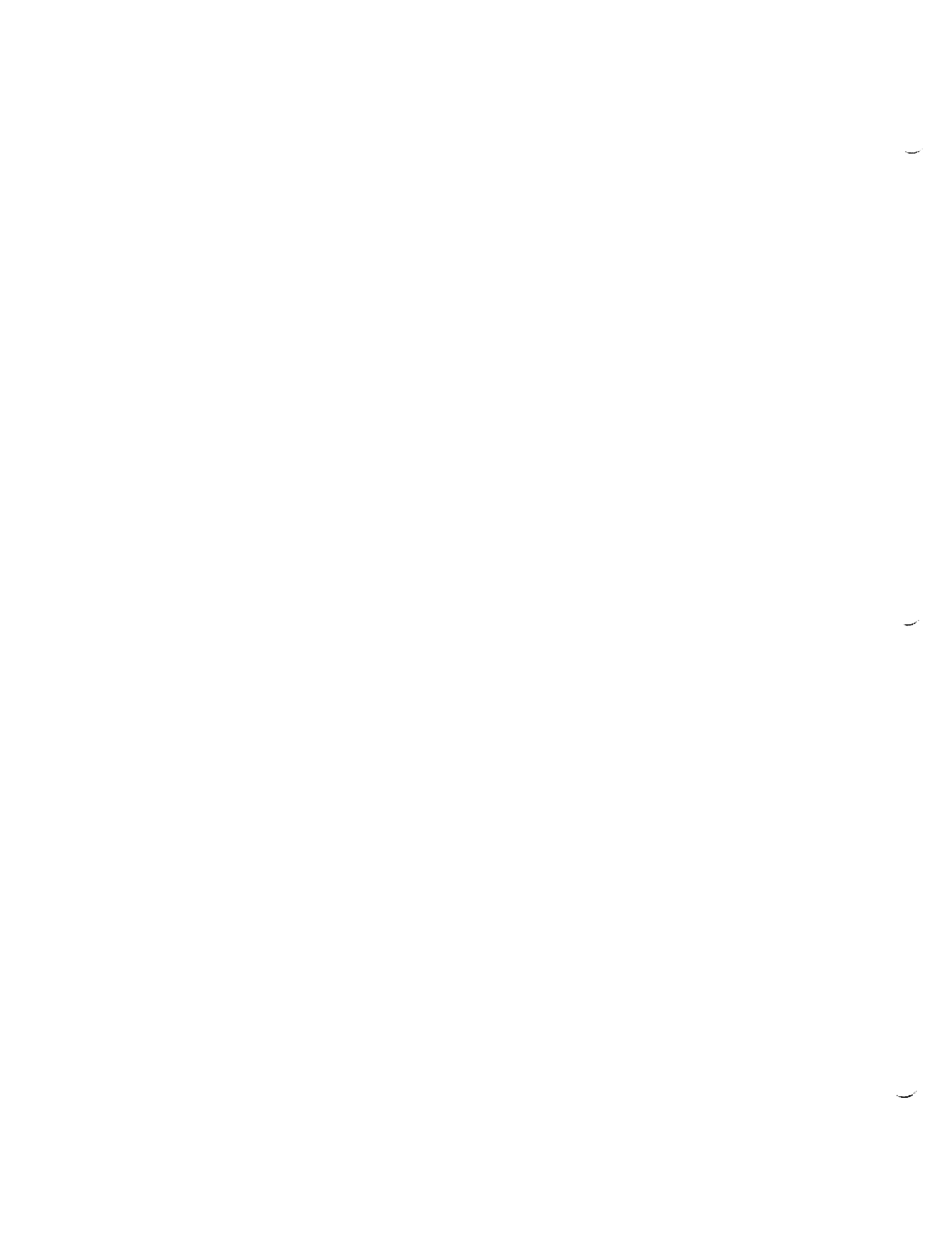
AV No. 1  
 DURATION 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31  
 MONTH N D J F M A M J J A S O N D J F M A M J J A S O N D J F  
 YEAR 1961 1962 1963 1964

BASIC AIRFRAME & PROPULSION - BEING - RESOLVE - IN PROG  
 DEFENSIVE & DEFENSIVE SUBSYSTEMS - BEING - RESOLVE - IN PROG  
 MISSILE SUBSYSTEMS - BEING - RESOLVE - IN PROG  
 OTHER SUBSYSTEMS - BEING - RESOLVE - IN PROG  
 AIR TESTING - BEING - RESOLVE - IN PROG







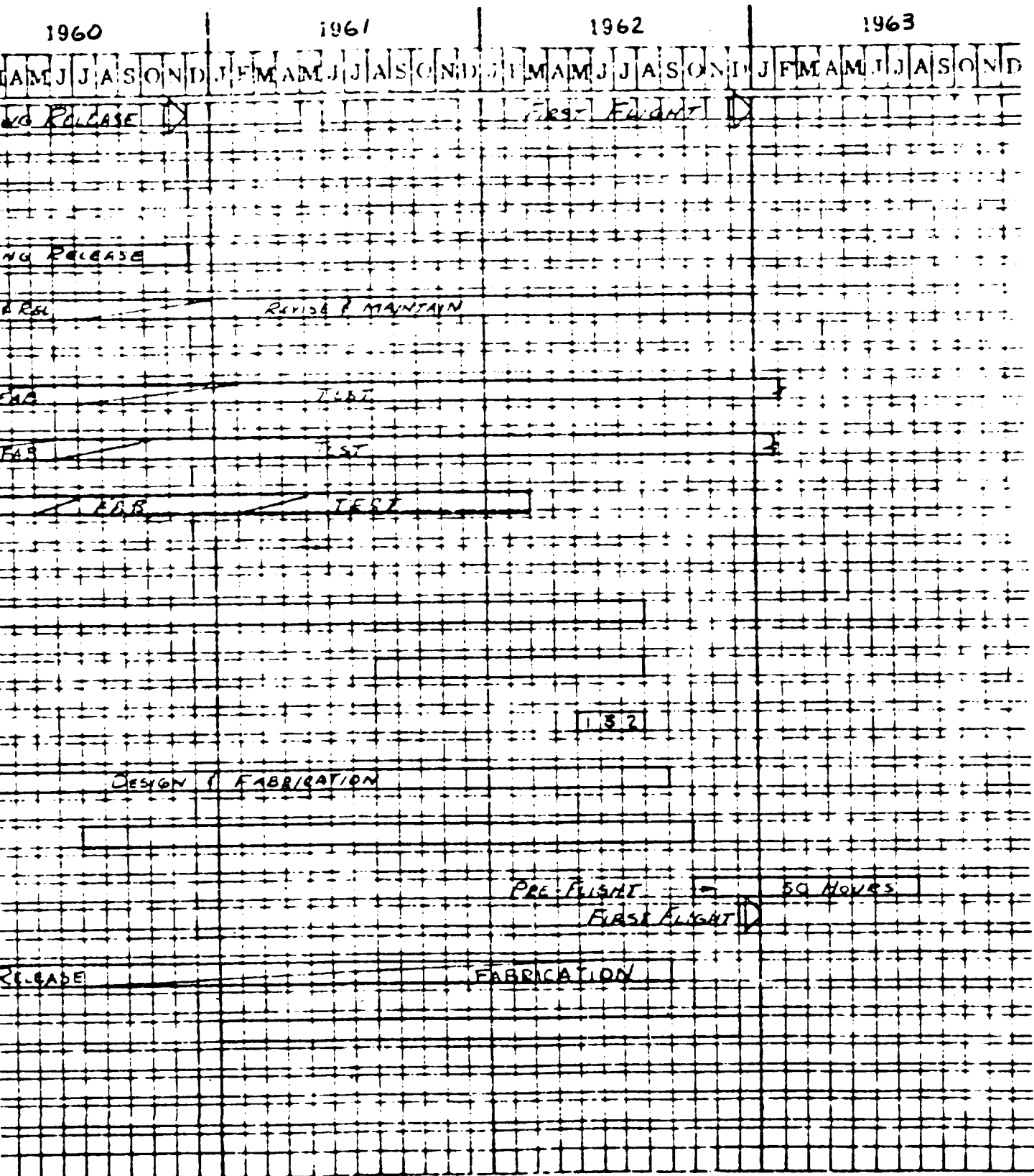


# 15 B-70 PROTOTYPE PROGRAM (1 AIRPLANE)

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21 DECEMBER 1959

Page 1





1961

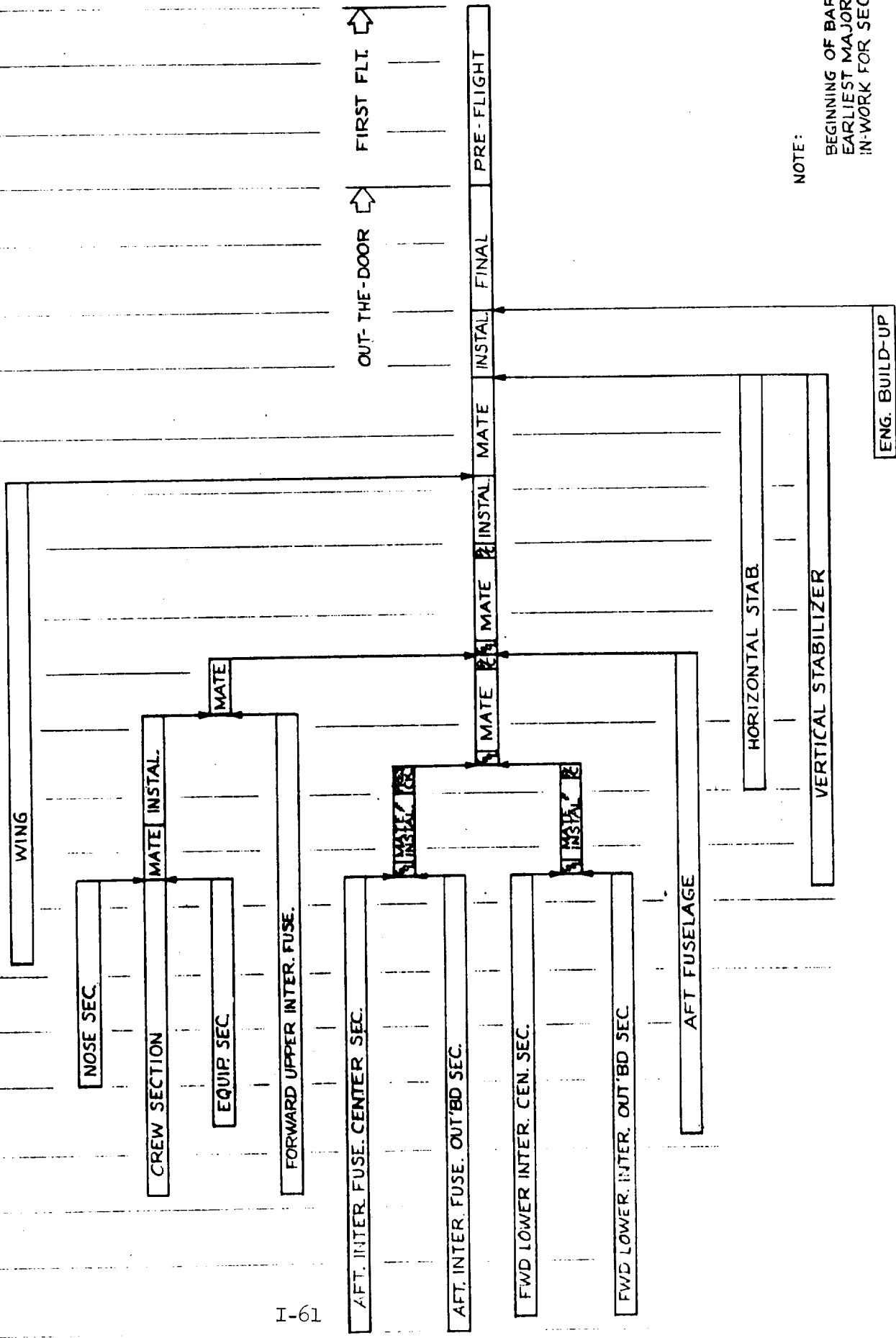
1962

MAR	APR	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
10/17/24/31	7/14/21	5/12/19/26	2/9/16/23/30	7/14/21	4/11/18/25	8/15/22/29	13/20/27	10/17/24	8/15/22/29	5/12/19/26	2/9/16/23/30	13/20/27	10/17/24	8/15/22/29	5/12/19/26	13/20/27	10/17/24	7/14/21	5/12/19/26	2/9/16/23/30	7/14/21

21 DECEMBER 1959

Page 2

# B-70 PROTOTYPE SCHEDULE PLAN W-15



I-61

NOTE:

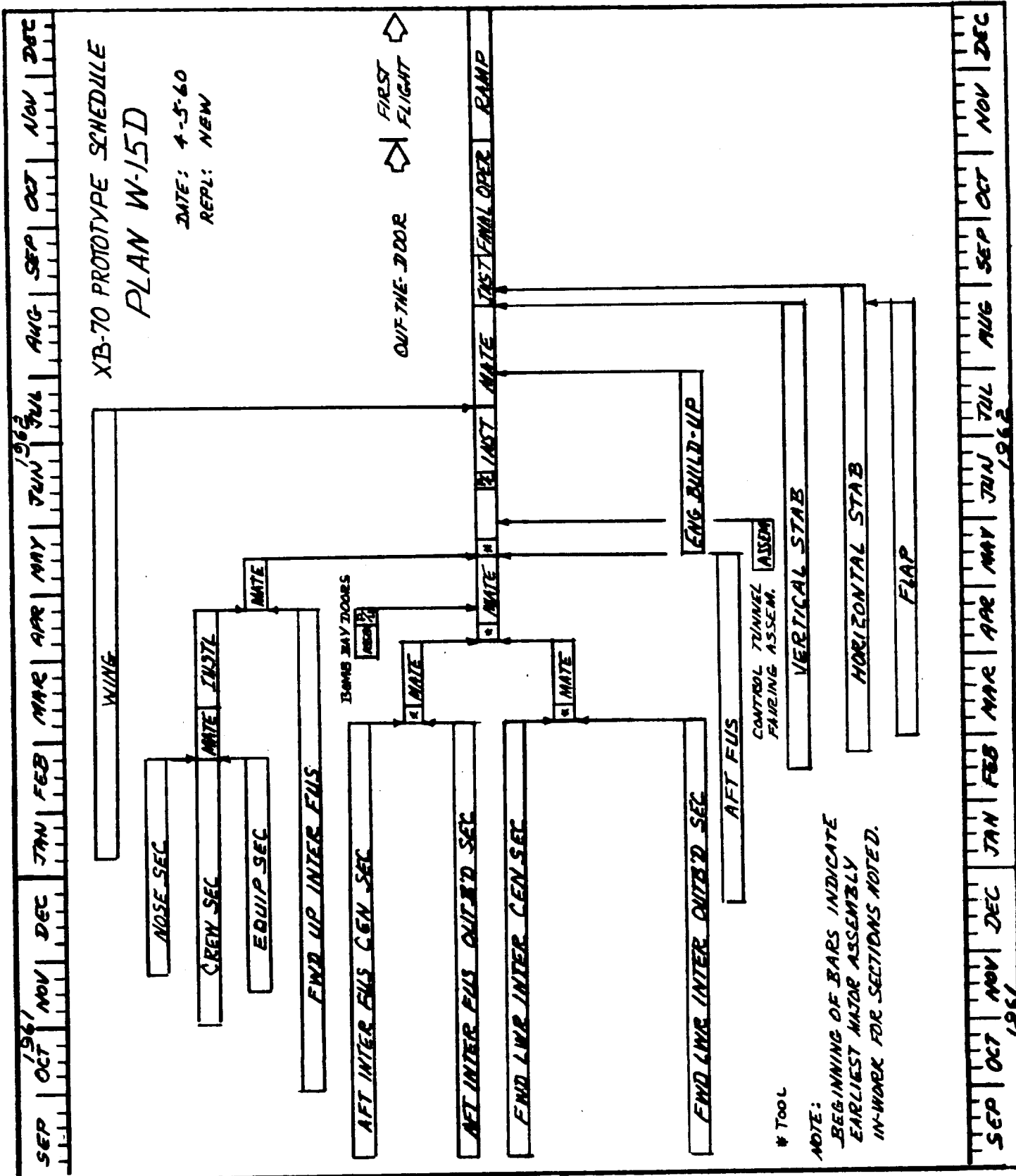
BEGINNING OF BARS INDICATE  
EARLIEST MAJOR ASSEMBLY  
IN-WORK FOR SECTIONS NOTED

PROTOTYPE  
 XB-70 FLIGHT TEST SCHEDULE  
 PLAN W-15  
 REVISED 30 DECEMBER 1959

FLIGHT  
 GROUND TESTS

370 FLT HOURS  
 37 FLT MONTHS

AV 161	PERFORMANCE, SEC, AICS, PROPULSION, FTY, ENVIRONMENT																																																											
DURATION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42																		
MONTH	F M A M J J A S O N D												J F M A M J J A S O N D																																															
YEAR	1962												1963												1964												1965												1966											

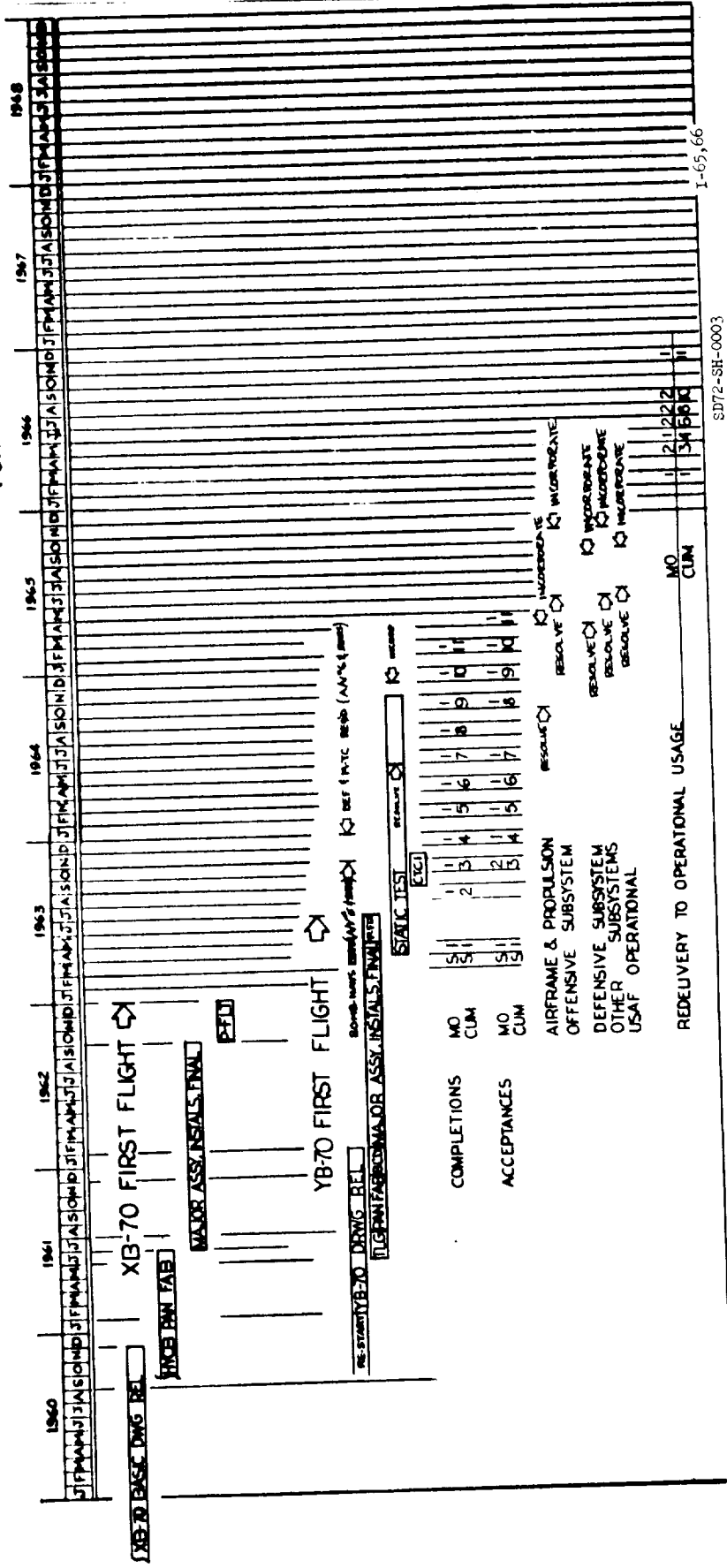






21 SEPTEMBER 1960

PLAN W27R  
(ONE XB-70 & 11 YB-70'S)



I-65,66

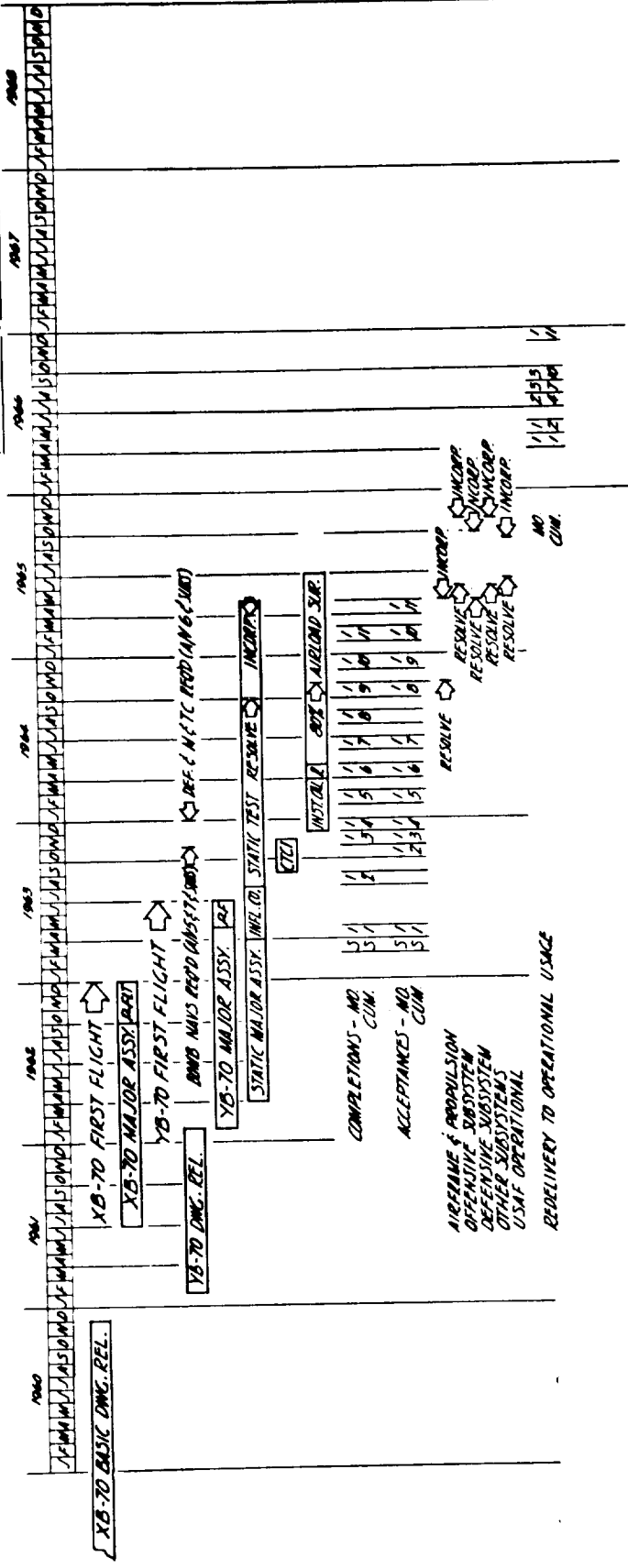
SD72-SH-0003







PLAN N-27R (REF. R-9-60)  
 (ONE XB-70 & 11 YB-70'S)

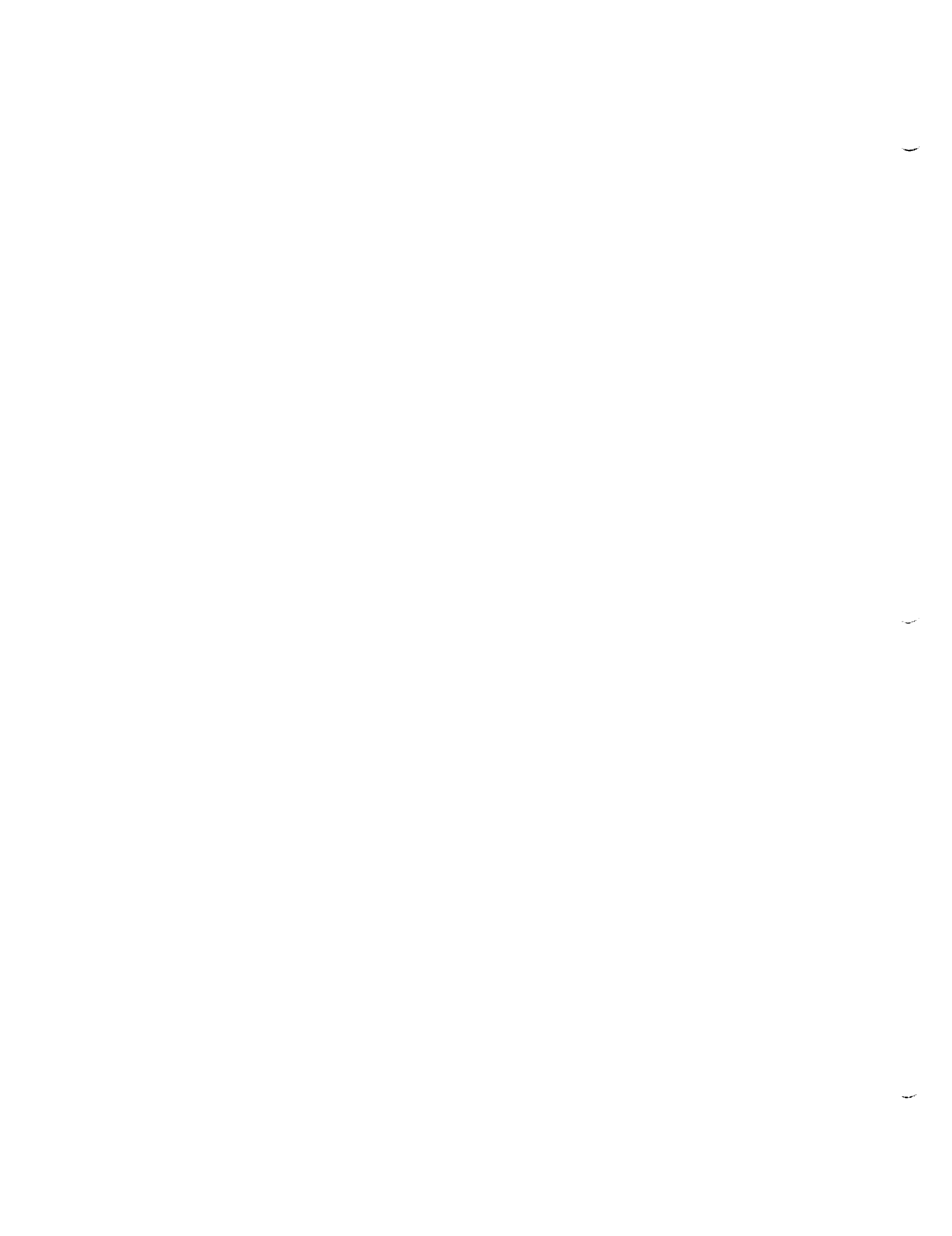


I-69,70

SD72-SH-0003

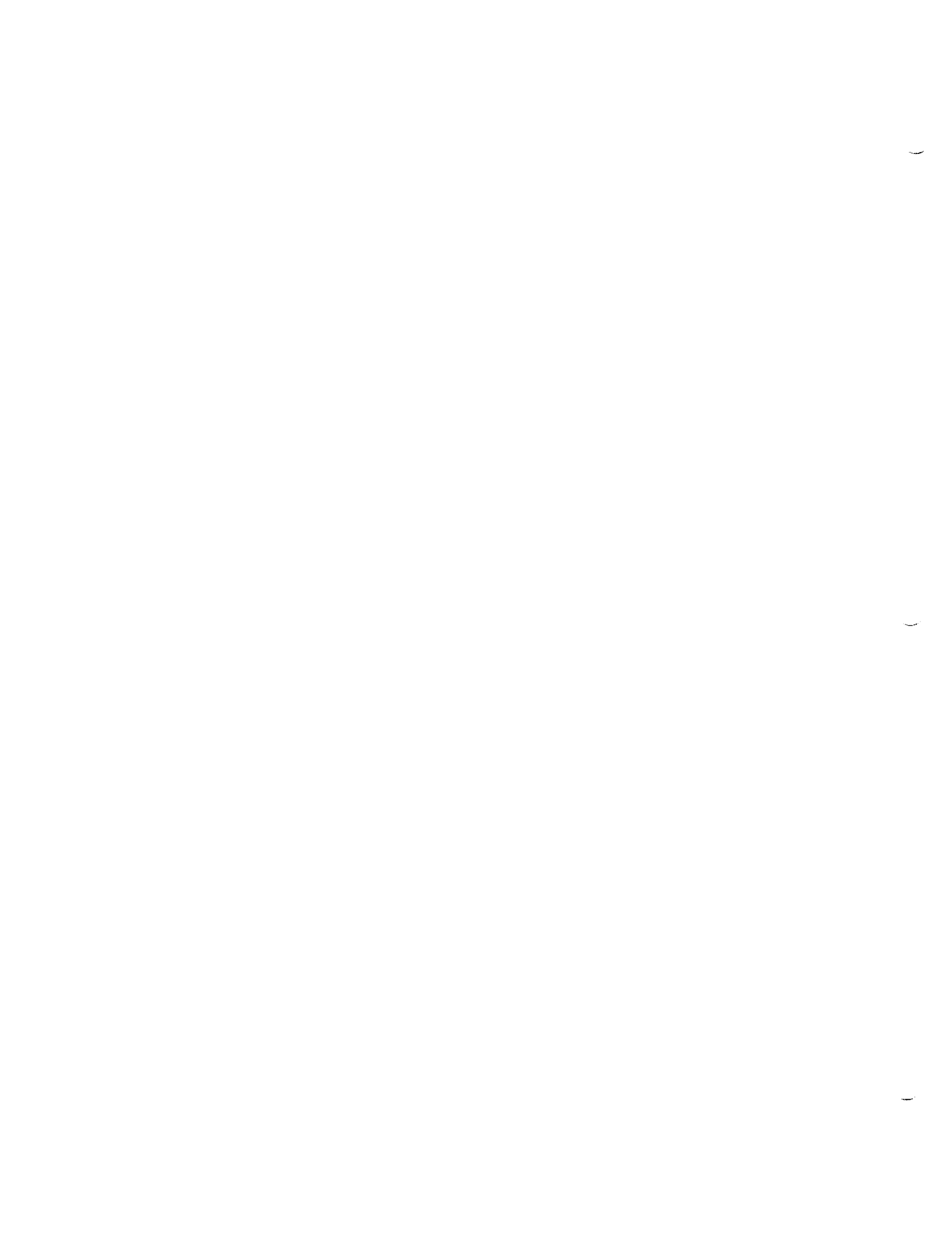
















**XB-70 FLIGHT TEST SCHEDULE**  
 PLAN 61-4-1  
 1 APRIL 1961

 PREFLIGHT &  
 GROUND TESTS

520 FLIGHT HOURS  
 48 FLIGHT MONTHS

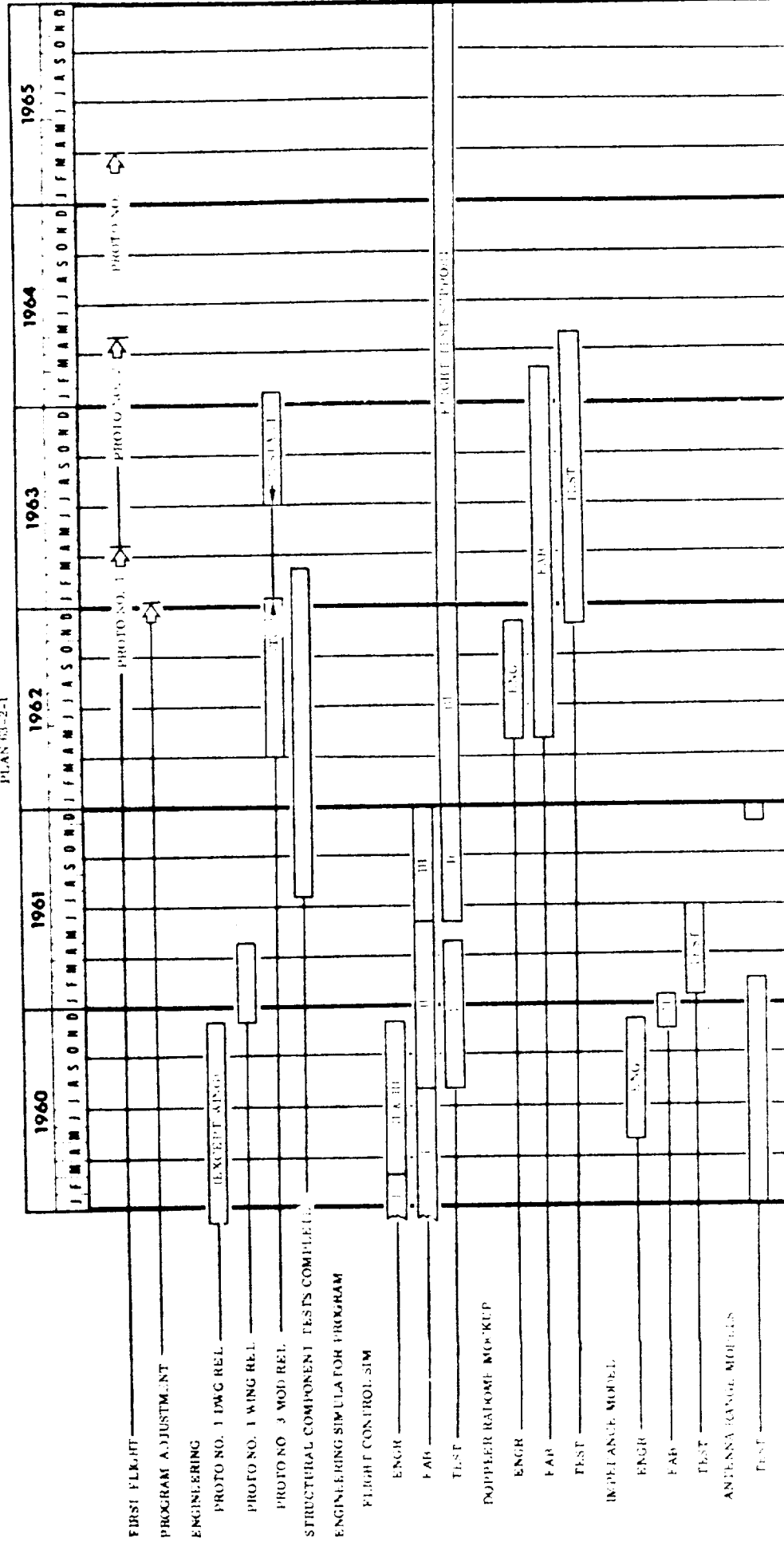
 XB-70 #3  
 OFFENSIVE ENVIRON.  
 STAB CONT, PERF, THERMAL INVEST.

	INITIAL AIRWORTH	AIRFRAME & PROPULSION											
2	9 6 8 10 12 14	16	18	20	22	24	26	28	30				
BND	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
1962	1963											1964	1965

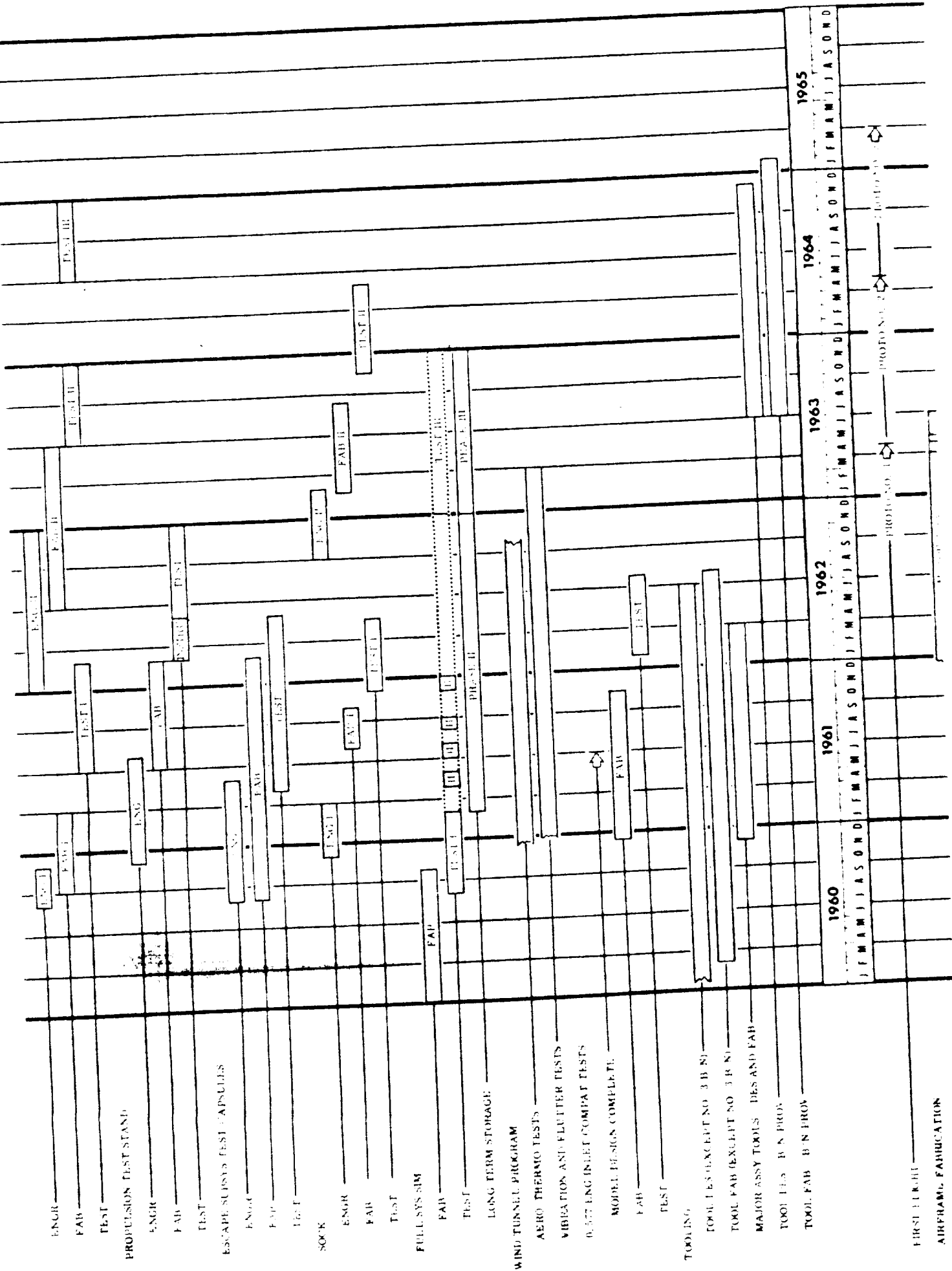
**XB-70 #1**  
 DURATION MONTHS  
 YEARS



B-70 MASTER PHASING SCHEDULE  
PLAN 63-2-1







1965

1964

1963

1962

1961

1960

PROTON

PROFESSOR

PROFESSOR

PROFESSOR

PROFESSOR

PROFESSOR

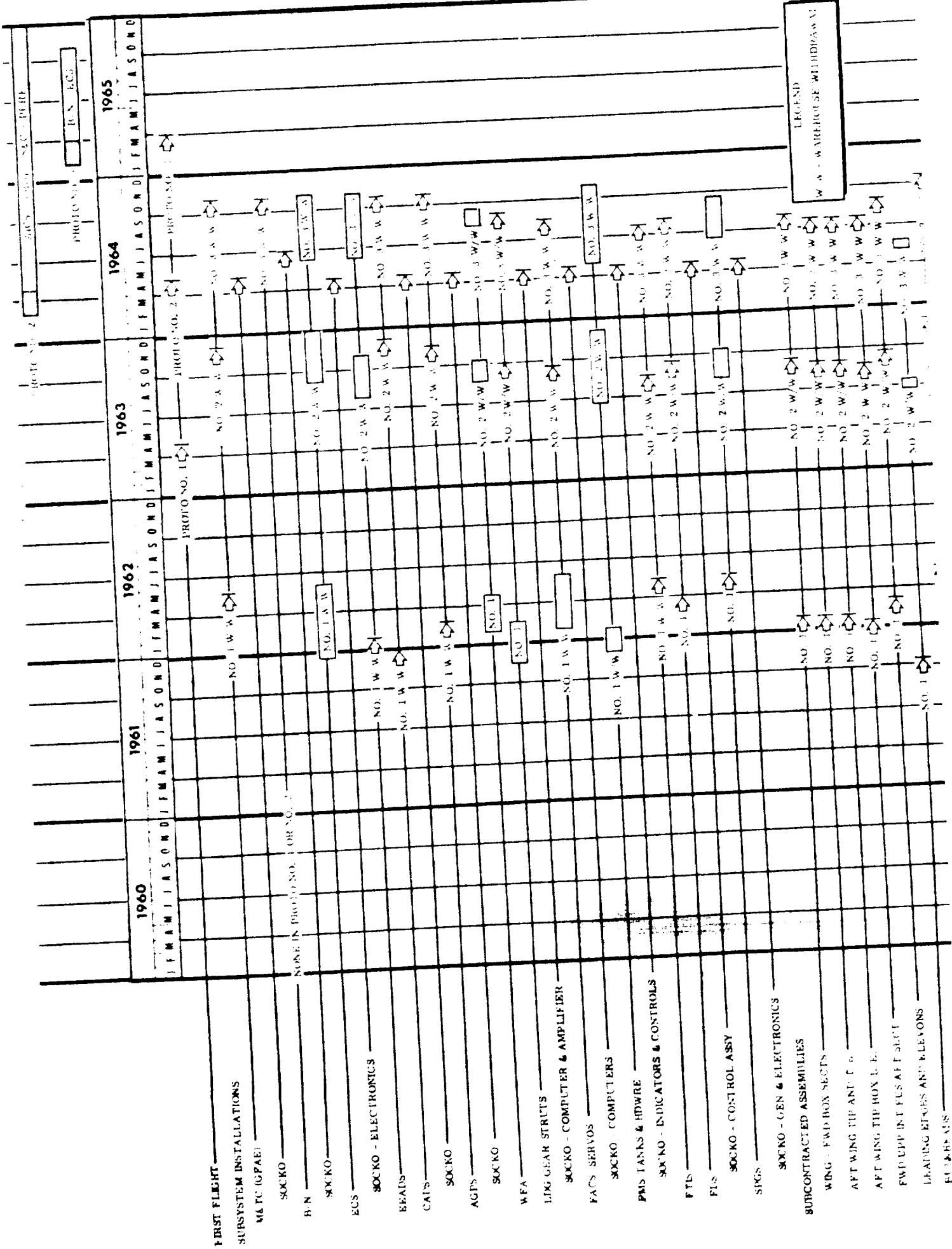
FIRST FLIGHT  
AIRFRAME FABRICATION











- FIRST FLIGHT
- SUBSYSTEM INSTALLATIONS
- MATC (GPAE)
- SOCKO
- BUN
- SOCKO
- ECS
- SOCKO - ELECTRONICS
- BEATS
- CATS
- SOCKO
- AGTS
- SOCKO
- WFA
- LING GEAR STRUTS
- SOCKO - COMPUTER & AMPLIFIER
- FAC'S SERVOS
- SOCKO COMPUTERS
- PMS TASKS & HWRE
- SOCKO - INDICATORS & CONTROLS
- FTS
- FLS
- SOCKO - CONTROL ASSY
- SIGS
- SOCKO - GEN & ELECTRONICS
- SUBCONTRACTED ASSEMBLIES
- WING - FWD BOX SECTS
- AFT WING TIP ANT T-6
- AFT WING TIP BOX D.E.
- FWD UP INT FCS AFT SECT
- LEADING EDGES AND ELEVONS
- FUELS

LEGEND  
W/W - WAREHOUSE WITHDRAWN

BUN ECG

1965

1964

1963

1962

1961

1960

J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D

PROTO NO. 1

PROTO NO. 2

PROTO NO. 1

PROTO NO. 2

PROTO NO. 1 OR NO. 2







XB-70 FLIGHT TEST SCHEDULE  
PLAN 63-E-1  
31 JANUARY 1963

PARTRIGHT &  
GROUND STOPS

520 FLIGHT HOURS  
10 PERCENT MONTHS

XB-70 No. 3  
(SN 62-2008)

200 5-30  
200 2-30

XB-70 No. 2  
(SN 62-2007)

AICS 2-5-65 PRODUCTION HOURS  
START CONT 10-100  
PERF 3-30

200 30

XB-70 No. 1  
(SN 62-2001)

INITIAL AICS 2-5-65 DATA 5-3-65  
AICUT START CONT 5-30  
5-30 PERF 8-30

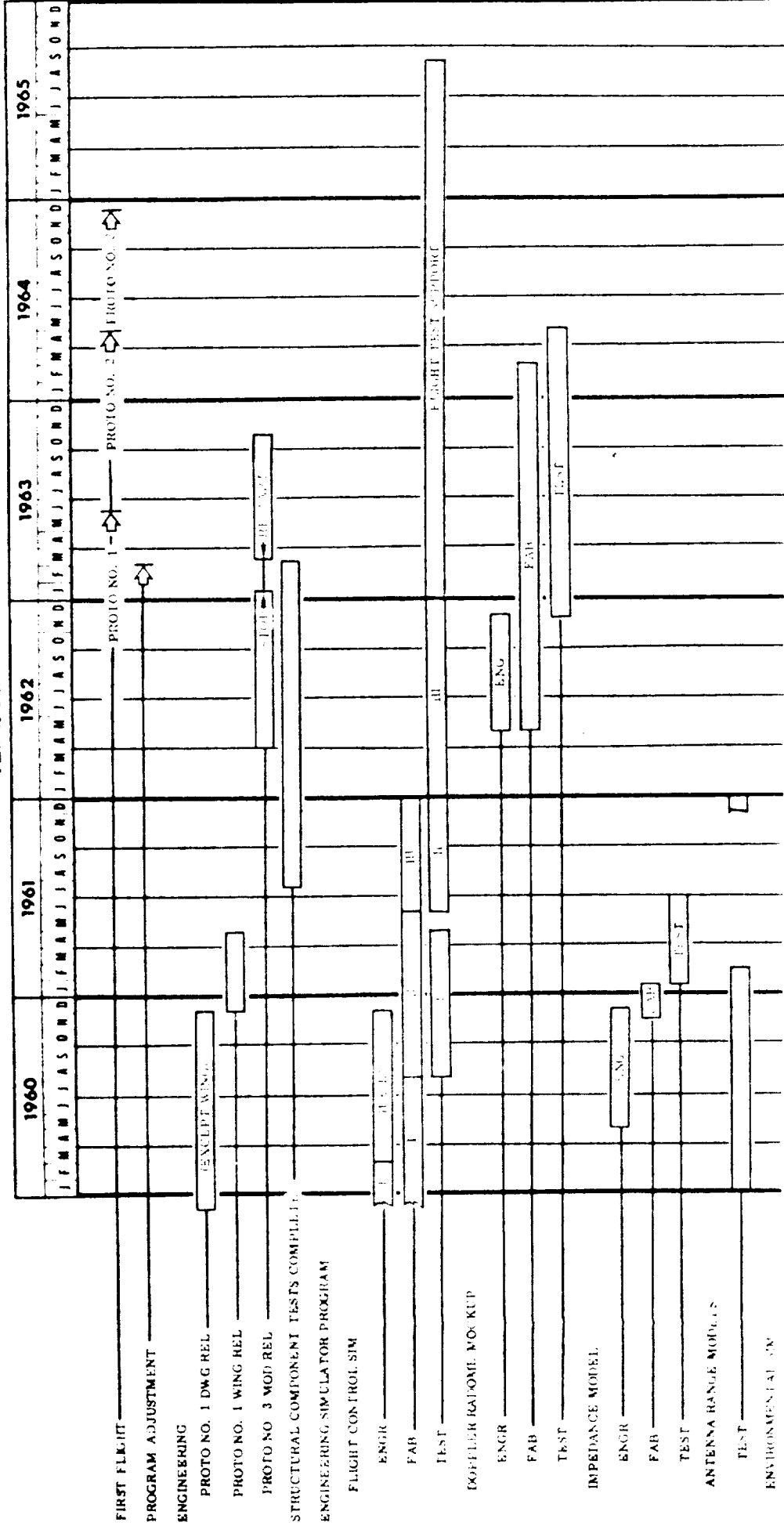
210 31  
280 40

JFMAMJJAS O N D J F M A M J J A S O N D J F M A M J J A S O N D  
1963 1964 1965

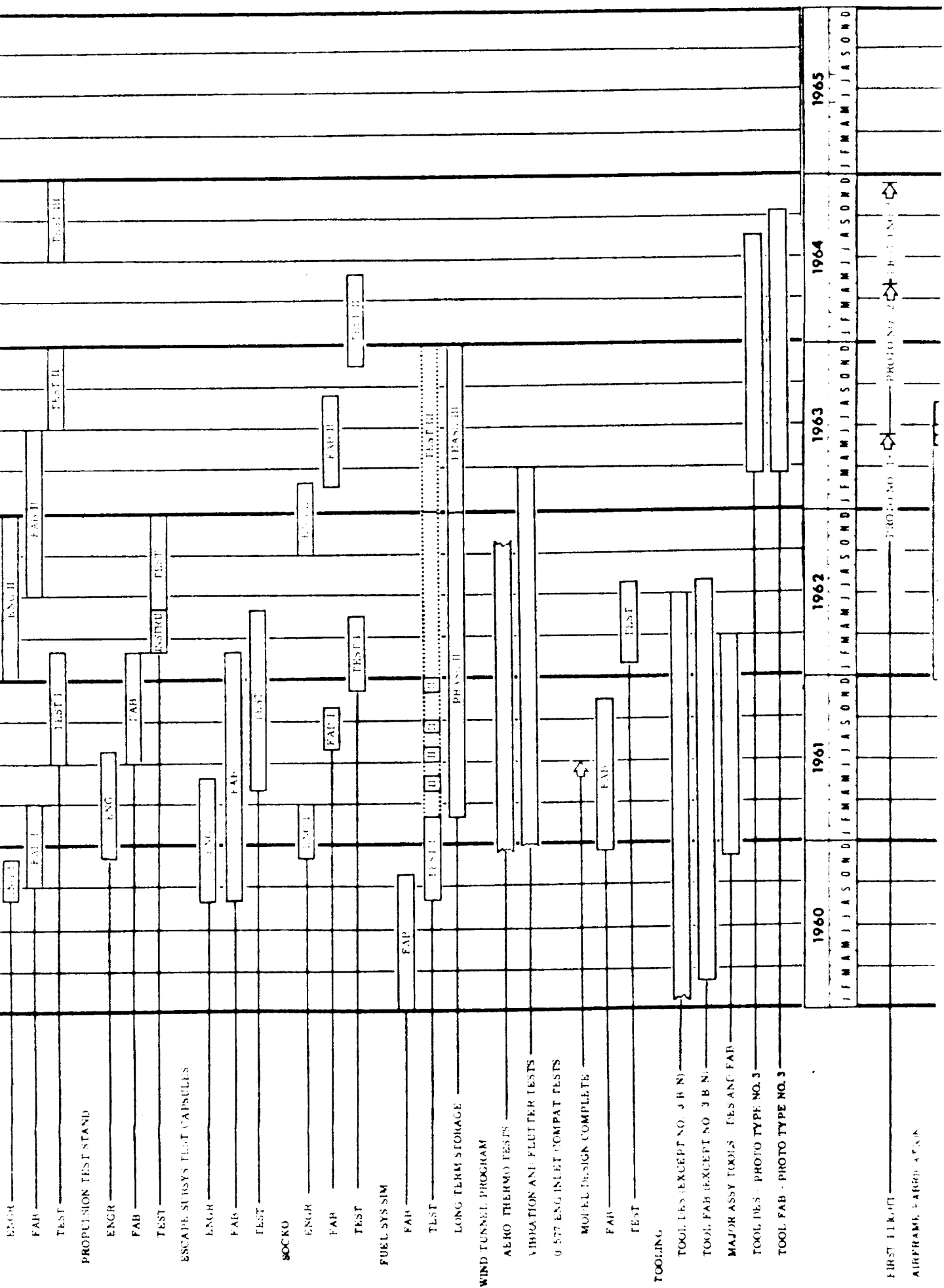




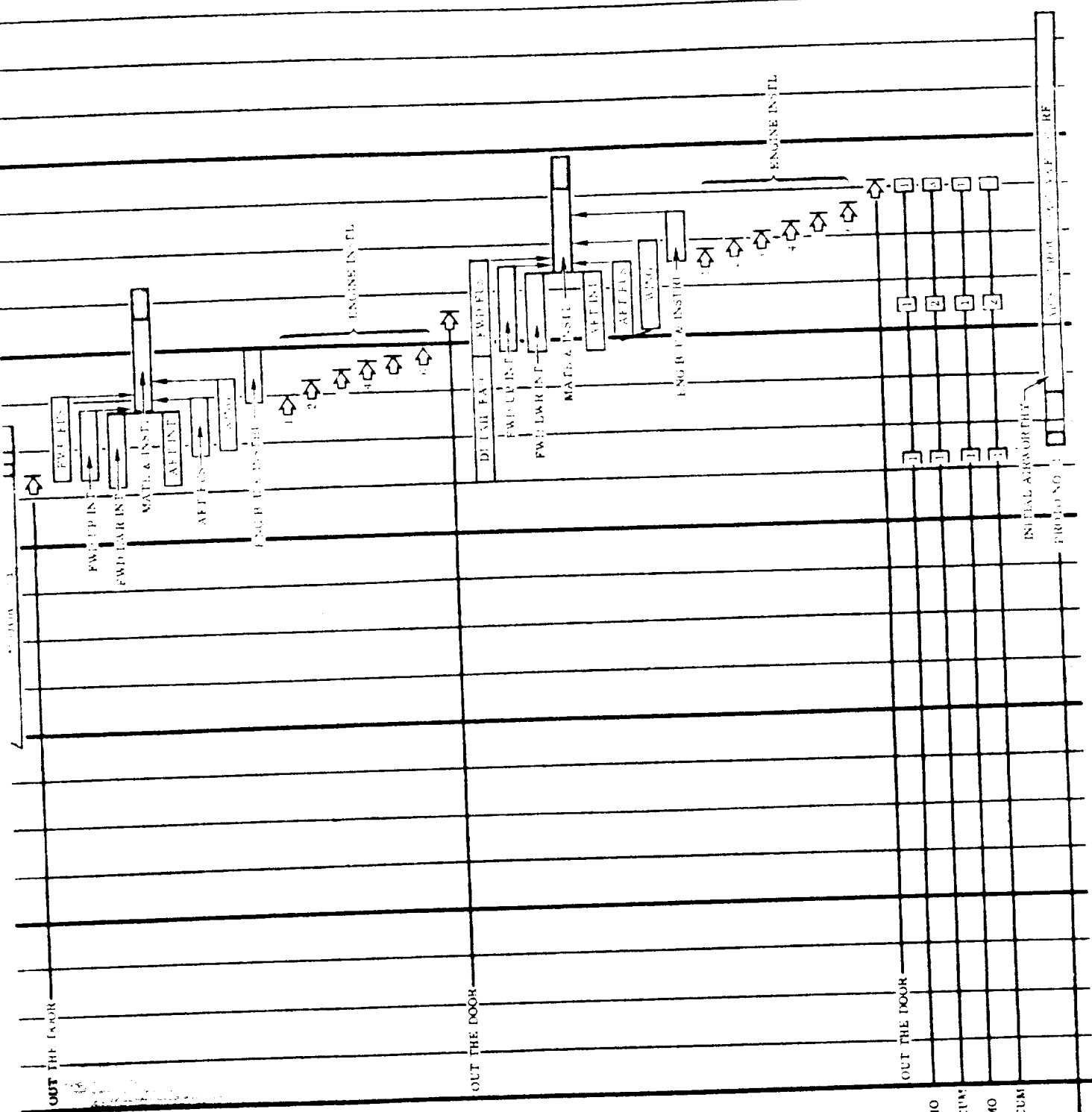
B-70 MASTER PHASING SCHEDULE  
PLAN 63-2-1A











PROTOTYPE NO. 1

PROTOTYPE NO. 2

PROTOTYPE NO. 3

MO  
CUM

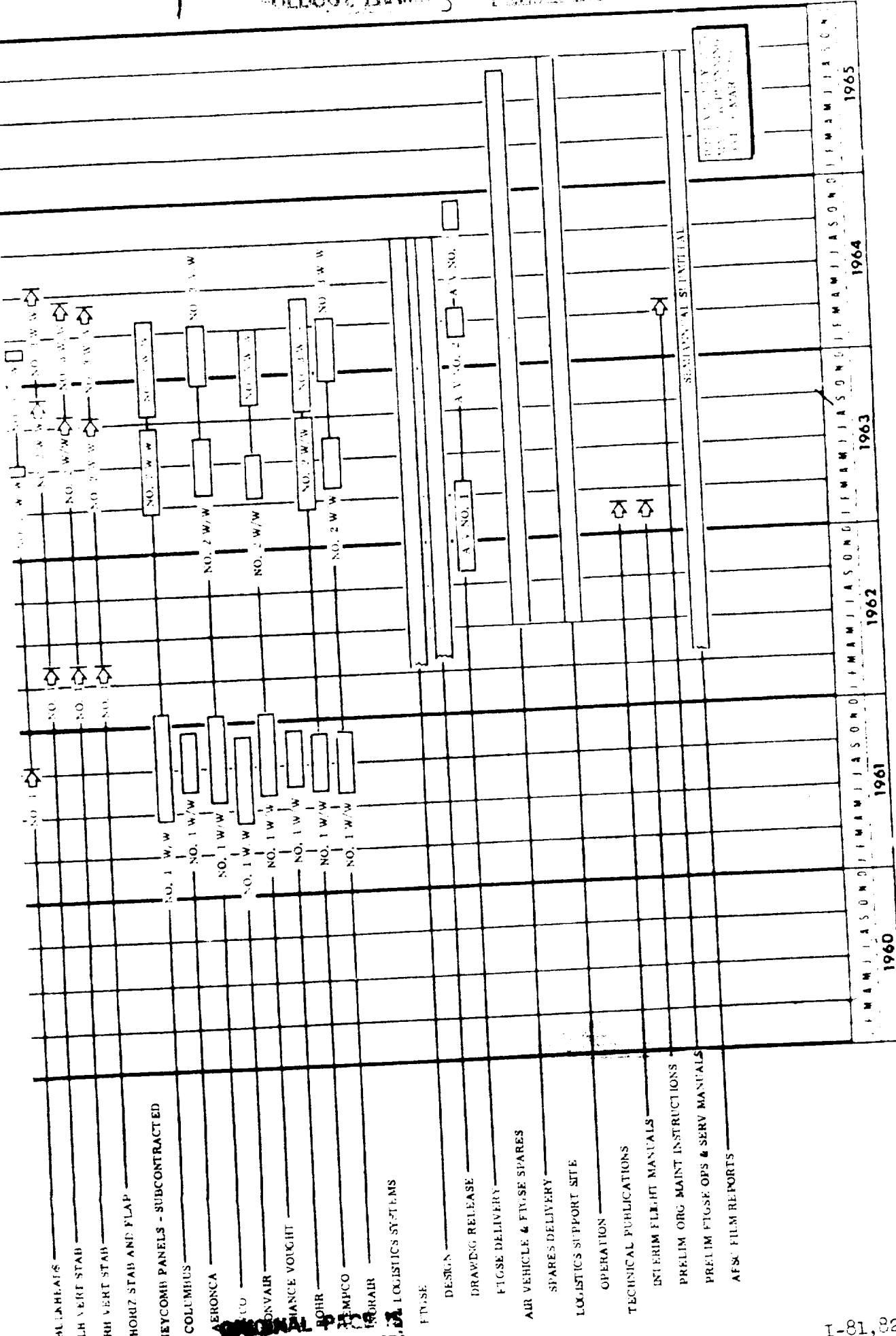
COMPLETIONS

ACCEPTANCES

FLIGHT TEST

RD

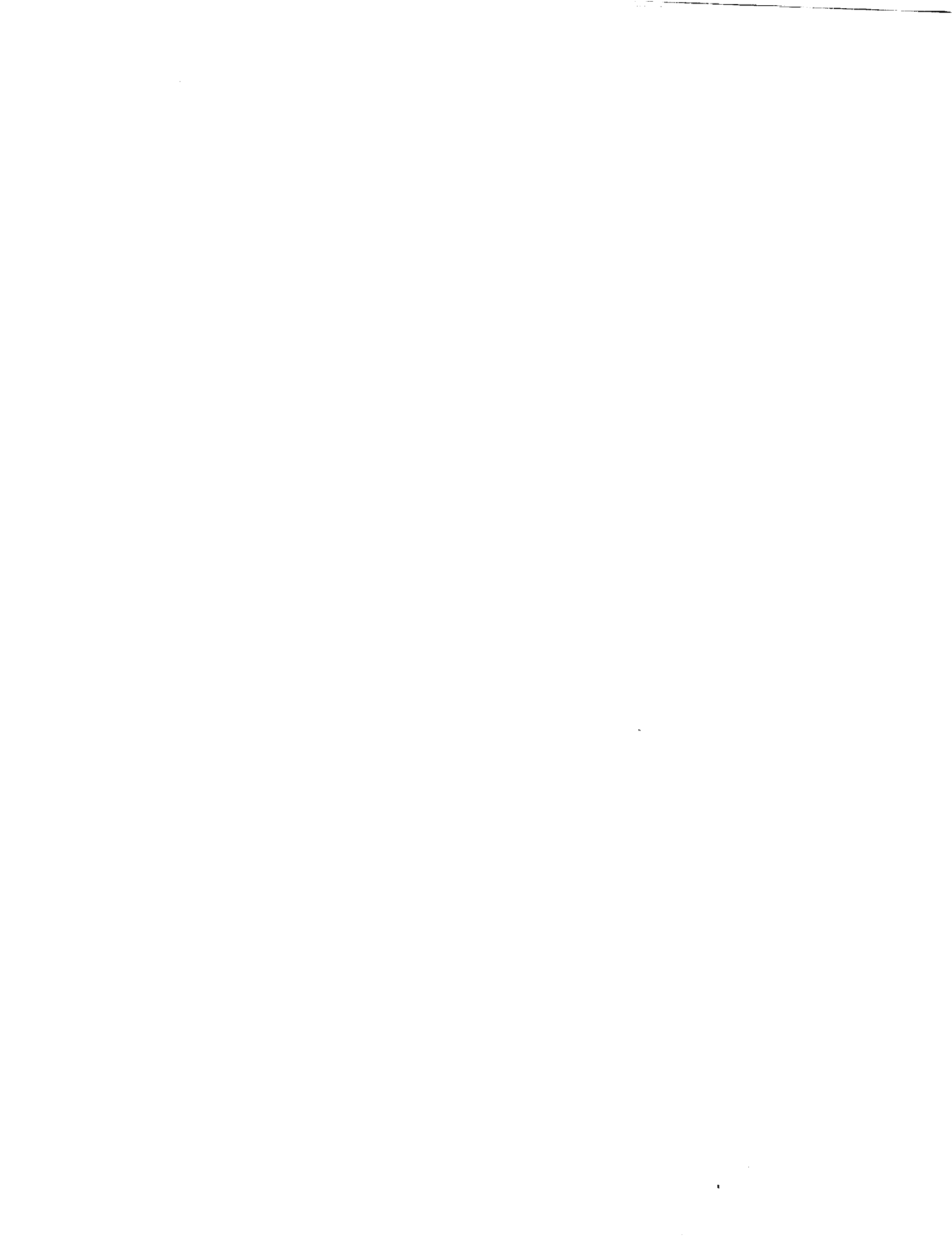




**ORIGINAL OF POOR QUALITY**

SD72-SH-0003

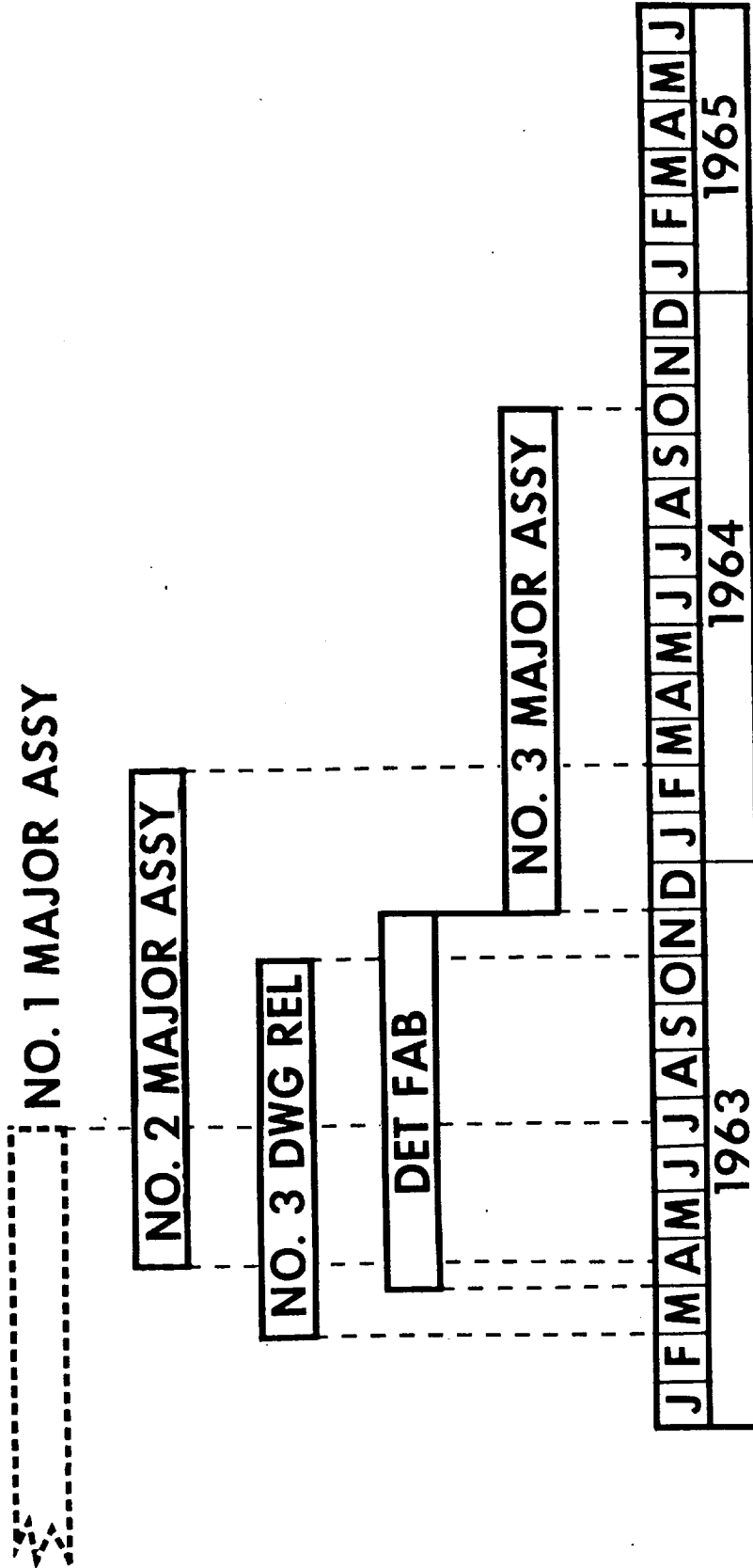
I-81,82



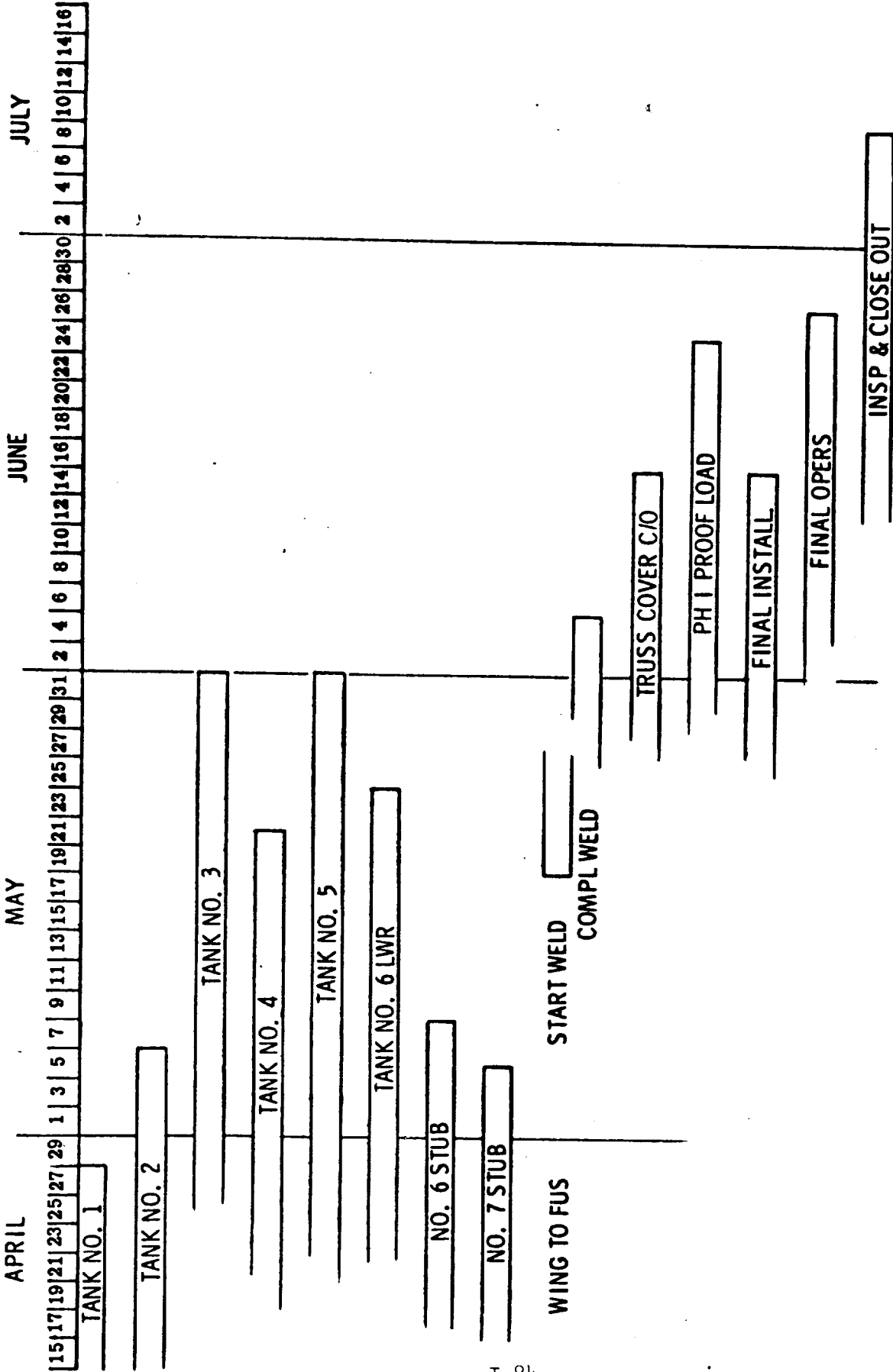


# **XB-70A PROGRAM**

**PLAN 63-2-14 (Page 1)**



XB-70A NO. 1 FINAL ASSEMBLY PLAN



# XB-70A FB FLIGHT TEST SCHEDULE

PLAN 63-21A Page (3)

REV D 4-27-63

PREFLIGHT &  
GROUND TESTS

520 FLIGHT HOURS  
48 FLIGHT MONTHS

FLY HOURS  
FLY MONTHS

XB-70A NR 1  
(62-200) BIN 3-50  
ENVIRON 200

110 7

XB-70A NR 2  
(62-201) A/C 5 2-20 PROP 2-20  
SFC 10-100 PERF 3-30  
A/C 5 3-30 PROP 3-30  
SFC 3-50 PERF 2-20  
VAF 1-10

170 17

XB-70A NR 1  
(66-001) INITIAL AIRWORTH  
5-50  
XB-70A NR 2  
(66-002) VAF 1-10 PERF 2-20

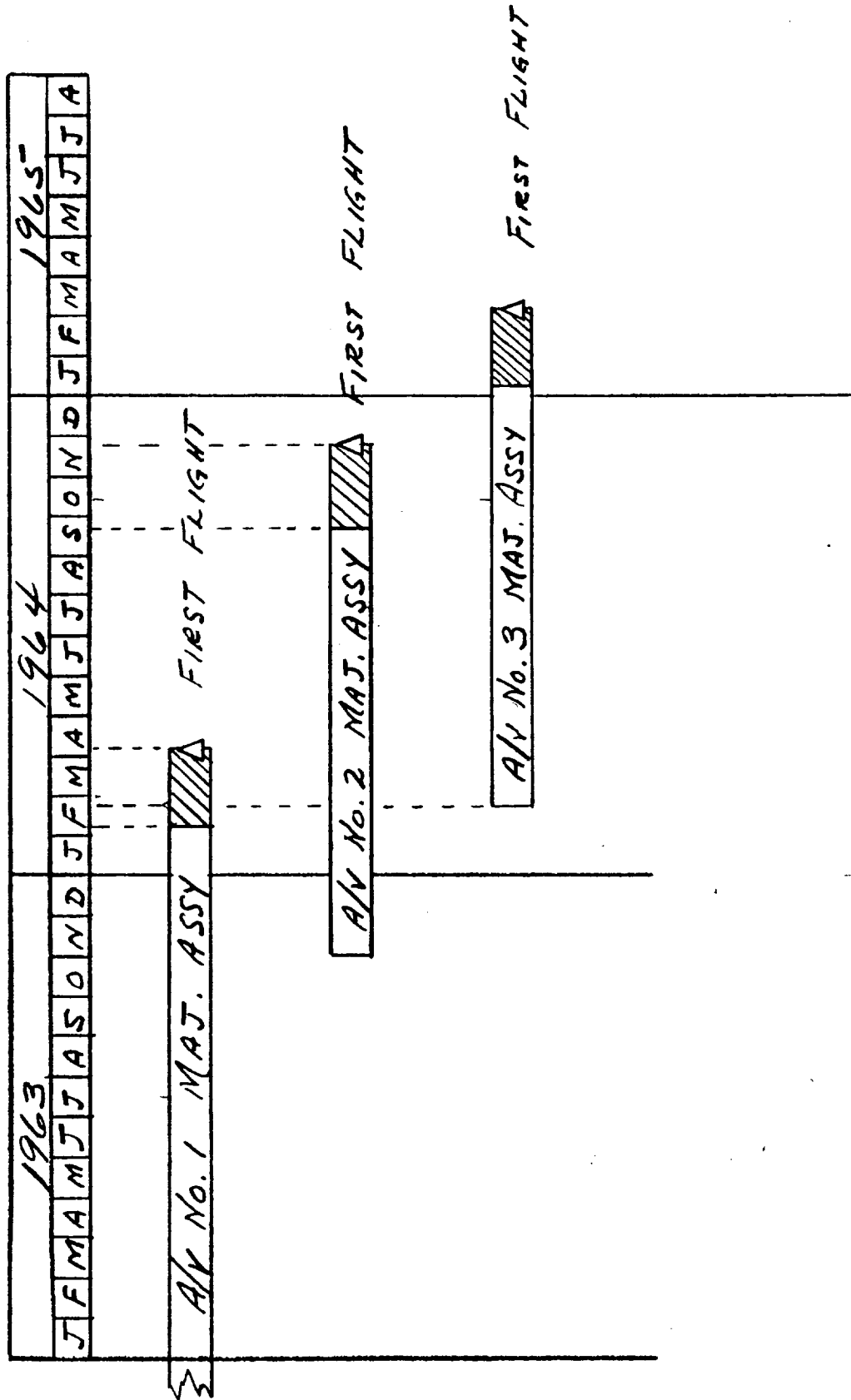
240 24

520 48

J.F. MANN JASON D. JASON D. J.F. MANN JASON D.  
1963 1964 1965

**XB-70 PROGRAM**  
**(63-9-19)**

10/2/63



**XB-70A FB FLIGHT TEST SCHEDULE**  
 PLAN 63-9-19  
 27 SEPT 1963

PREFLIGHT &  
 GROUND TESTS

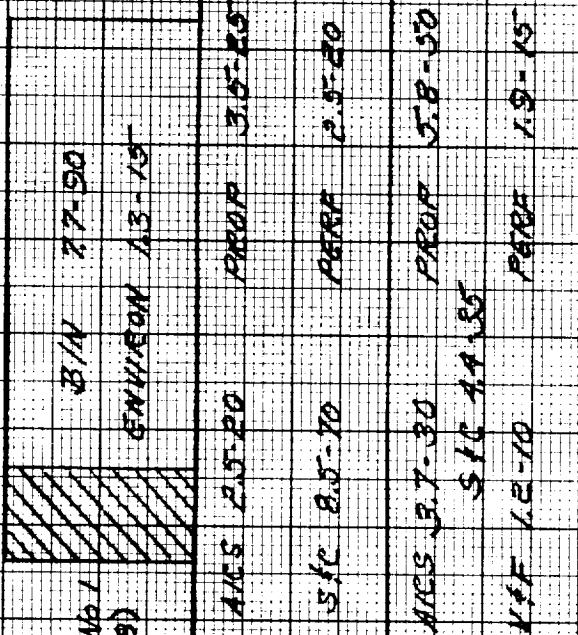
XB-70B No. 1  
 (62-208)

XB-70A No. 2  
 (62-207)

XB-70A No. 1  
 (62-201)

FLTS 1-12

PHASE II PROOF LOADS



FLT HOURS  
 1065

FLT MONTHS  
 9

185

17

180

22

120

19

J F M A M J J A S O N D  
 1964

J F M A M J J A S O N D  
 1965

J F M A M J J A S O N D  
 1966

**INTERNAL LETTER**  
**NORTH AMERICAN AVIATION, INC.**

**TO** . Those Listed  
**ADDRESS**  
(Show Dept., Group,  
Div., & Location)

**DATE** . 31 March 1964

**FROM** . W. R. Bradley  
**ADDRESS** . D/191 - IAD

**PHONE** . 4001

**SUBJECT** . XB-70A Schedule Revision  
Schedule Plan 64-3-5

Please revise in-house operating plans to reflect the following schedule objectives:

	<u>A/V No. 1</u>	<u>A/V No. 2</u>
Shop Completion	7 May 1964	15 October 1964
First Flight	27 June 1964	15 December 1964

Implementation of this plan has been approved by Mr. Stroh. Specific instructions will be issued in a separate letter regarding EAC, and Current Business loads.

*W. R. Bradley*  
W. R. Bradley  
Chief  
B-70 Program Analysis

WRB:ip

cc: W. Spivak, D/190; G. Barton, D/177 PMD; D. Peitzke, D/163; C. Adams, D/098;  
H. Harris, D/157; R. Ferren, D/186; D. Ince, D/186; D. Rogerson, D/184;  
W. Scott, D/168; F. Hargrove, D/163; R. Odom, D/163; H. Bone, D/198;  
W. Emsley, D/198; H. Wilkerson, D/186; K. Kleinwachter, D/192; R. Scholl, D/61;  
J. Boyer, D/141 PMD; W. Yoakley, D/93 PMD; C. Sell, D/93; R. Gottschalk, D/052;  
E. Hanlon, D/168; K. Bengtson, D/060.

**XB-70A FLIGHT TEST SCHEDULE**

**PLAN 64-3-5**  
**1 APRIL 1964**

**PREFLIGHT &  
 GROUND TESTS**

**AICS 2.5-20 PROP 4.5-35**  
**SFC 8.5-70 PERF 2.5-20**

**INITIAL AIRWORTH 5-90**  
**AICS 3.7-30 PROP 4.8-40**  
**SFC 4.4-35 VFF 1.2-10 PERF 1.9-15**

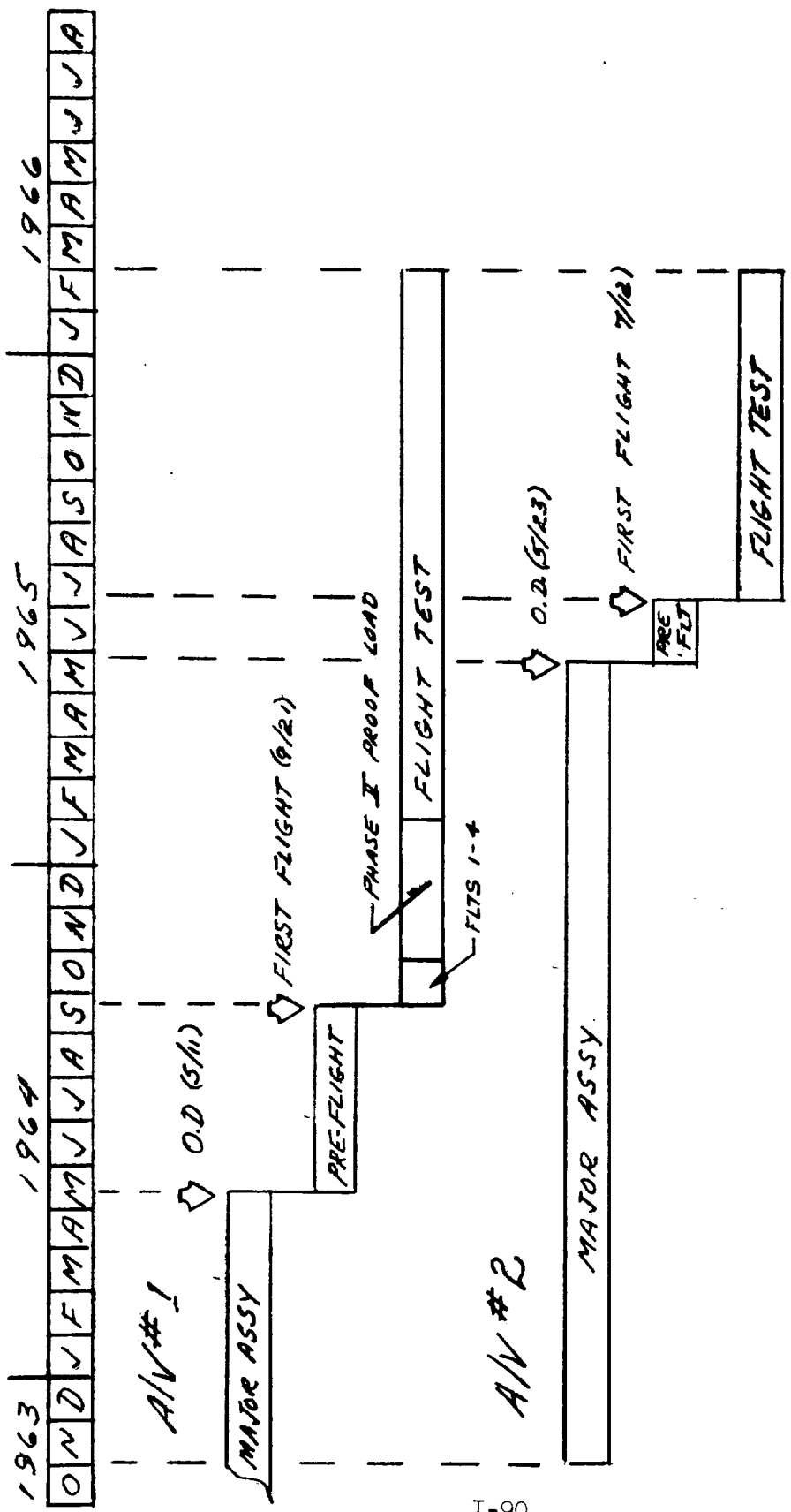
**FLTS 1 & 2**  
**PHASE II**  
**PROOF LOADS**

**J F M A M J J A S O N D J F M A M J J A S O N D**  
**1 9 6 4 1 9 6 5 1 9 6 6**

MFG COMPL DATE	FLY / BT FLY DATE	FLT. HRS.	FLT. MON.
10/15/64	12/15/64	145	18
5/7/64	6/27/64	170	21
		315	39

# XB-70A PROGRAM


## PLAN 64-11-1

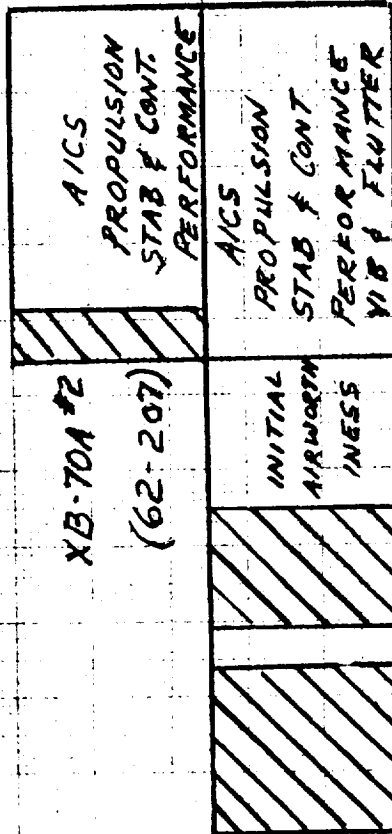




# XB-70A FLIGHT TEST SCHEDULE

PLAN 64-11-1  
9 Nov. 1964

 PREFLIGHT & GROUND TESTS



XB-70A #1  
(62-001)

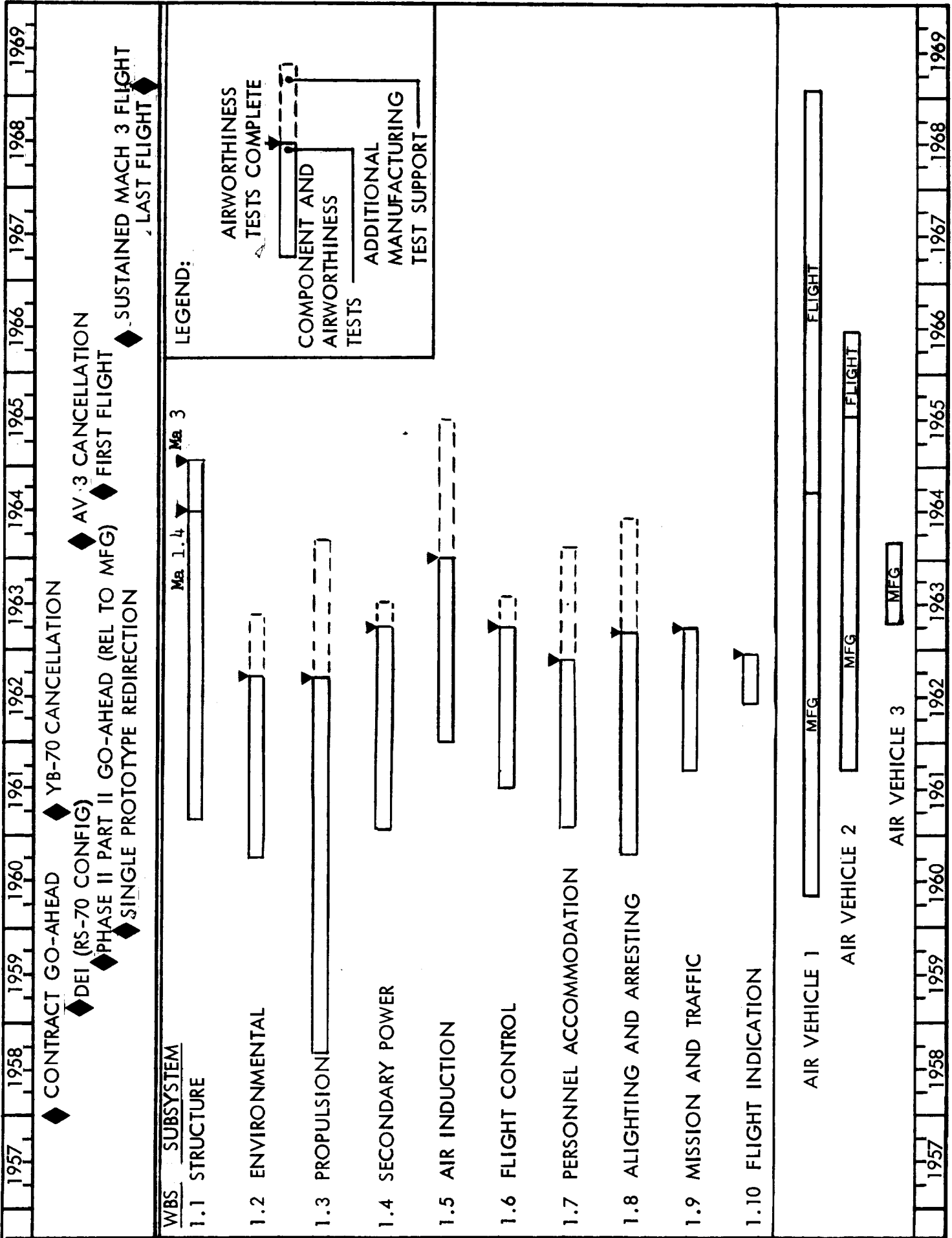
XB-70A #2  
(62-207)

FLTS 1-A → PHASE II PROOF LOADS

MFG. COMP.	1 <sup>ST</sup> FLT.	5 <sup>TH</sup> FLT.	FLT. HOURS	FLT. MONTHS
5-28-65	7-12-65	-	65	8.0
		1-30-65	115	14.5
			180	22.5

J F M A M J J A S O N D	J F M A M J J A S O N D	J F M A M J J A S O N D
1964	1965	1966

# PROGRAM DEVELOPMENT SUMMARY



#### IV-5 PROGRAM SUMMARY COST DATA

This section provides a summary of the B-70 program cost data. It includes the following cost related summaries:

<u>Title</u>	<u>Page</u>
Total Program by EOC/WBS	I-93
Time-Phased Total Program by EOC	I-96
Engineering Hours - Group Matrix	I-98
Total Program by SDW	I-102
Total Program by WBS Level 4	I-175
Air Vehicle (WBS 1.0) by Subsystem	I-226

#### Total Program by EOC/WBS

This summary presents the Work Breakdown Structure level 4 (system) and level 5 (subsystem) items by Element of Cost. A sub-total of the subsystems has been provided along with a program total. The data is not time-phased and Subdivision of Work detail is not included.

#### Time-Phased Total Program by EOC

This summary contains a time-phased schedule for each Element of Cost. The data is not provided by Subdivision of Work or WBS item. SDW and WBS time-phased EOC detail is available within volumes II, III and IV under the individual WBS items.

#### Engineering Hours - Group Matrix

This matrix contains the direct labor hours charged by each B-70 Engineering Group against a particular WBS level 4 or level 5 item. This matrix allows the analyst to identify and rearrange the engineering hours if desired. Each WBS element in volumes II, III and IV contains its own engineering hours matrix.

#### Total Program by SDW

This sections presents the total program by Subdivision of Work. The data is presented in graphic form with the corresponding computer outputs which provided EOC detail included behind the charts. Charts and computer outputs are in the cost breakdown and time-phased formats.

#### Total Program by WBS Level 4

This section provides the level 4 WBS items by Element of Cost. The data is presented in graphic form with the corresponding computer outputs included behind the charts. Charts and computer outputs are in the cost breakdown and time-phased formats.

#### Air Vehicle (WBS 1.0) by Subsystem

This section presents the Air Vehicle data by each Subsystem within the Air Vehicle. Data is in cost breakdown and time-phased formats. Charts and the corresponding computer outputs, (which provide Element of Cost detail) are included.



B-70 TOTAL PROGRAM BY EOC/WBS

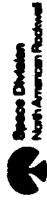
Work Breakdown Structure Code	Air Vehicle 1.0	Airframe Structures 1.1	ECS 1.2	Propulsion 1.3	Secondary Power 1.4	Air Induction 1.5	Flight Control 1.6	Per Accom and Escape 1.7	Alight and Arresting 1.8	MATC 1.9	Flight Indication 1.10	Test Instrum 1.11	Subay Instal C/O & Preflight 1.12	Air Veh Total 1.0
Design/Eng'g Hrs Labor	(1,826,579) 8,505,232	(8,302,581) 40,769,287	(985,802) 4,912,462	(1,761,024) 8,489,644	(1,950,276) 9,832,880	(630,695) 3,110,162	(1,130,155) 5,567,013	(526,124) 2,560,264	(199,309) 998,488	(213,308) 995,250	(530,886) 2,686,991	(316,502) 1,967,649	(18,373,241) 90,415,322	
Engr Burden	7,919,655	36,746,727	4,335,751	7,185,430	9,231,077	2,700,615	5,118,121	2,375,291	874,375	908,594		2,647,685	1,952,457	81,995,778
Production Hrs Labor	(11,904,709) 38,337,731													(4,590,814) 14,796,835
Shop Support Hrs Labor	(508,479) 1,488,671	(4,386,037) 13,183,710	(111,236) 320,730	(442,874) 1,393,646	(339,739) 1,041,422	(151,065) 470,196	(573,357) 1,712,747	(510,049) 1,610,946	(2,650) 9,280	(16,223) 47,473	(174,639) 591,227	(65,703) 236,401	(7,282,051) 22,106,449	
Tooling & STE Hrs Labor														
Planning Hrs Labor		(716,532) 2,442,730												(280,324) 963,821
Test/Q.C. Hrs Labor	(5,411) 17,456	(1,950,765) 6,871,767	(8,931) 27,132	(27,838) 87,911	(19,595) 63,051	(10,036) 31,264	(34,093) 110,134	(21,266) 65,983	(301) 1,273	(771) 2,617	(19,251) 66,972	(587,203) 2,135,631	(2,685,461) 9,481,191	
Mfg Burden	1,966,438	74,073,403	418,209	1,717,820	1,354,238	629,614	2,232,702	1,932,869	11,602	62,860	1,435,666	22,277,981	108,113,402	
Eng'g Material Mfg Material	916,866	11,693,669 27,227,491	167,696	815,446	805,279	546,226	1,173,454	966,093	8,199	98,457	747,683	9,848,132	17,939,068 37,075,623	
Tool'g & STE Mat'l Subcontract	106,624	103,499,447 8,205,547	13,552,727 582,839	1,598,442 608,353	29,005,372 1,369,796	9,301,831 412,883	7,425,036 427,124	1,153,331 146,407	14,352,749 704,276	1,505,370 85,538	3,097,830 136,403	1,318,030	194,492,135 14,208,425	
Wind Tunnel Other Cost	2,267,739	2,760,920 12,295,983	197,805	3,383,427	330,209	1,243,178 326,113	257,964	69,926	61	9,157	48,942		4,004,098 19,187,326	
Sub-Total	23,188,681	378,108,412	24,515,351	35,280,119	53,033,324	18,772,082	24,024,295	10,901,110	16,960,303	3,715,316	3,234,233	8,779,082	55,496,937	656,009,245
Gen & Admin IDWA	303,828	6,495,097 21,332,575	391,060	563,172	921,444 429,186	288,326	410,733	200,741 1,455,704	298,913	55,450	58,329	158,094	1,155,919 4,685,745	11,401,106 27,903,210
Total Cost	23,492,509	406,036,084	24,906,411	35,843,291	54,383,954	19,060,408	24,435,028	12,557,555	17,259,216	3,770,766	3,292,562	8,937,176	61,338,601	695,313,561

B-70 TOTAL PROGRAM BY EOC/WBS (Cont)

Work Breakdown Structure Code	Elements of Cost	Prog	Log.	Weapon	Major	Flight	GSE	GSE	GSE	Spares	STE	Tooling	Dim.	CST	Handling
		Mgmt	Support	System	Airframe	Test	Basic	Maint	Basic	Maint	Spares	STE	Tooling	Tooling	CST
		2.22	2.23	2.24	3.0	4.41	5.50	5.51	6.60	7.0	8.0	8.80	8.81	8.82	
Design/Engr'g	Hrs Labor	(1,270,491) 6,216,096	(257,696) 1,173,517	(760,698) 3,510,080	(240,192) 1,226,299	(2,279,153) 12,765,763	(1,580,700) 6,894,024	(83,812) 440,678	(478,239) 1,681,648	(2,348) 9,865	(1,887) 6,601	(70,589) 230,082	(622) 2,666	(12,502) 54,755	
Engr Burden		5,223,627	1,302,642	3,195,969	1,292,101	15,219,035	7,561,259	515,432	2,473,632	11,814	8,358	317,488	3,279	59,444	
Production	Hrs Labor			(220,672) 804,564	(690,140) 2,225,908	(11,030) 35,575	(224,559) 746,798	(735,485) 2,303,896							
Shop Support	Hrs Labor	(16,626) 106,311	(18,407) 84,244	(14,410) 43,901		(301,586) 1,219,027	(272,322) 1,287,067	(21,443) 95,429							
Tooling & STE	Hrs Labor														
Planning	Hrs Labor			(101) 454		(77) 299	(7,858) 28,551	(24,444) 75,067				(1,590) 4,716			
Test/Q.C.	Hrs Labor			(1,503) 5,452	(91,027) 331,711	(374,099) 1,745,335	(14,866) 52,560	(4,891) 18,007	(49,983) 164,304	(801) 2,829	(20,487) 70,716	(274,195) 938,690	(4,593) 14,964	(2,135) 7,163	
Mfg Burden		23,954	99,385	409,156	3,255,981	4,051,204	2,313,564	127,366	3,350,652	909,243	2,568,949	21,250,021	839,884	553,355	
Engr'g Material		3,911	6,808	50,351		1,577,071	216,590	7,532	12,960						
Mfg Material				5,575		144,913	1,578,449		6,357,812						
Tool'g & STE Mat'l															
Subcontract		476	578	122,190,126		276,599	233,560	1,866	862,366		844,371	22,268,688	1,275,734	342,074	
MPC				4,608,407							99,362	1,940,267	117,271	33,624	
Wind Tunnel		367,673	3,274	287,993		1,202,278	60,604		348,211		85	260,953			
Other Cost															
Sub-Total		11,942,048	2,670,448	135,112,028	8,332,000	38,237,099	20,973,026	1,206,310	17,630,548	2,367,101	7,866,974	68,936,543	3,051,863	1,543,857	
Gen & Admin		168,238	47,323	1,412,919	156,042	1,015,951	397,683	26,637	379,674	44,456	143,367	1,243,123	56,552	27,983	
IDWA															
Total Cost		12,110,286	2,717,771	136,524,947	8,488,042	39,253,050	21,370,709	1,232,947	18,010,222	2,411,557	8,010,341	70,179,666	3,108,415	1,571,840	

B-70 TOTAL PROGRAM BY EOC/WBS (Cont)

Work Breakdown Structure Code	Elements of Cost	Preprod 9.90	Training 9.91	Pubs 9.92	Photo Lab 9.93	Reliab 9.94	Computing 9.96	Photo-Temp Lab 9.97	Termination Costs 9.98	Total Program
	Design/Engr'g Hrs Labor	(8,922) 38,128	(104,274) 462,569	(210,947) 968,036	(46,644) 230,590	(83,785) 418,454	(194,434) 1,005,464	(28,164) 136,957		(26,089,340) 127,887,594
	Engr Burden	39,181	401,368	1,105,284	204,502	393,933	911,337	115,198		122,350,661
	Production Hrs Labor	(64,772) 201,412								(18,579,501) 59,902,030
	Shop Support Hrs Labor	(7,386) 22,321								(7,934,231) 24,964,749
	Tooling & STE Hrs Labor	(100,268) 351,743								(7,725,192) 26,410,131
	Planning Hrs Labor	(960) 3,075								(1,602,992) 5,520,820
	Test/Q.C. Hrs Labor	(12,562) 43,657								(3,536,603) 12,876,579
	Mfg Burden	678,796								148,544,912
	Engr'g Material	11,413								19,956,849
	Mfg Material	65,232								45,227,604
	Tool'g & STE Mat'l	289,149								25,616,633
	Subcontract									316,682,261
	MPC	37,169								22,503,265
	Wind Tunnel									4,004,098
	Other Cost	454	903	39,254					7,414,547	29,173,555
	Sub-Total	1,781,730	866,410	2,263,529	435,092	812,387	1,916,801	252,155	7,414,547	991,621,741
	Gen & Admin IDWA	33,557	2,310	46,767	7,168	13,499	31,522	3,543	159,806	16,819,226 27,903,210
	Total Cost	1,815,287	868,720	2,310,296	442,260	825,886	1,948,323	255,698	7,574,353	1,036,344,177



B-70 Timephased Total Program Cost by Elements of Cost

	Design Engineering				Production		Shop Support		Tooling		Planning		Test/Q. C.		Manufacturing		
	Hrs	Labor	Burden	Total Dollars	Hrs	Labor	Hrs	Labor	Hrs	Labor	Hrs	Labor	Hrs	Labor	Burden	Total Dollars	
March 1958	(224, 102)	1, 021, 230	1, 019, 625	2, 040, 855				30, 195	37, 248	(9, 756)					953	52, 649	121, 045
Sept. 1958	(962, 476)	4, 224, 618	3, 726, 313	7, 950, 931			(70, 826)	210, 278	32, 232	(5, 241)					10, 944	248, 876	508, 041
March 1959	(1, 300, 835)	5, 632, 353	4, 452, 989	10, 085, 342			(463, 629)	1, 367, 133	93, 095	(20, 749)					27, 491	1, 716, 979	3, 233, 022
Sept. 1959	(1, 963, 304)	8, 294, 387	6, 996, 100	15, 290, 487	(101, 470)	374, 296	(523, 109)	1, 525, 807	295, 989	(79, 393)					95, 251	2, 292, 346	4, 653, 629
March 1960	(1, 977, 400)	8, 988, 258	7, 420, 501	16, 408, 759	(118, 765)	440, 321	(627, 351)	1, 859, 886	1, 283, 247	(373, 166)					207, 645	3, 458, 681	7, 397, 770
Sept. 1960	(1, 980, 615)	9, 159, 817	7, 320, 977	16, 480, 794	(37, 591)	110, 112	(1, 102, 985)	3, 344, 122	1, 628, 432	(483, 006)					432, 618	5, 767, 623	11, 561, 877
March 1961	(2, 914, 805)	13, 476, 094	9, 900, 538	23, 376, 632	(588, 807)	1, 851, 083	(2, 011, 299)	6, 154, 692	5, 987, 274	(287, 754)					1, 015, 864	14, 461, 162	29, 998, 159
Sept. 1961	(2, 070, 298)	9, 997, 248	9, 493, 886	19, 491, 134	(1, 857, 107)	5, 852, 799	(1, 027, 135)	3, 123, 515	8, 823, 994	(221, 364)					1, 134, 493	20, 953, 190	40, 543, 065
March 1962	(1, 921, 251)	9, 644, 550	8, 724, 056	18, 368, 606	(2, 760, 855)	8, 483, 947	(630, 452)	1, 845, 539	3, 223, 286	(968, 596)					1, 095, 181	17, 253, 519	32, 335, 166
Sept. 1962	(1, 779, 907)	8, 888, 090	8, 826, 893	17, 714, 983	(2, 719, 064)	8, 653, 756	(482, 878)	1, 695, 183	1, 362, 316	(413, 106)					1, 209, 082	15, 955, 627	29, 269, 447
March 1963	(1, 508, 598)	8, 447, 807	8, 409, 539	16, 857, 346	(2, 501, 544)	8, 170, 620	(298, 494)	1, 175, 964	1, 032, 982	(306, 391)					1, 184, 900	13, 724, 700	25, 289, 207
Sept. 1963	(1, 531, 990)	7, 953, 066	8, 279, 246	16, 232, 312	(2, 719, 690)	7, 769, 055	(193, 786)	748, 142	846, 104	(238, 243)					1, 774, 133	15, 530, 437	28, 831, 346
March 1964	(1, 424, 507)	7, 747, 296	8, 710, 534	16, 457, 830	(2, 671, 497)	9, 554, 346	(102, 256)	298, 456	1, 522, 493	(384, 607)					1, 583, 562	18, 192, 084	31, 430, 225
Sept. 1964	(1, 102, 524)	6, 111, 242	7, 114, 310	13, 225, 552	(1, 373, 648)	4, 616, 476	(76, 931)	228, 056	434, 710	(164, 933)					1, 011, 976	8, 736, 057	15, 127, 139
March 1965	(1, 395, 919)	6, 720, 474	8, 176, 637	14, 897, 111	(842, 863)	2, 957, 137	(112, 978)	469, 433	175, 713	(39, 634)					726, 479	5, 667, 087	10, 044, 667
Sept. 1965	(748, 849)	4, 427, 997	4, 741, 032	9, 169, 029	(206, 550)	842, 175	(55, 370)	228, 980	30, 627	(6, 424)					507, 568	1, 995, 249	3, 623, 732
March 1966	(694, 981)	3, 927, 923	5, 012, 046	8, 939, 969	(34, 838)	71, 348	(73, 222)	272, 473	3	(4)					504, 030	1, 343, 494	2, 196, 297
Sept. 1966	(886, 979)	3, 225, 144	4, 025, 439	7, 250, 583	(45, 212)	154, 559	(71, 684)	386, 895	386	(48)					354, 409	1, 195, 152	2, 095, 387
<b>Total</b>	<b>(26, 089, 340)</b>	<b>127, 887, 594</b>	<b>122, 350, 661</b>	<b>250, 238, 255</b>	<b>(18, 579, 501)</b>	<b>59, 902, 030</b>	<b>(7, 934, 231)</b>	<b>24, 964, 749</b>	<b>26, 410, 131</b>	<b>(7, 725, 192)</b>	<b>5, 520, 820</b>	<b>(1, 602, 992)</b>	<b>12, 876, 879</b>	<b>148, 544, 912</b>	<b>148, 544, 912</b>	<b>278, 219, 221</b>	



B-70 Timephased Total Program Cost by Elements of Cost (Cont)

	Eng. Mat'l.	Mfg Mat'l	Tool Mat'l	Subcont	Total Mat'l	MPC	Wind Tunnel	Other Cost	Sub-Total	Gen. & Admin.	IDWA	Grand Total
March 1958	2,805		458		3,263	177	170,368	12,261	2,347,969			2,347,969
Sept. 1958	129,704		-438	8,190,545	8,319,811	79,706	583,528	225,388	17,667,405			17,667,405
March 1959	396,374		-20	21,955,014	22,351,368	615,612	610,704	867,657	37,763,705		23,214	37,786,919
Sept. 1959	314,975		89,694	49,566,389	49,971,058	1,388,679	695,957	1,344,630	73,344,440		8,848	73,353,288
March 1960	1,462,342	985	604,007	41,888,408	43,955,742	2,757,281	338,115	2,308,745	73,166,412	1,333,706	13,335	74,513,453
Sept. 1960	1,076,249	39,128	905,281	27,724,692	29,745,350	1,910,668	403,089	1,812,982	61,914,760	1,240,256	96,298	63,251,314
March 1961	2,780,086	1,028,879	3,523,328	32,621,709	39,954,002	1,553,828	296,523	2,630,548	97,769,692	1,912,414	4,372,691	104,054,797
Sept. 1961	3,187,634	4,713,924	11,005,192	38,932,401	57,839,151	2,712,655	237,221	2,908,775	123,732,001	2,391,716	5,913,127	132,036,844
March 1962	1,153,259	4,986,229	4,915,358	30,307,483	41,362,329	1,834,327	207,559	2,805,872	96,913,859	1,664,247	2,924,005	101,502,111
Sept. 1962	1,583,823	5,576,903	2,297,855	25,663,044	35,121,625	1,560,821	177,914	2,729,681	86,574,471	1,465,022	2,610,066	90,649,559
March 1963	1,560,504	7,726,164	691,031	21,314,707	31,292,406	1,887,490	148,254	1,934,463	77,409,166	1,342,569	2,496,459	81,248,194
Sept. 1963	2,779,207	7,727,118	844,638	7,862,704	19,213,667	1,370,510	118,797	1,267,568	67,034,200	1,167,491	3,068,199	71,269,890
March 1964	598,383	6,407,347	476,551	10,336,412	17,818,693	2,217,114	1	1,357,564	69,281,427	1,560,908	4,803,875	75,646,210
Sept. 1964	579,250	2,713,606	125,098	250,099	3,668,053	1,324,915	-1	1,928,482	35,274,140	783,726	1,561,617	37,619,483
March 1965	836,247	870,802	100,368	68,654	1,876,071	563,170	1	1,021,828	28,402,848	765,790	4,727	29,173,365
Sept. 1965	610,581	1,120,300	-1,083		1,729,798	308,764		3,239,124	18,070,447	485,297	6,749	18,562,493
March 1966	389,490	1,093,354	3,791		1,486,635	308,288	11,740	400,400	13,343,329	356,383		13,699,712
Sept. 1966	515,936	1,222,865	35,524		1,774,325	109,260	4,328	377,587	11,611,470	349,701		11,961,171
<b>Total</b>	<b>19,956,849</b>	<b>45,227,604</b>	<b>25,616,633</b>	<b>316,682,261</b>	<b>407,483,347</b>	<b>22,503,265</b>	<b>4,004,098</b>	<b>29,173,555</b>	<b>991,621,741</b>	<b>16,819,226</b>	<b>27,903,210</b>	<b>1,036,344,177</b>

ENGINEERING HOURS - GROUP MATRIX

GRP NO.	TITLE	VRS															
		1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.11	2.22	2.23	2.24	3.0	
2	PROPULSION DES. & DEV.	63,051	5,556	6,709	220,179	46,231	76,006	18,277	2,602				2,389			2,067	
3	ELECT. & AVIONICS INSTALL	142,209	137,424		5,412	403,054											
4	FLUID POWER SYSTEM					455,785											
5	EMPERNAGE																
6	CONTROLS SYSTEM																
7	LANDING GEAR																
10	STRUCTURAL ANALYSIS	1019,126			5,662	8,204											
11	WEIGHT CONTROL	259,843	32,796	11,297	7,559	12,895			1,925			17,174				3,622	
12	CHECKING	6,829	146,505		12,431				8,084								
13	AERODYNAMICS	57,726	124,770														
14	WIND TUNNEL MODELS	246,723	125,534														
15	DATA CONTROL																
16	PHOTOGRAPHIC LAB																
18	PROPULSION SYS. TEST																
19	PROPULSION SYS. DEV.				2,963	42,122											
20	OPERATION PLANNING																
21	FLIGHT TEST MAINTENANCE																
27	PROPOSAL & PROCUREMENT CONT.																
28	FIELD SERVICE PUBLICATION																
28	FIELD SERVICE PUBLICATION																
30	NUMERICAL DESIGN																
32	ARMAMENT																
33	ADVANCED STRUCTURES																
34	STRUCTURAL PROJECTS																
35	FUSELAGE																
36	WING & EMPERNAGE																
37	FIELD SERVICE HANDBOOK																
40	WING & EMPERNAGE STRUCTURES																
41	ENVIR. SYS. & EQUIP. DES.																
42	AGE ELECTRONIC EQUIP.																
43	FUEL SYSTEMS																
45	DESIGN ILLUSTRATION																
46	MECH. & PROPULSION ADMIN.																
47	HUMAN FACTORS & C/PIT DISPLAYS																
48	COMM. & INDICATING SYS.																
49	AVIONIC INTEG. & CONTROL																
50	METALLURGY																
51	STRUCTURAL DYNAMICS																
53	DESIGN PRODUCTIVITY																
54	MATERIAL & PROCESS																
55	FLT. CONTROLS ANALYSIS																
57	ENGINEERING SPECS																
58	NON-METALLICS																
59	X-RAY PHOTO TEMP. LAB																
60	DATA SERVICES (BLUEPRINT)																
61	OPERATIONS ADMIN.																
63	FLT. TEST MAINT. (PALMDALE)																
64	DESIGN SUPPORT																
65	PHOTO-INSTRUMENTATION																
66	METALLIC MATERIALS LAB.																
67	STRUCTURAL TEST LAB.																
69	B-70 PLANNING - DESIGN																
70	AGE MECHANICAL EQUIP.																
71	SUPT. EQUIP. - AGE																
72	ENGINEERING COMPUTING																
73	STRUCTURAL LOADS																
74	FLIGHT TEST INSTRUM.																
75	NON-METALLICS																
76	FLT. TEST PROJECT ENGRG.																
77	RELIABILITY & MAINTAINABILITY																
78	TRAINING AIDS																
79	PACKAGING																
80	FLIGHT OPERATIONS																
82	FIELD SERVICE																
84	WEAPON SYS. ANALYSIS																
85	COMM. & INDICATING SYS.																
86	ELECTRONIC INTEGRATION																

ENGINEERING HOURS - GROUP MATRIX

GRP	WBS															
U.	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.11	2.22	2.23	2.24	3.0	
10	58,619															
11	7,291	7,659	30,465	22,691	4,803		178,540	3,810				7,811			9,397	
12	9,286	20,998	21,618	32,172	290,530		26,992	3,895				21,060			13,104	
13	36,764	138,560	8,977	49,167	57,963	24,696	39,404	6,334		11,315					10,015	
14		126,386		34,023		107,818				5,078		3,745			8,645	
15		33,567		94,890		89,739										
101											54,535					
102											127,801					
103											131,220					
104												16,778				
107												12,605				
109	10,296	40,465	7,980	78,321	167,950		60,007	14,310		38,493					35,802	
110	95,149	5,532			36,026											
112																
113																
114				4,819				1,990			119,889					
116																
117																
119																
120																
121																
123																
125																
127																
128																
129																
130																
131	5,078	70,307		7,947	218,095		35,979	4,200		1,507						
132	17,873	32,130	221,086	13,344		36,131										
133	54,456	197,753	128,814	6,658		24,499										
134		75,897		18,587												
146	5,582			19,595				5,657								
150								13,406								
151																
155																
157																
169																
	72,105	201,632	55,214	62,717	30,003		45,766	9,775	8,637	17,494	34,326	37,205	138,355	6,563		
	1,826,579	8,229,868	985,802	1,761,024	1,950,276	630,695	1,130,155	526,124	199,309	213,308	530,886	1,270,491	257,696	760,698	0	
	1,745,000	7,203,460	971,618	1,585,058	1,719,776	319,826	1,041,371	489,801	190,672	196,472	507,488	1,270,491	257,696	737,178		
	81,579	1,026,408	14,184	175,966	230,500	310,869	88,784	36,323	8,637	16,836	23,398			23,520		

\* Hours not identifiable to specific Engineering groups.  
Hours charged by various Engineering and Logistics groups.

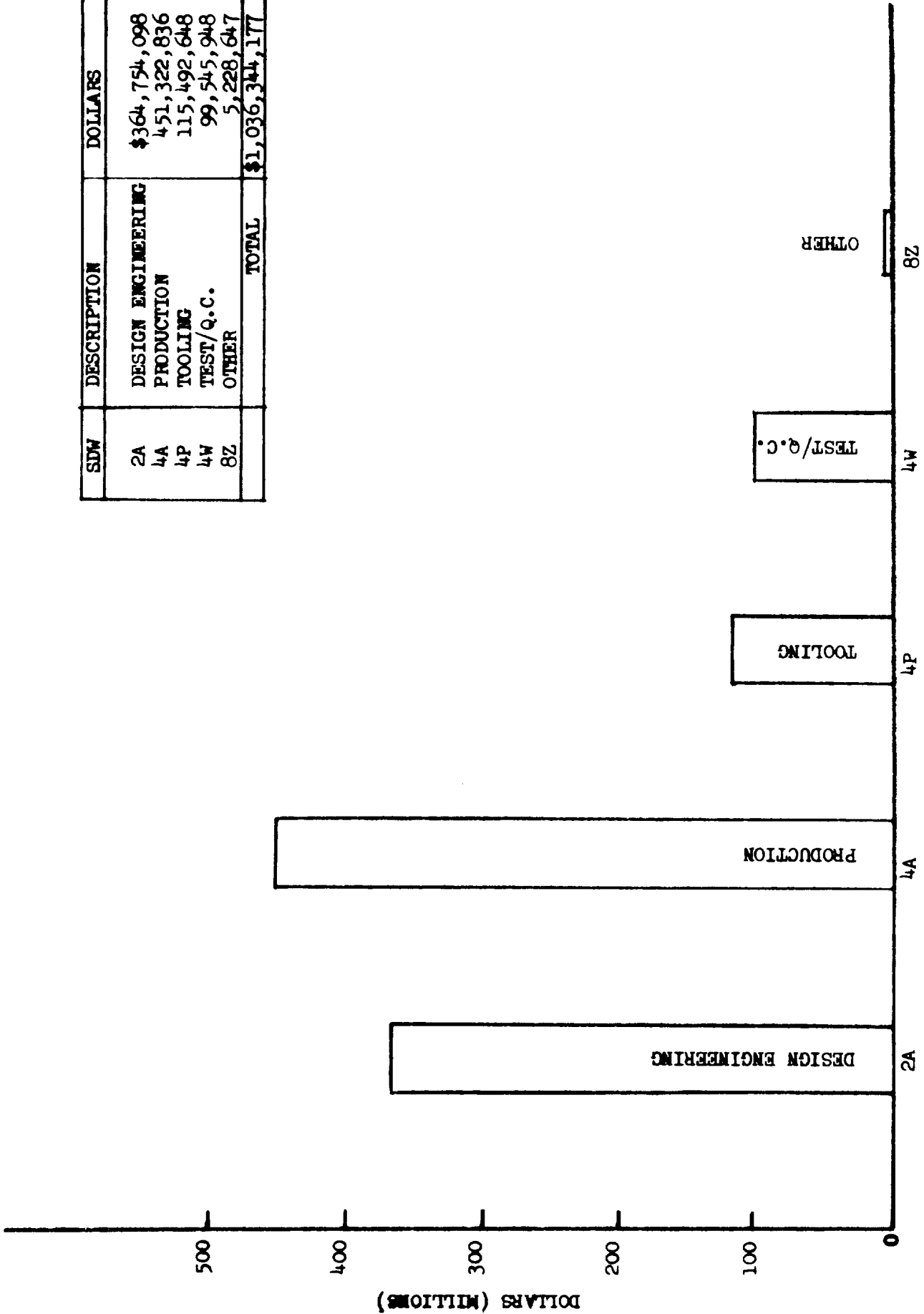
GRP NO.	TITLE	WBS											GRP TOTAL			
		4.41	5.50	5.51	6.60	7.0	8.0	9.90	9.91	9.92	9.93	9.94		9.96	9.97	
2	PROPULSION DES. & DEV.	11,266														286,065
3	ELECT. & AVIONICS INSTALL	23,979	2,046													507,767
4	FLUID POWER SYSTEM	49,148	2,931													751,065
5	EMI SHIELDING															137,424
6	CONTROLS SYSTEM	9,201														226,344
7	LANDING GEAR	15,004														205,676
10	STRUCTURAL ANALYSIS	20,569	1,810													1,055,371
11	WEIGHT CONTROL	24,361														347,280
12	CHECKING	2,569	2,122													219,142
13	AERODYNAMICS															188,358
14	WIND TUNNEL MODELS	2,654														638,263
15	DATA CONTROL	1,346														18,550
16	PHOTOGRAPHIC LAB															17,476
18	PROPULSION SYS. TEST	35,626									17,476					237,172
19	PROPULSION SYS. DEV.	11,066	3,194													346,480
20	OPERATION PLANNING															44,726
21	FLIGHT TEST MAINTENANCE	54,492														54,492
27	PROPOSAL & PROCUREMENT CONT.															11,985
28	FIELD SERVICE PUBLICATION															7,150
30	NUMERICAL DESIGN															225,261
32	ARMAMENT															14,163
33	ADVANCED STRUCTURES	21,099														277,149
34	STRUCTURAL PROJECTS		10,166													297,497
35	FUSELAGE	27,567														1,926,018
36	WING & EMPENNAGE	1,135														504,779
37	FIELD SERVICE HANDBOOK	4,391														4,391
40	WING & EMPENNAGE STRUCTURES															484,893
41	ENVIR. SYS. & EQUIP. DES.	21,530														468,920
42	AGE ELECTRONIC EQUIP.	28,429	470,690	9,363												514,532
43	FUEL SYSTEMS	12,221														236,339
45	DESIGN ILLUSTRATION		8,769													257,936
46	MECH. & PROPULSION ADMIN.															5,225
47	HUMAN FACTORS & CRT DISPLAYS	8,135	7,830													501,222
48	COMM. & INDICATING SYS.															196,226
49	AVIOMIC INTEG. & CONTROL	23,114														301,671
50	METALLURGY		1,508													202,822
51	STRUCTURAL DYNAMICS	44,610														465,781
53	DESIGN PRODUCTIBILITY															283,237
54	MATERIAL & PROCESS															467,611
55	FLT. CONTROLS ANALYSIS	78,219														384,852
57	ENGINEERING SPECS															359,383
58	NON-METALLICS	1,288														2,674
59	X-RAY PHOTO TEMP. LAB															45,725
60	DATA SERVICES (BLUEPRINT)															28,164
61	OPERATIONS ADMIN.															62,868
63	FLT. TEST MAINT. (PALMDALE)	618,686	1,733	2,394												639,729
64	DESIGN SUPPORT															163,706
65	PHOTO-INSTRUMENTATION															53,482
66	METALLIC MATERIALS LAB.															371,660
67	STRUCTURAL TEST LAB.	3,547														400,323
69	B-70 PLANNING - DESIGN															9,047
70	AGE MECHANICAL EQUIP.	24,955	329,661													358,005
71	SUPT. EQUIP. - AGE		166,042													218,715
72	ENGINEERING COMPUTING	10,716														242,456
73	STRUCTURAL LOADS	21,984														391,149
74	FLIGHT TEST INSTRUM.	57,586														69,928
75	NON-METALLICS	1,246														178,283
76	FLT. TEST PROJECT ENGRG.	65,681	4,794													98,931
77	RELIABILITY & MAINTAINABILITY	11,368	3,415	1,066												121,914
78	TRAINING AIDS															51,320
79	PACKAGING															61,551
80	FLIGHT OPERATIONS	133,570	1,137													151,309
82	FIELD SERVICE		1,245													22,247
84	WEAPON SYS. ANALYSIS															241,741
85	COMM. & INDICATING SYS.															72,750
86	ELECTRONIC INTEGRATION															164,612

ENGINEERING HOURS - GROUP MATRIX

GRP NO.	TITLE	MBS										GRP TOTALS				
		4.41	5.50	5.51	6.60	7.0	8.0	9.90	9.91	9.92	9.93		9.94	9.96	9.97	
88	ELECTRONICS GROUP															71,911
89	FLT. TEST DATA REDUCTION	5,474														5,474
90	ELECTRONIC SYSTEM ADMIN.															7,811
92	THERMODYNAMICS															53,156
94	FLIGHT SIMULATION															328,732
95	ELECTRICAL SYS. DES.	39,225														186,130
96	WIND TUNNEL PROJECTS															173,271
97	LABORATORY SERVICES		3,247													326,821
98	FIELD SERVICE PUBLICATION															111,563
99	AUXILIARY CONTROL SYS.	20,128														238,324
101	FLT. TEST INSTRUM. (PALMDALE)	8,638														63,173
102	FLT. TEST INSTRUM. LAB L.A.	49,072														176,873
103	FLT. TEST ENGRG. ADMIN.	10,512														27,290
104	FLT. TEST INSTRUM. DES.	243,366		25,459												131,220
107	FLT. TEST MAINT. SUPT. PALMDALE	1,482														281,430
109	HYD. LAB.	36,580	5,228													358,521
110	ELECTRICAL POWER LAB.	26,986														275,100
112	ENGINEERING TEST PILOTS	71,236														26,986
113	FLT TEST DATA ACQUISITION	22,405														71,236
114	FLT TEST INSTRUM. DEV.															149,103
116	ADVANCED AEROSPACE SYS.															7,429
117	PRELIMINARY ANALYSIS															4,169
119	PRELIMINARY DESIGN															75,040
120	R&D PROGRAMS		5,774													28,167
121	ADVANCED PROJECTS															15,839
123	PRELIM. DESIGN - MATERIAL															4,150
125	ELECTRICAL SYS. EQUIP.	15,205	1,766	2,984												291,787
127	B-70 PROJECT GROUP		21,181													351,607
128	OPERATIONS RESEARCH															39,784
129	OPERATIONS & MILITARY SYS. ANA.	1,642														60,197
130	FLIGHT SCIENCES															13,344
131	AERO SPECIAL PROJECTS	45,170														82,043
132	THERMODYNAMICS	61,938														352,390
133	AERODYNAMICS															447,878
134	WIND TUNNEL PROJECTS															100,396
146	THERMODYNAMICS															49,421
150	LIFE SCIENCES	1,078														13,406
151	AIRCRAFT DES. ADMIN.	39,017														1,078
155	PROPULSION SCIENCES	5,931														45,933
157	SPECIFICATIONS & REQMS.	7,201														5,931
169	B-70 PROGRAM PLANNING															25,937
	VARIOUS	84,509	*495,060	* 40,958	* 462,245											2,038,250
	TOTAL	2,279,153	1,576,846	83,812	462,245	0	0	3,900	104,274	210,947	46,644	194,434	83,785	28,164		25,347,115
	DESIGN ENG. SIM. TEST / Q.C.	2,271,271	1,576,734	83,812	462,245			3,900	104,274	210,947	46,644	194,434	83,785	28,164		23,302,117
		7,882	112													2,044,998

\*Hours not identifiable to specific Engineering groups.  
Hours charged by various Engineering and Logistics groups.

TOTAL PROGRAM COSTS  
BY SUBDIVISION OF WORK



NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
 DATA PREPARED UNDER  
 NASA CONTRACT NAS9-12100

APRIL 1972

COST BREAKDOWNS  
 B-70 AIRCRAFT STUDY

SUMMARY

	DESIGN /ENGR HOURS DOLLARS	PROD HOURS DOLLARS	TOOLING AND STE HOURS DOLLARS	TEST /QC HOURS DOLLARS
DESIGN/ENGINEERING	23302117	653686	88539	2044998
LABOR AT \$ 4.902	115437100	3594515	306613	8549366
ENGR BURDEN AT \$ 4.690	109642698	3777186	403677	8527100
PRODUCTION		18579501		
LABOR AT \$ 3.224		59902030		
SHOP SUPPORT	865036	65703		7003492
LABOR AT \$ 3.146	3523470	236401		21204878
TOOLING AND STE			7725192	
LABOR AT \$ 3.419			26410131	
PLANNING		999319	573094	30579
LABOR AT \$ 3.444		3391957	2008072	120791
TEST/QC	109351	2507741	303481	615030
LABOR AT \$ 3.641	469495	9392967	1038739	1975378
MFG BURDEN AT \$ 3.772	4644993	89696493	26487513	27715913
ENGR MATERIAL	2133167			17823682
MFG MATERIAL		45227604		
TOOLING/STE MATL			25616633	
SURCONTRACT	97949124	190269106	27567841	896190
MPC	3905661	13269106	3336112	1992386
WIND TUNNEL				4004098
OTHER COST	21610125	958898	275421	1210159
SUB-TOTAL	359315833	419716263	113450752	94019941
GEN & ADMIN	5438265	7614013	2041896	1615357
IDWA		23992560		3910650
TOTAL COST	364754098	451322836	115492648	99545948

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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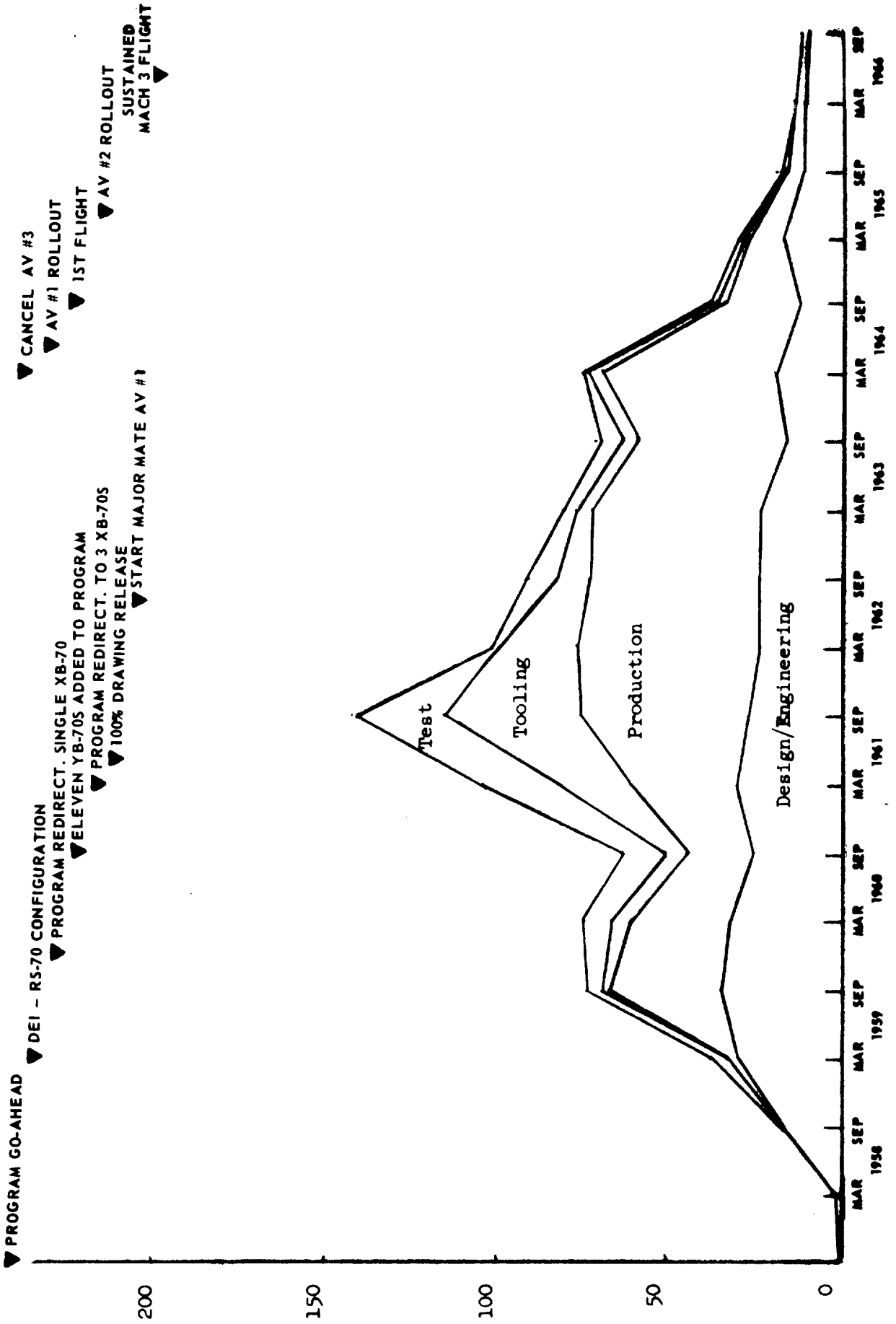
COST BREAKDOWNS  
 B-70 AIRCRAFT STUDY

SUMMARY

	OTHER COST HOURS DOLLARS	TOTAL HOURS DOLLARS
DESIGN/ENGINEERING		26089340
LABOR AT \$ 4.902		127887594
ENGR BURDEN AT \$ 4.690		122350661
PRODUCTION	18579501	
LABOR AT \$ 3.224		59902030
SHOP SUPPORT	7934231	
LABOR AT \$ 3.146		24964749
TOOLING AND STE	7725192	
LABOR AT \$ 3.419		26410131
PLANNING	1602992	
LABOR AT \$ 3.444		5520820
TEST/CC	3536603	
LABOR AT \$ 3.641		12876579
MFG BURDEN AT \$ 3.772		148544912
ENGR MATERIAL		19956849
MFG MATERIAL		45227604
TOOLING/STE MATL		25616633
SUBCONTRACT		316682261
MPC		22503265
WIND TUNNEL		4004098
OTHER COST	5118952	29173555
SUB-TOTAL	5118952	991621741
GEN & ADMIN	109695	16819226
IDWA		27903210
TOTAL COST	522864710	36344177



B-70 TOTAL PROGRAM  
SUBDIVISIONS OF WORK RECAP

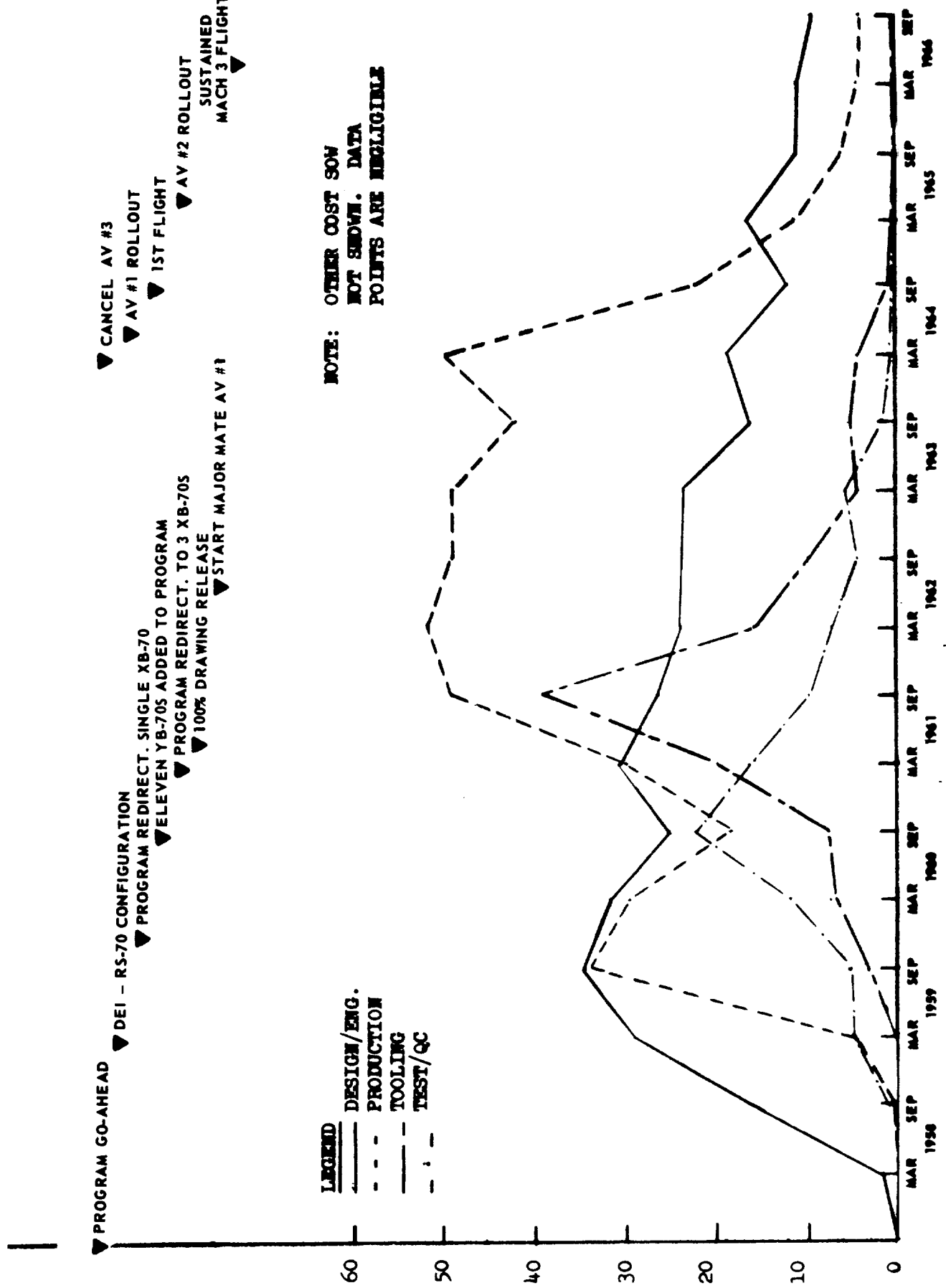


B-70 TOTAL PROGRAM  
SUBDIVISION OF WORK RECAP

- ▼ PROGRAM GO-AHEAD
- ▼ DEI - RS-70 CONFIGURATION
- ▼ PROGRAM REDIRECT. SINGLE XB-70
- ▼ ELEVEN YB-70S ADDED TO PROGRAM
- ▼ PROGRAM REDIRECT. TO 3 XB-70S
- ▼ 100% DRAWING RELEASE
- ▼ START MAJOR MATE AV #1
- ▼ CANCEL AV #3
- ▼ AV #1 ROLLOUT
- ▼ 1ST FLIGHT
- ▼ AV #2 ROLLOUT
- ▼ SUSTAINED MACH 3 FLIGHT

**LEGEND**  
 \_\_\_\_\_ DESIGN/ENG.  
 - - - - - PRODUCTION  
 \_\_\_\_\_ TOOLING  
 - - - - - TEST/QC

**NOTE:** OTHER COSTS NOT SHOWN. DATA POINTS ARE NEGLIGIBLE



NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUMMARY

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	1453.5	244019	4.465	1089626	1072274	2161900	2805
Q-2 58							
Q-3 59	6210.5	1043199	4.298	4483783	3975189	8458972	129704
Q-4 59							
Q-1 59	10568.5	1802544	3.964	7148396	6169568	13318364	396374
Q-2 59							
Q-3 59	15450.0	2719086	3.919	10655670	9288446	19944116	314975
Q-4 59							
Q-1 60	18493.0	3205709	4.033	12927347	10879182	23806529	1462342
Q-2 60							
Q-3 60	22788.0	3828627	3.906	14954071	13088600	28042671	1076249
Q-4 60							
Q-1 61	45078.5	7693217	3.766	28973091	24361700	53334791	2780086
Q-2 61							
Q-3 61	45103.5	8178495	3.618	29587123	30447076	60034199	3187634
Q-4 61							
Q-1 62	39648.5	6766510	3.654	24726197	25977575	50703772	1153259
Q-2 62							
Q-3 62	35033.5	5885833	3.772	22201910	24782520	46984430	1583823
Q-4 62							
Q-1 63	28978.5	4945478	4.047	20012314	22134239	42146553	1560504
Q-2 63							
Q-3 63	33422.5	5614977	3.785	21253975	23809683	45063658	2779207
Q-4 63							
Q-1 64	29961.5	5113475	4.104	20985437	26902618	47888055	598383
Q-2 64							
Q-3 64	17160.5	3020249	4.140	12502324	15850367	28352691	579250
Q-4 64							
Q-1 65	14910.5	2585121	4.293	11098054	13843724	24941778	836247
Q-2 65							
Q-3 65	6751.0	1134281	5.339	6056480	6736281	12792761	610581
Q-4 65							
Q-1 66	5238.0	907827	5.266	4780726	6355540	11136266	389490
Q-2 66							

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUMMARY

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-3 66	4630.5	778212	5.301	4125379	5220591	9345970	515936
Q-4 66							
Q-1 67							
Q-2 67							
Q-3 67							
TOTAL	380880.5	65467859		257561903	270895573	528457476	19956849

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUMMARY

	MFG MATL	TOOL/STE MATL	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST
Q-1 58		458		3263	177	170368	12261
Q-2 58							
Q-3 58		-438	8190545	8319811	79706	583528	225388
Q-4 58							
Q-1 59		-20	21955014	22351368	615612	610704	867657
Q-2 59							
Q-3 59		89694	49566389	49971058	1388679	695957	1344630
Q-4 59							
Q-1 60	985	604007	41888408	43955742	2757281	338115	2308745
Q-2 60							
Q-3 60	39128	905281	27724692	29745350	1910668	403089	1812982
Q-4 60							
Q-1 61	1028879	3523328	32621709	39954002	1553828	296523	2630548
Q-2 61							
Q-3 61	4713924	11005192	38932401	57839151	2712655	237221	2403775
Q-4 61							
Q-1 62	4986229	4915358	30307483	41362329	1834327	207559	2805872
Q-2 62							
Q-3 62	5576903	2297855	25663044	35121625	1560821	177914	2729681
Q-4 62							
Q-1 63	7726164	691031	21314707	31292406	1887490	148254	1934463
Q-2 63							
Q-3 63	7727118	844638	7862704	19213667	1370510	118797	1267568
Q-4 63							
Q-1 64	6407347	476551	10336412	17818693	2217114	1	1357564
Q-2 64							
Q-3 64	2713506	125098	250099	3668053	1324915	-1	1928482
Q-4 64							
Q-1 65	870802	100368	68654	1876071	563170	1	1021828
Q-2 65							
Q-3 65	1120300	-1083		1729798	308764		3239124
Q-4 65							
Q-1 66	1093354	3791		1486635	308288	11740	400400
Q-2 66							

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUMMARY

	MFG MATL	TOOL/STE MATL	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST
Q-3 66	1222865	35524		1774325	109260	4328	377587
Q-4 66							
Q-1 67							
Q-2 67							
Q-3 67							
TOTAL	45227604	25616633	316682261	407483347	22503265	4004098	29173555

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
 DATA PREPARED UNDER  
 NASA CONTRACT NAS9-12100

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUMMARY

	TOTAL O/C \$	SUB TOTAL	G & A	IDWA	TOTAL CCST
Q-1 58	182629	2347969			2347969
Q-2 58					
Q-3 58	808916	17667405			17667405
Q-4 58					
Q-1 59	1478361	37763705		23214	37786919
Q-2 59					
Q-3 59	2040587	73344440		8848	73353298
Q-4 59					
Q-1 60	2646860	73166412	1333706	13335	74513453
Q-2 60					
Q-3 60	2216071	61914760	1240256	96298	63251314
Q-4 60					
Q-1 61	2927071	57769692	1912414	4372691	104054797
Q-2 61					
Q-3 61	3145996	123732001	2391716	5913127	132036844
Q-4 61					
Q-1 62	3013431	96913859	1664247	2924005	101502111
Q-2 62					
Q-3 62	2907595	86574471	1465022	2610066	90649559
Q-4 62					
Q-1 63	2082717	77409166	1342569	2496455	81248194
Q-2 63					
Q-3 63	1386365	67034200	1167491	3068195	71269890
Q-4 63					
Q-1 64	1357565	69281427	1560908	4803875	75646210
Q-2 64					
Q-3 64	1929481	35274140	733726	1561617	37619483
Q-4 64					
Q-1 65	1021829	28402848	765750	4727	29173365
Q-2 65					
Q-3 65	3239124	18070447	485297	6749	18562493
Q-4 65					
Q-1 66	412140	13343329	356383		13699712
Q-2 66					

NORTH AMERICAN ROCKWELL CORP.  
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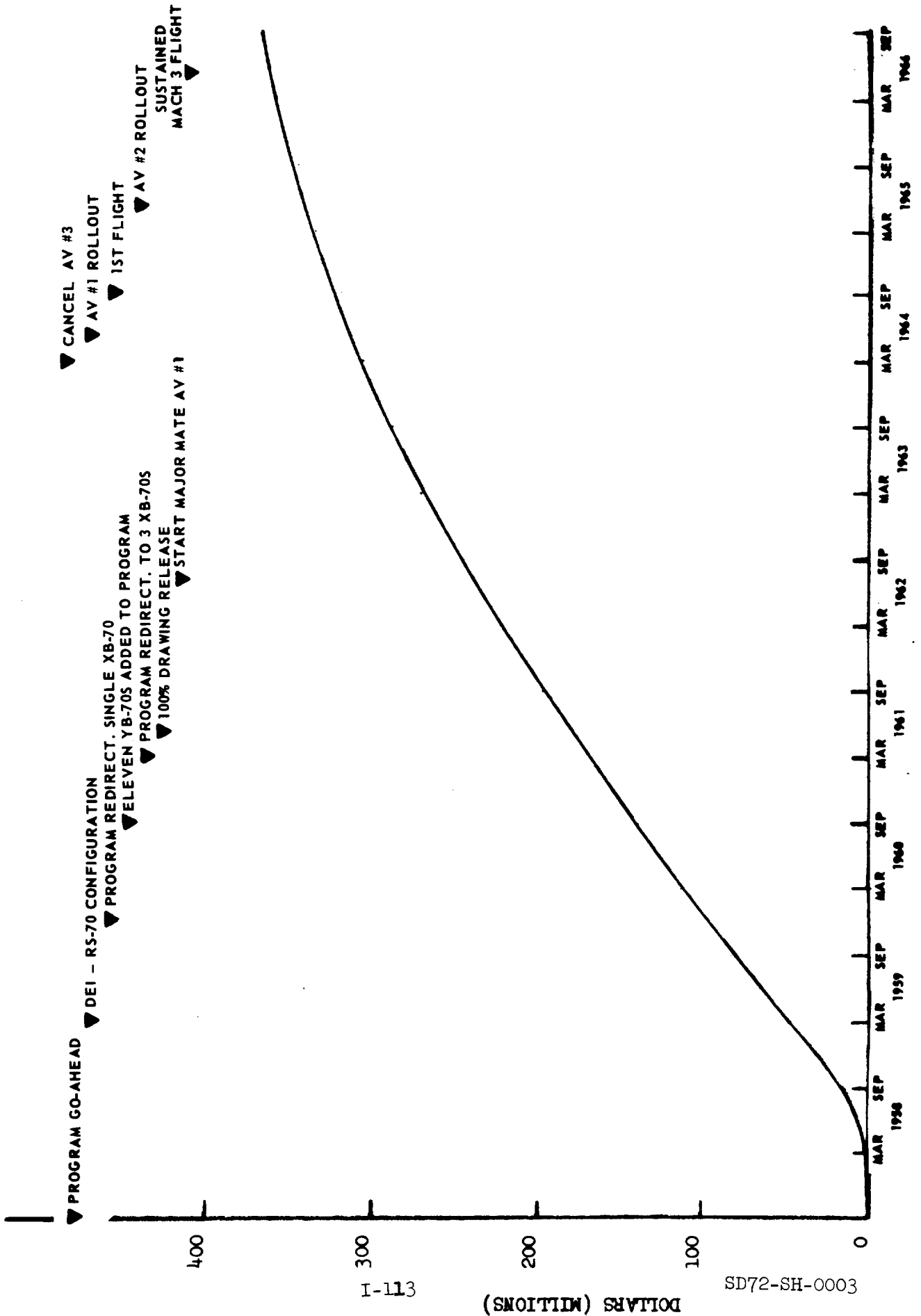
TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUMMARY

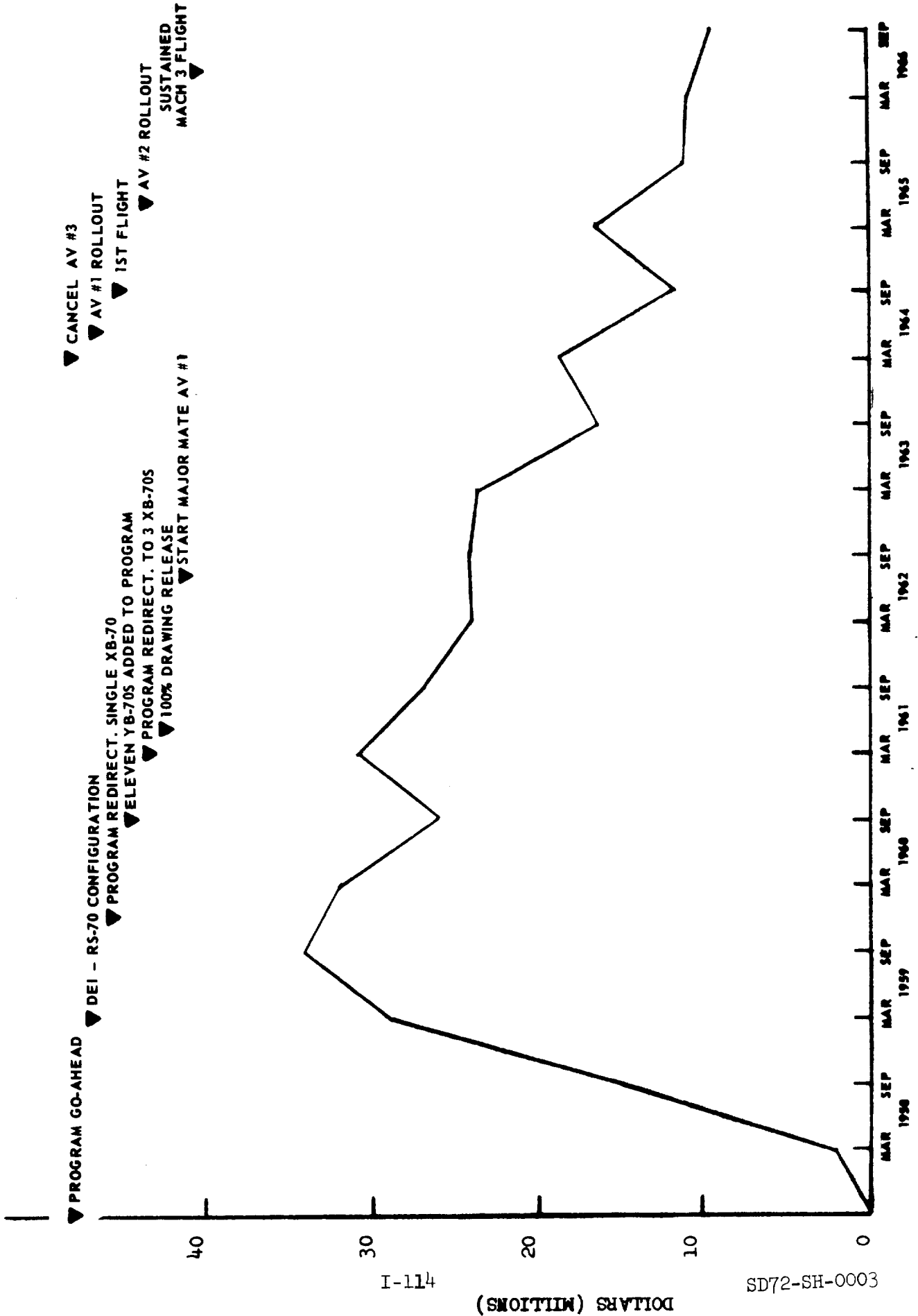
	TOTAL G/C \$	SUB TOTAL	G & A	IDWA	TOTAL CCST
Q-3 66	381915	11611470	349701		11961171
Q-4 66					
Q-1 67					
Q-2 67					
Q-3 67					
TOTAL	33177653	991621741	16819226	2790321010	36344177



SUBDIVISION OF WORK - DESIGN/ENGINEERING  
CUMULATIVE COST



SUBDIVISION OF WORK - DESIGN/ENGINEERING  
TOTAL COST



I-114

DOLLARS (MILLIONS)

SD72-SH-0003

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
DATA PREPARED UNDER  
NASA CONTRACT NAS9-12100

APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

DESIGN/ENGINEERING  
SUBD CF WORK DESIGN/ENGINEERING

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58	1285.5	215935	4.561	984908	982469	1967377
Q-2 58						
Q-3 58	5455.5	916586	4.383	4017197	3589981	7607178
Q-4 58						
Q-1 59	7238.5	1235367	4.321	5337750	4270928	9608678
Q-2 59						
Q-3 59	10758.0	1893478	4.211	7973824	6820192	14794016
Q-4 59						
Q-1 60	10866.0	1883428	4.545	8559249	7115705	15674954
Q-2 60						
Q-3 60	10275.5	1726243	4.712	8133680	6376365	14510045
Q-4 60						
Q-1 61	15097.5	2576625	4.745	12226134	8808626	21034760
Q-2 61						
Q-3 61	9738.5	1765899	4.931	8707812	8120279	16828091
Q-4 61						
Q-1 62	8929.0	1523905	5.205	7932400	6986598	14918998
Q-2 62						
Q-3 62	8274.0	1390048	5.153	7163597	7042561	14206158
Q-4 62						
Q-1 63	7804.0	1331920	5.692	7581180	7438415	15019595
Q-2 63						
Q-3 63	8645.0	1452358	5.238	7607383	7549912	15157295
Q-4 63						
Q-1 64	7687.5	1311994	5.493	7206255	8027653	15233908
Q-2 64						
Q-3 64	4727.0	831995	5.679	4724618	5433207	10157825
Q-4 64						
Q-1 65	7469.0	1294692	4.881	6320033	7684626	14004659
Q-2 65						
Q-3 65	4061.5	682359	5.647	3852977	4405374	8258351
Q-4 65						

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

DESIGN/ENGINEERING  
SUBD OF WORK DESIGN/ENGINEERING

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66	3972.0	688475	5.673	3905445	4987468	8892913
Q-2 66						
Q-3 66	3457.5	580810	5.514	3202658	4002339	7204997
TOTAL	135741.5	23302117		115437100	109642698	225079798

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SHOP SUPPORT  
 SUBD CF WORK DESIGN/ENGINEERING

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58	58.5	9825	3.068	30143	26769	56912
Q-2 58						
Q-3 58	25.0	4170	3.165	13198	12690	25888
Q-4 58						
Q-1 59	130.5	22163	2.747	60882	83454	144336
Q-2 59						
Q-3 59	333.0	58681	2.883	169151	237428	406579
Q-4 59						
Q-1 60	-102.5	-17730	2.883	-51116	-30519	-81635
Q-2 60						
Q-3 60	193.5	32623	2.908	94879	120404	215283
Q-4 60						
Q-1 61	194.0	33148	2.855	94636	117149	211785
Q-2 61						
Q-3 61	46.5	8455	2.851	24105	40719	64824
Q-4 61						
Q-1 62	90.0	15375	4.602	70755	60851	131606
Q-2 62						
Q-3 62	901.0	151348	4.434	671148	673703	1344851
Q-4 62						
Q-1 63	966.0	164787	4.543	748672	806804	1555476
Q-2 63						
Q-3 63	381.5	64077	4.706	301516	336805	638321
Q-4 63						
Q-1 64	58.5	9955	3.289	32738	54389	87127
Q-2 64						
Q-3 64	45.0	7890	3.528	27838	55148	82986
Q-4 64						
Q-1 65	592.5	102730	3.694	379449	571615	951064
Q-2 65						
Q-3 65	310.5	52136	3.760	196010	327981	523991
Q-4 65						

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SHOP SUPPORT  
SUBD CF WORK DESIGN/ENGINEERING

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66	426.0	73717	3.697	272566	537856	810422
Q-2 66						
Q-3 66	426.0	71686	5.397	386900	611747	998647
TOTAL	5075.5	865036		3523470	4644993	8168463

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

TEST/QC  
 SUBD OF WORK DESIGN/ENGINEERING

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58	1.5	314	3.029	951		951
Q-2 58						
Q-3 58	1.5	162	2.790	452		452
Q-4 58						
Q-1 59		-28	2.107	-59		-59
Q-2 59						
Q-3 59	13.5	2331	3.155	7354		7354
Q-4 59						
Q-1 60	15.0	2624	3.558	9337		9337
Q-2 60						
Q-3 60	13.5	2353	3.380	7954		7954
Q-4 60						
Q-1 61	10.5	1771	3.023	5353		5353
Q-2 61						
Q-3 61	3.0	489	3.268	1598		1598
Q-4 61						
Q-1 62	1.5	231	4.541	1049		1049
Q-2 62						
Q-3 62	7.5	1378	3.152	4343		4343
Q-4 62						
Q-1 63	24.0	4056	3.492	14163		14163
Q-2 63						
Q-3 63	12.0	1993	3.380	6736		6736
Q-4 63						
Q-1 64	12.0	2061	3.656	7534		7534
Q-2 64						
Q-3 64	21.0	3685	3.744	13796		13796
Q-4 64						
Q-1 65	111.0	19309	4.305	83118		83118
Q-2 65						
Q-3 65	111.0	18728	4.400	82403		82403
Q-4 65						

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

TEST/QC  
SUBD CF WORK DESIGN/ENGINEERING

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66	153.0	26497	4.755	125998		125998
Q-2 66						
Q-3 66	127.5	21397	4.553	97415		97415
TOTAL	639.0	109351		469495		469495



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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK DESIGN/ENGINEERING

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	1345.5	226074	4.494	1016002	1009238	2025240	2773
Q-2 58							
Q-3 58	5482.0	920918	4.377	4030847	3602671	7633518	6062
Q-4 58							
Q-1 59	7369.0	1257502	4.293	5398573	4354382	9752955	22452
Q-2 59							
Q-3 59	11104.5	1954490	4.170	8150329	7057620	15207949	31805
Q-4 59							
Q-1 60	10778.5	1868322	4.555	8517470	7085186	15602656	1920
Q-2 60							
Q-3 60	10482.5	1761219	4.677	8236513	6496769	14733282	27562
Q-4 60							
Q-1 61	15302.0	2611544	4.720	12326123	8925775	21251898	20317
Q-2 61							
Q-3 61	9788.0	1774843	4.921	8733515	8160998	16894513	33856
Q-4 61							
Q-1 62	9020.5	1539511	5.199	8004204	7047449	15051653	7165
Q-2 62							
Q-3 62	9182.5	1542774	5.081	7839088	7716264	15555352	52861
Q-4 62							
Q-1 63	8794.0	1500763	5.560	8344015	8245219	16589234	82054
Q-2 63							
Q-3 63	9038.5	1518428	5.213	7915635	7886717	15802352	112498
Q-4 63							
Q-1 64	7758.0	1324010	5.473	7246527	8082042	15328569	86821
Q-2 64							
Q-3 64	4793.0	843570	5.650	4766252	5488355	10254607	145181
Q-4 64							
Q-1 65	8172.5	1416731	4.788	6782600	8256241	15038841	260374
Q-2 65							
Q-3 65	4483.0	753223	5.485	4131390	4733355	8864745	397176
Q-4 65							
Q-1 66	4551.0	788689	5.457	4304009	5525324	9829333	352596
Q-2 66							

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK DESIGN/ENGINEERING

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-3 66	4011.0	673893	5.471	3686973	4614086	8301059	489694
TOTAL	141456.0	24276504		119430065	114287691	233717756	2133167

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUBD OF WORK DESIGN/ENGINEERING

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST	TOTAL O/C \$
Q-1 58			2773	150		5327	5327
Q-2 58							
Q-3 58		7757025	7763087	69122		122097	122097
Q-4 58							
Q-1 59		18307304	18329756	487295		600394	600394
Q-2 59							
Q-3 59		17724348	17756153	487258		1009592	1009592
Q-4 59							
Q-1 60		12966858	12968778	769666		2175747	2175747
Q-2 60							
Q-3 60		8542875	8570437	510488		1609170	1609170
Q-4 60							
Q-1 61		6721717	6742034	194377		2479273	2479273
Q-2 61							
Q-3 61		6786998	6820854	197306		2347828	2347828
Q-4 61							
Q-1 62		5989869	5997034	190957		2641236	2641236
Q-2 62							
Q-3 62		5818544	5871405	188930		2374803	2374803
Q-4 62							
Q-1 63		4615350	4697404	204112		1758544	1758544
Q-2 63							
Q-3 63		920200	1032698	40647		-703353	-703353
Q-4 63							
Q-1 64		1776056	1862877	253168		1033774	1033774
Q-2 64							
Q-3 64		12390	157571	56665		1006084	1006084
Q-4 64							
Q-1 65		9590	269964	81155		829953	829953
Q-2 65							
Q-3 65			397176	71018		1496851	1496851
Q-4 65							
Q-1 66			352596	73090		561259	561259
Q-2 66							

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK DESIGN/ENGINEERING

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST	TOTAL O/C \$
Q-3 66			489694	30257		261546	261546
TOTAL		97949124	100082291	3905661		21610125	21610125

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUBD CF WORK DESIGN/ENGINEERING

	SUB TOTAL	G & A	IDWA	TOTAL COST
Q-1 58	2033490			2033490
Q-2 58				
Q-3 58	15587824			15587824
Q-4 58				
Q-1 59	29170400			29170400
Q-2 59				
Q-3 59	34460952			34460952
Q-4 59				
Q-1 60	31516847	527806		32044653
Q-2 60				
Q-3 60	25423377	484389		25907766
Q-4 60				
Q-1 61	30667582	569855		31237437
Q-2 61				
Q-3 61	26260501	487998		26748499
Q-4 61				
Q-1 62	23880880	400839		24281719
Q-2 62				
Q-3 62	23590450	402676		24393166
Q-4 62				
Q-1 63	23249294	388710		23638004
Q-2 63				
Q-3 63	16172344	270403		16442747
Q-4 63				
Q-1 64	18478388	391266		18869654
Q-2 64				
Q-3 64	11474927	244163		11719090
Q-4 64				
Q-1 65	16219913	427406		16647319
Q-2 65				
Q-3 65	10829790	288938		11118728
Q-4 65				
Q-1 66	10816278	280278		11096556
Q-2 66				

NORTH AMERICAN ROCKWELL CORP.  
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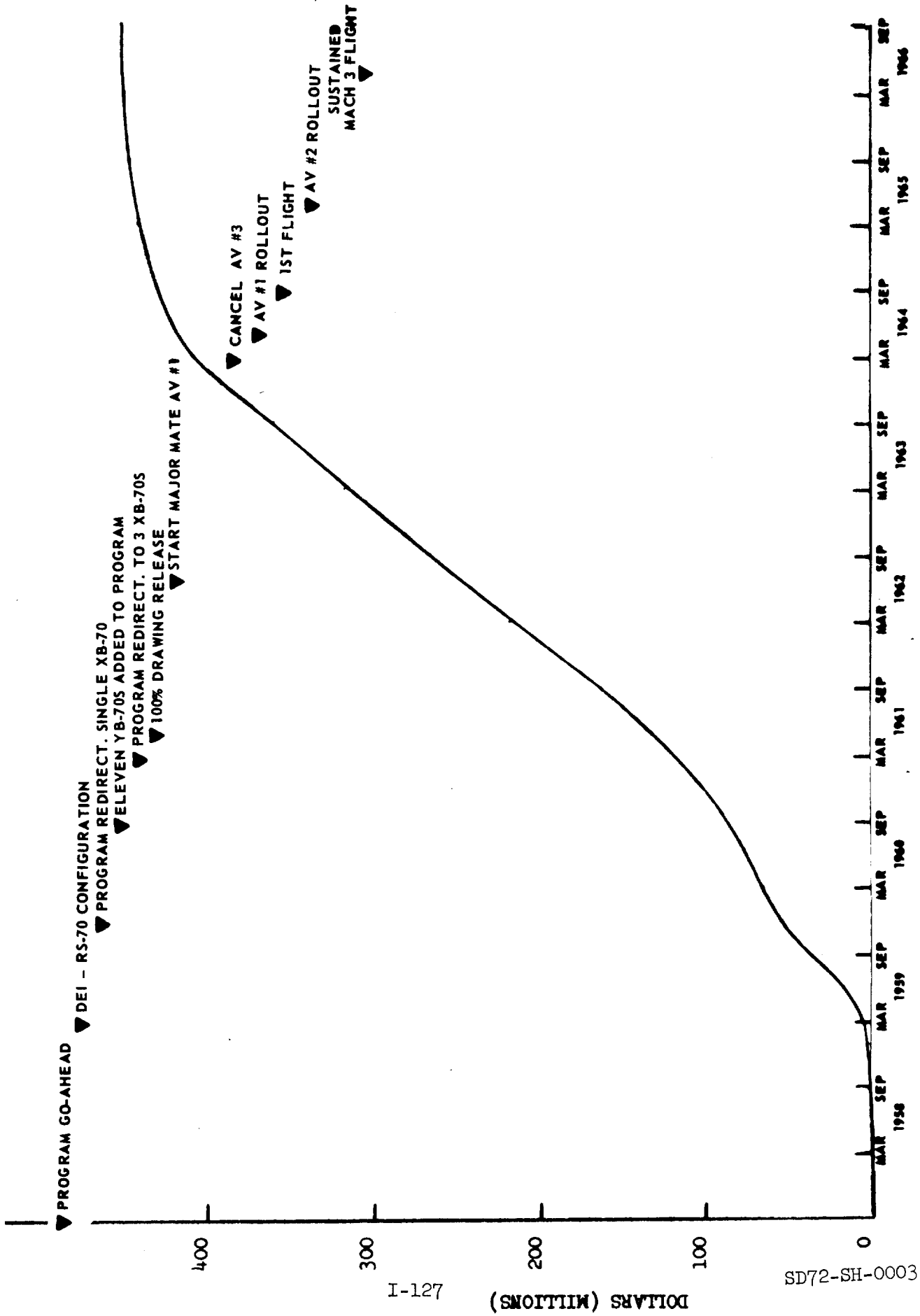
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

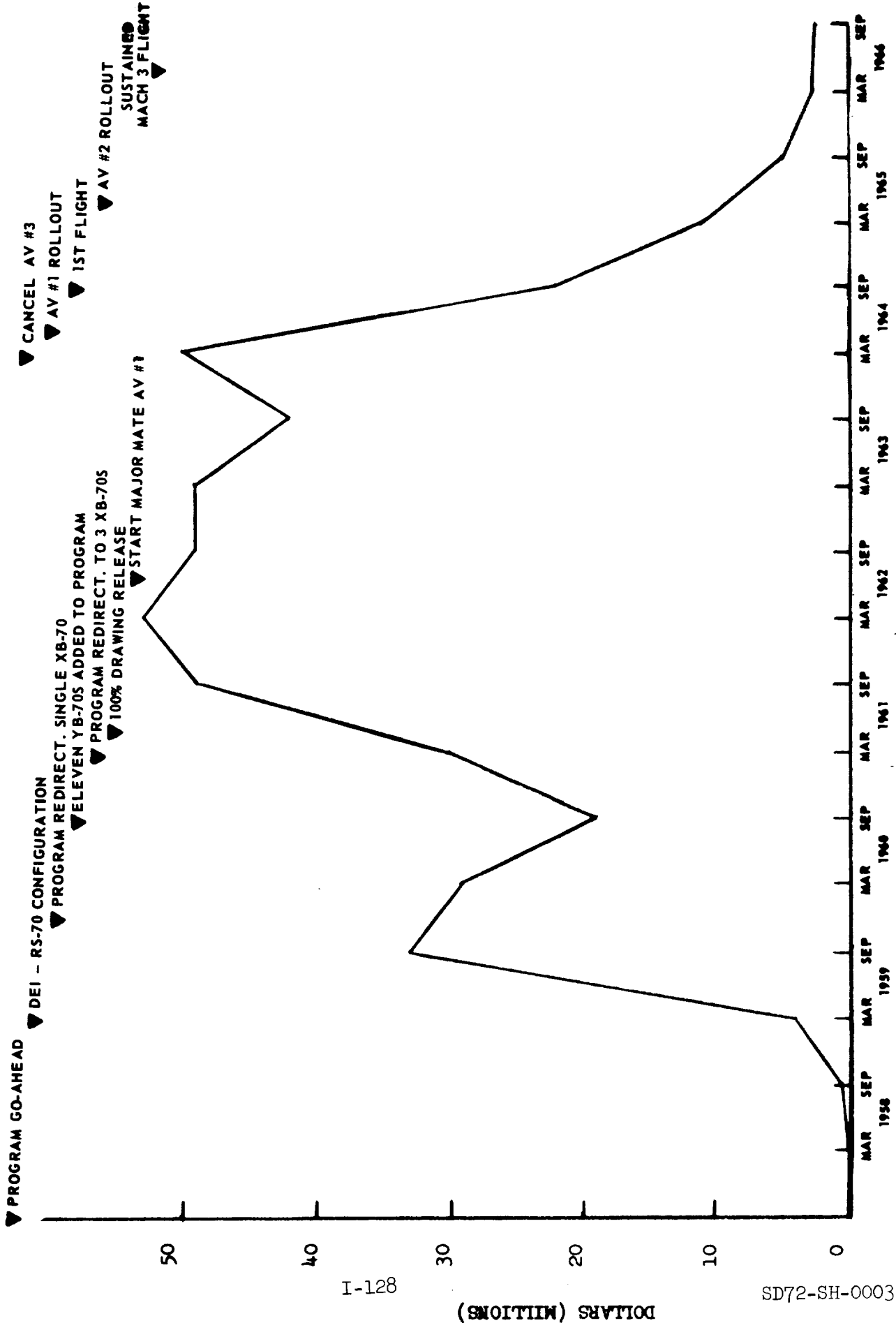
SUBD OF WORK DESIGN/ENGINEERING

	SUB TOTAL	G & A	IOWA	TOTAL COST
Q-3 66	9082556	273538		9356094
TOTAL	359315833	5438265		364754098

SUBDIVISION OF WORK - PRODUCTION  
CUMULATIVE COST



SUBDIVISION OF WORK - PRODUCTION  
TOTAL COST





NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

DESIGN/ENGINEERING  
SUBD OF WORK PRODUCTION

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58		8	4.625	37	36	73
Q-2 58						
Q-3 58	81.0	13518	5.414	73189	9721	82910
Q-4 58						
Q-1 59	97.5	16629	5.456	90721	14539	105260
Q-2 59						
Q-3 59	174.0	30569	5.273	161199	34800	195999
Q-4 59						
Q-1 60	67.5	11822	5.498	64997	16644	81641
Q-2 60						
Q-3 60	6.0	985	3.308	3258	2051	5309
Q-4 60						
Q-1 61	15.0	2627	3.711	9748	10923	20671
Q-2 61						
Q-3 61	6.0	979	3.667	3590	2866	6456
Q-4 61						
Q-1 62	180.0	30659	5.079	155718	150624	306342
Q-2 62						
Q-3 62	478.5	80495	4.925	396463	405779	802242
Q-4 62						
Q-1 63	394.5	67287	5.128	345043	362402	707445
Q-2 63						
Q-3 63	-40.5	-6783	8.401	-56985	292996	236011
Q-4 63						
Q-1 64	291.0	49692	4.907	243820	299746	543566
Q-2 64						
Q-3 64	1351.5	237795	5.233	1244487	1488317	2732804
Q-4 64						
Q-1 65	340.5	59132	5.122	302897	380119	683016
Q-2 65						
Q-3 65	279.0	46918	10.988	515549	263676	779225
Q-4 65						

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

DESIGN/ENGINEERING  
SUBD OF WORK PRODUCTION

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66	30.0	5239	3.531	18498	19169	37667
Q-2 66						
Q-3 66	36.0	6115	3.644	22286	22778	45064
TOTAL	3787.5	653686		3594515	3777186	7371701

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

PRODUCTION  
SUBD OF WORK PRODUCTION

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-3 59	576.0	101470	3.689	374296		374296
Q-4 59						
Q-1 60	685.5	118765	3.707	440321	26794	467115
Q-2 60						
Q-3 60	223.5	37591	2.929	110112	124644	234756
Q-4 60						
Q-1 61	3450.0	588807	3.144	1851083	2222707	4073790
Q-2 61						
Q-3 61	10242.0	1857107	3.152	5852799	7451964	13304763
Q-4 61						
Q-1 62	16177.5	2760855	3.073	8483947	11377959	19861906
Q-2 62						
Q-3 62	16185.0	2719064	3.183	8653756	12084445	20738201
Q-4 62						
Q-1 63	14658.0	2501544	3.266	8170620	11177352	19347972
Q-2 63						
Q-3 63	16189.0	2719690	2.857	7769055	12422441	20191496
Q-4 63						
Q-1 64	15653.5	2671497	3.576	9554346	15608666	25163012
Q-2 64						
Q-3 64	7804.5	1373648	3.361	4616476	7482151	12098627
Q-4 64						
Q-1 65	4863.0	842863	3.508	2957137	4682385	7639522
Q-2 65						
Q-3 65	1230.0	206550	4.077	842175	1536020	2378195
Q-4 65						
Q-1 66	201.0	34838	2.048	71348	796503	867851
Q-2 66						
Q-3 66	268.5	45212	3.419	154559	577621	732180
TOTAL	108407.0	18579501		59902030	87571652	147473682

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SHOP SUPPORT  
SUBD CF WORK PRODUCTION

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-3 64	261.0	45842	3.628	166336	233354	399690
Q-4 64						
Q-1 65	114.0	19861	3.528	70065	95548	165613
Q-2 65						
Q-3 65					-819	-819
TOTAL	375.0	65703		236401	328083	564484

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

PLANNING  
SUBD CF WORK PRODUCTION

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-3 58	12.0	1905	2.998	5711		5711
Q-4 58						
Q-1 59	55.5	9569	2.960	28324		28324
Q-2 59						
Q-3 59	133.5	23401	2.989	69940		69940
Q-4 59						
Q-1 60	270.0	46837	3.160	147990	483	148473
Q-2 60						
Q-3 60	544.5	91472	3.050	278949		278949
Q-4 60						
Q-1 61	969.0	165472	3.022	500012	74950	574962
Q-2 61						
Q-3 61	877.5	159170	2.916	464167	78444	542611
Q-4 61						
Q-1 62	853.5	145699	2.977	433695	80306	514001
Q-2 62						
Q-3 62	790.5	132779	2.963	393483	87351	480834
Q-4 62						
Q-1 63		56	3.786	212	207	419
Q-2 63						
Q-3 63	577.5	97031	6.937	673144	475960	1149104
Q-4 63						
Q-1 64	487.5	83307	3.102	258399	407389	665788
Q-2 64						
Q-3 64	138.0	24312	3.303	80295	121346	201641
Q-4 64						
Q-1 65	66.0	11438	3.116	35645	54104	89749
Q-2 65						
Q-3 65	25.5	4370	3.108	13583	20687	34270
Q-4 65						
Q-1 66	9.0	1460	3.348	4888	7926	12814
Q-2 66						

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

PLANNING  
SUBD OF WORK PRODUCTION

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-3 66	6.0	1041	3.381	3520	5091	8611
TOTAL	5815.5	999319		3391957	1414244	4806201

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

TEST/QC  
SUBD CF WORK PRODUCTION

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-3 58	6.0	931	4.908	4569		4569
Q-4 58						
Q-1 59	6.0	898	4.257	3823		3823
Q-2 59						
Q-3 59	25.5	4471	4.665	20855		20855
Q-4 59						
Q-1 60	54.0	9426	4.992	47058		47058
Q-2 60						
Q-3 60	22.5	3891	3.664	14255		14255
Q-4 60						
Q-1 61	258.0	43990	3.144	138307		138307
Q-2 61						
Q-3 61	753.0	136554	3.152	430433		430433
Q-4 61						
Q-1 62	1564.5	267073	3.236	864169		864169
Q-2 62						
Q-3 62	1891.5	317877	3.405	1082380		1082380
Q-4 62						
Q-1 63	1798.5	307065	3.600	1105326		1105326
Q-2 63						
Q-3 63	2212.5	371608	4.214	1566032	211683	1777715
Q-4 63						
Q-1 64	2415.0	412102	3.595	1481396	53338	1534734
Q-2 64						
Q-3 64	1473.0	259290	3.696	958460	77076	1035536
Q-4 64						
Q-1 65	885.0	153497	4.055	622469	25418	647887
Q-2 65						
Q-3 65	541.5	90941	4.605	418803	14999	433802
Q-4 65						
Q-1 66	441.0	76420	4.942	377682		377682
Q-2 66						

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

TEST/QC  
SUBD OF WORK PRODUCTION

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-3 66	307.5	51707	4.969	256950		256950
Q-4 66						
TOTAL	14655.0	2507741		9392967	382514	9775481



NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUBD CF WORK PRODUCTION

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58		8	4.625	37	36	73	
Q-2 58							
Q-3 58	99.0	16354	5.104	83469	9721	93190	
Q-4 58							
Q-1 59	159.0	27096	4.535	122868	14539	137407	
Q-2 59							
Q-3 59	909.0	159911	3.916	626290	34800	661090	
Q-4 59							
Q-1 60	1077.0	186850	3.748	700366	43921	744287	
Q-2 60							
Q-3 60	796.5	133939	3.036	406574	126695	533269	
Q-4 60							
Q-1 61	4692.0	800896	3.120	2499150	2308580	4807730	
Q-2 61							
Q-3 61	11878.5	2153810	3.134	6750989	7533274	14284263	
Q-4 61							
Q-1 62	18775.5	3204286	3.101	9937529	11608889	21546418	
Q-2 62							
Q-3 62	19345.5	3250215	3.239	10526082	12577575	23103657	
Q-4 62							
Q-1 63	16851.0	2875952	3.345	9621201	11539961	21161162	
Q-2 63							
Q-3 63	18938.5	3181546	3.128	9951246	13403080	23354326	
Q-4 63							
Q-1 64	18847.0	3216598	3.587	11537961	16369139	27907100	
Q-2 64							
Q-3 64	11028.0	1940887	3.641	7066054	9402244	16468298	
Q-4 64							
Q-1 65	6268.5	1086791	3.670	3988213	5237574	9225787	
Q-2 65							
Q-3 65	2076.0	348779	5.133	1790110	1834563	3624673	
Q-4 65							
Q-1 66	681.0	117957	4.005	472416	823598	1296014	
Q-2 66							

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK PRODUCTION

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-3 66	618.0	104075	4.202	437315	605490	1042805	
Q-4 66							
TOTAL	133040.0	22805950		76517870	93473679	169991549	

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK PRODUCTION

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A
Q-1 58					5641	5714	
Q-2 58							
Q-3 58		433520	433520	3846	112960	643516	
Q-4 58							
Q-1 59		3605554	3605554	95601	190600	4029162	
Q-2 59							
Q-3 59		31120511	31120511	850134	269832	32901567	
Q-4 59							
Q-1 60	985	26106017	26107002	1549061	17912	28418262	541775
Q-2 60							
Q-3 60	39128	16577782	16616910	988720	23528	18162427	360026
Q-4 60							
Q-1 61	1028879	20718972	21747851	680216	28145	27263942	564889
Q-2 61							
Q-3 61	4713924	24061973	28775897	1087445	23430	44171035	899225
Q-4 61							
Q-1 62	4986229	21395753	26381982	1072774	6125	49007299	869965
Q-2 62							
Q-3 62	5576903	16058125	21635028	949206	8120	45696011	796676
Q-4 62							
Q-1 63	7726164	15617765	23343929	1424319	-77	45929333	816456
Q-2 63							
Q-3 63	7727118	6345602	14072720	965241	66893	38459180	690205
Q-4 63							
Q-1 64	6407347	8015425	14422772	1783781	88340	44201993	1029285
Q-2 64							
Q-3 64	2713606	170650	2884256	1042937	68173	20463664	468592
Q-4 64							
Q-1 65	870802	41457	912259	273995	20144	10432185	291674
Q-2 65							
Q-3 65	1120300		1120300	199863	8265	4953101	135327
Q-4 65							
Q-1 66	1093354		1093354	226761	6816	2622945	78995
Q-2 66							

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK PRODUCTION

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	CTHER COST	SUB TOTAL	G & A
Q-3 66	1222865		1222865	75206	14051	2354927	70923
Q-4 66							
TOTAL	45227604	190269106	235496710	13269106	958898	419716263	7614013

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK PRODUCTION

	IDWA	TOTAL COST
Q-1 58		5714
Q-2 58		
Q-3 58		643516
Q-4 58		
Q-1 59	11147	4040309
Q-2 59		
Q-3 59	4243	32905810
Q-4 59		
Q-1 60	6400	28966437
Q-2 60		
Q-3 60	59151	18581604
Q-4 60		
Q-1 61	2512358	30341189
Q-2 61		
Q-3 61	3923564	48993824
Q-4 61		
Q-1 62	2924005	52801269
Q-2 62		
Q-3 62	2610066	49102753
Q-4 62		
Q-1 63	2496459	49242248
Q-2 63		
Q-3 63	3068199	42217584
Q-4 63		
Q-1 64	4803875	50035153
Q-2 64		
Q-3 64	1561617	22493873
Q-4 64		
Q-1 65	4727	10728586
Q-2 65		
Q-3 65	6749	5095177
Q-4 65		
Q-1 66		2701940
Q-2 66		

NORTH AMERICAN ROCKWELL CORP.  
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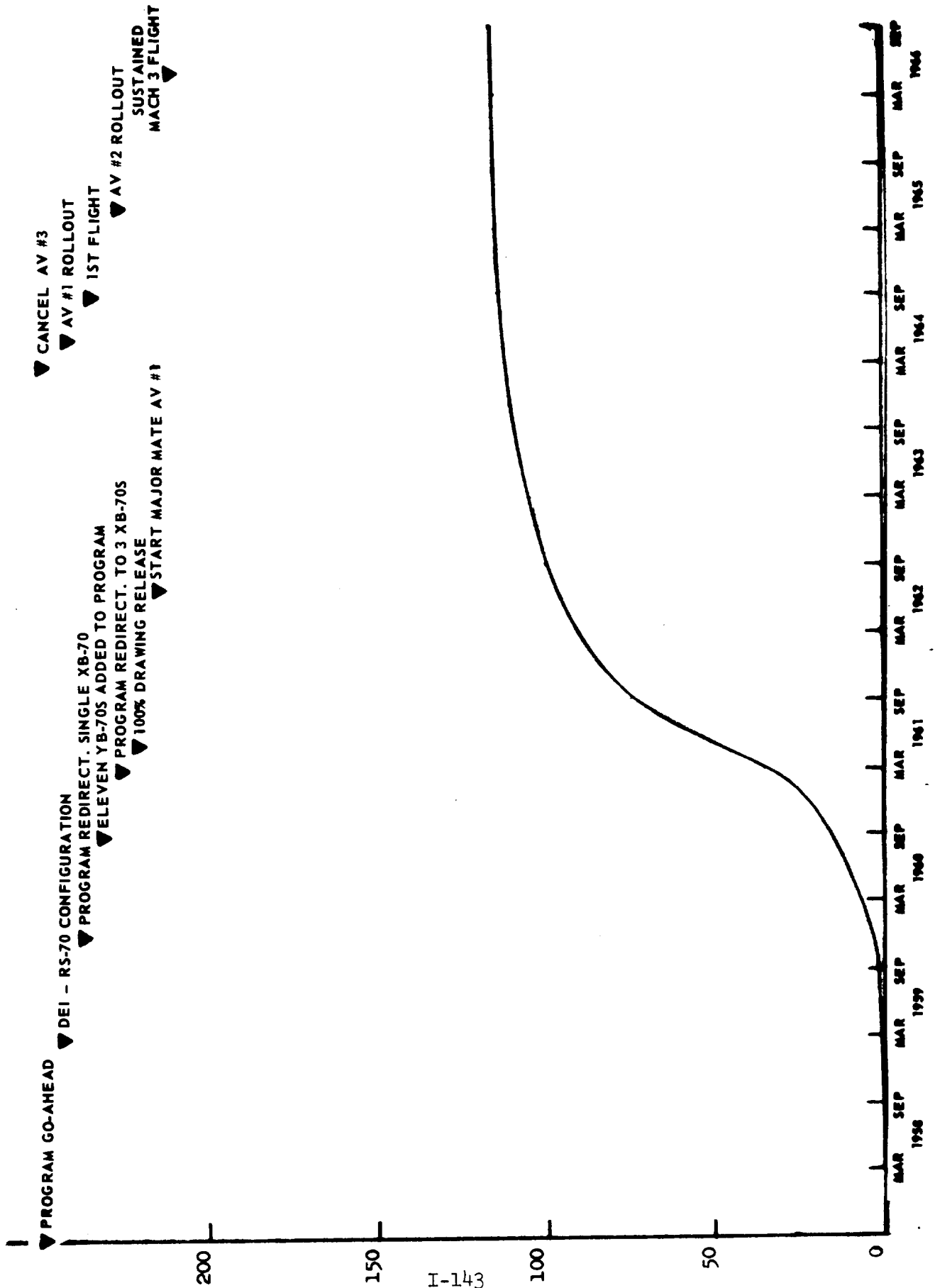
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD CF WORK PRODUCTION

	IDWA	TOTAL COST
Q-3 66		2425850
Q-4 66		
TOTAL	23992560	451322836

SUBDIVISION OF WORK - TOOLING  
CUMULATIVE COST

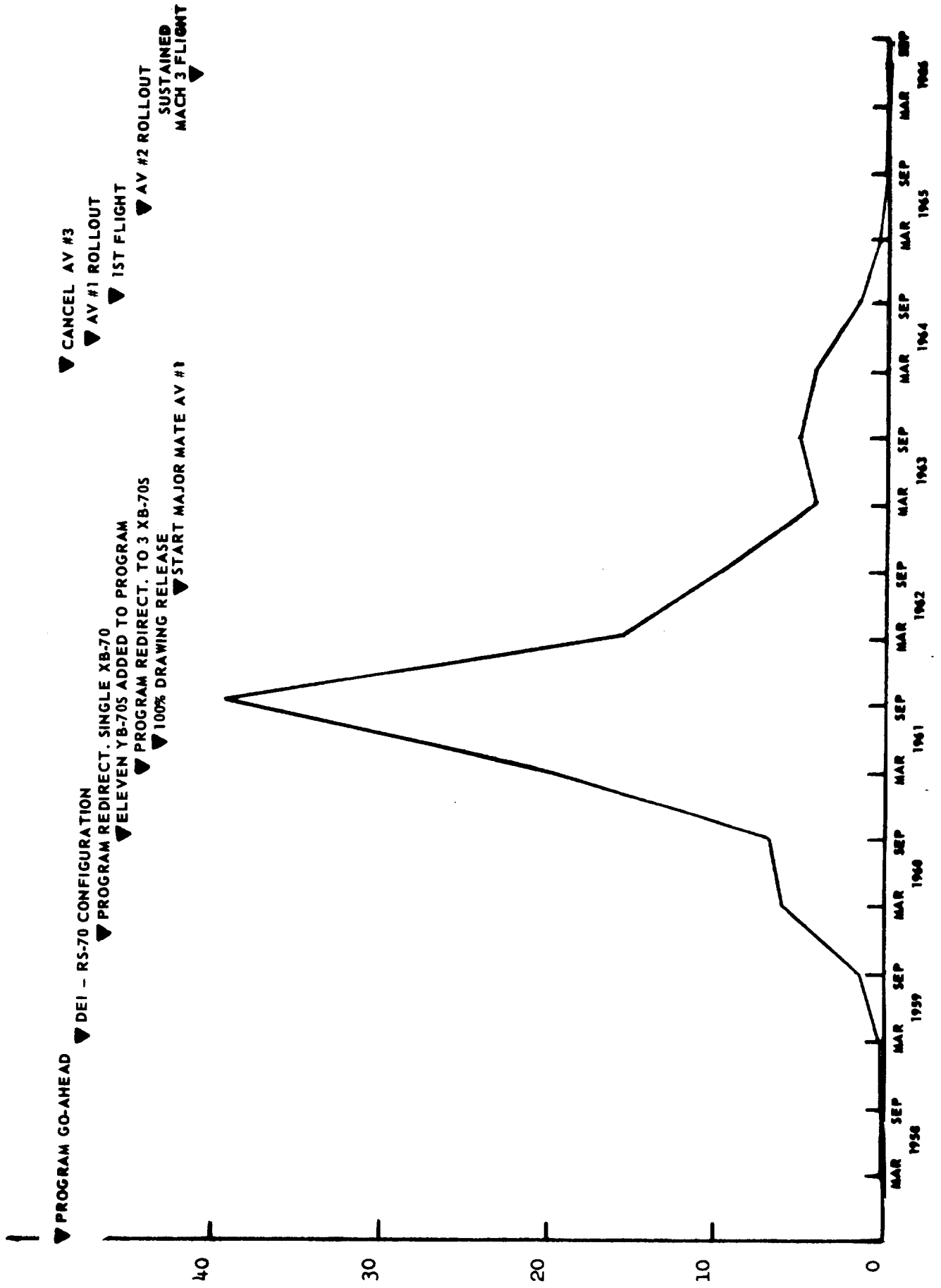


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DOLLARS (MILLIONS)

SD72-SH-0003

SUBDIVISION OF WORK - TOOLING  
TOTAL COST





NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

DESIGN/ENGINEERING  
SUBD CF WORK TOOLING AND STE

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58	1.5	152	4.704	715	690	1405
Q-2 58						
Q-3 58	1.5	308	3.078	948	1168	2116
Q-4 58						
Q-1 59		3	5.333	16	13	29
Q-2 59						
Q-3 59	10.5	1898	3.065	5818	6683	12501
Q-4 59						
Q-1 60	18.0	3217	2.841	9141	12115	21256
Q-2 60						
Q-3 60	27.0	4588	2.917	13381	17398	30779
Q-4 60						
Q-1 61	82.5	13982	2.797	39102	52142	91244
Q-2 61						
Q-3 61	103.5	18729	3.162	59221	78409	137630
Q-4 61						
Q-1 62	105.0	17939	3.913	70191	82749	152940
Q-2 62						
Q-3 62	59.5	9950	3.320	33033	52482	85515
Q-4 62						
Q-1 63	31.5	5271	4.349	22923	28541	51464
Q-2 63						
Q-3 63	40.5	6727	4.236	28493	34829	63322
Q-4 63						
Q-1 64	23.5	3977	4.070	16186	26637	42823
Q-2 64						
Q-3 64	6.0	1115	3.887	4334	5527	9861
Q-4 64						
Q-1 65	3.0	436	4.736	2065	2684	4749
Q-2 65						
Q-3 65	1.5	213	4.305	917	1358	2275
Q-4 65						

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

DESIGN/ENGINEERING  
SUBD OF WORK TOOLING AND STE

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66						
Q-2 66						
Q-3 66		34	3.794	129	252	381
TOTAL	515.0	88539		306613	403677	710290

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

TOOLING AND STE  
SUBD OF WORK TOOLING AND STE

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58	58.5	9756	3.818	37248	25807	63055
Q-2 58						
Q-3 58	31.5	5241	6.150	32232	9793	42025
Q-4 58						
Q-1 59	121.5	20749	4.487	93095	58510	151605
Q-2 59						
Q-3 59	451.5	79393	3.728	295989	237541	533530
Q-4 59						
Q-1 60	2152.5	373166	3.439	1283247	1114281	2397528
Q-2 60						
Q-3 60	2875.5	483006	3.371	1628432	1421088	3049520
Q-4 60						
Q-1 61	9241.0	1577087	3.543	5587274	4589745	10177019
Q-2 61						
Q-3 61	14640.0	2654808	3.324	8823994	8794005	17617999
Q-4 61						
Q-1 62	5676.0	968596	3.328	3223286	3528233	6751519
Q-2 62						
Q-3 62	2458.5	413106	3.298	1362316	1720672	3082988
Q-4 62						
Q-1 63	1795.5	306391	3.371	1032982	1169126	2202108
Q-2 63						
Q-3 63	1418.0	238243	3.551	846104	1099135	1945239
Q-4 63						
Q-1 64	2253.0	384607	3.959	1522493	1638411	3160904
Q-2 64						
Q-3 64	937.5	164933	2.636	434710	673266	1107976
Q-4 64						
Q-1 65	228.0	39634	4.433	175713	188582	364295
Q-2 65						
Q-3 65	38.0	6424	4.768	30627	33292	63919
Q-4 65						

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

TOOLING AND STE  
SUBD OF WORK TOOLING AND STE

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66		4	.750	3	42	45
Q-2 66						
Q-3 66		48	8.042	386		386
TOTAL	44376.5	7725192		26410131	26301529	52711660

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
8-70 AIRCRAFT STUDY

PLANNING  
SUBD OF WORK TOOLING AND STE

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-3 60		8	2.625	21		21
Q-4 60						
Q-1 61	717.0	122282	3.174	388072	49103	437175
Q-2 61						
Q-3 61	343.5	62214	3.069	190907	26371	217278
Q-4 61						
Q-1 62		7	.142	-1		-1
Q-2 62						
Q-3 62						
Q-4 62						
Q-1 63						
Q-2 63						
Q-3 63	2238.0	375960	3.679	1383260	64739	1447999
Q-4 63						
Q-1 64	36.0	6047	2.555	15448	16558	32006
Q-2 64						
Q-3 64	10.5	1967	7.195	14152	13469	27621
Q-4 64						
Q-1 65	19.5	3351	3.297	11047	9138	20185
Q-2 65						
Q-3 65	6.0	1123	4.185	4700	6016	10716
Q-4 65						
Q-1 66		3				
Q-2 66						
Q-3 66	1.5	132	3.530	466	590	1056
TOTAL	3372.0	573094		2008072	185984	2194056

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

TEST/QC  
SUBD CF WORK TOOLING AND STE

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58		1	2.000	2		2
Q-2 58						
Q-3 58		49	5.469	268		268
Q-4 58						
Q-1 59		80	3.038	243		243
Q-2 59						
Q-3 59	9.0	1526	3.080	4700		4700
Q-4 59						
Q-1 60	46.5	8100	3.259	26399		26399
Q-2 60						
Q-3 60	93.0	15527	3.394	52706		52706
Q-4 60						
Q-1 61	232.5	39652	3.318	131583		131583
Q-2 61						
Q-3 61	510.0	92533	3.580	331313		331313
Q-4 61						
Q-1 62	229.5	39190	3.136	122905		122905
Q-2 62						
Q-3 62	115.5	19304	3.210	61970		61970
Q-4 62						
Q-1 63	69.0	11864	3.364	39911		39911
Q-2 63						
Q-3 63	285.0	47905	3.509	168106		168106
Q-4 63						
Q-1 64	97.5	16652	3.679	61260		61260
Q-2 64						
Q-3 64	51.0	8849	3.435	30395		30395
Q-4 64						
Q-1 65	10.5	1892	3.640	6886		6886
Q-2 65						
Q-3 65		54	1.296	70		70
Q-4 65						

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B-70 AIRCRAFT STUDY

TEST/QC  
SUBD OF WORK TOOLING AND STE

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66	1.5	303	. 73	22		22
TOTAL	1750.5	303481		1038739		1038739

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK TOOLING AND STE

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	TOOL/STE MATL
Q-1 58	60.0	9909	3.831	37965	26497	64462	458
Q-2 58							
Q-3 58	33.0	5598	5.975	33448	10961	44409	-438
Q-4 58							
Q-1 59	121.5	20832	4.481	93354	58523	151877	-20
Q-2 59							
Q-3 59	471.0	82817	3.701	306507	244224	550731	89694
Q-4 59							
Q-1 60	2217.0	384483	3.430	1318787	1126396	2445183	604007
Q-2 60							
Q-3 60	2995.5	503129	3.368	1694540	1438486	3133026	905281
Q-4 60							
Q-1 61	10273.0	1753003	3.506	6146031	4690990	10837021	3523328
Q-2 61							
Q-3 61	15597.0	2828284	3.325	9405435	8898785	18304220	11005192
Q-4 61							
Q-1 62	6010.5	1025732	3.331	3416381	3610982	7027363	4915358
Q-2 62							
Q-3 62	2633.5	442360	3.294	1457319	1773154	3230473	2297855
Q-4 62							
Q-1 63	1896.0	323526	3.387	1095816	1197667	2293483	691031
Q-2 63							
Q-3 63	3981.5	668835	3.627	2425963	1198703	3624666	844638
Q-4 63							
Q-1 64	2410.0	411283	3.928	1615387	1681606	3296993	476551
Q-2 64							
Q-3 64	1005.0	176864	2.734	483591	692262	1175853	125098
Q-4 64							
Q-1 65	261.0	45313	4.319	195711	200404	396115	100368
Q-2 65							
Q-3 65	45.5	7814	4.647	36314	40666	76980	-1083
Q-4 65							
Q-1 66	1.5	310	.81	25	42	67	3791
Q-2 66							



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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD CF WORK TOOLING AND STE

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	TOOL/STE MATL
Q-3 66	1.5	214	4.584	981	842	1823	35524
TOTAL	50014.0	8690306		29763555	26891190	56654745	25616633

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK TOOLING AND STE

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 58		458	25		64945		64945
Q-2 58							
Q-3 58		-438	-24		43947		43947
Q-4 58							
Q-1 59	42156	42136	1116		195129		195129
Q-2 59							
Q-3 59	712227	801921	27056	6411	1386119		1386119
Q-4 59							
Q-1 60	2649331	3253338	236605	19797	5954923	120308	6075231
Q-2 60							
Q-3 60	2441985	3347266	263528	5831	6750051	169356	6919407
Q-4 60							
Q-1 61	4960522	8483850	439839	43741	19804451	371091	20175542
Q-2 61							
Q-3 61	8019616	19024808	1159702	160627	38649357	695654	39345011
Q-4 61							
Q-1 62	2889461	7804819	479159	48035	15359376	248094	15607470
Q-2 62							
Q-3 62	3760321	6058176	300466	-24940	9564175	142832	9707007
Q-4 62							
Q-1 63	1008179	1699210	110294	625	4103612	68402	4172014
Q-2 63							
Q-3 63	557934	1402572	100588	-5776	5122050	85152	5207202
Q-4 63							
Q-1 64	441443	917994	111423	6981	4333391	92106	4425497
Q-2 64							
Q-3 64	67059	192157	67393	8590	1443993	30724	1474717
Q-4 64							
Q-1 65	17607	117975	35764	2110	551964	14727	566691
Q-2 65							
Q-3 65		-1083	-193	704	76408	2040	78448
Q-4 65							
Q-1 66		3791	786	1070	5714	171	5885
Q-2 66							

NORTH AMERICAN ROCKWELL CORP.  
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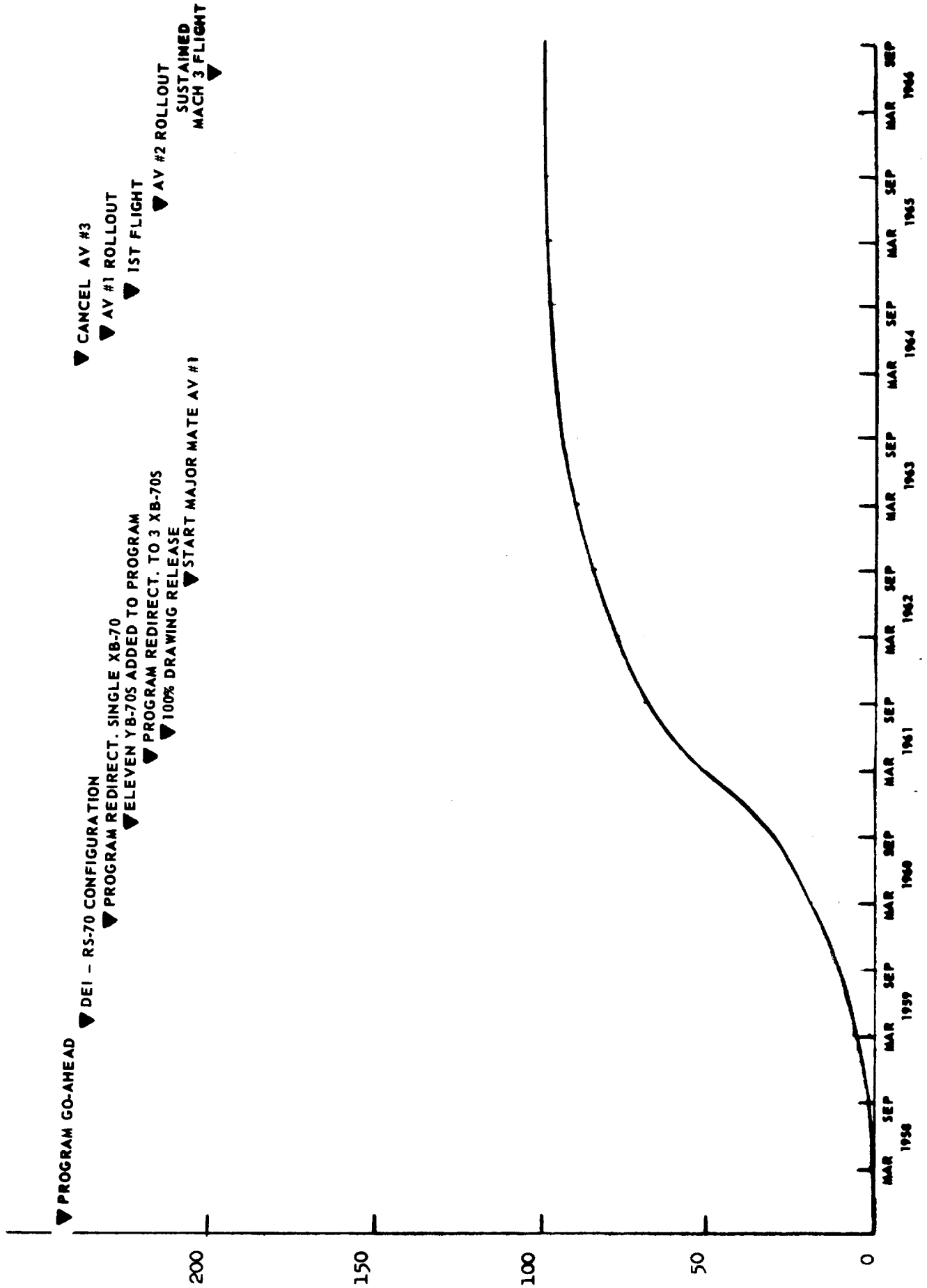
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

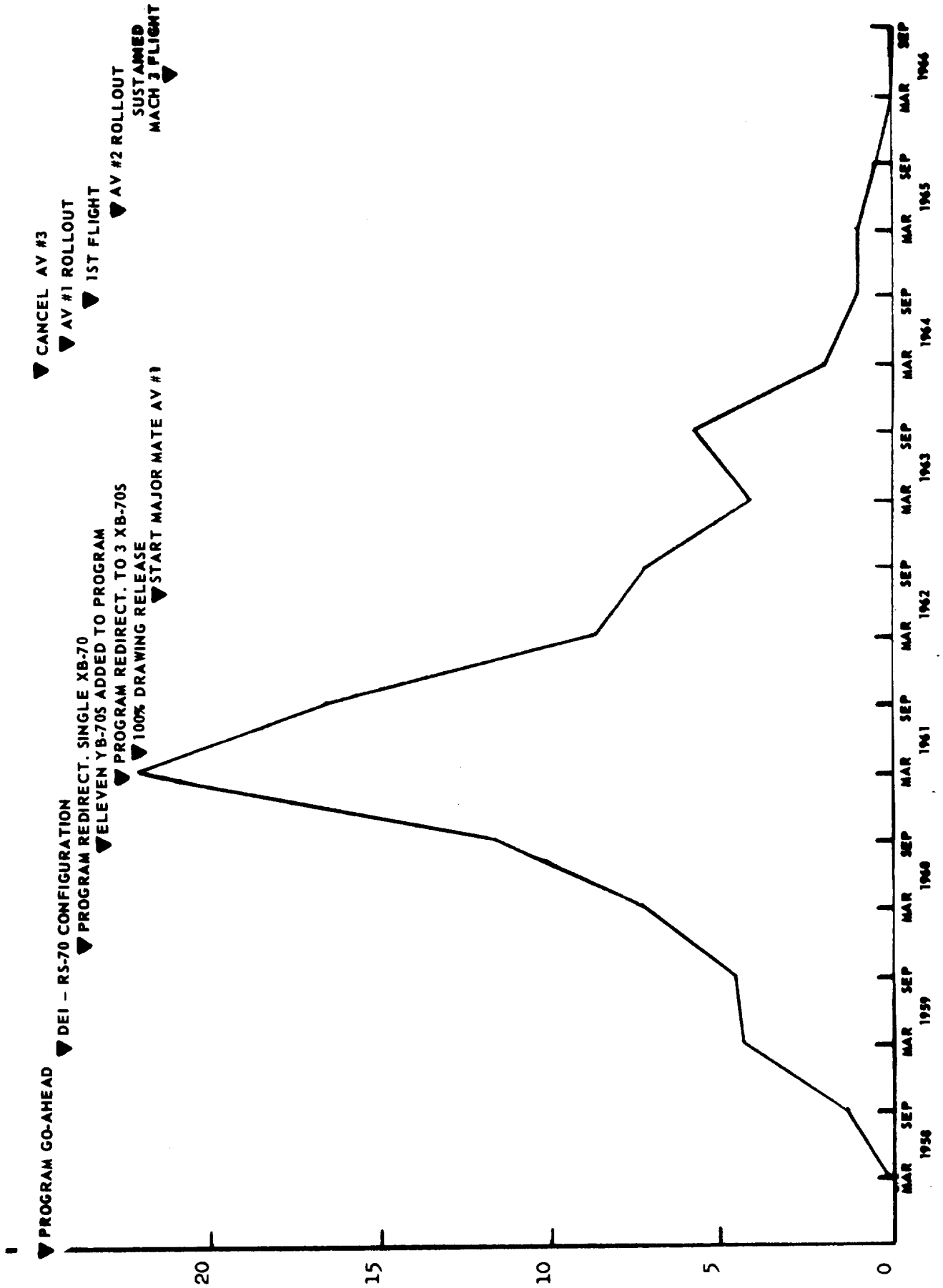
SUBD OF WORK TOOLING AND STE

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-3 66		35524	2185	1615	41147	1239	42386
TOTAL	27567841	53184474	3336112	275421	113450752	2041896	115492648

SUBDIVISION OF WORK - TEST/QC  
CUMULATIVE COST



SUBDIVISION OF WORK - TEST/Q.C.  
TOTAL COST



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 B-70 AIRCRAFT STUDY

DESIGN/ENGINEERING  
 SUBD OF WORK TEST/QC

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58	48.0	8007	4.442	35570	36430	72000
Q-2 58						
Q-3 58	190.5	32064	4.157	133284	125443	258727
Q-4 58						
Q-1 59	286.0	48836	4.175	203866	167509	371375
Q-2 59						
Q-3 59	213.0	37359	4.110	153546	134425	287971
Q-4 59						
Q-1 60	456.0	78933	4.496	354871	276037	630908
Q-2 60						
Q-3 60	1480.5	248799	4.057	1009498	925163	1934661
Q-4 60						
Q-1 61	1884.0	321571	3.735	1201110	1028847	2229957
Q-2 61						
Q-3 61	1570.0	284691	4.309	1226625	1292332	2518957
Q-4 61						
Q-1 62	2043.5	348748	4.262	1486241	1504085	2990326
Q-2 62						
Q-3 62	1782.0	299414	4.325	1294997	1326071	2621068
Q-4 62						
Q-1 63	610.0	104120	4.789	498661	580181	1078842
Q-2 63						
Q-3 63	474.5	79688	4.695	374175	401509	775684
Q-4 63						
Q-1 64	344.5	58844	4.776	281035	356498	637533
Q-2 64						
Q-3 64	179.5	31619	4.358	137803	187259	325062
Q-4 64						
Q-1 65	240.0	41659	2.292	95479	109208	204687
Q-2 65						
Q-3 65	115.5	19359	3.025	58554	70624	129178
Q-4 65						

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

DESIGN/ENGINEERING  
SUBD CF WORK TEST/QC

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66	7.5	1267	3.141	3980	5409	9389
Q-2 66						
Q-3 66		20	3.550	71	70	141
TOTAL	11925.0	2044998		8549366	8527100	17076466

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B-70 AIRCRAFT STUDY

PRODUCTION  
SUBD OF WORK TEST/QC

ON-SITE LABOR

MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
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Q-1 61

TOTAL



NORTH AMERICAN ROCKWELL CORP.  
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B-70 AIRCRAFT STUDY

SHOP SUPPORT  
SUBD OF WORK TEST/QC

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58		21	2.476	52	73	125
Q-2 58						
Q-3 58	397.0	66656	2.957	197080	226393	423473
Q-4 58						
Q-1 59	2587.0	441466	2.959	1306251	1575015	2881266
Q-2 59						
Q-3 59	2638.5	464428	2.921	1356656	1817377	3174033
Q-4 59						
Q-1 60	3722.0	645081	2.962	1911002	2347642	4258644
Q-2 60						
Q-3 60	6371.5	1070362	3.036	3249243	4101487	7350730
Q-4 60						
Q-1 61	11591.0	1978151	3.063	6060056	7407508	13467564
Q-2 61						
Q-3 61	5618.0	1018680	3.043	3099410	4561687	7661097
Q-4 61						
Q-1 62	3604.0	615077	2.885	1774784	2206170	3980954
Q-2 62						
Q-3 62	1973.5	331530	3.089	1024035	1389456	2413491
Q-4 62						
Q-1 63	784.0	133707	3.196	427292	571231	998523
Q-2 63						
Q-3 63	771.5	129709	3.443	446626	917209	1363835
Q-4 63						
Q-1 64	541.0	92301	2.879	265718	409934	675652
Q-2 64						
Q-3 64	131.5	23199	1.460	33882	76837	110719
Q-4 64						
Q-1 65	-55.5	-9613	2.071	19919	39506	59425
Q-2 65						
Q-3 65	19.5	3234	10.195	32970	56757	89727
Q-4 65						

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B-70 AIRCRAFT STUDY

SHOP SUPPORT  
SUBD GF WORK TEST/QC

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66	-3.0	-495	.188	-93	1184	1091
Q-2 66						
Q-3 66		-2	2.500	-5	57	52
TOTAL	40691.5	7003492		21204878	27705523	48910401

NORTH AMERICAN ROCKWELL CORP.  
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 B-70 AIRCRAFT STUDY

PLANNING  
 SUBD OF WORK TEST/QC

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 63		-51	3.353	-171	-20	-191
Q-2 63						
Q-3 63	160.0	26947	3.973	107071	2465	109536
Q-4 63						
Q-1 64	8.5	1451	3.747	5437	3399	8836
Q-2 64						
Q-3 64	8.5	1449	3.738	5417	3410	8827
Q-4 64						
Q-1 65	3.0	548	3.880	2126	791	2917
Q-2 65						
Q-3 65	1.5	219	3.881	850	316	1166
Q-4 65						
Q-1 66		16	3.813	61	23	84
TOTAL	181.5	30579		120791	10384	131175

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 B-70 AIRCRAFT STUDY

TEST/QC  
 SUBD OF WORK TEST/QC

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 58						
Q-2 58						
Q-3 58	9.0	1609	3.515	5655		5655
Q-4 58						
Q-1 59	46.0	7812	3.006	23484		23484
Q-2 59						
Q-3 59	114.0	20081	3.105	62342		62342
Q-4 59						
Q-1 60	242.5	42040	2.970	124851		124851
Q-2 60						
Q-3 60	661.5	111179	3.217	357703		357703
Q-4 60						
Q-1 61	1336.5	228052	3.248	740621		740621
Q-2 61						
Q-3 61	652.0	118187	3.140	371149		371149
Q-4 61						
Q-1 62	194.5	33156	3.229	107058		107058
Q-2 62						
Q-3 62	116.5	19540	3.091	60389		60389
Q-4 62						
Q-1 63	43.5	7461	3.418	25500		25500
Q-2 63						
Q-3 63	58.0	9824	3.385	33259		33259
Q-4 63						
Q-1 64	52.5	8988	3.713	33372		33372
Q-2 64						
Q-3 64	15.0	2661	3.504	9325		9325
Q-4 64						
Q-1 65	21.0	3692	3.794	14006		14006
Q-2 65						
Q-3 65	10.0	1653	3.806	6292		6292
Q-4 65						

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B-70 AIRCRAFT STUDY

TEST/QC  
SUBD OF WORK TEST/QC

ON-SITE LABOR

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$
Q-1 66		83	3.952	328	-40	288
Q-2 66						
Q-3 66		12	3.667	44	46	90
TOTAL	3572.5	616030		1975378	6	1975384

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B-70 AIRCRAFT STUDY

SUBD CF WORK TEST/QC

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	48.0	8028	4.437	35622	36503	72125	32
Q-2 58							
Q-3 58	596.5	100329	3.349	336019	351836	687855	123642
Q-4 58							
Q-1 59	2919.0	498114	3.079	1533601	1742524	3276125	373922
Q-2 59							
Q-3 59	2965.5	521868	3.013	1572544	1951802	3524346	283170
Q-4 59							
Q-1 60	4420.5	766054	3.121	2390724	2623679	5014403	1460422
Q-2 60							
Q-3 60	8513.5	1430340	3.228	4616444	5026650	9643094	1048687
Q-4 60							
Q-1 61	14811.5	2527774	3.166	8001787	8436355	16438142	2759769
Q-2 61							
Q-3 61	7840.0	1421558	3.304	4697184	5854019	10551203	3153778
Q-4 61							
Q-1 62	5842.0	996981	3.378	3368083	3710255	7078338	1146094
Q-2 62							
Q-3 62	3872.0	650484	3.658	2379421	2715527	5094948	1530962
Q-4 62							
Q-1 63	1437.5	245237	3.879	951282	1151392	2102674	1478450
Q-2 63							
Q-3 63	1464.0	246168	3.904	961131	1321183	2282314	2666709
Q-4 63							
Q-1 64	946.5	161584	3.624	585562	769831	1355393	511562
Q-2 64							
Q-3 64	334.5	58928	3.164	186427	267506	453933	434069
Q-4 64							
Q-1 65	208.5	36286	3.625	131530	149505	281035	575873
Q-2 65							
Q-3 65	146.5	24465	4.033	98666	127697	226363	213405
Q-4 65							
Q-1 66	4.5	871	4.909	4276	6576	10852	36894
Q-2 66							

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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 NASA CONTRACT NAS9-12100

APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUBD OF WORK TEST/QC

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-3 66		30	3.667	110	173	283	26242
Q-4 66							
Q-1 67							
Q-2 67							
Q-3 67							
TOTAL	56370.5	9695099		31850413	36243013	68093426	17823682

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUBD OF WORK TEST/QC

	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER CCST	TOTAL O/C \$	SUB TOTAL
Q-1 58		32	2	170368	1293	171661	243820
Q-2 58							
Q-3 58		123642	6762	583528	-9669	573859	1392118
Q-4 58							
Q-1 59		373922	31600	610704	76663	687367	4369014
Q-2 59							
Q-3 59	9303	292473	24231	695957	58795	754752	4595802
Q-4 59							
Q-1 60	166202	1626624	201949	338115	77173	415288	7258264
Q-2 60							
Q-3 60	162050	1210737	147532	403089	62100	465189	11466552
Q-4 60							
Q-1 61	220498	2980267	239396	296523	12891	309414	19967219
Q-2 61							
Q-3 61	63814	3217592	268202	237221	58866	296087	14333084
Q-4 61							
Q-1 62	32400	1178494	91437	207559	74612	282171	8630440
Q-2 62							
Q-3 62	26054	1557016	122219	177914	359722	537636	7311819
Q-4 62							
Q-1 63	73413	1551863	148765	148254	169674	317928	4121230
Q-2 63							
Q-3 63	38968	2705677	264034	118797	311123	429920	5681945
Q-4 63							
Q-1 64	103488	615050	68742	1	-28401	-28400	2010785
Q-2 64							
Q-3 64		434069	157920	-1	-23441	-23442	1022480
Q-4 64							
Q-1 65		575873	172256	1	6129	6130	1035294
Q-2 65							
Q-3 65		213405	38076		2453	2453	480297
Q-4 65							
Q-1 66		36894	7651	11740	176	11916	67313
Q-2 66							



NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUBD OF WORK TEST/QC

	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER CCST	TOTAL O/C \$	SUB TOTAL
Q-3 66		26242	1612	4328		4328	32465
Q-4 66							
Q-1 67							
Q-2 67							
Q-3 67							
TOTAL	896190	18719872	1992386	4004098	1210159	5214257	94019941

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
DATA PREPARED UNDER  
NASA CONTRACT NAS9-12100

APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

SUBD OF WORK TEST/QC

	G & A	IOWA	TOTAL COST
Q-1 58			243820
Q-2 58			
Q-3 58			1392118
Q-4 58			
Q-1 59		12067	4381081
Q-2 59			
Q-3 59		4605	4600407
Q-4 59			
Q-1 60	143472	6935	7408671
Q-2 60			
Q-3 60	224344	37147	11728043
Q-4 60			
Q-1 61	405343	1860333	22232895
Q-2 61			
Q-3 61	302929	1989563	16625576
Q-4 61			
Q-1 62	144747		8775187
Q-2 62			
Q-3 62	122637		7434456
Q-4 62			
Q-1 63	68906		4190136
Q-2 63			
Q-3 63	95001		5776946
Q-4 63			
Q-1 64	42785		2053570
Q-2 64			
Q-3 64	21755		1044235
Q-4 64			
Q-1 65	27621		1062915
Q-2 65			
Q-3 65	12813		493110
Q-4 65			
Q-1 66	2026		69339
Q-2 66			

C4

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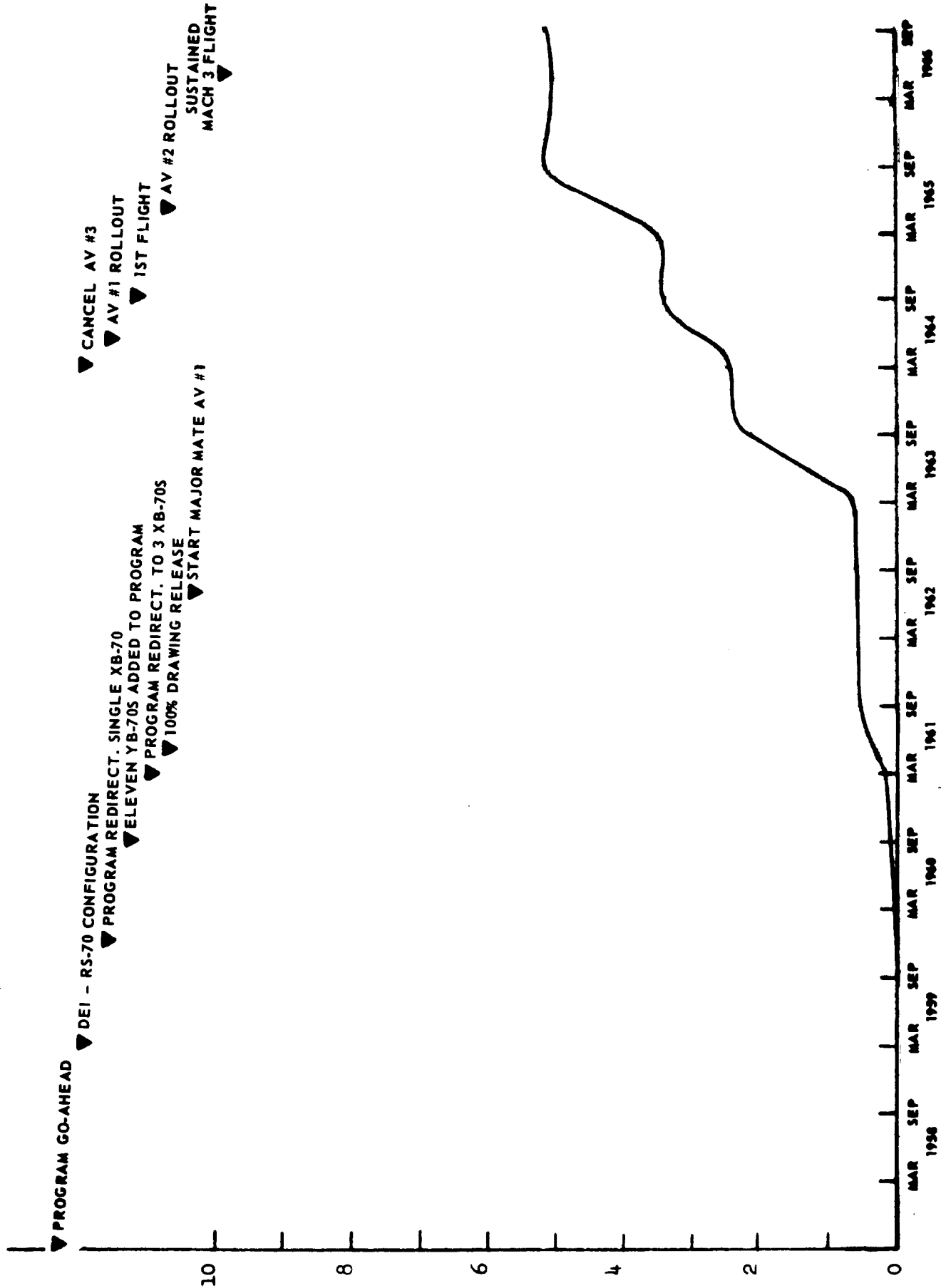
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

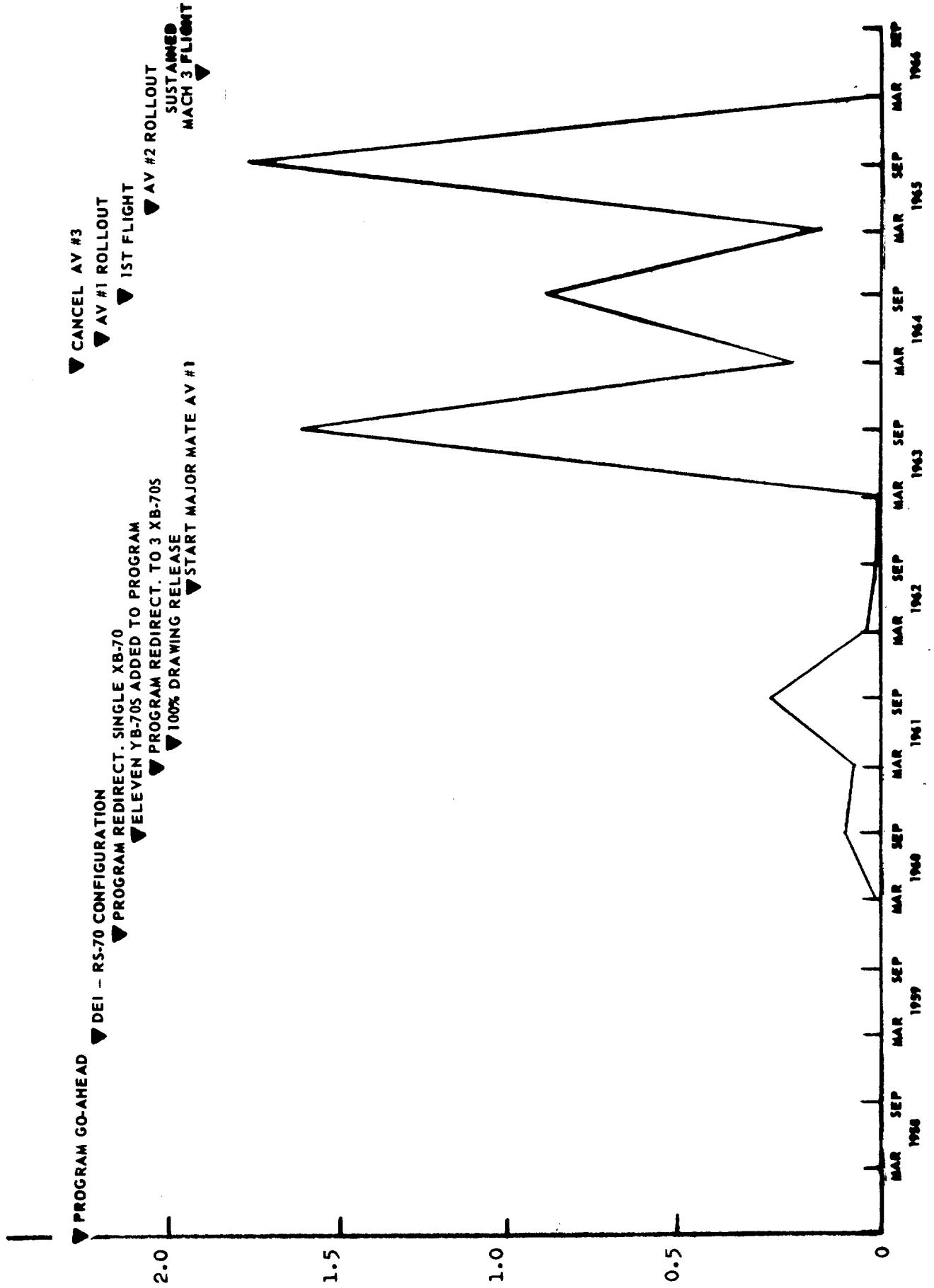
SUBD OF WORK TEST/QC

	G & A	IDWA	TOTAL COST
Q-3 66	978		33443
Q-4 66			
Q-1 67			
Q-2 67			
Q-3 67			
TOTAL	1615357	3910650	99545948

SUBDIVISION OF WORK - OTHER COSTS  
CUMULATIVE COST



SUBDIVISION OF WORK - OTHER COSTS  
TOTAL COST



NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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 NASA CONTRACT NAS9-12100

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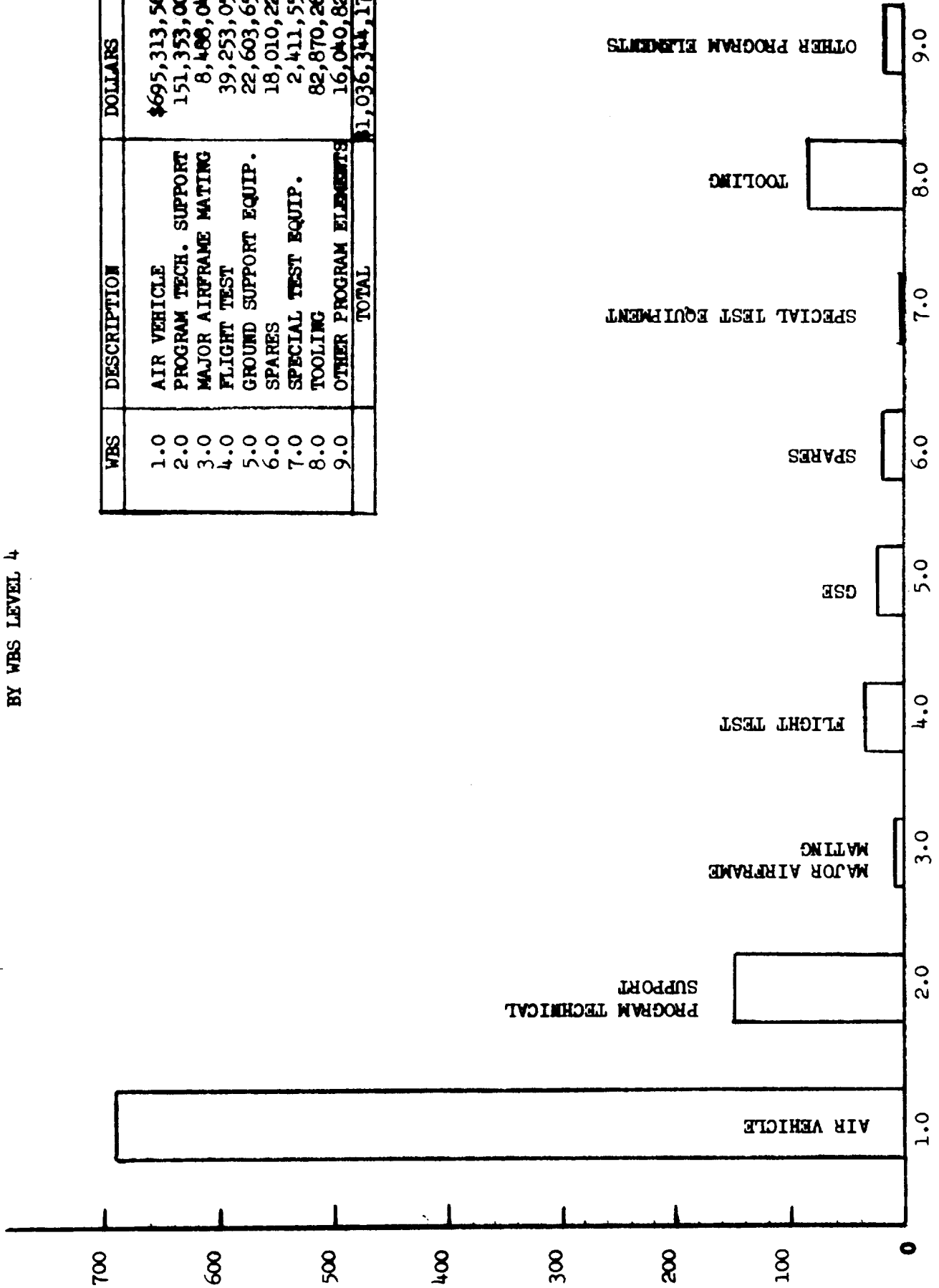
TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

SUBD CF WORK OTHER COST

	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 60	18116	18116	345	18461
Q-2 60				
Q-3 60	112353	112353	2141	114494
Q-4 60				
Q-1 61	66498	66498	1236	67734
Q-2 61				
Q-3 61	318024	318024	5910	323934
Q-4 61				
Q-1 62	35864	35864	602	36466
Q-2 62				
Q-3 62	11976	11976	201	12177
Q-4 62				
Q-1 63	5697	5697	95	5792
Q-2 63				
Q-3 63	1598681	1598681	26730	1625411
Q-4 63				
Q-1 64	256870	256870	5466	262336
Q-2 64				
Q-3 64	869076	869076	18492	887568
Q-4 64				
Q-1 65	163492	163492	4362	167854
Q-2 65				
Q-3 65	1730851	1730851	46179	1777030
Q-4 65				
Q-1 66	-168921	-168921	-5087	-174008
Q-2 66				
Q-3 66	100375	100375	3023	103398
TOTAL	5118952	5118952	109695	5228647

TOTAL PROGRAM COSTS  
BY WBS LEVEL 4

WBS	DESCRIPTION	DOLLARS
1.0	AIR VEHICLE	\$695,313,561
2.0	PROGRAM TECH. SUPPORT	151,353,004
3.0	MAJOR AIRFRAME MATING	8,488,042
4.0	FLIGHT TEST	39,253,050
5.0	GROUND SUPPORT EQUIP.	22,603,656
6.0	SPARES	18,010,222
7.0	SPECIAL TEST EQUIP.	2,411,557
8.0	TOOLING	82,870,262
9.0	OTHER PROGRAM ELEMENTS	16,040,823
	TOTAL	\$1,036,344,177



DOLLARS (MILLIONS)

I-175

SD72-SH-0003

APRIL 1972

COST BREAKDOWNS  
B-70 AIRCRAFT STUDY

SUMMARY

	4-SYSTEM 1 HOURS DOLLARS	4-SYSTEM 2 HOURS DOLLARS	4-SYSTEM 3 HOURS DOLLARS	4-SYSTEM 4 HOURS DOLLARS
DESIGN/ENGINEERING	18373241	2288885	240192	2279153
LABOR AT \$ 4.902	90415322	10899693	1226299	12765763
ENGR BURDEN AT \$ 4.690	81995778	9722238	1292101	15219035
PRODUCTION	16632843	220672	590140	11030
LABOR AT \$ 3.224	53533877	304564	2225908	35575
SHOP SUPPORT	7282051	49443		301586
LABOR AT \$ 3.146	22106449	234456		1219027
TOOLING AND STE				
LABOR AT \$ 3.419				
PLANNING	996856	101		77
LABOR AT \$ 3.444	3406551	454		294
TEST/QC	2685461	1503	91027	374099
LABOR AT \$ 3.641	9481191	5452	331711	1745335
MFG BURDEN AT \$ 3.772	108113402	532495	3255981	4051204
ENGR MATERIAL	17939068	61070		1577071
MFG MATERIAL	37075623	5575		144913
TOOLING/STE MATL				
SUBCONTRACT	194492135	122190126		
MPC	14208425	4509461		276599
WIND TUNNEL	4004098			
OTHER COST	19187326	658940		1202278
SUB-TOTAL	656009245	149724524	8332000	38237099
GEN & ADMIN	11401105	1628480	156042	1015951
IDWA	27903210			
TOTAL COST	695213561	151353004	8488042	39253050



COST BREAKDOWNS  
 B-70 AIRCRAFT STUDY

SUMMARY

	4-SYSTEM 5 HOURS DOLLARS	4-SYSTEM 6 HOURS DOLLARS	4-SYSTEM 7 HOURS DOLLARS	4-SYSTEM 8 HOURS DOLLARS
DESIGN/ENGINEERING	1664512	478239	2348	85600
LABOR AT \$ 4.902	7334702	1681543	9365	294104
ENGR BURDEN AT \$ 4.690	8076691	2473632	11814	388569
PRODUCTION	224559	735485		
LABOR AT \$ 3.224	746798	2303896		
SHOP SUPPORT	293765			
LABOR AT \$ 3.146	1382496			
TOOLING AND STE			215320	7409604
LABOR AT \$ 3.419			774818	25283570
PLANNING	7858	24444		572696
LABOR AT \$ 3.444	28551	75067		2006823
TEST/CC	19757	49983	801	301410
LABOR AT \$ 3.641	70567	164304	2829	1031533
MFG BURDEN AT \$ 3.772	2440730	3350652	909243	25212209
ENGR MATERIAL	224122	12960		
MFG MATERIAL	1578449	6357812		
TOOLING/STE MATL			596617	24730867
SUBCONTRACT				
MPC	235426	862365	61915	2190524
WIND TUNNEL				
OTHER COST	60604	348211		261038
SUB-TOTAL	22179336	17630548	2367101	81399237
GEN & ADMIN IDWA	424320	379674	44456	1471025
TOTAL COST	22603656	18010222	2411557	82870262

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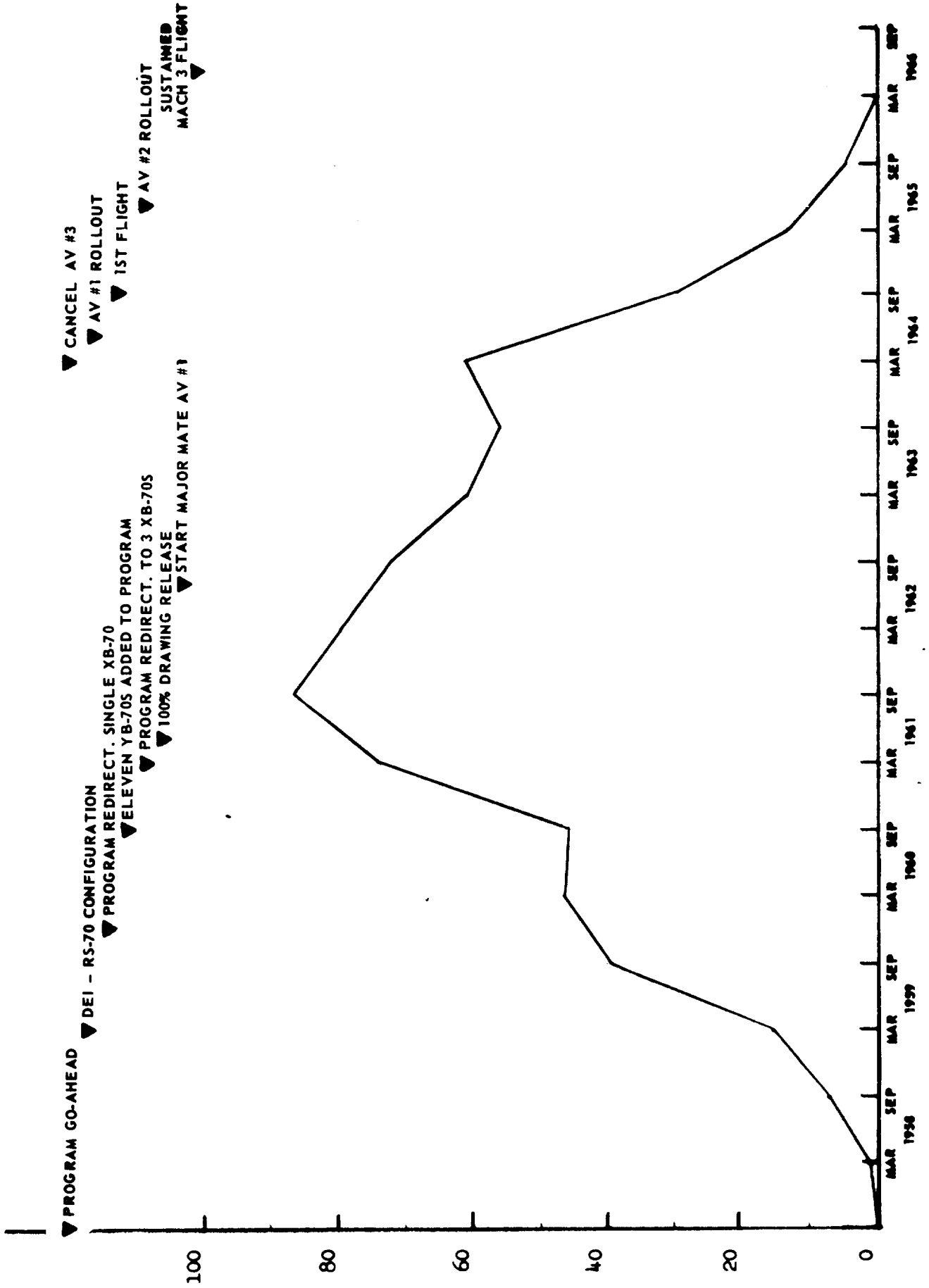
APRIL 1972

COST BREAKDOWNS  
 B-70 AIRCRAFT STUDY

SUMMARY

	4-SYSTEM	
	9	TOTAL
	HOURS	HOURS
	DOLLARS	DOLLARS
DESIGN/ENGINEERING	677170	26089340
LABOR AT \$ 4.902	3260198	127887594
ENGR BURDEN AT \$ 4.690	3170303	122350661
PRODUCTION	64772	18579531
LABOR AT \$ 3.224	201412	59902030
SHOP SUPPORT	7386	7934231
LABOR AT \$ 3.146	22321	24964749
TOOLING AND STF	100268	7725192
LABOR AT \$ 3.419	351743	26410131
PLANNING	960	1602992
LABOR AT \$ 3.444	3075	5520320
TEST/CC	12562	3536603
LABOR AT \$ 3.641	43657	12876579
MFG BURDEN AT \$ 3.772	678796	148544912
ENGR MATERIAL	142558	19956849
MFG MATERIAL	65232	45227604
TOOLING/STE MATL	289149	25616633
SUBCONTRACT		316082201
MPC	53549	22503265
WIND TUNNEL		4004093
OTHER COST	7455158	29173555
SUB-TOTAL	15742651	991621741
GEN & ADMIN	298172	16819226
IDWA		27903210
TOTAL COST	160408231	1036344177

WBS 1.0 AIR VEHICLE  
TOTAL COST



NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 AIR VEHICLE

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN *	ENGR MATL
Q-1 58	833.5	140876	4.498	633697	621920	1255617	2347
Q-2 58							
Q-3 58	4504.0	756519	4.301	3254152	2858265	6112417	127533
Q-4 58							
Q-1 59	8094.5	1381891	3.908	5400427	4699639	10100066	378864
Q-2 59							
Q-3 59	11586.5	2039976	3.912	7980488	7237688	15218176	307531
Q-4 59							
Q-1 60	13644.5	2365214	4.102	9702203	8425198	18127401	1460731
Q-2 60							
Q-3 60	16257.5	3066646	3.943	12091192	10519010	22610202	1068555
Q-4 60							
Q-1 61	31444.5	5367312	3.777	20272640	17738504	38011144	2757954
Q-2 61							
Q-3 61	27673.0	5018668	3.707	18603600	19983809	38587409	3170330
Q-4 61							
Q-1 62	30989.5	5289113	3.644	19275406	20424239	39699645	1122159
Q-2 62							
Q-3 62	27315.0	4588293	3.768	17378358	19335663	36714021	1509779
Q-4 62							
Q-1 63	22305.5	3807078	4.084	15547700	17171454	32719154	1434773
Q-2 63							
Q-3 63	25203.5	4233655	3.722	15758865	19110234	34869099	2667529
Q-4 63							
Q-1 64	24354.5	4156438	4.071	16921040	22251963	39173003	507280
Q-2 64							
Q-3 64	13238.0	2329853	4.201	9786975	12369579	22156554	495889
Q-4 64							
Q-1 65	6514.0	1128335	4.098	4624293	5697795	10322088	616224
Q-2 65							
Q-3 65	1746.5	293896	5.877	1727265	1612773	3340038	226751
Q-4 65							
Q-1 66	37.5	6965	5.168	35995	52276	88271	54888

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 AIR VEHICLE

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-2 66							
Q-3 66	-1.5	-276	3.283	-906	-329	-1735	29951
Q-4 66							
Q-1 67							
Q-2 67							
Q-3 67							
TOTAL	267742.5	45970452		178993390	190109180	369102570	17939068

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 AIR VEHICLE

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST	TOTAL O/C \$
Q-1 58			2347	127	170368	10939	181307
Q-2 58							
Q-3 58		119071	246604	8031	583528	207890	791418
Q-4 58							
Q-1 59		3551218	3910082	125666	610704	743098	1353802
Q-2 59							
Q-3 59		22077595	22385126	629551	695957	1268555	1964512
Q-4 59							
Q-1 60	400	22356322	23817453	1518661	338115	2169302	2507417
Q-2 60							
Q-3 60	15609	17805774	18889938	1199030	403089	1617664	2020753
Q-4 60							
Q-1 61	1001899	22966514	26726367	975245	296523	2384200	2680723
Q-2 61							
Q-3 61	4707321	29255957	37133608	1503312	237221	1866953	2104174
Q-4 61							
Q-1 62	4903221	25968919	31954299	1300120	207559	2322574	2530133
Q-2 62							
Q-3 62	5119756	21324489	27954024	1200133	177914	2300733	2478647
Q-4 62							
Q-1 63	5800375	14438909	21674057	1325907	148254	1721443	1869697
Q-2 63							
Q-3 63	6559067	6836961	16063557	1128736	118797	-142029	-23232
Q-4 63							
Q-1 64	5706444	7491653	13705377	1691259	1	951347	951348
Q-2 64							
Q-3 64	2336960	250099	3082948	1112254	-1	871332	871331
Q-4 64							
Q-1 65	508486	68654	1193364	358819	1	625325	625326
Q-2 65							
Q-3 65	440981		667632	119113		250132	250132
Q-4 65							
Q-1 66	5227		60115	12468	11740	17868	29608

NORTH AMERICAN ROCKWELL CORP.  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 AIR VEHICLE

	MFG MATL	SUBC	TOTAL MATERIAL	MFC	WIND TUNNEL	OTHER COST	TOTAL O/C \$
Q-2 66							
Q-3 66	-30023		-72	-7	4328		4328
Q-4 66							
Q-1 67							
Q-2 67							
Q-3 67							
TOTAL	37075623	194492135	249506826	14208425	4004098	19167326	23191424

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 AIR VEHICLE

	SUB TOTAL	G & A	IDWA	TOTAL COST
Q-1 58	1439398			1439398
Q-2 58				
Q-3 58	7158470			7158470
Q-4 58				
Q-1 59	15489616		23214	15512830
Q-2 59				
Q-3 59	40197365		8848	40206213
Q-4 59				
Q-1 60	45970932	815552	13335	46799819
Q-2 60				
Q-3 60	44719923	912644	96298	45728865
Q-4 60				
Q-1 61	68393479	1366557	4372691	74132727
Q-2 61				
Q-3 61	79328503	1566569	5913127	86808199
Q-4 61				
Q-1 62	75524197	1305193	2924005	79753395
Q-2 62				
Q-3 62	68346825	1159073	2610066	72115964
Q-4 62				
Q-1 63	57588815	1011192	2496459	61096466
Q-2 63				
Q-3 63	52038160	916757	3068199	56023116
Q-4 63				
Q-1 64	55520987	1268114	4803875	61592976
Q-2 64				
Q-3 64	27223087	612412	1561617	29397116
Q-4 64				
Q-1 65	12499597	341493	4727	12845817
Q-2 65				
Q-3 65	4376915	119740	6749	4503404
Q-4 65				
Q-1 66	190462	5735		196197



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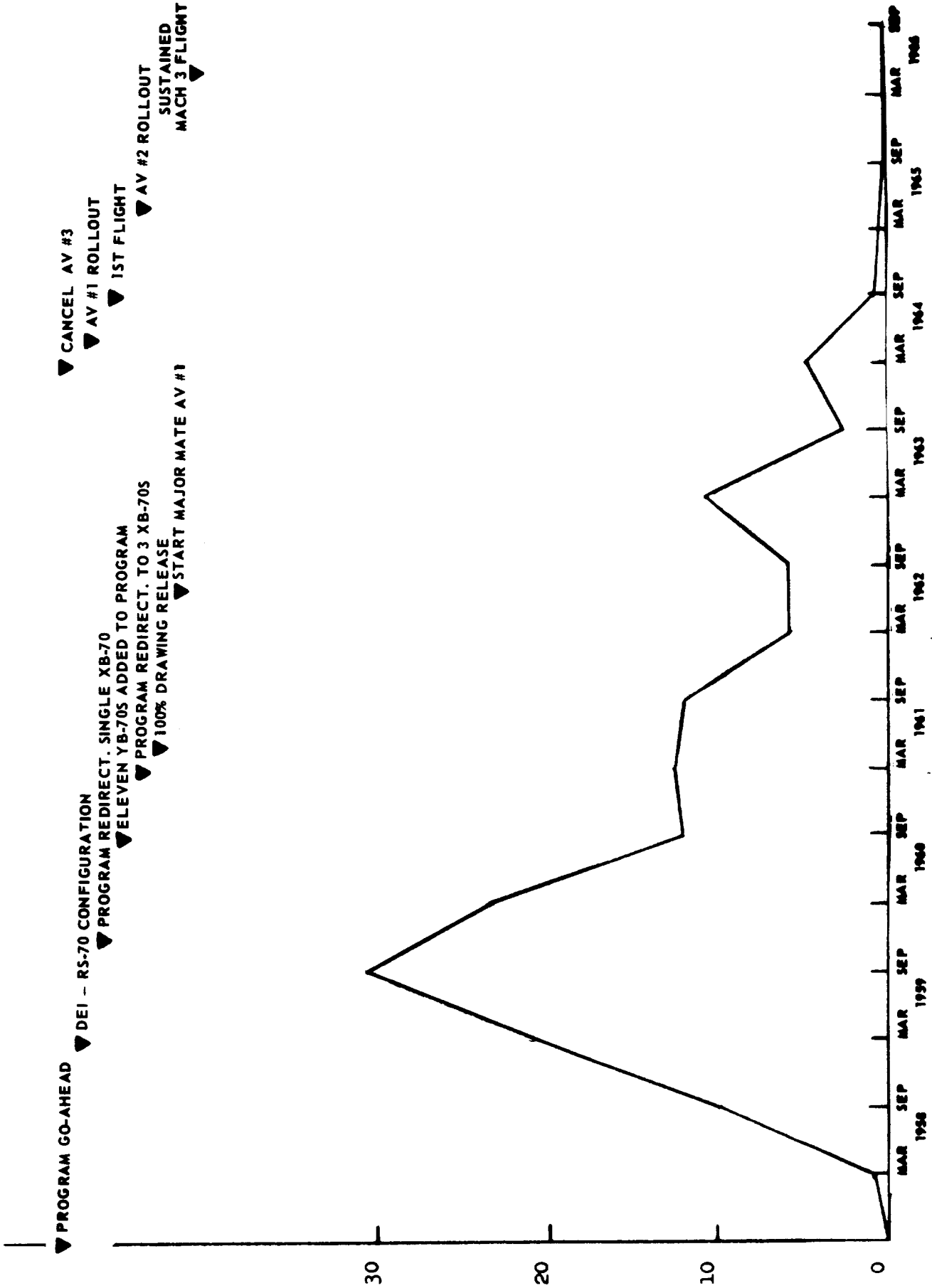
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
AIR VEHICLE

	SUB TOTAL	G & A	IDWA	TOTAL COST
Q-2 66				
Q-3 66	2514	75		2589
Q-4 66				
Q-1 67				
Q-2 67				
Q-3 67				
TOTAL	65609245	11401106	27903210	695313561

WBS 2.0 PROGRAM TECHNICAL SUPPORT  
TOTAL COST



(MILLIONS) DOLLARS

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
 DATA PREPARED UNDER  
 NASA CONTRACT NAS9-12100

APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4- SYSTEM 2  
 PROGRAM TECHNICAL SUPPORT

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	461.0	77220	4.506	347920	351010	698930	458
Q-2 58							
Q-3 58	1053.0	176919	4.275	756308	693720	1450028	2166
Q-4 58							
Q-1 59	1354.5	231665	4.233	980633	816158	1796791	513
Q-2 59							
Q-3 59	2073.0	365030	4.010	1463695	951641	2415336	2191
Q-4 59							
Q-1 60	1795.5	311298	4.083	1271181	771979	2043160	-2462
Q-2 60							
Q-3 60	808.5	135799	4.588	622982	675370	1298352	-21
Q-4 60							
Q-1 61	1908.0	325504	4.471	1455475	1059510	2514985	20115
Q-2 61							
Q-3 61	947.0	171751	4.890	839995	813250	1653245	11941
Q-4 61							
Q-1 62	720.0	123049	5.163	635293	546363	1182156	20703
Q-2 62							
Q-3 62	714.0	119950	5.061	607111	583492	1190603	-1084
Q-4 62							
Q-1 63	785.5	134121	5.385	722262	709360	1431622	6109
Q-2 63							
Q-3 63	858.0	144220	5.701	822192	767960	1590152	-281
Q-4 63							
Q-1 64	726.0	123769	5.611	694431	720093	1414524	-8
Q-2 64							
Q-3 64	360.0	63348	5.918	374917	404470	779387	642
Q-4 64							
Q-1 65	175.5	30434	6.266	190703	206557	397260	88
Q-2 65							
Q-3 65	90.0	15139	6.113	92545	99030	191575	
Q-4 65							
Q-1 66	40.5	6966	5.778	40253	51953	92206	

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
 B-7C AIRCRAFT STUDY

4-SYSTEM 2  
 PROGRAM TECHNICAL SUPPORT

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
2-2 66							
2-3 66	26.5	4412	6.057	26723	32317	59040	
TOTAL	14896.5	2560604		11944619	10254733	22199352	61070

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
 DATA PREPARED UNDER  
 NASA CONTRACT NAS9-12100

APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 2  
 PROGRAM TECHNICAL SUPPORT

	MFG MATL	TOOL/STE MATL	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL
Q-1 58				458	25	1322	700735
Q-2 58							
Q-3 58			8071474	8073640	71699	17498	9612865
Q-4 58							
Q-1 59			18423796	18424309	488568	124559	20834227
Q-2 59							
Q-3 59			27488794	27490985	751086	65035	30722442
Q-4 59							
Q-1 60			19532086	19529624	1158583	76573	22807940
Q-2 60							
Q-3 60			9918918	9918897	588487	53870	11859606
Q-4 60							
Q-1 61	4780		9655195	9680090	278815	87526	12561416
Q-2 61							
Q-3 61	795		9676444	9689180	278460	46716	11667601
Q-4 61							
Q-1 62			4338564	4359267	139518	19136	5700077
Q-2 62							
Q-3 62			4338555	4337471	137677	69301	5735052
Q-4 62							
Q-1 63			6875798	6881907	292624	56143	8662296
Q-2 63							
Q-3 63			1025743	1025462	33029	13464	2662107
Q-4 63							
Q-1 64			2844759	2844751	390630	21542	4671447
Q-2 64							
Q-3 64				642	234	1826	782089
Q-4 64							
Q-1 65				88	26	2468	399842
Q-2 65							
Q-3 65						1498	193073
Q-4 65							
Q-1 66						71	92277

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 2  
PROGRAM TECHNICAL SUPPORT

	MFG MATL	TOOL/STE MATL	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL
Q-2 66							
Q-3 66						392	59432
TOTAL	5575		122190126	122256771	4609461	658940	149724524

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 2  
PROGRAM TECHNICAL SUPPORT

	G & A	TOTAL COST
Q-1 58		700735
Q-2 58		
Q-3 58		9612865
Q-4 58		
Q-1 59		20834227
Q-2 59		
Q-3 59		30722442
Q-4 59		
Q-1 60	434560	23242500
Q-2 60		
Q-3 60	225961	12085567
Q-4 60		
Q-1 61	233430	12794845
Q-2 61		
Q-3 61	216820	11884421
Q-4 61		
Q-1 62	95676	5795753
Q-2 62		
Q-3 62	96262	5831314
Q-4 62		
Q-1 63	144832	8807128
Q-2 63		
Q-3 63	44510	2706617
Q-4 63		
Q-1 64	99399	4770846
Q-2 64		
Q-3 64	16642	798731
Q-4 64		
Q-1 65	10667	410500
Q-2 65		
Q-3 65	5152	198225
Q-4 65		
Q-1 66	2779	95056

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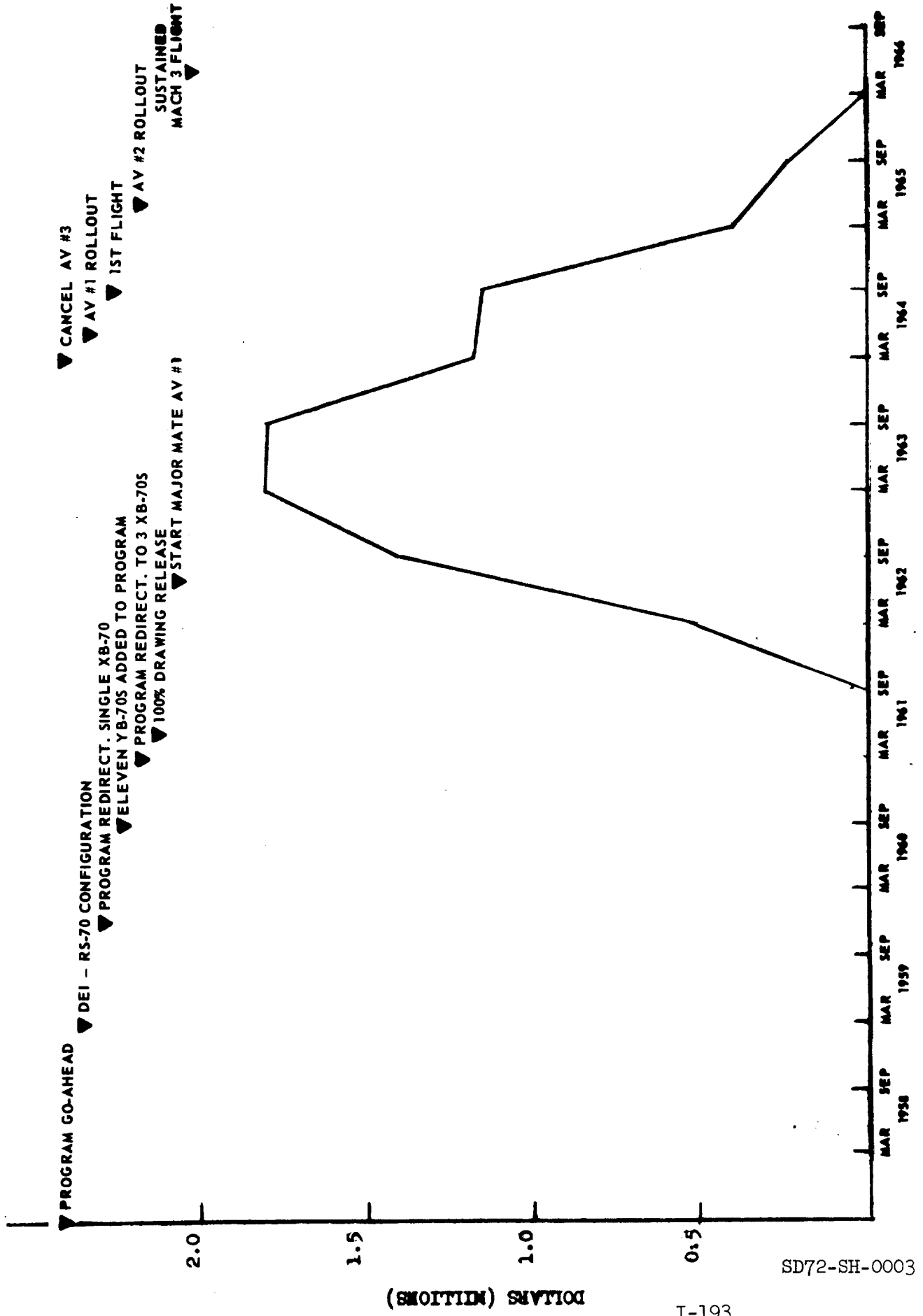
TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 2  
PROGRAM TECHNICAL SUPPORT

	G & A	TOTAL COST
2-2 66		
2-3 66	1790	61222
TOTAL	1628480	151353004



WBS 3.0 MAJOR AIRFRAME MATING  
TOTAL COST



SD72-SH-0003

DOLLARS (MILLIONS)

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
 DATA PREPARED UNDER  
 NASA CONTRACT NAS9-12100

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 3  
 MAJOR AIRFRAME MATING

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	G & A
Q-1 58							
Q-2 58							
Q-3 58							
Q-4 58							
Q-1 59							
Q-2 59							
Q-3 59							
Q-4 59							
Q-1 60							
Q-2 60							
Q-3 60							
Q-4 60							
Q-1 61							
Q-2 61							
Q-3 61							
Q-4 61							
Q-1 62	373.5	63807	4.025	256853	264990	521843	8789
Q-2 62							
Q-3 62	988.5	166218	3.959	658065	716163	1374228	23066
Q-4 62							
Q-1 63	1306.5	223071	3.738	833843	941429	1775272	29683
Q-2 63							
Q-3 63	1297.0	217772	3.595	782834	977517	1760351	29433
Q-4 63							
Q-1 64	730.5	124688	3.976	495709	659132	1154841	24572
Q-2 64							
Q-3 64	840.0	147893	3.277	484702	639038	1123740	23911
Q-4 64							
Q-1 65	279.0	48190	3.468	167122	218776	385898	10296
Q-2 65							
Q-3 65	177.0	29720	3.526	104790	131037	235827	6292
TOTAL	5992.0	1021359		3783918	4548082	8332000	156042

NORTH AMERICAN ROCKWELL CORP.  
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NASA CONTRACT NAS9-12100

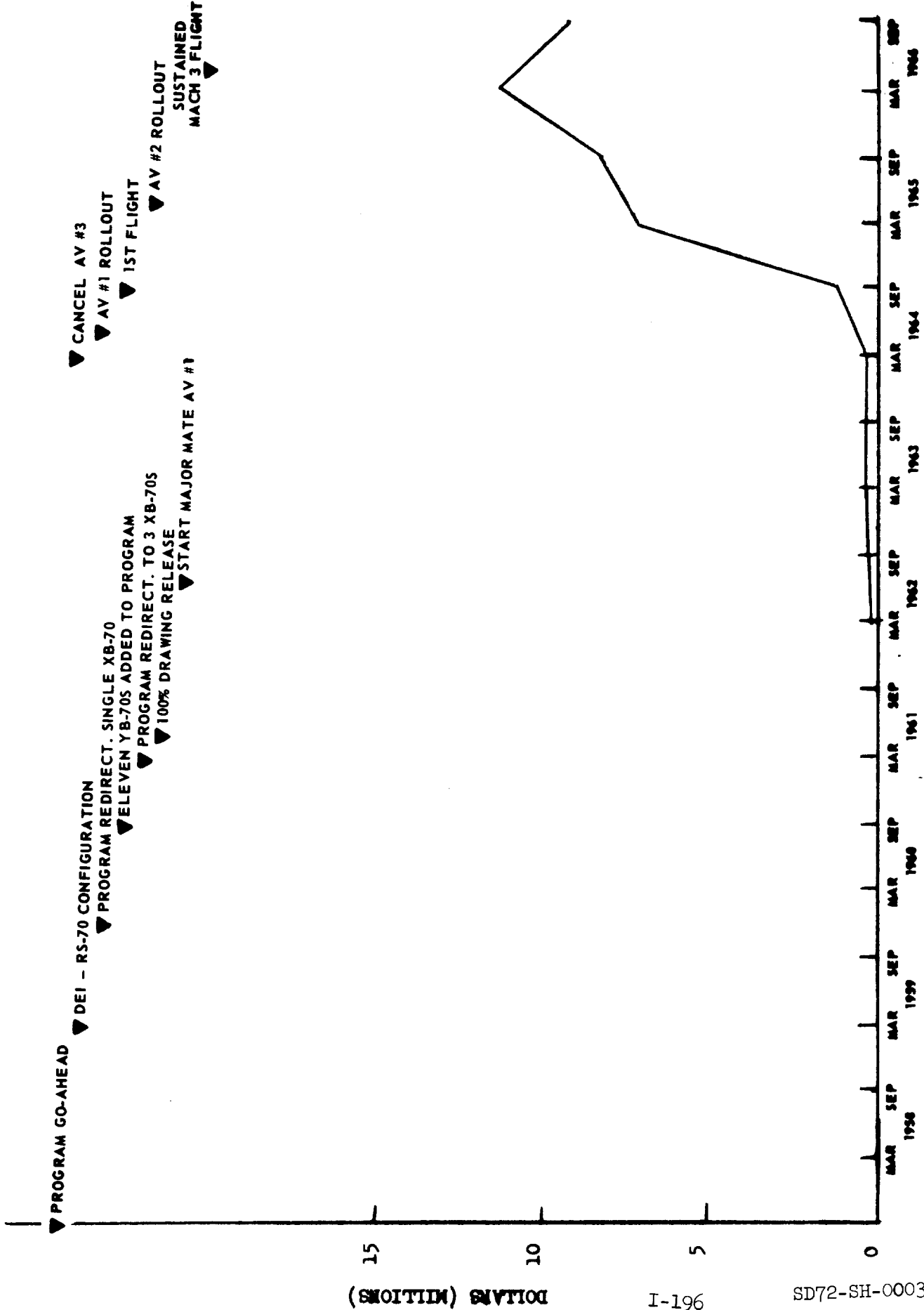
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 3  
MAJOR AIRFRAME MATING

	TOTAL COST
Q-1 58	
Q-2 58	
Q-3 58	
Q-4 58	
Q-1 59	
Q-2 59	
Q-3 59	
Q-4 59	
Q-1 60	
Q-2 60	
Q-3 60	
Q-4 60	
Q-1 61	
Q-2 61	
Q-3 61	
Q-4 61	
Q-1 62	530632
Q-2 62	
Q-3 62	1397294
Q-4 62	
Q-1 63	1804955
Q-2 63	
Q-3 63	1789784
Q-4 63	
Q-1 64	1179413
Q-2 64	
Q-3 64	1147651
Q-4 64	
Q-1 65	396194
Q-2 65	
Q-3 65	242119
TOTAL	8488042

WBS 4.0 FLIGHT TEST  
TOTAL COST



DOLLARS (MILLIONS)

I-196

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NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
DATA PREPARED UNDER  
NASA CONTRACT NAS9-12100

APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 4  
FLIGHT TEST

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	7.5	1359	4.574	6216	6184	12400	
Q-2 58							
Q-3 58	36.0	6104	4.270	26065	23802	49867	
Q-4 58							
Q-1 59	39.0	6549	4.213	27589	22421	50010	
Q-2 59							
Q-3 59	34.5	6025	4.188	25231	21935	47166	
Q-4 59							
Q-1 60	27.0	4788	4.556	21815	17784	39599	
Q-2 60							
Q-3 60	9.0	1479	4.766	7049	5409	12458	
Q-4 60							
Q-1 61	34.5	5837	4.853	28327	19500	47827	
Q-2 61							
Q-3 61	43.5	7801	4.862	37931	35314	73245	56
Q-4 61							
Q-1 62	117.0	20232	4.834	97801	91410	189211	6191
Q-2 62							
Q-3 62	174.0	29216	4.806	140408	144038	284446	48918
Q-4 62							
Q-1 63	217.5	37020	4.911	181815	194634	376449	55915
Q-2 63							
Q-3 63	195.0	32665	4.322	141163	169922	311085	44862
Q-4 63							
Q-1 64	154.5	26340	4.641	122253	153855	276108	55071
Q-2 64							
Q-3 64	573.0	100877	4.698	473964	626365	1100329	60861
Q-4 64							
Q-1 65	3334.5	578612	5.100	2950829	3603756	6559585	192131
Q-2 65							
Q-3 65	3741.0	628395	5.428	3411014	3891131	7302145	322275
Q-4 65							
Q-1 66	4668.0	809083	5.469	4424696	5725441	10150137	318035

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 4  
 FLIGHT TEST

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-2 66							
Q-3 66	3950.5	663563	5.488	3641833	4512338	8154171	472756
TOTAL	17356.0	2965945		15765999	19270239	35036238	1577071

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 4  
 FLIGHT TEST

	MFG MATL	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST	TOTAL O/C \$	SUB TOTAL
Q-1 58							12400
Q-2 58							
Q-3 58							49867
Q-4 58							
Q-1 59							50010
Q-2 59							
Q-3 59							47166
Q-4 59							
Q-1 60							39599
Q-2 60							
Q-3 60							12458
Q-4 60							
Q-1 61							47827
Q-2 61							
Q-3 61		56	5				73306
Q-4 61							
Q-1 62		6191	488		34	34	195924
Q-2 62							
Q-3 62		48918	3855		15	15	337234
Q-4 62							
Q-1 63		55915	5507				437871
Q-2 63							
Q-3 63		44862	4419		-49	-49	360317
Q-4 63							
Q-1 64		55071	5871				337050
Q-2 64							
Q-3 64	-45	60816	22125		54346	54346	1237616
Q-4 64							
Q-1 65	26302	218433	65333		167427	167427	7010778
Q-2 65							
Q-3 65	81546	403821	72039		290413	290413	8068418
Q-4 65							
Q-1 66	-2458	315577	65450		476643	476643	11007807

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 4  
FLIGHT TEST

	MFG MATL	TOTAL MATERIAL	MFC	WIND TUNNEL	OTHER COST	TOTAL O/C \$	SUB TOTAL
2-2 66							
2-3 66	39568	512324	31507		213449	213449	8911451
TOTAL	144913	1721984	276599		1202278	1202278	38237099



NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 4  
FLIGHT TEST

	G & A	TOTAL COST
Q-1 58		12400
Q-2 58		
Q-3 58		49867
Q-4 58		
Q-1 59		50010
Q-2 59		
Q-3 59		47166
Q-4 59		
Q-1 60	755	40354
Q-2 60		
Q-3 60	237	12695
Q-4 60		
Q-1 61	847	48674
Q-2 61		
Q-3 61	1358	74664
Q-4 61		
Q-1 62	3288	199212
Q-2 62		
Q-3 62	5660	342894
Q-4 62		
Q-1 63	7320	445191
Q-2 63		
Q-3 63	6024	366341
Q-4 63		
Q-1 64	7172	344222
Q-2 64		
Q-3 64	26334	1263950
Q-4 64		
Q-1 65	187047	7197825
Q-2 65		
Q-3 65	215478	8283896
Q-4 65		
Q-1 66	286046	11293853

NORTH AMERICAN ROCKWELL CORP.  
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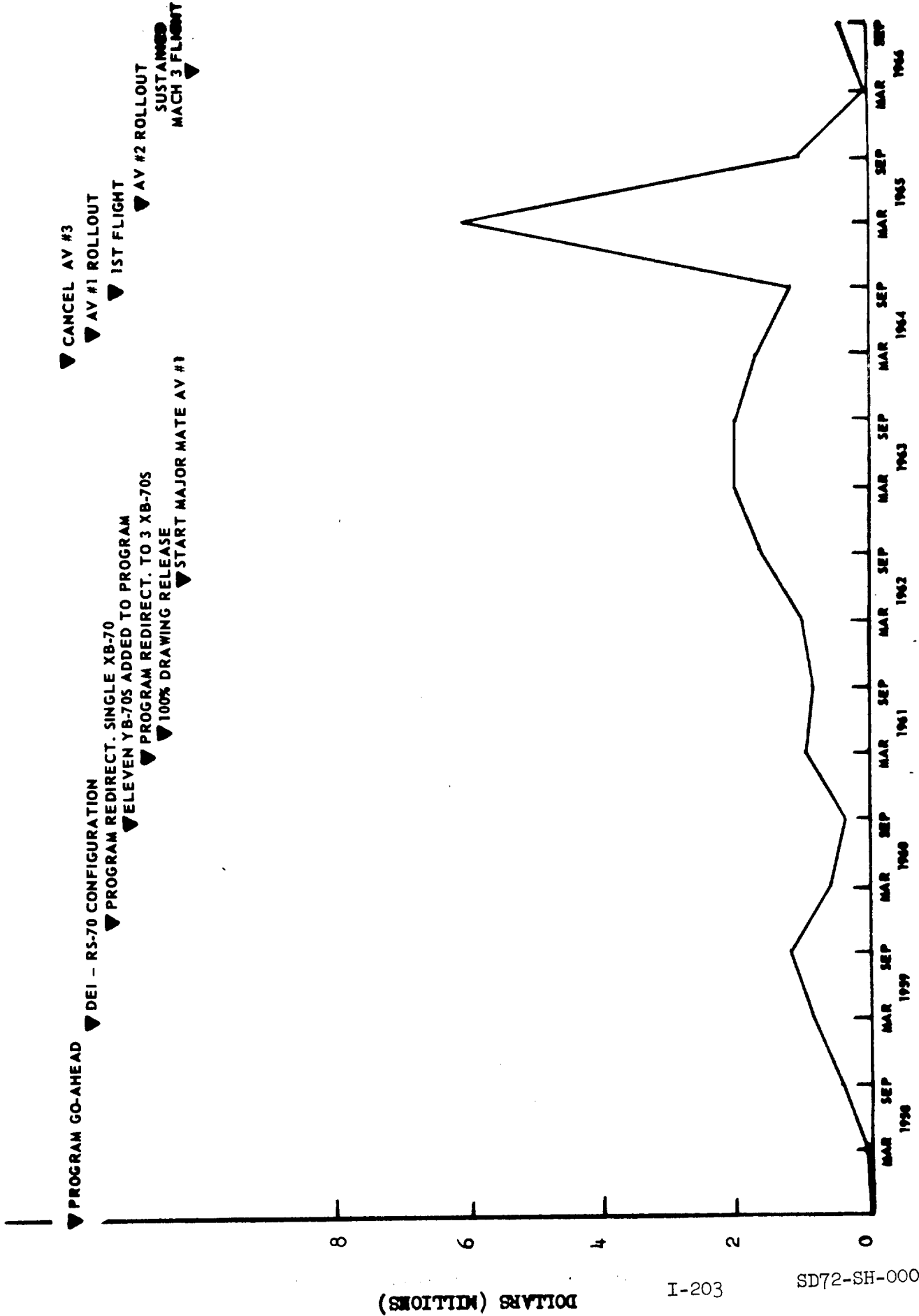
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM        4  
  FLIGHT TEST

	G & A	TOTAL COST
J-2 66		
J-3 66	268385	9179836
TOTAL	1015951	39253050

WBS 5.0 GROUND SUPPORT EQUIPMENT  
TOTAL COST



DOLLARS (MILLIONS)

I-203

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NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 5  
 GROUND SUPPORT EQUIPMENT

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	43.5	7440	4.369	32509	33840	66349	
Q-2 58							
Q-3 58	295.5	49675	4.167	207000	196733	403733	5
Q-4 58							
Q-1 59	648.0	110516	3.788	418673	385828	804501	16997
Q-2 59							
Q-3 59	872.5	153664	3.881	596373	560241	1156614	5253
Q-4 59							
Q-1 60	448.5	77895	4.466	347849	292504	640353	1150
Q-2 60							
Q-3 60	261.0	43829	5.126	224667	162053	386720	5
Q-4 60							
Q-1 61	711.0	121423	4.611	559910	411157	971067	-12
Q-2 61							
Q-3 61	466.5	34572	4.952	418813	394710	813523	441
Q-4 61							
Q-1 62	656.5	112044	4.773	534772	502786	1037558	-4
Q-2 62							
Q-3 62	958.5	161012	4.209	677715	736860	1414575	975
Q-4 62							
Q-1 63	981.0	167581	4.323	724510	802664	1527174	53198
Q-2 63							
Q-3 63	854.5	143807	4.595	660774	746242	1407016	43239
Q-4 63							
Q-1 64	779.0	132955	4.630	615545	729511	1345056	29934
Q-2 64							
Q-3 64	555.0	97628	4.860	474488	562780	1037268	7881
Q-4 64							
Q-1 65	3672.0	636573	3.969	2526447	3311591	5838038	11502
Q-2 65							
Q-3 65	496.5	83437	4.808	401149	538397	939546	47154
Q-4 65							
Q-1 66	28.5	5143	5.428	27914	-23603	4311	2493

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM        5  
GROUND SUPPORT EQUIPMENT

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
2-2 66							
2-3 66	124.5	21257	5.363	114006	173327	287333	3911
TOTAL	12852.5	2210451		9563114	10517621	20080735	224122

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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TIME PHASED EXPEND.  
 8-70 AIRCRAFT STUDY

4-SYSTEM 5  
 GROUND SUPPORT EQUIPMENT

	MFG MATL	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 58					66349		66349
Q-2 58							
Q-3 58		5			403738		403738
Q-4 58							
Q-1 59		16997	1379		822377		822877
Q-2 59							
Q-3 59		5253	445	4629	1166941		1166941
Q-4 59							
Q-1 60		1150	150	9366	651019	12404	663423
Q-2 60							
Q-3 60		5		3025	389750	7426	397176
Q-4 60							
Q-1 61		-12	-1	7379	978433	18182	996615
Q-2 61							
Q-3 61		441	37	4277	818278	15206	833484
Q-4 61							
Q-1 62	10523	10519	829	3063	1051969	17657	1069626
Q-2 62							
Q-3 62	166760	167735	13216	7687	1603213	26910	1630123
Q-4 62							
Q-1 63	328048	381246	37552	6417	1952389	32627	1985016
Q-2 63							
Q-3 63	446157	489396	48205	6715	1951332	32626	1983958
Q-4 63							
Q-1 64	275255	305189	32529	4632	1687406	35904	1723310
Q-2 64							
Q-3 64	110990	118871	43052	3114	1202305	25583	1227888
Q-4 64							
Q-1 65	74758	86260	25954	21	5950273	158753	6109026
Q-2 65							
Q-3 65	49653	96807	17434	157	1053944	28119	1082063
Q-4 65							
Q-1 66	45444	47937	9904	43	62195	1873	64068

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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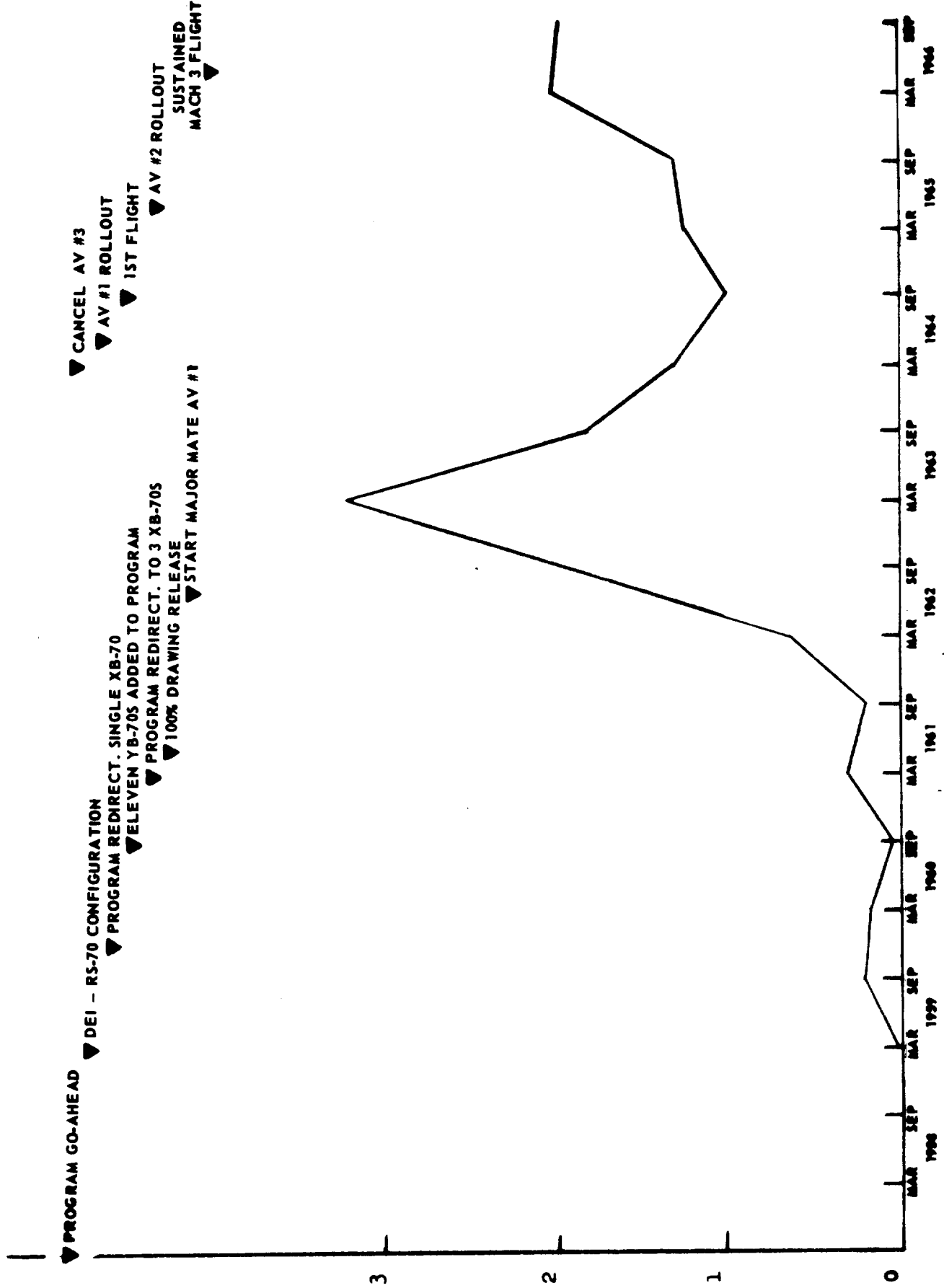
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 5  
GROUND SUPPORT EQUIPMENT

	MFG MATL	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-2 66							
Q-3 66	70861	74772	4741	79	366925	11050	377975
TOTAL	1578449	1802571	235426	60604	22179336	424320	22603656

WBS 6.0 SPARES  
TOTAL COST



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I-208

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NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4- SYSTEM 6  
SPARES

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 59	21.0	3517	3.442	12105	13538	25643	
Q-2 59							
Q-3 59	168.0	29646	3.381	100239	118019	218258	
Q-4 59							
Q-1 60	115.5	19919	3.941	78501	86395	164896	
Q-2 60							
Q-3 60	34.5	5679	4.459	25322	22893	48215	
Q-4 60							
Q-1 61	204.0	34719	4.275	148427	138345	287272	
Q-2 61							
Q-3 61	130.5	23755	3.647	86639	119167	205806	372
Q-4 61							
Q-1 62	462.0	78918	3.055	241102	295548	536650	253
Q-2 62							
Q-3 62	1825.5	306489	3.045	933136	1175192	2108328	7021
Q-4 62							
Q-1 63	1105.5	188784	3.077	580910	774465	1355375	2304
Q-2 63							
Q-3 63	725.5	121916	3.373	411201	560770	971971	162
Q-4 63							
Q-1 64	544.5	92902	3.278	304558	454070	758628	557
Q-2 64							
Q-3 64	414.0	72768	3.477	253037	359191	612228	79
Q-4 64							
Q-1 65	577.5	95953	3.557	355509	498110	853619	1676
Q-2 65							
Q-3 65	405.0	67866	3.512	238319	358326	596645	259
Q-4 65							
Q-1 66	391.5	67866	2.931	192124	462237	654361	277
Q-2 66							
Q-3 66	436.5	73454	3.591	263786	387518	651304	
Q-4 66							
TOTAL	7561.0	1288151		4224915	5824284	10049199	12960

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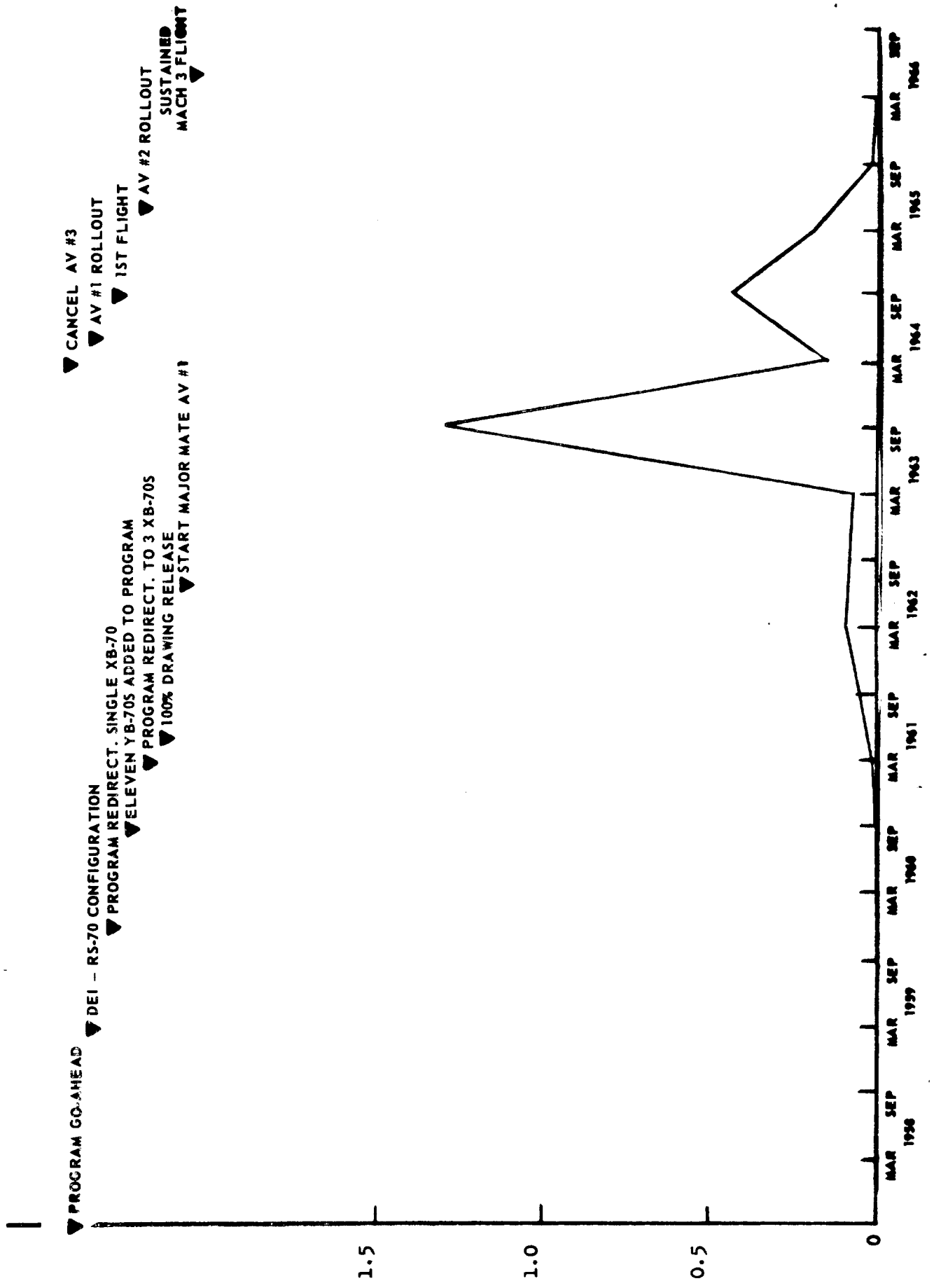
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 6  
SPARES

	MFG MATL	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 59					25543		25643
Q-2 59							
Q-3 59					218258		218258
Q-4 59							
Q-1 60				1814	166710	3176	169886
Q-2 60							
Q-3 60				377	48592	926	49518
Q-4 60							
Q-1 61				3247	290519	5399	295918
Q-2 61							
Q-3 61		372	31	1369	207578	3857	211435
Q-4 61							
Q-1 62	70552	70805	5579	6426	619460	10397	629857
Q-2 62							
Q-3 62	238871	295892	23316	25758	2453294	41178	2494472
Q-4 62							
Q-1 63	1597741	1600045	157604	39228	3152252	52705	3204957
Q-2 63							
Q-3 63	715023	715185	70446	30632	1788234	29899	1818133
Q-4 63							
Q-1 64	422870	423427	45137	30335	1257527	26757	1284284
Q-2 64							
Q-3 64	265679	265758	96682	36385	1011053	21513	1032566
Q-4 64							
Q-1 65	261256	262932	78643	32718	1227912	32761	1260673
Q-2 65							
Q-3 65	548220	548479	97848	38157	1281129	34180	1315309
Q-4 65							
Q-1 66	1045141	1045418	216819	53790	1970388	59342	2029730
Q-2 66							
Q-3 66	1142459	1142459	70261	47975	1911999	57584	1969583
Q-4 66							
TOTAL	6357812	6370772	862366	348211	17630548	379674	18010222

WBS 7.0 SPECIAL TEST EQUIPMENT  
TOTAL COST



- ▼ PROGRAM GO.AHEAD
- ▼ DEI - RS-70 CONFIGURATION
- ▼ PROGRAM REDIRECT. SINGLE XB-70
- ▼ ELEVEN YB-70S ADDED TO PROGRAM
- ▼ PROGRAM REDIRECT. TO 3 XB-70S
- ▼ 100% DRAWING RELEASE
- ▼ START MAJOR MATE AV #1
- ▼ CANCEL AV #3
- ▼ AV #1 ROLLOUT
- ▼ 1ST FLIGHT
- ▼ AV #2 ROLLOUT
- ▼ SUSTAINED MACH 3 FLIGHT

DOLLARS (MILLIONS)

I-211

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-- SYSTEM 7  
 SPECIAL TEST EQUIPMENT

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	TOTL/STE MATL
Q-3 60	1.5	149	2.953	440	567	1007	1486
Q-4 60							
Q-1 61	7.5	1344	3.501	4706	4801	9507	21
Q-2 61							
Q-3 61	28.5	5235	4.039	21142	20140	41282	5420
Q-4 61							
Q-1 62	30.0	4960	3.373	16731	17524	34255	57699
Q-2 62							
Q-3 62	70.5	11959	3.094	36997	44749	81746	3717
Q-4 62							
Q-1 63	40.5	7044	3.331	23464	26225	49689	18632
Q-2 63							
Q-3 63	705.0	118501	3.510	415948	371913	787861	436382
Q-4 63							
Q-1 64	58.5	9894	4.941	48890	45712	94602	50451
Q-2 64							
Q-3 64	220.5	38707	3.352	129749	291536	421285	942
Q-4 64							
Q-1 65	118.5	20399	3.762	76746	83004	159750	16400
Q-2 65							
Q-3 65	1.5	243	51.728	12570	14634	27204	5467
Q-4 65							
Q-1 66							
Q-2 66							
Q-3 66		34	3.794	129	252	381	
TOTAL	1282.5	218469		787512	921057	1708569	596617

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 7  
 SPECIAL TEST EQUIPMENT

	MPC	SUB TOTAL	G & A	TOTAL CCST
Q-3 60	195	2688	51	2739
Q-4 60				
Q-1 61	2	9530	177	9707
Q-2 61				
Q-3 61	458	47160	876	48036
Q-4 61				
Q-1 62	4547	96501	1620	98121
Q-2 62				
Q-3 62	293	85756	1439	87195
Q-4 62				
Q-1 63	1835	70156	1173	71329
Q-2 63				
Q-3 63	42984	1267227	21188	1288415
Q-4 63				
Q-1 64	5378	150431	3201	153632
Q-2 64				
Q-3 64	343	422570	8991	431561
Q-4 64				
Q-1 65	4905	181055	4831	185886
Q-2 65				
Q-3 65	975	33646	898	34544
Q-4 65				
Q-1 66				
Q-2 66				
Q-3 66		381	11	392
TOTAL	61915	2367101	44456	2411557



NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 8  
TOOLING

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	60.0	5909	3.831	37965	26497	64462	
Q-2 58							
Q-3 58	33.0	5598	5.975	33448	10961	44409	
Q-4 58							
Q-1 59	121.5	20832	4.481	93354	59523	151877	
Q-2 59							
Q-3 59	471.0	82812	3.701	306496	244211	550707	
Q-4 59							
Q-1 60	2209.5	382854	3.430	1313292	1121784	2435076	
Q-2 60							
Q-3 60	2847.0	478274	3.371	1612353	1358044	2970397	
Q-4 60							
Q-1 61	10169.0	1734982	3.503	6086875	4632369	10719244	
Q-2 61							
Q-3 61	15496.5	2809913	3.322	9333669	8829240	18162909	
Q-4 61							
Q-1 62	5941.5	1014120	3.330	3376959	3568397	6945356	
Q-2 62							
Q-3 62	2554.5	428933	3.302	1416218	1721345	3137563	
Q-4 62							
Q-1 63	1834.0	313394	3.389	1062161	1159696	2221857	
Q-2 63							
Q-3 63	3206.0	538608	3.654	1968571	786202	2754773	
Q-4 63							
Q-1 64	2257.0	384809	3.900	1500621	1566846	3067467	
Q-2 64							
Q-3 64	751.5	132523	2.531	335449	379405	714854	
Q-4 64							
Q-1 65	135.0	23548	4.852	114246	110891	225137	
Q-2 65							
Q-3 65	43.5	7511	3.126	23476	25735	49211	
Q-4 65							
Q-1 66	1.5	310	.81	25	42	67	

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4- SYSTEM 8  
 TOOLING

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-2 66							
Q-3 66	1.5	180	4.733	852	590	1442	
TOTAL	48132.5	8369310		28616030	25600778	54216808	



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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 8  
 TOOLING

	TOOL/STE MATH	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 58	458	458	25		64945		64945
Q-2 58							
Q-3 58	-438	-438	-24		43947		43947
Q-4 58							
Q-1 59	-20	-20	-1		151856		151856
Q-2 59							
Q-3 59	89694	89694	7597	6411	654409		654409
Q-4 59							
Q-1 60	603602	603602	79373	17573	3135624	59743	3195367
Q-2 60							
Q-3 60	861421	861421	113277	5785	3950880	75276	4026156
Q-4 60							
Q-1 61	3487324	3487324	294679	43741	14544988	270289	14815277
Q-2 61							
Q-3 61	10927409	10927409	923366	159465	30173149	560707	30733856
Q-4 61							
Q-1 62	4801644	4801644	378369	48035	12173404	204329	12377733
Q-2 62							
Q-3 62	2253043	2253043	177538	-24940	5543204	93043	5636247
Q-4 62							
Q-1 63	672399	672399	65653	625	2960534	49500	3010034
Q-2 63							
Q-3 63	406708	406708	39528	-5776	3195233	53424	3248657
Q-4 63							
Q-1 64	395234	395234	42132	3702	3508535	74654	3583189
Q-2 64							
Q-3 64	115946	115946	42182	3603	876585	18652	895237
Q-4 64							
Q-1 65	83678	83678	25027	2110	335952	8963	344915
Q-2 65							
Q-3 65	-6550	-6550	-1168	704	42197	1127	43324
Q-4 65							
Q-1 66	3791	3791	786		4644	139	4783

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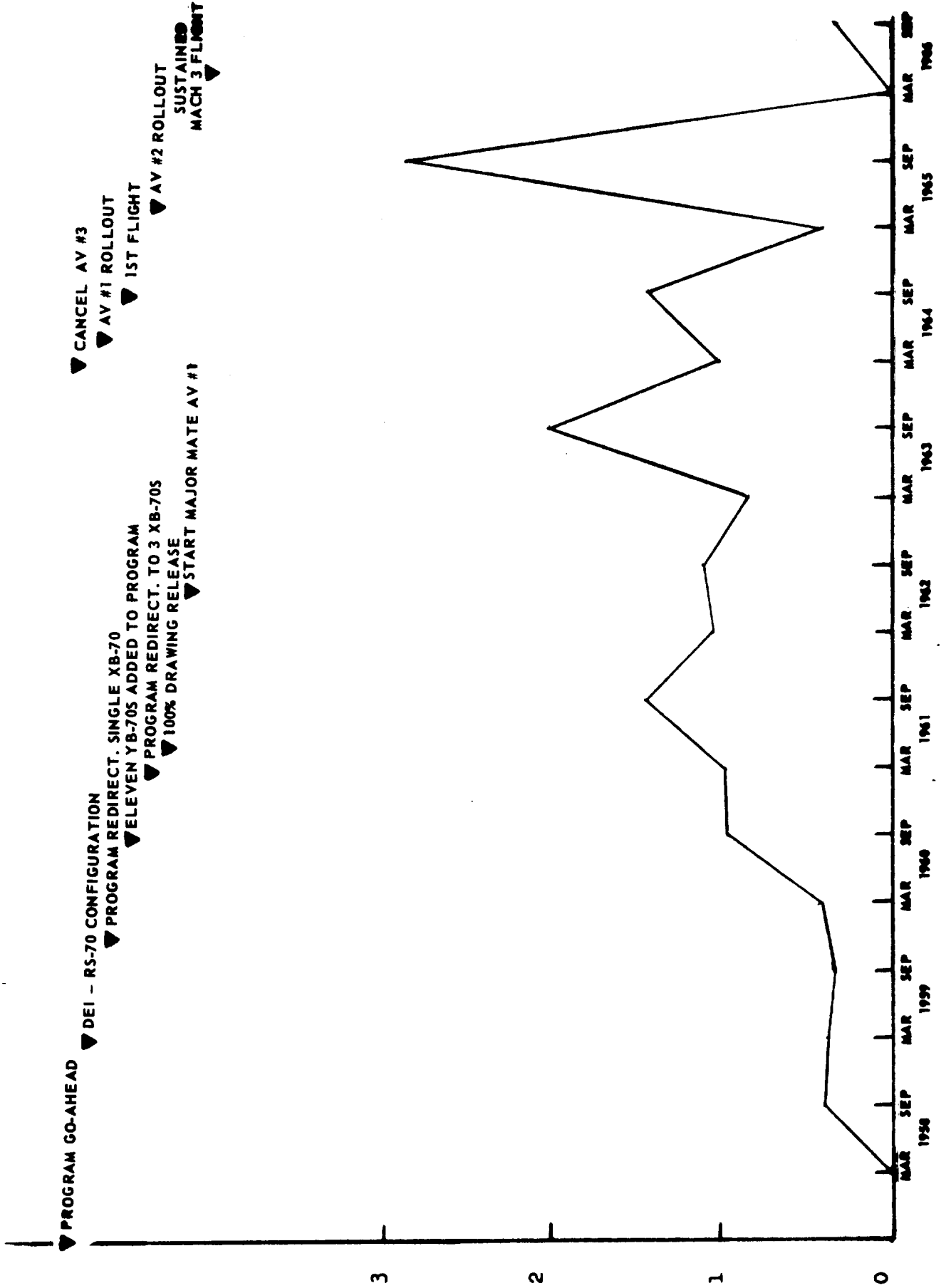
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 8  
TOOLING

	TOOL/STE MATL	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-2 66							
Q-3 66	35524	35524	2185		39151	1179	40330
TOTAL	24730867	24730867	2190524	261038	81399237	1471025	82870262

WBS 9.0 OTHER PROGRAM ELEMENTS  
TOTAL COST



(MILLIONS) DOLLARS

I-219

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4- SYSTEM 9  
 OTHER PROGRAM ELEMENTS

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	43.5	7215	4.341	31319	32923	64142	
Q-2 58							
Q-3 58	288.0	48384	4.274	206810	191708	398518	
Q-4 58							
Q-1 59	285.0	48574	4.439	215615	173861	389476	
Q-2 59							
Q-3 59	238.5	41933	4.368	183148	154711	337859	
Q-4 59							
Q-1 60	252.0	43741	4.401	192506	163538	356044	2923
Q-2 60							
Q-3 60	577.5	96772	3.824	370066	345254	715320	7710
Q-4 60							
Q-1 61	597.0	102096	4.082	416731	357014	773745	2029
Q-2 61							
Q-3 61	310.5	56790	4.320	245334	251446	496780	4494
Q-4 61							
Q-1 62	354.0	60267	4.833	291280	265818	557098	3957
Q-2 62							
Q-3 62	439.0	73763	4.798	353902	325018	678920	18214
Q-4 62							
Q-1 63	394.5	67385	4.981	335649	354312	689961	8205
Q-2 63							
Q-3 63	379.5	63633	4.596	292427	318923	611350	23696
Q-4 63							
Q-1 64	363.0	61680	4.578	282390	321436	603826	5549
Q-2 64							
Q-3 64	210.0	36652	5.158	189043	218003	407046	13898
Q-4 64							
Q-1 65	109.5	19077	4.831	92159	108244	200403	14626
Q-2 65							
Q-3 65	48.0	8074	5.617	45352	65218	110570	14142
Q-4 65							
Q-1 66	66.0	11494	5.196	59719	87194	146913	13797

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 9  
OTHER PROGRAM ELEMENTS

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
2-2 66							
2-3 66	93.0	15588	5.065	78956	115078	194034	9318
TOTAL	5048.5	863118		3882406	3849599	7732005	142558

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 9  
 OTHER PROGRAM ELEMENTS

	MFG MATL	TOOL/STE MATL	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL
Q-1 58							64142
Q-2 58							
Q-3 58							398518
Q-4 58							
Q-1 59							389476
Q-2 59							
Q-3 59							337859
Q-4 59							
Q-1 60	585	405		3913	514	34117	394588
Q-2 60							
Q-3 60	23519	42374		73603	9679	132261	930863
Q-4 60							
Q-1 61	22200	35983		60212	5088	104455	943500
Q-2 61							
Q-3 61	5808	72363		82665	6986	829995	1416426
Q-4 61							
Q-1 62	1933	56015		61905	4877	406604	1030484
Q-2 62							
Q-3 62	1516	41095		60825	4793	351127	1095665
Q-4 62							
Q-1 63				8205	808	110607	809581
Q-2 63							
Q-3 63	6871	1548		32115	3163	1364611	2011239
Q-4 63							
Q-1 64	2778	30866		39193	4178	346006	993203
Q-2 64							
Q-3 64	22	8210		22130	8043	957876	1395095
Q-4 64							
Q-1 65		290		14916	4463	191759	411541
Q-2 65							
Q-3 65				14142	2523	2658063	2785298
Q-4 65							
Q-1 66				13797	2861	-148015	15556

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 9  
OTHER PROGRAM ELEMENTS

	MFG MATL	TOOL/STE MATL	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL
Q-2 66							
Q-3 66				9318	573	115692	319617
TOTAL	65232	289149		496939	58549	7455158	15742651

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 9  
OTHER PROGRAM ELEMENTS

	G & A	TOTAL CGST
Q-1 58		64142
Q-2 58		
Q-3 58		398518
Q-4 58		
Q-1 59		389476
Q-2 59		
Q-3 59		337859
Q-4 59		
Q-1 60	7516	402104
Q-2 60		
Q-3 60	17735	948598
Q-4 60		
Q-1 61	17533	961033
Q-2 61		
Q-3 61	26323	1442749
Q-4 61		
Q-1 62	17298	1047782
Q-2 62		
Q-3 62	18391	1114056
Q-4 62		
Q-1 63	13537	823118
Q-2 63		
Q-3 63	33630	2044869
Q-4 63		
Q-1 64	21135	1014338
Q-2 64		
Q-3 64	29688	1424783
Q-4 64		
Q-1 65	10979	422520
Q-2 65		
Q-3 65	74311	2859609
Q-4 65		
Q-1 66	469	16025



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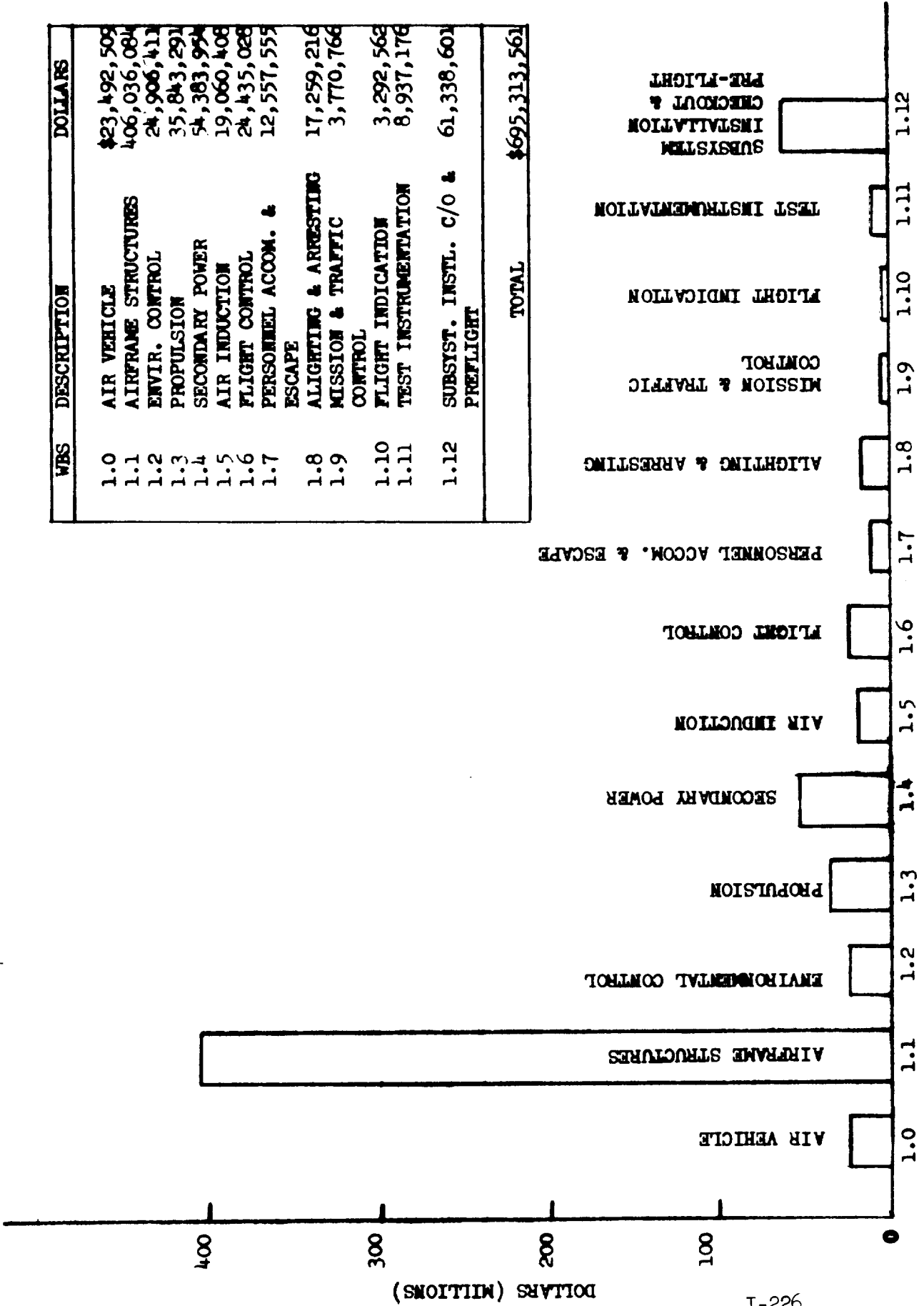
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 9  
OTHER PROGRAM ELEMENTS

	G & A	TOTAL COST
2-2 66		
2-3 66	9627	329244
TOTAL	298172	16040823

WBS 1.0  
 AIR VEHICLE  
 TOTAL COST BY WBS LEVEL 5



WBS	DESCRIPTION	DOLLARS
1.0	AIR VEHICLE	\$23,492,509
1.1	AIRFRAME STRUCTURES	406,036,084
1.2	ENVIR. CONTROL	24,906,411
1.3	PROPULSION	35,843,291
1.4	SECONDARY POWER	54,383,994
1.5	AIR INDUCTION	19,060,408
1.6	FLIGHT CONTROL	24,435,028
1.7	PERSONNEL ACCOM. & ESCAPE	12,557,555
1.8	ALIGNING & ARRESTING	17,259,216
1.9	MISSION & TRAFFIC CONTROL	3,770,766
1.10	FLIGHT INDICATION	3,292,562
1.11	TEST INSTRUMENTATION	8,937,176
1.12	SUBSYST. INSTL. C/O & PREFLIGHT	61,338,601
	TOTAL	\$695,313,561

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NORTH AMERICAN ROCKWELL CORP.  
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COST BREAKDOWNS  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 AIR VEHICLE

	5-SUBSYS 0	5-SUBSYS 01	5-SUBSYS 02	5-SUBSYS 03
	HOURS DOLLARS	HOURS DOLLARS	HOURS DOLLARS	HOURS DOLLARS
DESIGN/ENGINEERING	1826579	8302581	985802	1761024
LABOR AT \$ 4.921	8505232	40769287	4912462	8489644
ENGR BURDEN AT \$ 4.463	7919655	36746727	4335751	7185430
PRODUCTION		11904709		
LABOR AT \$ 3.222		38337731		
SHOP SUPPORT	508479	4386037	111236	442874
LABOR AT \$ 3.036	1488671	13183710	320730	1393646
PLANNING		716532		
LABOR AT \$ 3.417		2442730		
TEST/QC	5411	1950765	3931	27838
LABOR AT \$ 3.531	17456	6371767	27132	87911
MFG BURDEN AT \$ 3.918	1966438	74073403	418209	1717820
ENGR MATERIAL	916866	11693669	167696	815446
MFG MATERIAL		27227491		
SUBCONTRACT		103499447	13552727	11598442
MPC	106624	8205547	582839	608353
WIND TUNNEL		2760920		
OTHER COST	2267739	12295983	197805	3383427
SUB-TOTAL	23188681	378108412	24515351	35280119
GEN & ADMIN	303828	6595097	391060	563172
IDWA		21332575		
TOTAL COST	23492509	406036084	24906411	35843291

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COST BREAKDOWNS  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
AIR VEHICLE

	5-SUBSYS 04 HOURS DOLLARS	5-SUBSYS 05 HOURS DOLLARS	5-SUBSYS 06 HOURS DOLLARS	5-SUBSYS 07 HOURS DOLLARS
DESIGN/ENGINEERING	1950276	630695	1130155	526124
LABOR AT \$ 4.921	9832880	3110162	5567013	2580264
ENGR BURDEN AT \$ 4.463	9231077	2700615	5118121	2375291
PRODUCTION				
LABOR AT \$ 3.222				
SHOP SUPPORT	339739	151065	573357	510049
LABOR AT \$ 3.036	1041422	470196	1712747	1610946
PLANNING				
LABOR AT \$ 3.417				
TEST/CC	19595	10036	34093	21266
LABOR AT \$ 3.531	63051	31264	110134	65983
MFG BURDEN AT \$ 3.918	1354238	629614	2232702	1932869
ENGR MATERIAL	805279	546226	1173454	966093
MFG MATERIAL				
SUBCONTRACT	29005372	9301831	7425036	1153331
MPC	1369796	412883	427124	146407
WIND TUNNEL		1243178		
OTHER COST	330209	326113	257964	69926
SUB-TOTAL	53033324	18772082	24024295	10901110
GEN & ADMIN	921444	288326	410733	200741
IDWA	429186			1455704
TOTAL COST	54383954	19060408	24435028	12557555

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COST BREAKDOWNS  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 AIR VEHICLE

	5-SUBSYS 08 HOURS DOLLARS	5-SUBSYS 09 HOURS DOLLARS	5-SUBSYS 10 HOURS DOLLARS	5-SUBSYS 11 HOURS DOLLARS
DESIGN/ENGINEERING	199309	213308		530886
LABOR AT \$ 4.921	998488	995250		2686991
ENGR BURDEN AT \$ 4.463	874375	908594		2647685
PRODUCTION				137320
LABOR AT \$ 3.222				449311
SHOP SUPPORT	2650	16223		174639
LABOR AT \$ 3.036	9280	47473		591227
PLANNING				
LABOR AT \$ 3.417				
TEST/QC	301	771		19251
LABOR AT \$ 3.531	1273	2617		66972
MFG BURDEN AT \$ 3.918	11602	62860		1435666
ENGR MATERIAL	8199	98457		747683
MFG MATERIAL				
SUBCONTRACT	14352749	1505370	3097830	
MPC	704276	85538	136403	104605
WIND TUNNEL				
OTHER COST	61	9157		48942
SUB-TOTAL	16969303	3715316	3234233	8779082
GEN & ADMIN	298913	55450	58329	158094
IDWA				
TOTAL COST	17259216	3770766	3292562	8937176

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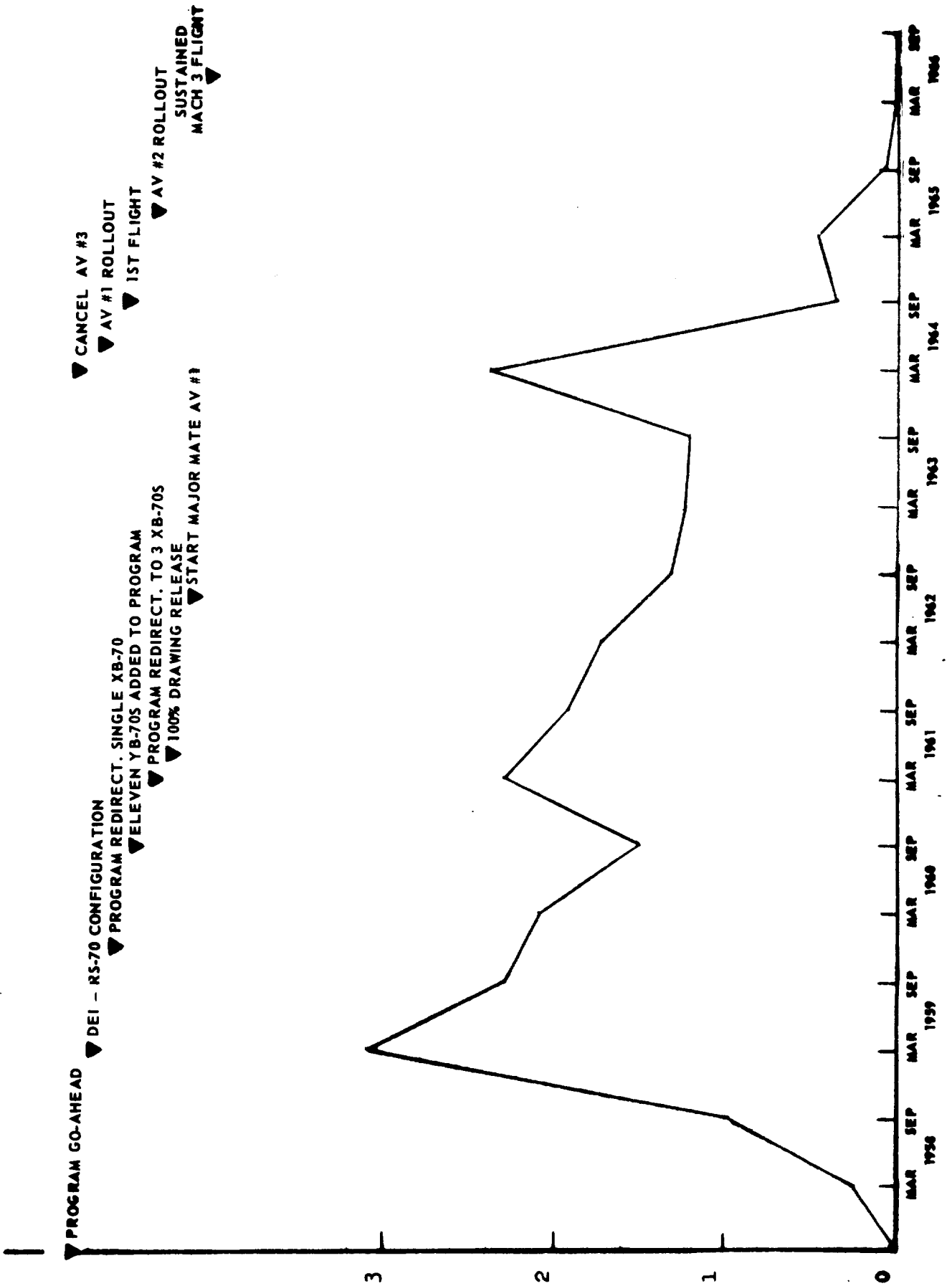
APRIL 1972

COST BREAKDOWNS  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 AIR VEHICLE

		5-SUBSYS	TOTAL
		12	
		HOURS	HOURS
		DOLLARS	DOLLARS
DESIGN/ENGINEERING		316502	18373241
LABOR AT \$ 4.921		1967649	90415322
ENGR BURDEN AT \$ 4.463		1952457	81995773
PRODUCTION		4590814	16632843
LABOR AT \$ 3.222		14796335	53583877
SHOP SUPPORT		65703	7282051
LABOR AT \$ 3.036		236401	22106449
PLANNING		280324	996856
LABOR AT \$ 3.417		963821	3406551
TEST/QC		587203	2685461
LABOR AT \$ 3.531		2135631	9481191
MFG BURDEN AT \$ 3.918		22277981	108113402
ENGR MATERIAL			17939065
MFG MATERIAL		9848132	37075623
SUBCONTRACT			194492135
MPC		1318030	14208425
WIND TUNNEL			4004098
OTHER COST			19187326
SUB-TOTAL		55496337	656009245
GEN & ADMIN		1155919	11401106
IDWA		4685745	27903210
TOTAL COST		61338601	695313561

WBS 1.0 AIR VEHICLE  
TOTAL COST



(SNOITIDN) DOLLARS

I-231

SD72-SH-0003

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 0

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	172.5	29031	4.478	130006	129008	259014	580
Q-2 58							
Q-3 58	710.5	119551	4.282	511882	464963	976845	4033
Q-4 58							
Q-1 59	2482.0	423635	3.342	1415716	1491139	2906855	212176
Q-2 59							
Q-3 59	1626.0	286500	3.776	1081827	1120502	2202329	40038
Q-4 59							
Q-1 60	1408.5	244031	4.074	994277	921451	1915728	31188
Q-2 60							
Q-3 60	926.5	155642	4.784	744600	559594	1304194	2349
Q-4 60							
Q-1 61	1393.0	237954	4.595	1093444	811378	1904822	17393
Q-2 61							
Q-3 61	1007.5	182719	4.742	866510	815387	1681897	6021
Q-4 61							
Q-1 62	756.0	128982	4.746	612204	591336	1203540	94482
Q-2 62							
Q-3 62	477.5	80082	4.804	384701	408438	793139	175904
Q-4 62							
Q-1 63	579.0	98955	4.963	491066	530825	1021891	28002
Q-2 63							
Q-3 63	733.0	123029	4.771	587030	679901	1266931	56537
Q-4 63							
Q-1 64	1126.5	192332	4.598	884399	1121463	2005862	153134
Q-2 64							
Q-3 64	43.0	7584	6.272	47570	52255	99825	75480
Q-4 64							
Q-1 65	148.0	25621	5.535	141817	163974	305791	14477
Q-2 65							
Q-3 65	14.5	2476	5.476	13558	9020	22578	4120
Q-4 65							
Q-1 66	13.5	2345	4.585	10752	15459	26211	-1



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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 0

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-2 66							
Q-3 66							951
TOTAL	13617.5	2340469		10011359	9886093	19897452	916866

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 0

	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 58	31		259625		259625
Q-2 58					
Q-3 58	221		981099		981099
Q-4 58					
Q-1 59	17966	39369	3176368		3176368
Q-2 59					
Q-3 59	3389	96374	2342130		2342130
Q-4 59					
Q-1 60	4203	124088	2075207	39539	2114746
Q-2 60					
Q-3 60	308	190853	1497704	28536	1526240
Q-4 60					
Q-1 61	1468	335640	2259323	41985	2301308
Q-2 61					
Q-3 61	507	202928	1891353	35147	1926500
Q-4 61					
Q-1 62	7441	382729	1688192	28336	1716528
Q-2 62					
Q-3 62	13853	313290	1296186	21756	1317942
Q-4 62					
Q-1 63	2758	185384	1238035	20700	1258735
Q-2 63					
Q-3 63	5570	-119201	1209837	20229	1230066
Q-4 63					
Q-1 64	16322	154695	2330013	49578	2379591
Q-2 64					
Q-3 64	27463	153568	356336	7582	363918
Q-4 64					
Q-1 65	4330	145615	470213	7209	477422
Q-2 65					
Q-3 65	735	58246	85679	2286	87965
Q-4 65					
Q-1 66	1	4161	30372	915	31287

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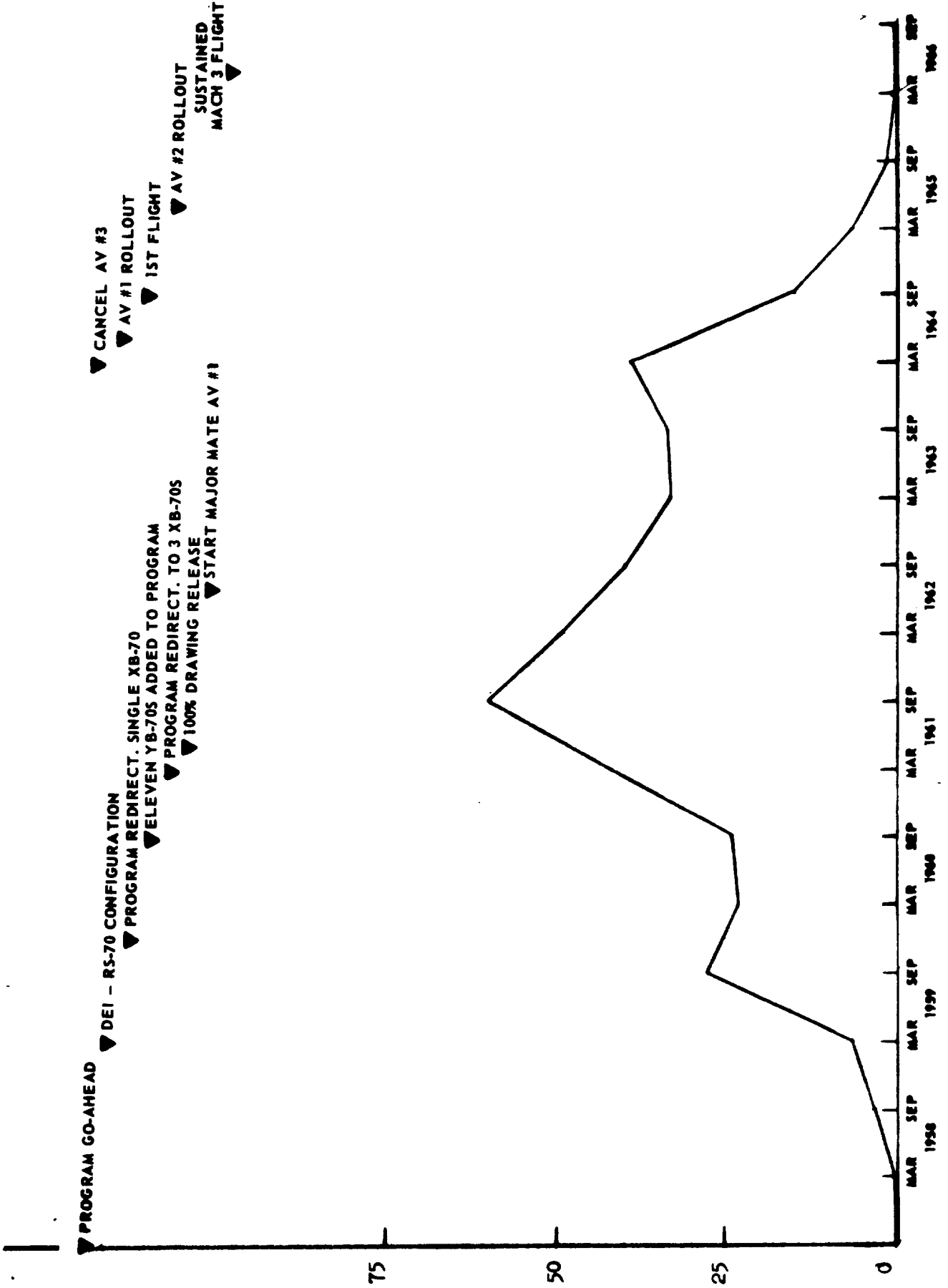
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 0

	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-2 66					
Q-3 66	58		1009	30	1039
TOTAL	106624	2267739	23188681	303828	23492509

WBS 1.1 AIRFRAME STRUCTURES  
TOTAL COST



DOLLARS (MILLIONS)

I-236

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NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 01  
 AIRFRAME STRUCTURE SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	337.0	56636	4.549	257642	248744	506386	1303
Q-2 58							
Q-3 58	1979.5	332138	4.402	1462076	1209014	2671090	79363
Q-4 58							
Q-1 59	2810.5	479843	4.270	2048848	1551497	3600345	41984
Q-2 59							
Q-3 59	5773.0	1015872	3.886	3947471	3444770	7392241	211323
Q-4 59							
Q-1 60	7275.5	1261100	4.041	5095626	4343517	9439143	1273622
Q-2 60							
Q-3 60	11785.0	1979889	3.751	7425705	6722864	14148569	451281
Q-4 60							
Q-1 61	20917.0	3569787	3.624	12936317	11791734	24728051	2128782
Q-2 61							
Q-3 61	19627.0	3559162	3.516	12513842	13989888	26503730	2265467
Q-4 61							
Q-1 62	19084.5	3257208	3.441	11207662	12396070	23603732	356931
Q-2 62							
Q-3 62	14766.0	2480613	3.698	9174404	10505554	19679958	582184
Q-4 62							
Q-1 63	12838.0	2191265	3.922	8593979	9725294	18319273	980165
Q-2 63							
Q-3 63	14471.0	2430993	3.461	8414289	10617834	19032123	2410084
Q-4 63							
Q-1 64	16807.0	2868154	3.883	11136159	14967877	26104036	112614
Q-2 64							
Q-3 64	6394.5	1125747	4.065	4576150	5871821	10447971	74866
Q-4 64							
Q-1 65	3264.0	565655	4.025	2276582	2836878	5113460	483180
Q-2 65							
Q-3 65	516.0	86787	6.115	530681	588384	1119065	179805
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 01  
 AIRFRAME STRUCTURES SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66		107	83.673	8953	9464	18417	34473
Q-2 66							
Q-3 66	-1.5	-332	3.497	-1161	-1074	-2235	26242
Q-4 66							
Q-1 67							
Q-2 67							
Q-3 67							
TOTAL	158644.0	27260624		101605225	110820130	212425355	11693669

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 01  
 AIRFRAME STRUCTURES SUBSYSTEM

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST	TOTAL O/C \$
Q-1 58			1303	71	153331	6924	160255
Q-2 58							
Q-3 58			79363	4340	472658	103301	575959
Q-4 58							
Q-1 59		2482862	2524846	69350	433600	369551	803151
Q-2 59							
Q-3 59		18548944	18760267	524984	494129	770276	1264405
Q-4 59							
Q-1 60	400	10535275	11809297	792629	155533	878175	1033708
Q-2 60							
Q-3 60	15609	6726157	7193047	460489	237823	1347120	1584943
Q-4 60							
Q-1 61	1001899	8623315	11753996	511447	163088	1709808	1872896
Q-2 61							
Q-3 61	4392657	19149968	25808092	1110881	137586	1106353	1243939
Q-4 61							
Q-1 62	3749452	15164432	19270815	805386	143216	1484430	1627646
Q-2 62							
Q-3 62	3466176	10612722	14661082	656618	147669	1602566	1750235
Q-4 62							
Q-1 63	4333058	4311210	9624433	706537	117121	1102170	1219291
Q-2 63							
Q-3 63	4341206	3595784	10337074	780443	89098	-199710	-110612
Q-4 63							
Q-1 64	4419870	3440025	7972509	955604		719909	719909
Q-2 64							
Q-3 64	1236831	250099	1561796	558856		646400	646400
Q-4 64							
Q-1 65	98561	68654	650395	196422		454097	454097
Q-2 65							
Q-3 65	171772		351577	62728		181638	181638
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 01  
 AIRFRAME STRUCTURES SUBSYSTEM

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST	TOTAL O/C \$
Q-1 66			34473	7150	11740	12975	24715
Q-2 66							
Q-3 66			26242	1612	4328		4328
Q-4 66							
Q-1 67							
Q-2 67							
Q-3 67							
TOTAL	27227491	103499447	142420607	8205547	2760920	12295983	15056903



NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 01  
 AIRFRAME STRUCTURES SUBSYSTEM

	SUB TOTAL	G & A	IDWA	TOTAL COST
Q-1 58	668015			668015
Q-2 58				
Q-3 58	3330752			3330752
Q-4 58				
Q-1 59	6997692		23214	7020906
Q-2 59				
Q-3 59	27941897		8848	27950745
Q-4 59				
Q-1 60	23074777	374654	13335	23462766
Q-2 60				
Q-3 60	23387048	500464	41128	23928640
Q-4 60				
Q-1 61	38866390	784744	2590967	42242101
Q-2 61				
Q-3 61	54666642	1076719	4214571	59957932
Q-4 61				
Q-1 62	45307579	798010	2924005	49029594
Q-2 62				
Q-3 62	36747893	628689	2610066	39986648
Q-4 62				
Q-1 63	29869534	544386	2496459	32910379
Q-2 63				
Q-3 63	30039028	539261	2489662	33067951
Q-4 63				
Q-1 64	35752058	801243	2536545	39089846
Q-2 64				
Q-3 64	13215023	310503	1380891	14906417
Q-4 64				
Q-1 65	6414374	184383	1197	6599954
Q-2 65				
Q-3 65	1715008	48587	1687	1765282
Q-4 65				

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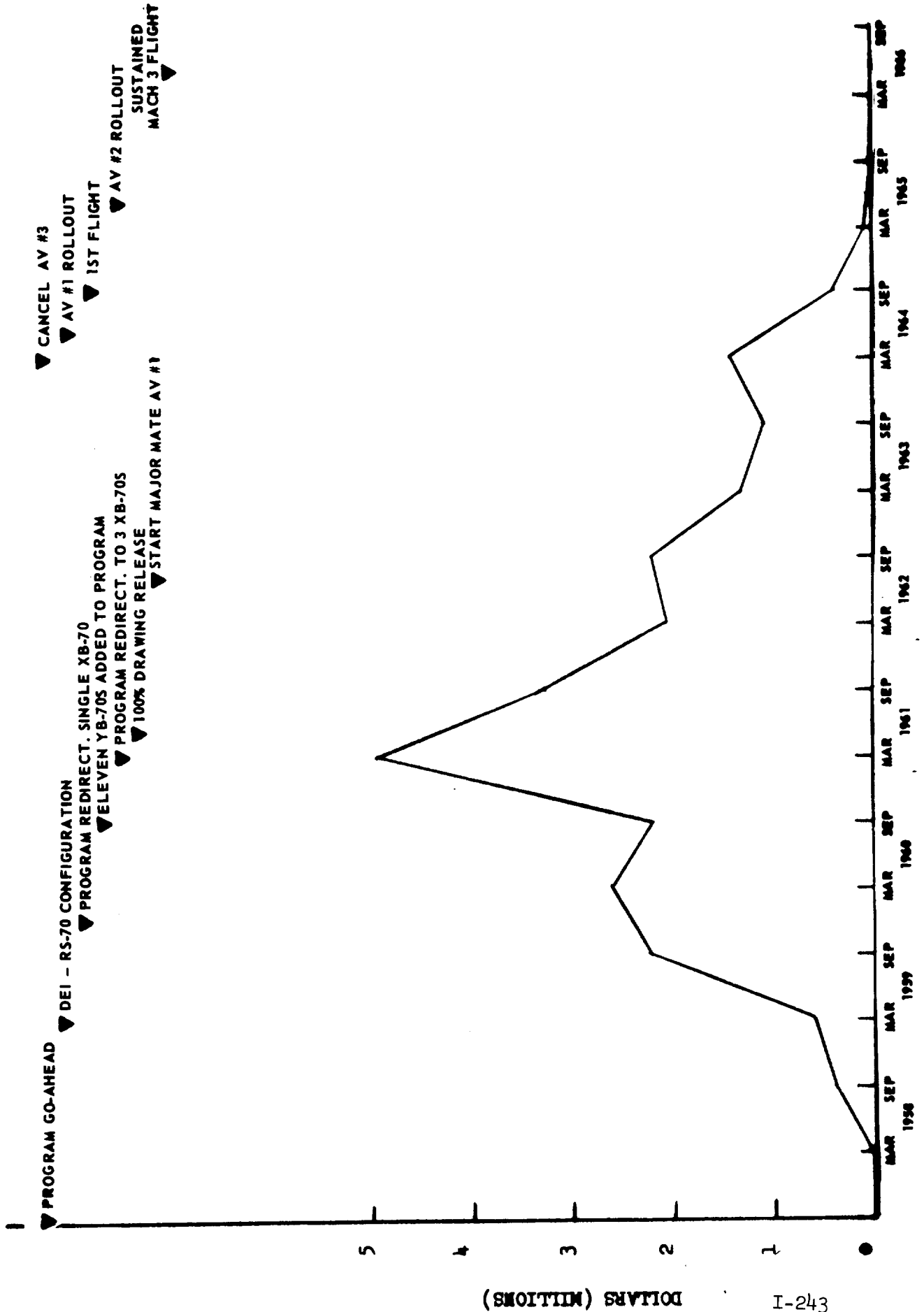
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4- SYSTEM 1  
5- SUBSYSTEM 01  
AIRFRAME STRUCTURES SUBSYSTEM

	SUB TOTAL	G & A	IDWA	TOTAL COST
Q-1 66	84755	2552		87307
Q-2 66				
Q-3 66	29947	902		30849
Q-4 66				
Q-1 67				
Q-2 67				
Q-3 67				
TOTAL	378108412	6595097	21332575	406036084

WBS 1.2 ENVIRONMENTAL CONTROL  
TOTAL COST



▼ CANCEL AV #3  
 ▼ AV #1 ROLLOUT  
 ▼ 1ST FLIGHT  
 ▼ AV #2 ROLLOUT  
 SUSTAINED  
 MACH 3 FLIGHT

▼ PROGRAM GO-AHEAD  
 ▼ DEI - RS-70 CONFIGURATION  
 ▼ PROGRAM REDIRECT. SINGLE XB-70  
 ▼ ELEVEN YB-70S ADDED TO PROGRAM  
 ▼ PROGRAM REDIRECT. TO 3 XB-70S  
 ▼ 100% DRAWING RELEASE  
 ▼ START MAJOR MATE AV #1

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 02  
 ENVIRONMENTAL CONTROL SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	39.0	6674	4.607	30745	30350	61095	
Q-2 58							
Q-3 58	262.5	44173	4.419	195218	173722	368940	189
Q-4 58							
Q-1 59	415.0	70883	4.261	302024	245269	547293	9315
Q-2 59							
Q-3 59	730.5	128753	4.177	537859	461180	999039	2464
Q-4 59							
Q-1 60	502.5	87101	4.701	409434	328183	737617	-46
Q-2 60							
Q-3 60	522.0	87653	4.671	409433	325423	734856	1217
Q-4 60							
Q-1 61	1348.5	230256	3.852	886946	749223	1636169	78532
Q-2 61							
Q-3 61	423.0	76752	5.394	413998	396477	810475	11483
Q-4 61							
Q-1 62	397.5	67990	5.602	380913	309468	690381	4877
Q-2 62							
Q-3 62	436.5	73412	5.378	394784	371888	766672	6394
Q-4 62							
Q-1 63	384.0	65502	5.617	367909	355399	723308	364
Q-2 63							
Q-3 63	425.0	71311	5.179	369296	413556	782852	2569
Q-4 63							
Q-1 64	363.0	62101	5.620	349001	382355	731356	9380
Q-2 64							
Q-3 64	142.5	25013	6.057	151516	156302	307818	40460
Q-4 64							
Q-1 65	36.0	6201	7.306	45307	40772	86079	498
Q-2 65							
Q-3 65	12.0	2020	7.261	14667	13245	27912	
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 02  
ENVIRONMENTAL CONTROL SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66	1.5	174	7.322	1274	1148	2422	
TOTAL	6441.0	1105969		5260324	4753960	10014284	167696

NORTH AMERICAN ROCKWELL CORP.  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 02  
 ENVIRONMENTAL CONTROL SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 58					61095		61095
Q-2 58							
Q-3 58		189	10	1729	370868		370868
Q-4 58							
Q-1 59	24221	33536	1431	4132	586392		586392
Q-2 59							
Q-3 59	1175206	1177670	32320	24125	2233154		2233154
Q-4 59							
Q-1 60	1693830	1693784	100488	15084	2546973	48528	2595501
Q-2 60							
Q-3 60	1350953	1352170	80315	13184	2180525	41545	2222070
Q-4 60							
Q-1 61	3007640	3086172	92807	16360	4831508	89784	4921292
Q-2 61							
Q-3 61	2313336	2324819	67248	17179	3219721	59831	3279552
Q-4 61							
Q-1 62	1315705	1320582	42198	17752	2070913	34760	2105673
Q-2 62							
Q-3 62	1315706	1322100	42281	18233	2149286	36075	2185361
Q-4 62							
Q-1 63	507497	507861	21593	26709	1279471	21393	1300864
Q-2 63							
Q-3 63	290117	292686	9576	18726	1103840	18456	1122296
Q-4 63							
Q-1 64	558516	567896	77704	14239	1391195	29601	1420796
Q-2 64							
Q-3 64		40460	14719	8325	371322	7901	379223
Q-4 64							
Q-1 65		498	149	1420	88146	2352	90498
Q-2 65							
Q-3 65				568	28480	760	29240
Q-4 65							

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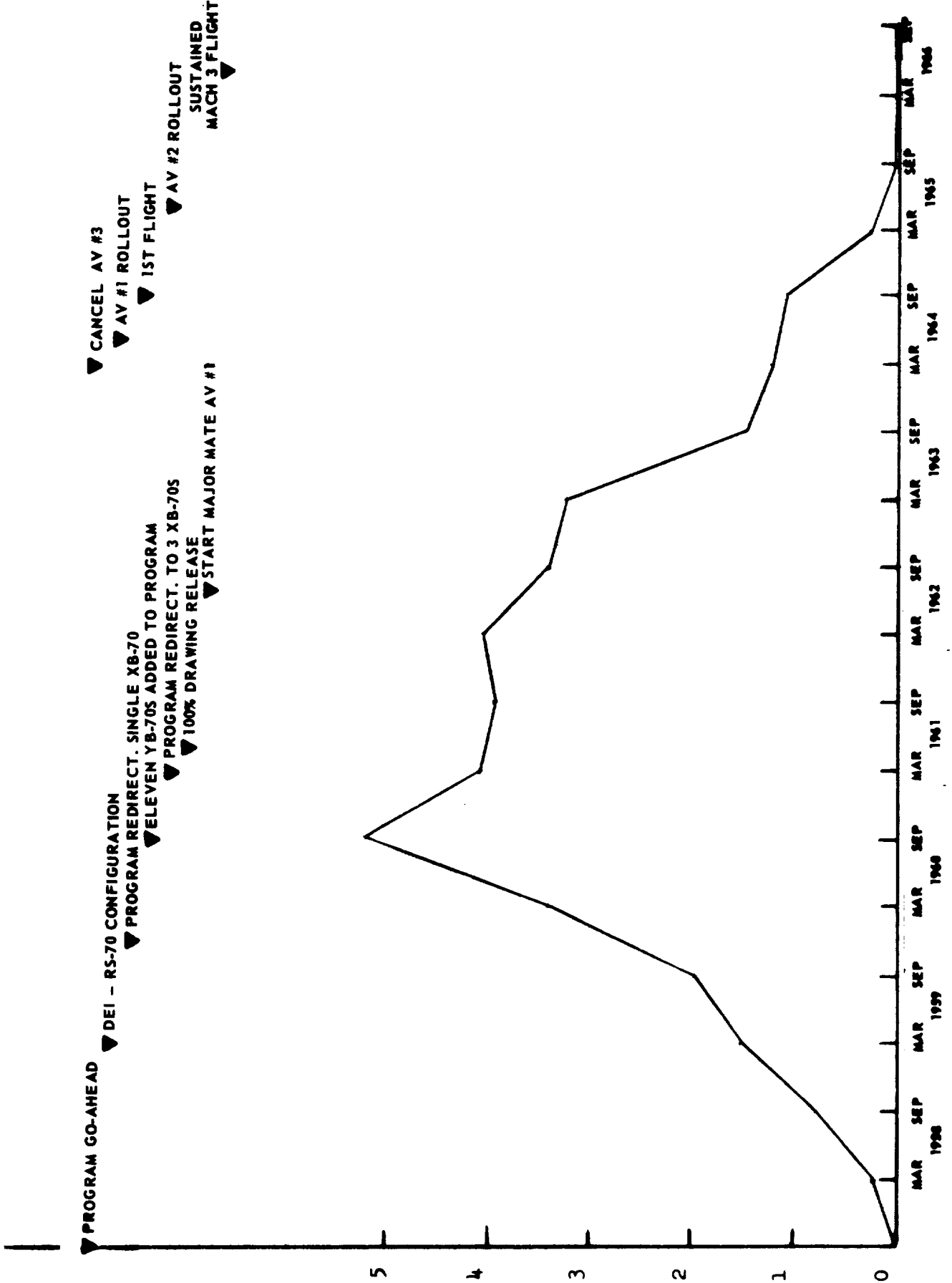
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 02  
ENVIRONMENTAL CONTROL SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 64				40	2462	74	2536
TOTAL	13552727	13720423	582839	197805	24515351	391060	24906411

WBS 1.3 PROPULSION  
TOTAL COST





NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4- SYSTEM 1  
 5- SUBSYSTEM 03  
 PROPULSION SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	130.5	21984	4.135	90903	93025	183928	263
Q-2 58							
Q-3 58	512.5	86098	4.058	349399	331937	681336	4451
Q-4 58							
Q-1 59	679.0	115733	4.064	470290	399248	869538	56868
Q-2 59							
Q-3 59	968.5	170459	4.061	692192	613550	1305742	3485
Q-4 59							
Q-1 60	886.0	153783	4.379	673434	549087	1222521	7588
Q-2 60							
Q-3 60	1199.5	201213	4.233	851780	702363	1554143	56067
Q-4 60							
Q-1 61	1732.5	295957	4.195	1241582	982830	2224412	103154
Q-2 61							
Q-3 61	1180.5	214102	4.253	910573	870467	1781040	105298
Q-4 61							
Q-1 62	1548.0	264318	3.936	1040331	988914	2029245	90877
Q-2 62							
Q-3 62	1154.5	193926	4.433	859737	794445	1654182	112780
Q-4 62							
Q-1 63	1061.5	180912	4.834	874471	851616	1726087	66819
Q-2 63							
Q-3 63	1030.0	172979	5.488	949311	635808	1585119	28415
Q-4 63							
Q-1 64	445.0	76011	5.936	451181	475185	926366	47125
Q-2 64							
Q-3 64	361.0	63449	5.995	380368	495729	876097	114109
Q-4 64							
Q-1 65	88.0	15179	6.572	99752	90694	190446	16402
Q-2 65							
Q-3 65	31.0	5132	6.501	33363	26319	59682	1637
Q-4 65							

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 03  
 PROPULSION SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66	3.0	488	5.096	2487	1987	4474	108
Q-2 66							
Q-3 66		13	3.615	47	46	93	
TOTAL	13011.0	2231736		9971201	8903250	18874451	815446

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 03  
 PROPULSION SUBSYSTEM

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	OTHR COST	SUB TOTAL	G & A
Q-1 58			263	14		184205	
Q-2 58							
Q-3 58			4451	244	97435	783466	
Q-4 58							
Q-1 59		276031	332899	12133	324815	1539385	
Q-2 59							
Q-3 59		276032	279517	7836	362862	1955957	
Q-4 59							
Q-1 60		941734	949322	56868	1106062	3334773	63538
Q-2 60							
Q-3 60		3290232	3346299	202592	23726	5126760	97680
Q-4 60							
Q-1 61		1368404	1471558	47916	268897	4012783	74570
Q-2 61							
Q-3 61		1376768	1482066	48335	494262	3805703	70721
Q-4 61							
Q-1 62		1497549	1588426	54778	348723	4021172	67496
Q-2 62							
Q-3 62		1370996	1483776	52412	173535	3363905	56463
Q-4 62							
Q-1 63		979302	1046121	48165	317624	3137997	52466
Q-2 63							
Q-3 63		75037	103452	5207	-215876	1477902	24711
Q-4 63							
Q-1 64		146357	193482	25121	38352	1183321	25178
Q-2 64							
Q-3 64			114109	41513	34468	1066187	22686
Q-4 64							
Q-1 65			16402	4905	5979	217732	5809
Q-2 65							
Q-3 65			1637	292	2392	64003	1707
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 03  
PROPULSION SUBSYSTEM

	MFG MATL	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A
Q-1 66			108	22	171	4775	144
Q-2 66							
Q-3 66						93	3
TOTAL		11598442	12413888	608353	3383427	35280119	563172

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 03  
PROPULSION SUBSYSTEM

	TOTAL COST
Q-1 58	184205
Q-2 58	
Q-3 58	783466
Q-4 58	
Q-1 59	1539385
Q-2 59	
Q-3 59	1955957
Q-4 59	
Q-1 60	3398311
Q-2 60	
Q-3 60	5224440
Q-4 60	
Q-1 61	4087353
Q-2 61	
Q-3 61	3876424
Q-4 61	
Q-1 62	4088668
Q-2 62	
Q-3 62	3420368
Q-4 62	
Q-1 63	3190463
Q-2 63	
Q-3 63	1502613
Q-4 63	
Q-1 64	1208499
Q-2 64	
Q-3 64	1088873
Q-4 64	
Q-1 65	223541
Q-2 65	
Q-3 65	65710
Q-4 65	

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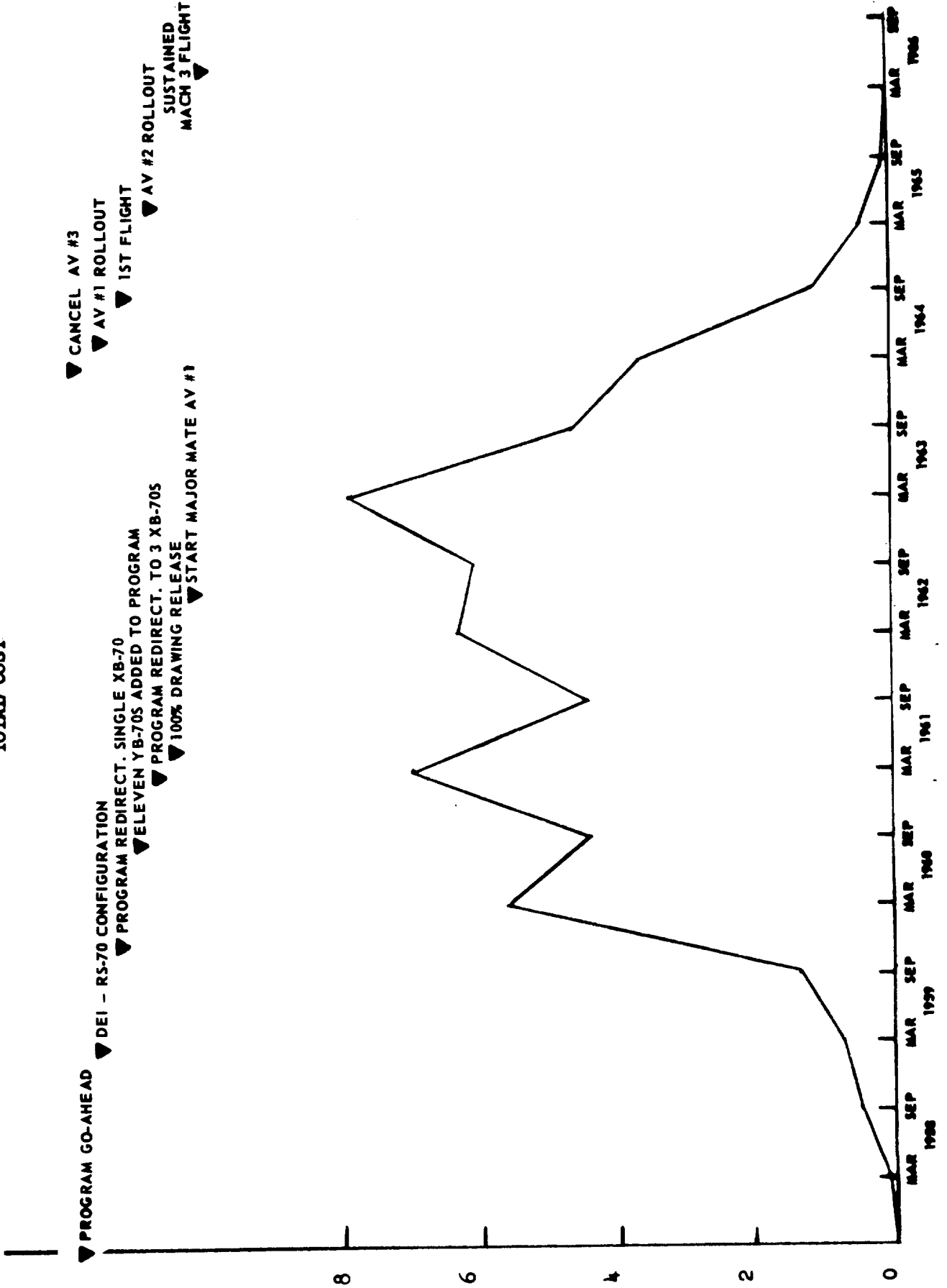
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 03  
PROPULSION SUBSYSTEM

	TOTAL COST
Q-1 66	4919
Q-2 66	
Q-3 66	96
TOTAL	35843291

WBS 1.4 SECONDARY POWER  
TOTAL COST



NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 04  
 SECONDARY POWER SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	30.0	5079	5.168	26246	23108	49354	179
Q-2 58							
Q-3 58	249.0	41834	4.357	182271	162631	344902	27548
Q-4 58							
Q-1 59	470.5	80363	4.032	324034	278520	602654	21316
Q-2 59							
Q-3 59	829.5	145918	3.898	568836	531170	1100006	17720
Q-4 59							
Q-1 60	1004.5	174075	4.042	703659	654466	1358125	16855
Q-2 60							
Q-3 60	1197.0	201099	4.141	832728	728358	1561086	72454
Q-4 60							
Q-1 61	1492.5	254745	4.369	1112956	865215	1978171	92089
Q-2 61							
Q-3 61	1144.5	207603	4.524	939108	921010	1860118	104467
Q-4 61							
Q-1 62	1608.0	274348	4.670	1281293	1216095	2497388	122708
Q-2 62							
Q-3 62	1411.5	236965	4.824	1143026	1175960	2318986	111426
Q-4 62							
Q-1 63	1147.5	196088	5.500	1078465	1045993	2124458	24719
Q-2 63							
Q-3 63	1169.0	196386	5.410	1062473	1111254	2173727	70705
Q-4 63							
Q-1 64	972.0	165763	5.543	918804	1023157	1941961	41318
Q-2 64							
Q-3 64	505.5	89023	5.833	519298	586155	1105453	45723
Q-4 64							
Q-1 65	166.0	28761	6.055	174141	187008	361149	25354
Q-2 65							
Q-3 65	63.0	10764	6.055	65175	69562	134737	9990
Q-4 65							



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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 04  
SECONDARY POWER SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66	3.0	796	6.080	4840	5553	10393	708
TOTAL	13463.0	2309610		10937353	10585315	21522668	805279

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 04  
 SECONDARY POWER SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	IDWA
Q-1 58		179	10		49543		
Q-2 58							
Q-3 58	119071	146619	2562	933	495016		
Q-4 58							
Q-1 59	119071	140387	4961	94	748096		
Q-2 59							
Q-3 59	238142	255862	8007	35	1363910		
Q-4 59							
Q-1 60	3881141	3897996	232483	8570	5497174	104738	
Q-2 60							
Q-3 60	2545564	2618018	160561	8872	4348537	82969	6655
Q-4 60							
Q-1 61	4430743	4522832	134717	11992	6647712	127238	199305
Q-2 61							
Q-3 61	2058135	2162602	67794	7917	4098431	80309	223226
Q-4 61							
Q-1 62	3400708	3523416	117750	26852	6165406	103486	
Q-2 62							
Q-3 62	3424537	3535963	117518	71482	6043949	101447	
Q-4 62							
Q-1 63	5303653	5328372	227647	54282	7734759	129325	
Q-2 63							
Q-3 63	2094079	2164784	74262	69807	4482580	74947	
Q-4 63							
Q-1 64	1390528	1431846	195378	67080	3636265	77372	
Q-2 64							
Q-3 64		45723	16633	10622	1178431	25074	
Q-4 64							
Q-1 65		25354	7584	-5831	388256	10358	
Q-2 65							
Q-3 65		9990	1783	-2331	144179	3847	
Q-4 65							

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 04  
SECONDARY POWER SLBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	IDWA
Q-1 66		708	146	-167	11080	334	
TOTAL	29005372	29810651	1369796	330209	53033324	921444	429186

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 04  
SECONDARY POWER SUBSYSTEM

	TOTAL COST
Q-1 58	49543
Q-2 58	
Q-3 58	495016
Q-4 58	
Q-1 59	748096
Q-2 59	
Q-3 59	1363910
Q-4 59	
Q-1 60	5601912
Q-2 60	
Q-3 60	4438161
Q-4 60	
Q-1 61	6974255
Q-2 61	
Q-3 61	4401966
Q-4 61	
Q-1 62	6268892
Q-2 62	
Q-3 62	6145396
Q-4 62	
Q-1 63	7864084
Q-2 63	
Q-3 63	4557527
Q-4 63	
Q-1 64	3713637
Q-2 64	
Q-3 64	1203505
Q-4 64	
Q-1 65	398614
Q-2 65	
Q-3 65	148026
Q-4 65	

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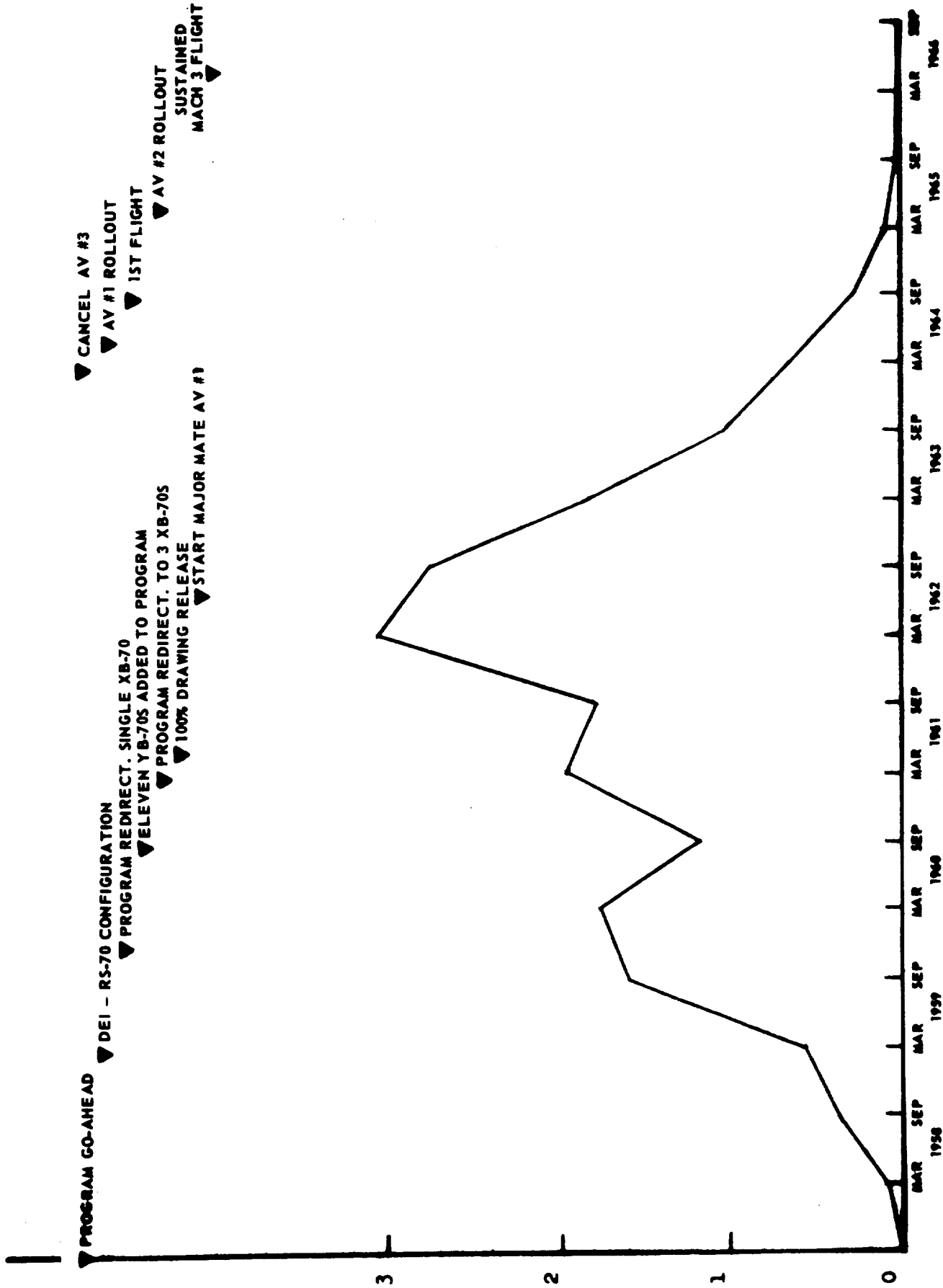
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 04  
SECONDARY POWER SUBSYSTEM

	TOTAL COST
Q-1 66	11414
TOTAL	54383954

**WBS 1.5 AIR INDUCTION  
TOTAL COST**



▼ PROGRAM GO-AHEAD  
 ▼ DEI - RS-70 CONFIGURATION  
 ▼ PROGRAM REDIRECT. SINGLE XB-70  
 ▼ ELEVEN YB-70S ADDED TO PROGRAM  
 ▼ PROGRAM REDIRECT. TO 3 XB-70S  
 ▼ 100% DRAWING RELEASE  
 ▼ START MAJOR MATE AV #1  
 ▼ CANCEL AV #3  
 ▼ AV #1 ROLLOUT  
 ▼ 1ST FLIGHT  
 ▼ AV #2 ROLLOUT  
 ▼ SUSTAINED MACH 3 FLIGHT

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
DATA PREPARED UNDER  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 05  
AIR INDUCTION SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	45.0	7716	4.399	33942	35107	69049	
Q-2 58							
Q-3 58	196.5	33021	4.184	138172	129321	267493	
Q-4 58							
Q-1 59	253.5	43194	4.177	180418	147780	328198	428
Q-2 59							
Q-3 59	204.0	35902	4.142	148701	128917	277618	
Q-4 59							
Q-1 60	477.0	82696	4.486	370956	302023	672979	189
Q-2 60							
Q-3 60	508.5	85199	4.468	380640	303934	684574	13102
Q-4 60							
Q-1 61	520.5	88768	4.572	405861	295175	701036	52777
Q-2 61							
Q-3 61	387.0	70260	4.532	318404	299649	618053	103089
Q-4 61							
Q-1 62	645.0	110062	4.382	482249	455475	937724	164090
Q-2 62							
Q-3 62	448.5	75384	4.624	348589	350603	699192	72663
Q-4 62							
Q-1 63	328.5	56003	4.920	275547	282788	558335	72039
Q-2 63							
Q-3 63	298.5	49921	4.391	219194	265346	484540	26249
Q-4 63							
Q-1 64	135.0	22904	5.555	127222	141272	268494	22396
Q-2 64							
Q-3 64	118.5	20676	5.563	115029	128229	243258	22310
Q-4 64							
Q-1 65	45.0	7756	6.562	50895	49146	100041	-2174
Q-2 65							
Q-3 65	13.5	2315	6.798	15738	15097	30835	-870
Q-4 65							

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 05  
AIR INDUCTION SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66		19	3.421	65	367	432	-62
TOTAL	4624.5	791796		3611622	3330229	6941851	546226



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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 05  
 AIR INDUCTION SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST	TOTAL O/C \$	SUB TOTAL
Q-1 58				17037		17037	86086
Q-2 58							
Q-3 58				110870		110870	378363
Q-4 58							
Q-1 59	79178	79606	2134	177104		177104	587042
Q-2 59							
Q-3 59	1126915	1126915	30791	201828		201828	1637152
Q-4 59							
Q-1 60	821044	821233	48734	182582		182582	1725528
Q-2 60							
Q-3 60	287575	300677	18784	165266		165266	1169301
Q-4 60							
Q-1 61	981911	1034688	32304	133435		133435	1901463
Q-2 61							
Q-3 61	875305	978394	33788	99635	4574	104209	1734444
Q-4 61							
Q-1 62	1730799	1894889	67937	64343	39674	104017	3004567
Q-2 62							
Q-3 62	1730800	1803463	60682	30245	92708	122953	2686290
Q-4 62							
Q-1 63	1063630	1135669	52260	31133	8418	39551	1785815
Q-2 63							
Q-3 63	283684	309933	11701	29699	180649	210348	1016522
Q-4 63							
Q-1 64	320990	343386	46470	1	24	25	658375
Q-2 64							
Q-3 64		22310	8116	-1	23	22	273706
Q-4 64							
Q-1 65		-2174	-650	1	30	31	97248
Q-2 65							
Q-3 65		-870	-155		12	12	29822
Q-4 65							

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 05  
AIR INDUCTION SUBSYSTEM

	SURC	TOTAL MATERIAL	MPC	WIND TUNNEL	OTHER COST	TOTAL O/C \$	SUB TOTAL
Q-1 66		-62	-13		1	1	358
TOTAL	9301831	9848057	412883	1243178	326113	1569291	18772082

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 05  
AIR INDUCTION SUBSYSTEM

	G & A	TOTAL COST
Q-1 58		86086
Q-2 58		
Q-3 58		378363
Q-4 58		
Q-1 59		587042
Q-2 59		
Q-3 59		1637152
Q-4 59		
Q-1 60	32877	1758405
Q-2 60		
Q-3 60	22279	1191580
Q-4 60		
Q-1 61	35335	1936798
Q-2 61		
Q-3 61	32231	1766675
Q-4 61		
Q-1 62	50432	3054999
Q-2 62		
Q-3 62	45088	2731378
Q-4 62		
Q-1 63	29858	1815673
Q-2 63		
Q-3 63	16991	1033513
Q-4 63		
Q-1 64	14010	672385
Q-2 64		
Q-3 64	5824	279530
Q-4 64		
Q-1 65	2595	99843
Q-2 65		
Q-3 65	795	30617
Q-4 65		

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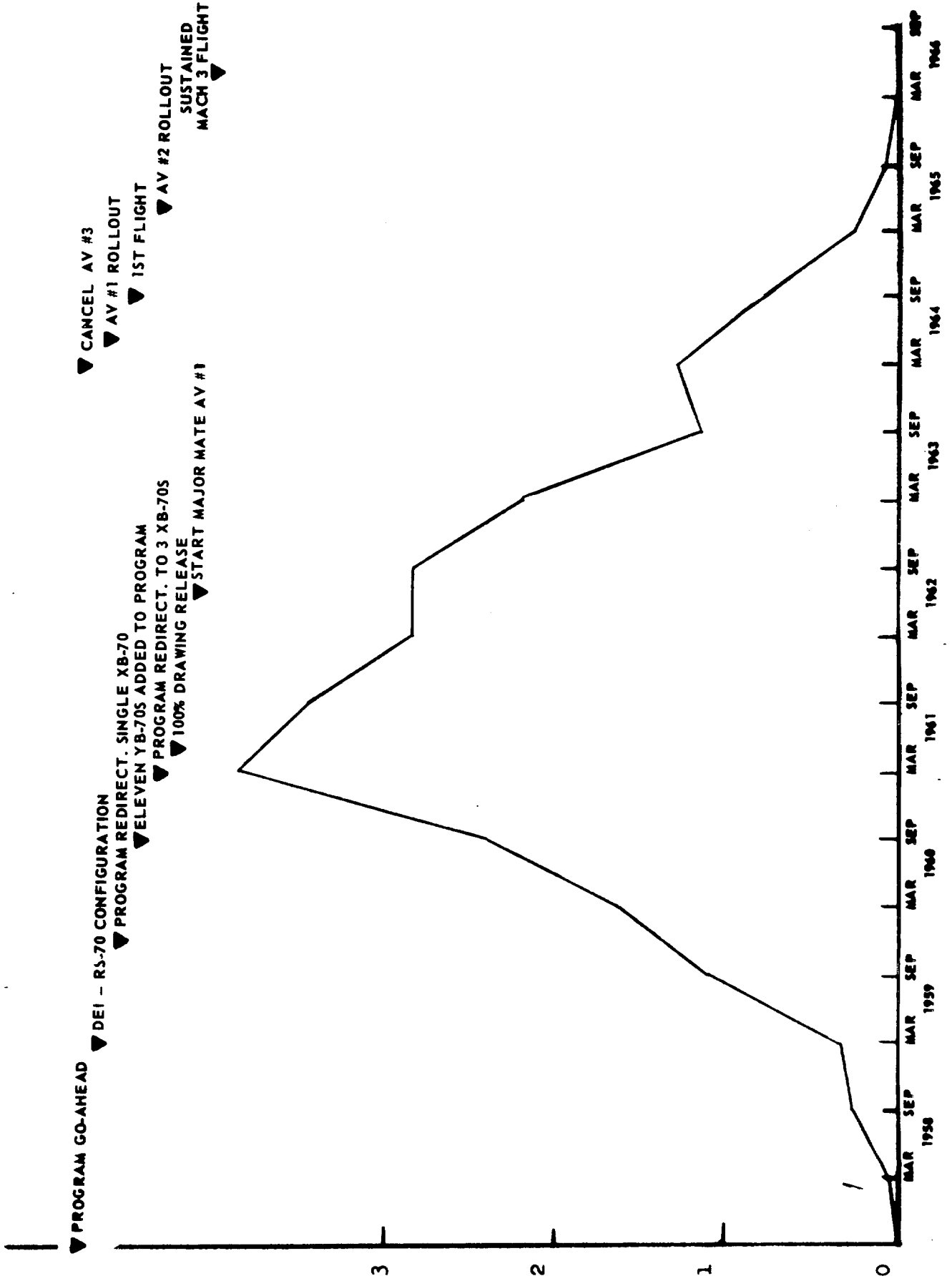
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 05  
AIR INDUCTION SUBSYSTEM

	G & A	TOTAL COST
Q-1 66	11	369
TOTAL	288326	19060408

**WBS 1.6 FLIGHT CONTROL  
TOTAL COST**



- ▼ PROGRAM GO-AHEAD
- ▼ DE1 - RS-70 CONFIGURATION
- ▼ PROGRAM REDIRECT. SINGLE XB-70
- ▼ ELEVEN YB-70S ADDED TO PROGRAM
- ▼ PROGRAM REDIRECT. TO 3 XB-70S
- ▼ 100% DRAWING RELEASE
- ▼ START MAJOR MATE AV #1
- ▼ CANCEL AV #3
- ▼ AV #1 ROLLOUT
- ▼ 1ST FLIGHT
- ▼ AV #2 ROLLOUT
- ▼ SUSTAINED MACH 3 FLIGHT

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 06  
 FLIGHT CONTROL SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	40.5	6891	4.800	33076	31352	64428	
Q-2 58							
Q-3 58	199.0	33513	4.461	149485	131925	281410	196
Q-4 58							
Q-1 59	234.0	40016	4.508	180378	137559	317937	1138
Q-2 59							
Q-3 59	673.0	118461	3.940	466791	428302	895093	16426
Q-4 59							
Q-1 60	1050.0	182252	3.897	710249	686243	1396492	21876
Q-2 60							
Q-3 60	1126.5	189204	3.971	751354	672054	1423408	217747
Q-4 60							
Q-1 61	1649.5	281714	3.830	1079025	941779	2020804	70878
Q-2 61							
Q-3 61	1267.5	229908	3.844	883713	953187	1836900	397370
Q-4 61							
Q-1 62	1028.0	175540	4.351	763726	733366	1497092	76206
Q-2 62							
Q-3 62	967.5	162631	4.200	682995	739003	1421998	128842
Q-4 62							
Q-1 63	487.5	83393	5.624	469039	488292	957331	149916
Q-2 63							
Q-3 63	515.5	86500	4.975	430371	502154	932525	18233
Q-4 63							
Q-1 64	376.5	64366	5.158	331992	383792	715784	32953
Q-2 64							
Q-3 64	333.0	58614	5.421	317744	367219	684963	33019
Q-4 64							
Q-1 65	100.5	17389	5.729	99624	110231	209855	6057
Q-2 65							
Q-3 65	31.5	5323	6.954	37018	41097	78115	2422
Q-4 65							

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 NASA CONTRACT NAS9-12100

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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 06  
 FLIGHT CONTROL SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 65	10.5	1890	1.753	3314	3268	6582	175
TOTAL	10090.5	1737605		7389894	7350823	14740717	1173454

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
 DATA PREPARED UNDER  
 NASA CONTRACT NAS9-12100

APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 06  
 FLIGHT CONTROL SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 58				3443	67871		67871
Q-2 58							
Q-3 58		196	11	4476	286093		286093
Q-4 58							
Q-1 59		1138	96	5137	324308		324308
Q-2 59							
Q-3 59	162500	178926	5831	14883	1094733		1094733
Q-4 59							
Q-1 60	162500	184376	12516	23083	1616467	30798	1647265
Q-2 60							
Q-3 60	619560	837307	65392	25159	2351266	44800	2396066
Q-4 60							
Q-1 61	1602525	1673403	51902	19307	3765916	69982	3835898
Q-2 61							
Q-3 61	1061735	1459105	63995	26111	3386111	62924	3449035
Q-4 61							
Q-1 62	1153889	1230095	42677	14453	2784317	46734	2831051
Q-2 62							
Q-3 62	1153889	1282731	46805	20831	2772365	46534	2818899
Q-4 62							
Q-1 63	951000	1100916	55148	24414	2137809	39088	2176897
Q-2 63							
Q-3 63	127402	145635	5888	23928	1107976	18528	1126504
Q-4 63							
Q-1 64	430036	462989	62571	17117	1258461	26777	1285238
Q-2 64							
Q-3 64		33019	12012	14034	744028	15832	759860
Q-4 64							
Q-1 65		6057	1812	14761	232485	6202	238687
Q-2 65							
Q-3 65		2422	432	5905	86874	2317	89191
Q-4 65							



NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 06  
 FLIGHT CONTROL SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
0-1 66		175	36	422	7215	217	7432
TOTAL	7425036	8598490	427124	257964	24024295	410733	24435028



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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 07  
 PERSONNEL ACCOMM AND ESCAPE SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	9.0	1621	4.716	7644	7367	15011	22
Q-2 58							
Q-3 58	195.0	32707	3.689	120658	123721	244379	11660
Q-4 58							
Q-1 59	463.5	79245	3.433	272063	279704	551767	34014
Q-2 59							
Q-3 59	406.0	71688	3.693	264736	267826	532562	14983
Q-4 59							
Q-1 60	693.0	120213	3.833	460742	407603	868345	109266
Q-2 60							
Q-3 60	524.5	88091	4.174	367688	309477	677165	252310
Q-4 60							
Q-1 61	1503.0	256658	3.516	902405	944320	1846725	174874
Q-2 61							
Q-3 61	814.5	147746	3.913	578184	641896	1220080	147286
Q-4 61							
Q-1 62	727.5	123926	4.564	565612	580941	1146553	120874
Q-2 62							
Q-3 62	394.5	66107	4.145	274025	309198	583223	76200
Q-4 62							
Q-1 63	154.5	26432	5.862	154944	140537	295481	2817
Q-2 63							
Q-3 63	100.0	16901	6.216	105050	117266	222316	844
Q-4 63							
Q-1 64	91.0	15324	6.798	104176	103046	207222	7132
Q-2 64							
Q-3 64	45.0	7850	6.796	53346	53578	106924	13576
Q-4 64							
Q-1 65	12.0	1954	8.881	17354	14501	31855	165
Q-2 65							
Q-3 65	6.0	915	8.725	7983	6689	14672	66
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 07  
PERSONNEL ACCOMM AND ESCAPE SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66		61	9.557	583	490	1073	4
TOTAL	6139.0	1057439		4257193	4308160	8565353	966093

NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4--SYSTEM 1  
 5--SUBSYSTEM 07  
 PERSONNEL ACCOMM AND ESCAPE SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	IDWA
Q-1 58		22	1	308	15342		
Q-2 58							
Q-3 58		11660	638		256677		
Q-4 58							
Q-1 59		34014	2881		588662		
Q-2 59							
Q-3 59		14983	1269		548814		
Q-4 59							
Q-1 60	163279	272545	24054	11302	1176246	22411	
Q-2 60							
Q-3 60	163280	415590	42864	7528	1143147	22212	22683
Q-4 60							
Q-1 61	389663	564537	25940	18811	2456013	59026	720307
Q-2 61							
Q-3 61	50124	197410	13736	6066	1437292	39952	712714
Q-4 61							
Q-1 62	130374	251248	13748	7283	1418832	23815	
Q-2 62							
Q-3 62	140375	216575	10460	7680	817938	13730	
Q-4 62							
Q-1 63	93036	95853	4227	-2249	393312	6575	
Q-2 63							
Q-3 63	23200	24044	828	-1986	245202	4099	
Q-4 63							
Q-1 64		7132	760	1002	216116	4598	
Q-2 64							
Q-3 64		13576	4939	1002	126441	2690	
Q-4 64							
Q-1 65		165	49	9226	41295	1101	
Q-2 65							
Q-3 65		66	12	3690	18440	492	
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 07  
PERSONNEL ACCOMM AND ESCAPE SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	IDWA
Q-1 66		4	1	263	1341	40	
TOTAL	1153331	2119424	146407	69926	10901110	200741	1455704

NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
DATA PREPARED UNDER  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 07  
PERSONNEL ACCOMM AND ESCAPE SUBSYSTEM

	TOTAL COST
Q-1 58	15342
Q-2 58	
Q-3 58	256677
Q-4 58	
Q-1 59	588662
Q-2 59	
Q-3 59	548814
Q-4 59	
Q-1 60	1198657
Q-2 60	
Q-3 60	1188042
Q-4 60	
Q-1 61	3235346
Q-2 61	
Q-3 61	2189958
Q-4 61	
Q-1 62	1442647
Q-2 62	
Q-3 62	831668
Q-4 62	
Q-1 63	399887
Q-2 63	
Q-3 63	249301
Q-4 63	
Q-1 64	270716
Q-2 64	
Q-3 64	129131
Q-4 64	
Q-1 65	42396
Q-2 65	
Q-3 65	18932
Q-4 65	

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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 07  
PERSONNEL ACCOMM AND ESCAPE SUBSYSTEM

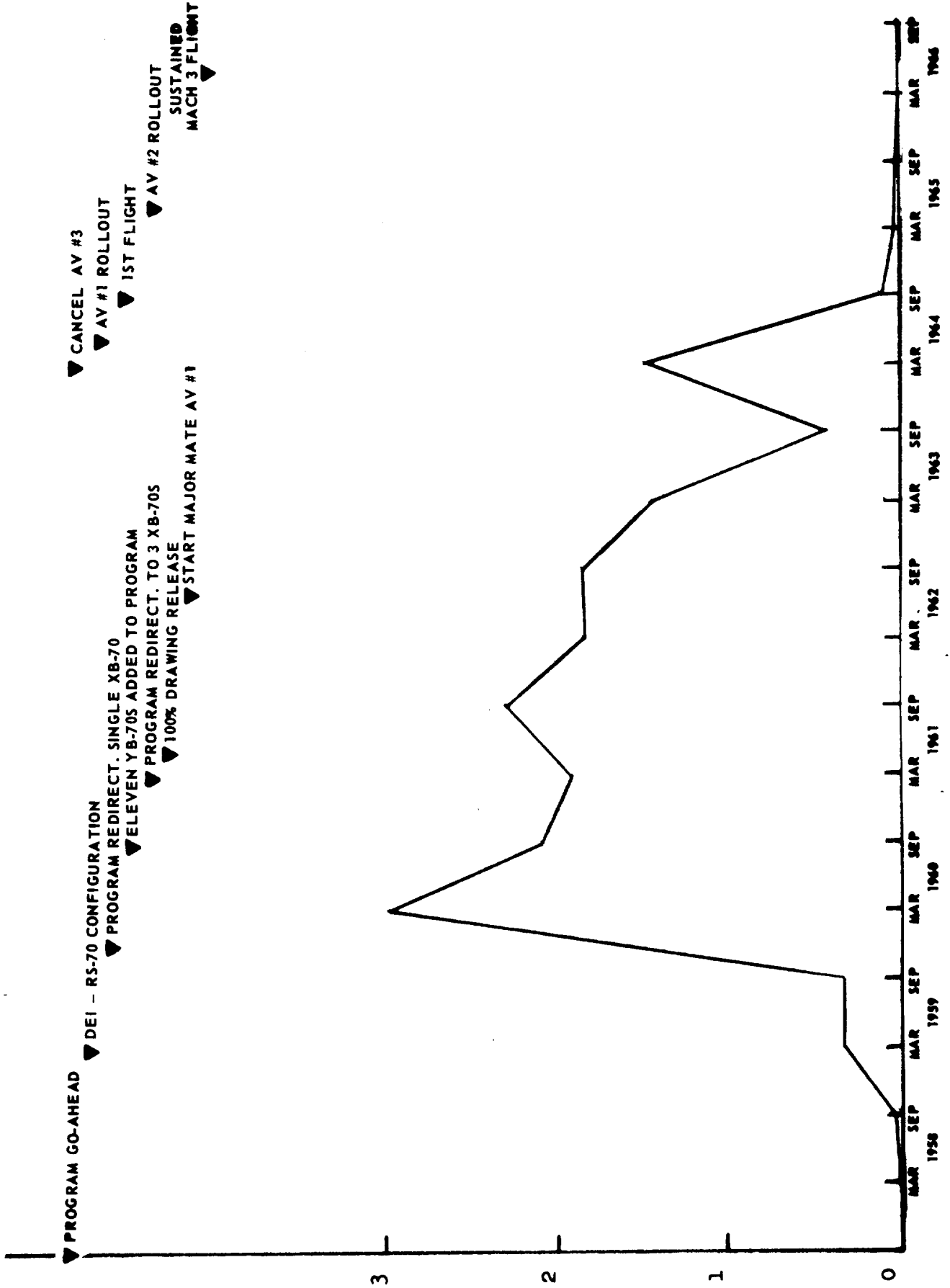
TOTAL  
COST

2-1 66 1381

TOTAL 12557555



**WBS 1.8 ALIGHTING & ARRESTING  
TOTAL COST**



- ▼ PROGRAM GO-AHEAD
- ▼ DEI - RS-70 CONFIGURATION
- ▼ PROGRAM REDIRECT. SINGLE XB-70
- ▼ ELEVEN YB-70S ADDED TO PROGRAM
- ▼ PROGRAM REDIRECT. TO 3 XB-70S
- ▼ 100% DRAWING RELEASE
- ▼ START MAJOR MATE AV #1
- ▼ CANCEL AV #3
- ▼ AV #1 ROLLOUT
- ▼ 1ST FLIGHT
- ▼ AV #2 ROLLOUT
- ▼ SUSTAINED MACH 3 FLIGHT

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
 DATA PREPARED UNDER  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 08  
 ALIGHTING AND ARRESTING SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58		95	4.674	444	432	876	
Q-2 58							
Q-3 58	40.5	6708	4.628	31044	26269	57313	
Q-4 58							
Q-1 59	82.5	14042	4.518	63440	48277	111717	
Q-2 59							
Q-3 59	70.5	12504	4.346	54342	44877	99219	
Q-4 59							
Q-1 60	118.5	20473	4.443	90953	78219	169172	
Q-2 60							
Q-3 60	127.5	21535	4.655	100245	80196	180441	-1588
Q-4 60							
Q-1 61	178.5	30789	4.930	151800	102837	254637	20
Q-2 61							
Q-3 61	108.0	19774	4.853	95959	89817	185776	1025
Q-4 61							
Q-1 62	105.0	17842	5.247	93609	82260	175869	6479
Q-2 62							
Q-3 62	114.0	19045	4.929	93872	94594	188466	2301
Q-4 62							
Q-1 63	73.5	12540	6.056	75936	74853	150789	665
Q-2 63							
Q-3 63	46.5	7687	5.140	39514	39713	79227	-702
Q-4 63							
Q-1 64	37.5	6300	5.921	37304	39629	76933	-110
Q-2 64							
Q-3 64	48.0	8359	5.895	49277	53670	102947	-111
Q-4 64							
Q-1 65	16.5	2724	6.860	18688	18118	36806	154
Q-2 65							
Q-3 65	10.5	1844	6.843	12618	12219	24837	62
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
 DATA PREPARED UNDER  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 08  
 ALIGHTING AND ARRESTING SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
2-1 66		-1	4.000	-4	-3	-7	4
TOTAL	1177.5	202260		1009041	885977	1895018	8199

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 08  
 ALIGHTING AND ARRESTING SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER CCST	SUB TOTAL	G & A	TOTAL COST
Q-1 58					876		876
Q-2 58							
Q-3 58					57313		57313
Q-4 58							
Q-1 59	213688	213688	5665		331070		331070
Q-2 59							
Q-3 59	213689	213689	5837		318745		318745
Q-4 59							
Q-1 60	2602603	2602603	154411		2926186	55753	2981939
Q-2 60							
Q-3 60	1771323	1765735	104887		2055063	39155	2094218
Q-4 60							
Q-1 61	1584016	1584036	45384		1884057	35012	1919069
Q-2 61							
Q-3 61	2024063	2025088	58077	18	2268959	42163	2311122
Q-4 61							
Q-1 62	1575463	1581942	50580	3	1808394	30353	1838747
Q-2 62							
Q-3 62	1575464	1577765	50205	7	1816443	30488	1846931
Q-4 62							
Q-1 63	1229581	1230246	52279		1433314	23964	1457278
Q-2 63							
Q-3 63	357658	356956	11424	27	447634	7485	455119
Q-4 63							
Q-1 64	1205201	1205091	165509	2	1447535	30700	1478235
Q-2 64							
Q-3 64		-111	-40	1	102797	2188	104985
Q-4 64							
Q-1 65		154	46	1	37007	987	37994
Q-2 65							
Q-3 65		62	11	1	24911	665	25576
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
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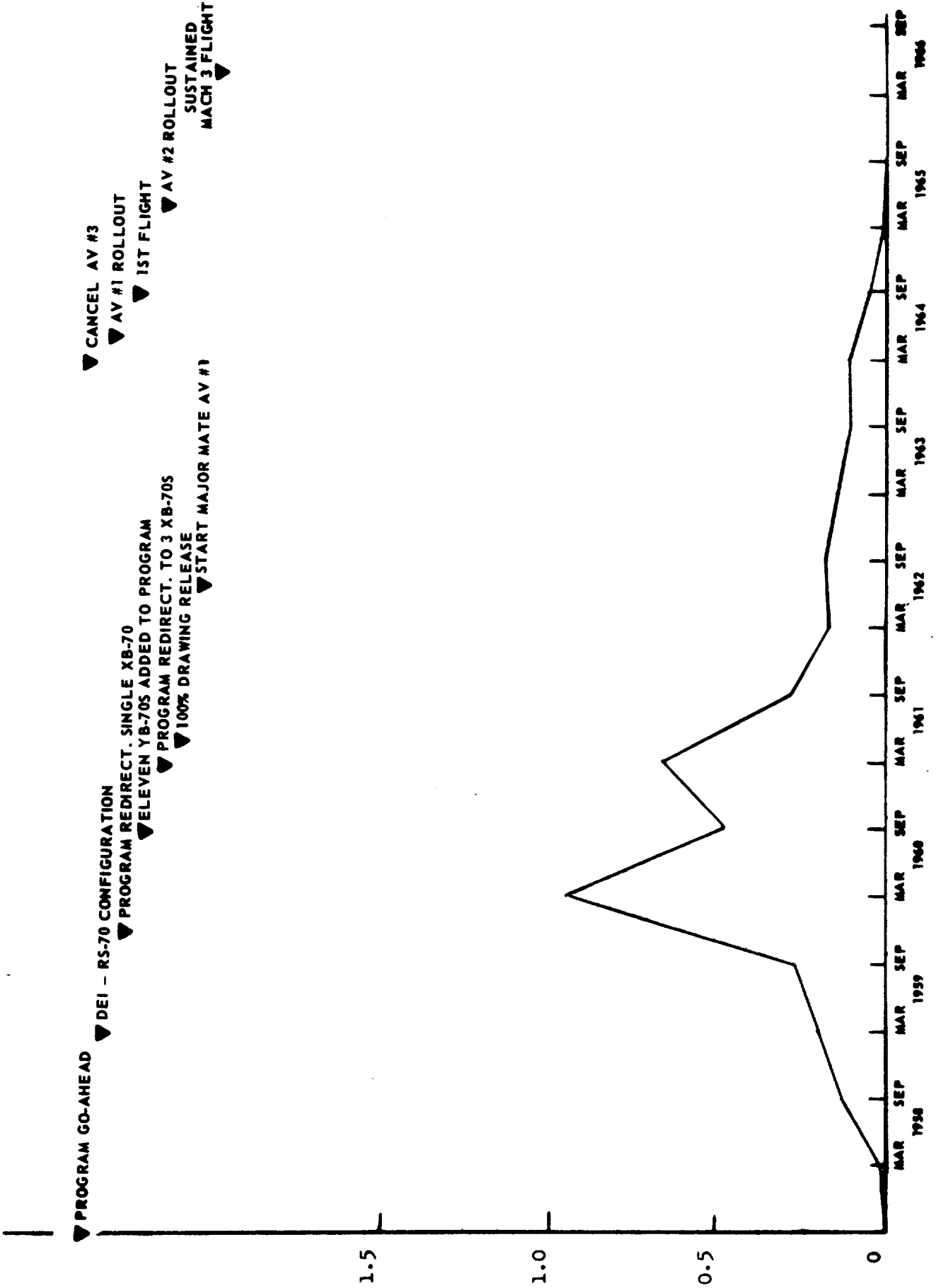
APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 08  
 ALIGHTING AND ARRESTING SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 66		4	1	1	-1		-1
TOTAL	14352749	14360948	704276	61	16960303	298913	17259216

WBS 1.9 MISSION & TRAFFIC CONTROL  
TOTAL COST



NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 09  
 MISSION AND TRAFFIC CONTROL SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	15.0	2605	4.382	11415	11852	23267	
Q-2 58							
Q-3 58	100.5	16840	4.236	71331	66060	137391	93
Q-4 58							
Q-1 59	136.5	23503	4.033	94777	81447	176224	1623
Q-2 59							
Q-3 59	187.5	32844	3.892	127839	119561	247400	1092
Q-4 59							
Q-1 60	122.5	21219	4.542	96380	79010	175390	193
Q-2 60							
Q-3 60	102.0	17146	4.453	76349	63550	139899	3538
Q-4 60							
Q-1 61	187.5	31783	4.204	133602	106628	240240	37272
Q-2 61							
Q-3 61	102.5	18608	4.603	85648	90932	176580	8813
Q-4 61							
Q-1 62	97.5	16619	5.051	83945	75616	159561	2234
Q-2 62							
Q-3 62	97.5	16302	5.203	84821	82473	167294	243
Q-4 62							
Q-1 63	61.5	10453	5.727	59867	56822	116689	26193
Q-2 63							
Q-3 63	53.5	9062	5.176	46904	51601	98505	3509
Q-4 63							
Q-1 64	39.5	6841	8.165	55858	42484	98342	4565
Q-2 64							
Q-3 64	31.5	5552	1.598	8872	36642	45514	6450
Q-4 64							
Q-1 65	4.5	707	7.755	5483	4851	10334	1848
Q-2 65							
Q-3 65	1.5	307	8.225	2525	2214	4739	739
Q-4 65							

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NORTH AMERICAN ROCKWELL CORP.  
SPACE DIVISION  
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TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 09  
MISSION AND TRAFFIC CONTRCL SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66		-89	3.101	-276	-299	-575	52
TOTAL	1341.0	230302		1045340	971454	2016794	98457

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NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 09  
 MISSION AND TRAFFIC CONTROL SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 58				264	23531		23531
Q-2 58							
Q-3 58		93	5	16	137505		137505
Q-4 58							
Q-1 59	24354	25977	782		202983		202983
Q-2 59							
Q-3 59	24354	25446	768		273614		273614
Q-4 59							
Q-1 60	711058	711251	42210	2938	931789	17755	949544
Q-2 60							
Q-3 60	306548	310086	18651	1222	469858	8953	478811
Q-4 60							
Q-1 61	357964	395235	13404	2885	651765	12112	663877
Q-2 61							
Q-3 61	81092	89905	3067	1007	270559	5027	275586
Q-4 61							
Q-1 62		2234	176	59	162030	2719	164749
Q-2 62							
Q-3 62		243	19	269	167825	2817	170642
Q-4 62							
Q-1 63		26193	2580	422	145884	2439	148323
Q-2 63							
Q-3 63		3509	346	36	102396	1712	104108
Q-4 63							
Q-1 64		4565	487	19	103413	286	103699
Q-2 64							
Q-3 64		6450	2347	17	54328	1156	55484
Q-4 64							
Q-1 65		1848	553	2	12737	340	13077
Q-2 65							
Q-3 65		739	132	1	5611	150	5761
Q-4 65							

NORTH AMERICAN ROCKWELL CORP.  
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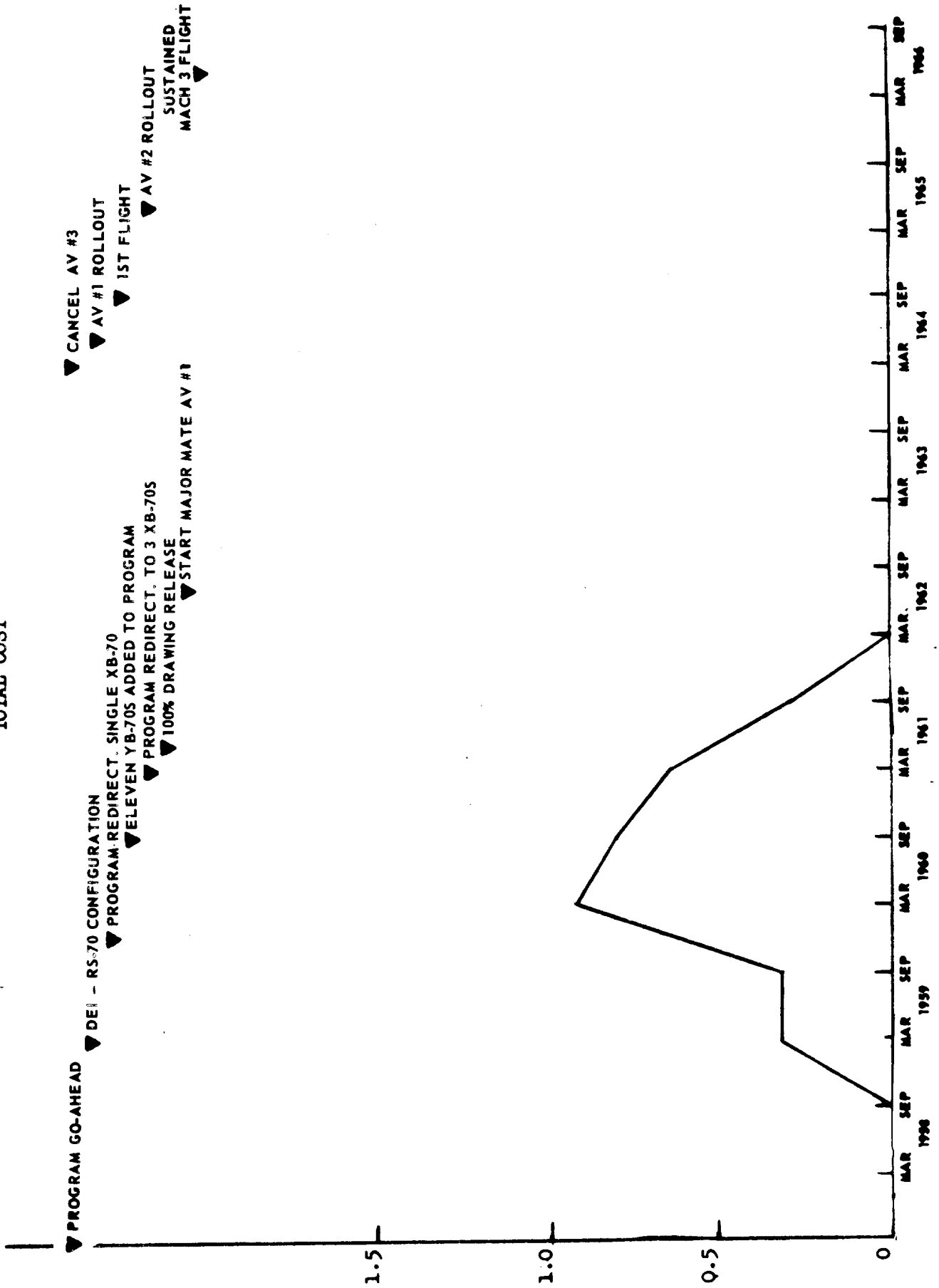
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 09  
MISSION AND TRAFFIC CONTROL SUBSYSTEM

	SUBC	TOTAL MATERIAL	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 66		52	11		-512	-16	-528
TOTAL	1505370	1603827	85538	9157	3715316	55450	3770766

WBS 1.10 FLIGHT INDICATION  
TOTAL COST



NORTH AMERICAN ROCKWELL CORP.  
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TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 10  
 FLIGHT INDICATION SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	SUBC
Q-1 59							311813
Q-2 59							
Q-3 59							311813
Q-4 59							
Q-1 60							843853
Q-2 60							
Q-3 60							744582
Q-4 60							
Q-1 61							620333
Q-2 61							
Q-3 61							265431
Q-4 61							
Q-1 62							
Q-2 62							
Q-3 62							
Q-4 62							
Q-1 63							
Q-2 63							
Q-3 63							
Q-4 63							
Q-1 64							
Q-2 64							
Q-3 64							
TOTAL							3097830

NORTH AMERICAN ROCKWELL CORP.  
 SPACE DIVISION  
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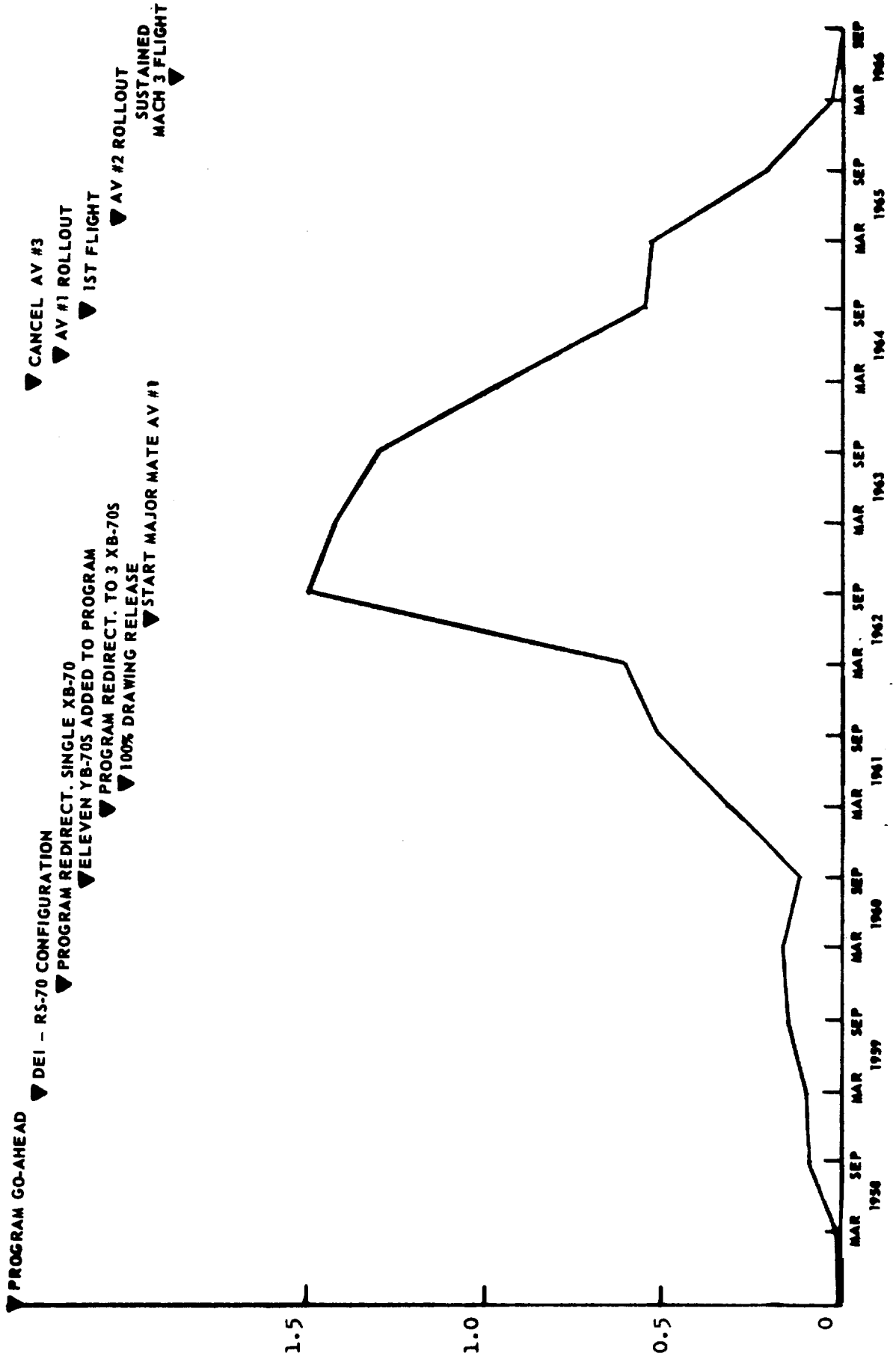
APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 10  
 FLIGHT INDICATION SUBSYSTEM

	MPC	SUR TOTAL	G & A	TOTAL COST
Q-1 59	8267	320080		320080
Q-2 59				
Q-3 59	8519	320332		320332
Q-4 59				
Q-1 60	50065	893923	21686	915609
Q-2 60				
Q-3 60	44177	788759	19712	808471
Q-4 60				
Q-1 61	17772	638105	11857	649962
Q-2 61				
Q-3 61	7603	273034	5074	278108
Q-4 61				
Q-1 62				
Q-2 62				
Q-3 62				
Q-4 62				
Q-1 63				
Q-2 63				
Q-3 63				
Q-4 63				
Q-1 64				
Q-2 64				
Q-3 64				
TOTAL	136403	3234233	58329	3292562

WBS 1.11 TEST INSTRUMENTATION  
TOTAL COST



NORTH AMERICAN ROCKWELL CORP.  
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APRIL 1972

TIME PHASED EXPEND.  
 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 11  
 TEST INSTRUMENTATION SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58	15.0	2536	4.573	11597	11539	23136	
Q-2 58							
Q-3 58	58.5	9936	4.289	42616	38702	81318	
Q-4 58							
Q-1 59	66.0	11299	4.237	47870	38638	86508	
Q-2 59							
Q-3 59	106.5	18638	4.266	79515	68101	147616	
Q-4 59							
Q-1 60	96.0	16520	5.306	87655	71524	159179	
Q-2 60							
Q-3 60	73.5	12321	5.246	64632	51196	115828	78
Q-4 60							
Q-1 61	229.5	39080	4.545	177622	130279	307901	2183
Q-2 61							
Q-3 61	289.5	52609	4.756	250193	227760	477953	20011
Q-4 61							
Q-1 62	615.5	105067	4.300	451789	445578	897367	82401
Q-2 62							
Q-3 62	793.5	133287	4.291	571893	622736	1194629	240842
Q-4 62							
Q-1 63	810.0	138016	4.541	626715	674455	1301170	83074
Q-2 63							
Q-3 63	649.5	109071	4.284	467256	638742	1105998	51086
Q-4 63							
Q-1 64	651.0	111288	3.789	421621	475575	897196	76773
Q-2 64							
Q-3 64	198.0	35030	5.923	207494	242620	450114	70007
Q-4 64							
Q-1 65	268.0	46155	4.233	195366	241992	437358	70263
Q-2 65							
Q-3 65	118.5	20117	4.317	86855	89234	176089	28780
Q-4 65							

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4-SYSTEM 1  
5-SUBSYSTEM 11  
TEST INSTRUMENTATION SUBSYSTEM

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66	6.0	1083	3.328	3604	14481	18085	19427
Q-2 66							
Q-3 66		43	4.837	208	199	407	2758
TOTAL	5044.5	862096		3794501	4083351	7877852	747683



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4-SYSTEM 1  
 5-SUBSYSTEM 11  
 TEST INSTRUMENTATION SUBSYSTEM

	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 58			23136		23136
Q-2 58					
Q-3 58			81318		81318
Q-4 58					
Q-1 59			86508		86508
Q-2 59					
Q-3 59			147616		147616
Q-4 59					
Q-1 60			159179	3033	162212
Q-2 60					
Q-3 60	10		115916	2208	118124
Q-4 60					
Q-1 61	184		310268	5766	316034
Q-2 61					
Q-3 61	1692	538	500194	9295	509489
Q-4 61					
Q-1 62	6532	616	986916	16565	1003481
Q-2 62					
Q-3 62	18978	132	1454581	24415	1478996
Q-4 62					
Q-1 63	8182	4269	1396695	23353	1420048
Q-2 63					
Q-3 63	5032	101571	1263687	21130	1284817
Q-4 63					
Q-1 64	8184	-51092	921061	19599	940660
Q-2 64					
Q-3 64	25469	2872	548462	11671	560133
Q-4 64					
Q-1 65	21010	25	528656	14105	542761
Q-2 65					
Q-3 65	5134	10	210013	5603	215616
Q-4 65					

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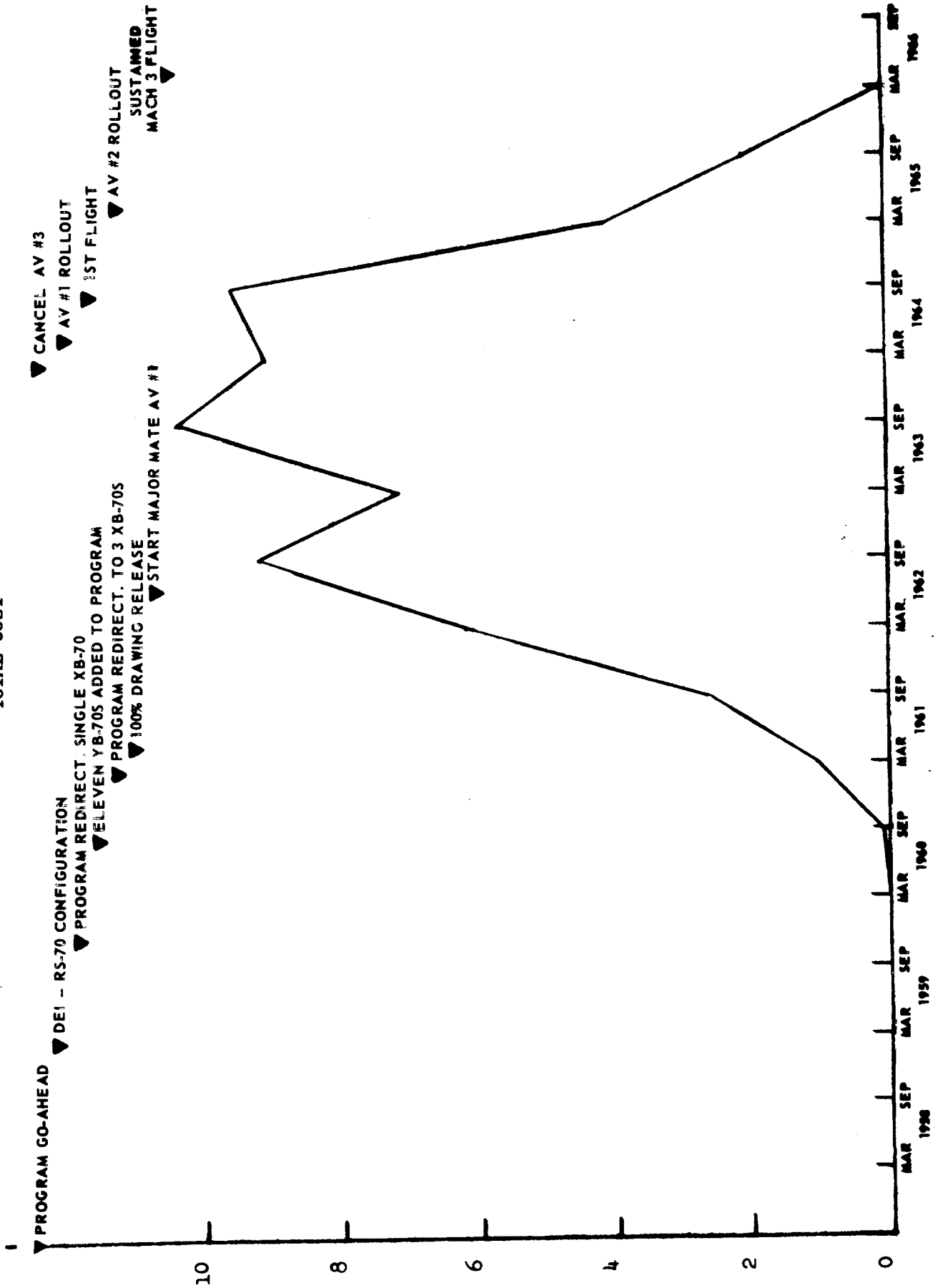
APRIL 1972

TIME PHASED EXPEND.  
B-70 AIRCRAFT STUDY

4-SYSTEM 1  
5-SUBSYSTEM 11  
TEST INSTRUMENTATION SUBSYSTEM

	MPC	OTHER COST	SUB TOTAL	G & A	TOTAL COST
Q-1 66	4029	1	41542	1251	42793
Q-2 66					
Q-3 66	169		3334	100	3434
TOTAL	104605	48942	8779082	158094	8937176

WBS 1.12 SUBSYST. INSTALL., C/O, & PREFLIGHT  
TOTAL COST



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 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 12  
 SUBSYSTEM INSTALLATION AND CHECKOUT

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 58		8	4.625	37	36	73	
Q-2 58							
Q-3 58							
Q-4 58							
Q-1 59	1.5	135	4.215	569	461	1030	
Q-2 59							
Q-3 59	13.5	2437	4.259	10379	8932	19311	
Q-4 59							
Q-1 60	10.5	1751	5.047	8838	3872	12710	
Q-2 60							
Q-3 60	165.0	27654	3.111	86038	1	86039	
Q-4 60							
Q-1 61	292.5	49321	3.032	151080	17096	168176	
Q-2 61							
Q-3 61	1321.5	239425	3.122	747468	687339	1434807	
Q-4 61							
Q-1 62	4377.0	747211	3.094	2312073	2549120	4861193	
Q-2 62							
Q-3 62	6253.5	1050539	3.204	3365511	3880771	7246282	
Q-4 62							
Q-1 63	4380.0	747519	3.317	2479762	2944580	5424342	
Q-2 63							
Q-3 63	5712.0	959815	3.197	3068177	4037059	7105236	
Q-4 63							
Q-1 64	3310.5	565054	3.722	2103323	3096128	5199451	
Q-2 64							
Q-3 64	5017.5	882956	3.306	3360311	4325359	7685670	
Q-4 64							
Q-1 65	2365.5	410233	3.655	1499284	1939630	3438914	
Q-2 65							
Q-3 65	928.5	155896	5.819	907084	739693	1646777	
Q-4 65							

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 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 12  
 SUBSYSTEM INSTALLATION AND CHECKOUT

	MAN- MONTHS	LABOR HOURS	LABOR RATE	LABOR DOLLARS	BURDEN DOLLARS	LABOR + BURDEN \$	ENGR MATL
Q-1 66		92	4.380	403	361	764	
Q-2 66							
Q-3 66							
TOTAL	34149.0	5840546		20100337	24230438	44330775	

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 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 12  
 SUBSYSTEM INSTALLATION AND CHECKOUT

	MFG MATL	TOTAL MATERIAL	MPC	SUB TOTAL	G & A	IDWA	TOTAL COST
Q-1 58				73			73
Q-2 58							
Q-3 58							
Q-4 58							
Q-1 59				1030			1030
Q-2 59							
Q-3 59				19311			19311
Q-4 59							
Q-1 60				12710	242		12952
Q-2 60							
Q-3 60				86039	2131	25832	114002
Q-4 60							
Q-1 61				168176	19146	862112	1049434
Q-2 61							
Q-3 61	314664	314664	26589	1776060	47176	762616	2585852
Q-4 61							
Q-1 62	1153769	1153769	90917	6105879	102487		6208366
Q-2 62							
Q-3 62	1653580	1653580	130302	9030164	151571		9181735
Q-4 62							
Q-1 63	1467317	1467317	144531	7036190	117645		7153835
Q-2 63							
Q-3 63	2217861	2217861	218459	9541556	169208	578537	10289301
Q-4 63							
Q-1 64	1286574	1286574	137149	6623174	189172	2267330	9079676
Q-2 64							
Q-3 64	1100129	1100129	400227	9186026	199305	180726	9566057
Q-4 64							
Q-1 65	409925	409925	122609	3971448	106052	3530	4081030
Q-2 65							
Q-3 65	269109	269109	48009	1963895	52531	5062	2021488
Q-4 65							

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 B-70 AIRCRAFT STUDY

4-SYSTEM 1  
 5-SUBSYSTEM 12  
 SUBSYSTEM INSTALLATION AND CHECKOUT

	MFG MATL	TOTAL MATERIAL	MPC	SUB TOTAL	G & A	IOWA	TOTAL COST
Q-1 66	5227	5227	1084	7075	213		7288
Q-2 66							
Q-3 66	-30023	-30023	-1846	-31869	-960		-32829
TOTAL	9848132	9848132	1318030	55496937	1155919	4685745	61338601

## IV-6 SUBCONTRACTOR COST SUMMARY

WBS	ITEM	ENGR	PROD	TOOLING	TEST	TOTAL
1.1	STRUCTURE	24,811,212	54,120,504	24,510,375	57,356	103,499,447
1.1.1	HORIZ. STAB.	2,203,729	3,784,068	4,153,083	-	10,140,880
1.1.2	WING	11,260,835	21,622,566	8,263,855	57,356	41,204,612
1.1.3	VERT STAB.	2,134,321	3,815,870	4,571,880	-	10,522,071
1.1.5	INTER FUS.	8,920,832	1,592,796	2,082,211	-	12,595,839
1.1.7	HONEYCOMB	291,495	23,305,204	5,439,346	-	29,036,045
1.2	ECLS	10,795,669	2,507,225	249,833	-	13,552,727
1.3	PROP	6,000,500	5,418,673	179,269	-	11,598,442
1.4	SEC PWR	5,829,793	22,969,171	206,408	-	29,005,372
1.5	AIR INDUCT	7,041,484	1,993,435	31,404	235,508	9,301,831
1.6	FLT CONTROL	2,188,837	4,768,647	467,552	-	7,425,036
1.7	PA & ESCAPE	186,772	848,947	58,354	59,258	1,153,331
1.8	ALIGHT & ARST	1,933,284	10,567,577	1,851,888	-	14,352,749
1.9	MISSION TRAF	996,565	126,449	-	382,356	1,505,370
1.10	FLT INDIC.	1,841,680	1,094,438	-	161,712	3,097,830
1.11	TEST INST	-	-	-	-	-
2.24	WEAPON SYST	36,323,328	85,854,040	12,758	-	122,190,126
	TOTAL	97,949,124	190,269,106	27,567,841	896,190	316,682,261



#### IV-7: Unit Cost Analysis

The Unit Cost of the B-70 Air Vehicle was developed from the actual production labor and material costs experienced on Vehicles 1, 2, and 3. It contains all production costs accumulated under the following WBS items:

- Subsystem Cost (1.1 through 1.11)
- Subsystem Installation, Checkout, and Preflight (1.12)
- Major Airframe Mating (3.0)

The Elements of Cost used to accumulate the total Production cost for each WBS item were:

- Production, Labor and Burden
- Shop Support, Labor and Burden
- Planning, Labor and Burden
- Quality Control, Labor and Burden
- Manufacturing Material
- Major Subcontract Cost
- Material Procurement Cost
- Other Production Cost
- IDWA
- General Administration

The initial Engineering, Tooling, Special Test Equipment, GSE, Spares, and Flight Operations cost such as training are not included.

As a result of the major differences in configuration between Air Vehicles 2 and 3, much of the new design effort associated with Air Vehicle 3 was still in process at the time of contract termination. Therefore, there was no appreciable Sustaining Engineering or Tooling effort.

Subsystem costs were allocated to Air Vehicles 1, 2, and 3 by use of in-house production labor hours for the Structures Subsystem, and Subcontractor cost data for the balance of the subsystems. An average unit cost method was used for those subsystems in which the subcontractor provided no unit cost data.

In-house Assembly, Installation, and Major Airframe Mating costs were allocated to Vehicles 1, 2, and 3 by use of the in-house production, assembly, and installation labor hours charged to each vehicle.

The production costs associated with those subsystems which were not used in the three B-70 Air Vehicles, such as the Boeing Wing, and the Hamilton Standard Air Induction Control Subsystems, were not included in the Vehicle Unit Costs.

Exhibit 2, page I-308, shows a summary of the actual unit cost of the three Air Vehicles, the number of equivalent units completed at contract termination, and the average unit cost of the three vehicles combined.

The number of equivalent subsystem units completed at the time of program termination was developed from the program closeout records.

An analysis of the Summary Data shows that the large improvement in the Structures cost for Air Vehicle 3 over Air Vehicle 2 was due primarily to the great strides made in honeycomb panel fabrication. For example, the production hours required to fabricate 5200 gross square feet of honeycomb panels for Air Vehicle 3, required less than 50 percent of the hours required for Air Vehicle 2:

Air Vehicle 1	259 hours per square foot
Air Vehicle 2	176.5 hours per square foot
Air Vehicle 3	84 hours per square foot

A quality control study also shows that Air Vehicle 3 had 12 percent of the rejection rate that Air Vehicle 2 had for the same section. An average unit cost was used for the ECS, Air Induction Control, and Test Instrumentation Subsystems, which were purchased for Air Vehicles 1 and 2 on the same contract, and the Personnel Accomodation and Escape, Alighting and Arresting, and Flight Indication Subsystems which were purchased for the three vehicles on the same contract. An analysis of the subcontract's cost shows that much of the material procurement and fabrication effort for the multiple unit orders were performed concurrently. Therefore, an average unit cost was computed for these subsystems by dividing the total production labor and material cost by the number of equivalent units completed. An analysis of the Flight Control Subsystem indicated that Air Vehicle 1 was charged with 92 percent of the total material cost for the three vehicles. Therefore, the subsystem unit cost for each of the three vehicles was adjusted to contain an equal amount of the total material cost based upon percent completion.

The Mission and Traffic Control Subsystem hardware was primarily Government Furnished Equipment and is therefore not included in the Vehicle Unit Cost.

The cost of Purchased Parts that could not be identified to a specific subsystem was included in WBS item 1.12, Subsystem Installation, Checkout, and Pre-Flight. The costs accumulated in this WBS item was allocated to Vehicles 1, 2, and 3 based upon the in-house production, assembly, and installation labor hours charged to each vehicle.

As a result of the major program changes, terminations and re-start cycles, which greatly affected the basic air vehicle configuration, quantities, test requirements, and program performance, the Average Vehicle Unit Cost

should be considered the more reliable data. It should also be noted that the total production quantity of 2.47 Air Vehicles identifies these units as major test vehicles rather than first production units.

The Budgetary and Planning Proposal generated in February 1959 for the production of 62 RS-70 Air Vehicles was analyzed in conjunction with the B-70 Cost Study to provide program growth visibility.

The first 12 of the 62 Air Vehicles were to be refurbished at a cost of \$4.8M after being used as flight test units.

Exhibit 3, page I-309, shows the cum average unit cost of the 62 vehicles as proposed. The vehicle costs shown do not include the Bomb/Nav or Defensive Subsystems. Initial Engineering, Tooling, and Special Test Equipment, as well as GSE are not included.

The results of the study shows an RS-70 First Unit Cost for the 62 vehicle proposal of \$157M, as compared with the B-70 Actual First Unit Cost of \$163M and an Average Unit Cost for the three Air Vehicles of \$123.8M.

In comparing the First Unit Costs of the RS-70 with the XB-70, it should be noted that the XB-70 includes the program inefficiencies, cost penalties resulting from program stop orders and redirections; while the cost of the RS-70, which was generated from the 62 vehicle proposal, does not include these costs.

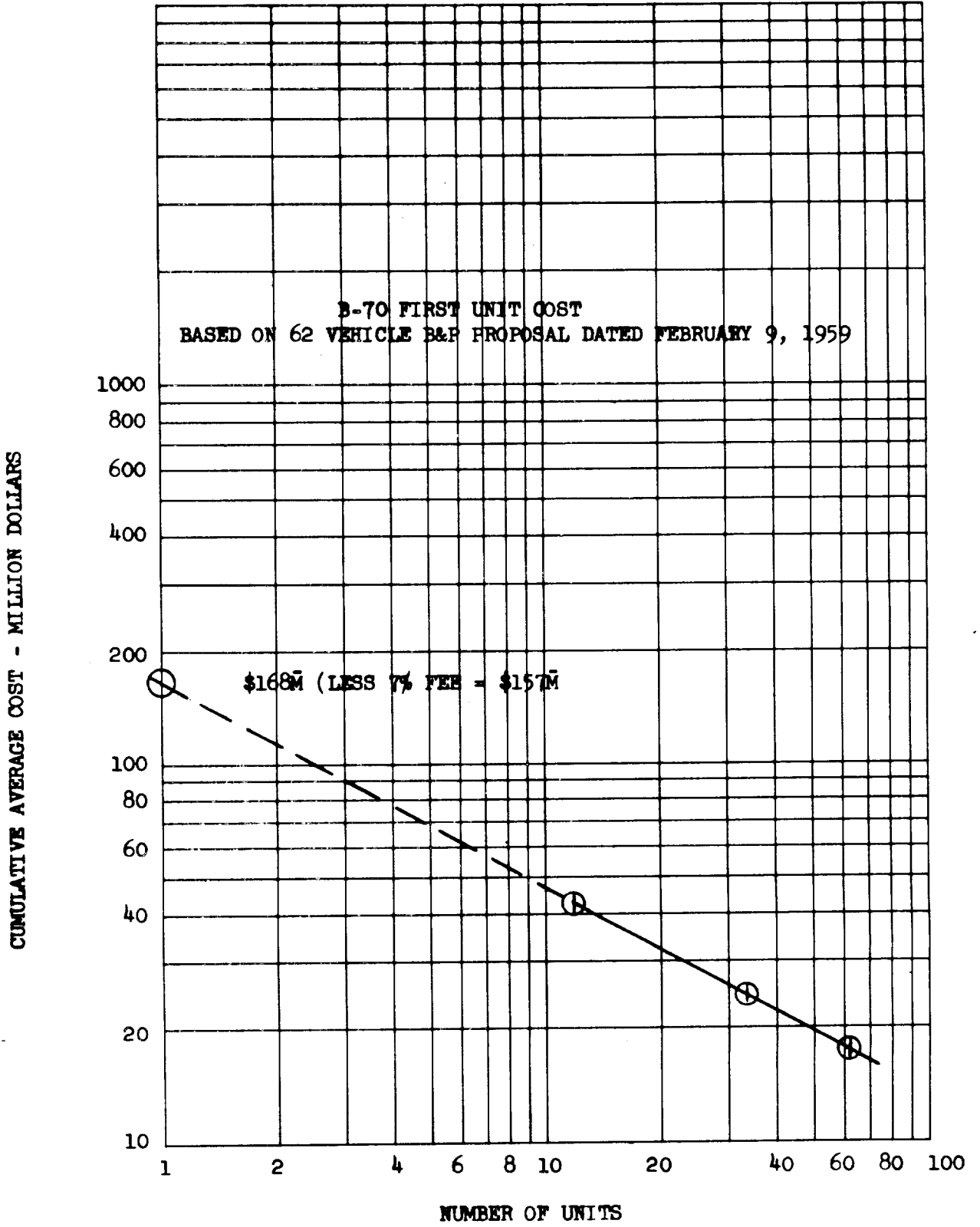
A technical analysis of the RS-70 and XB-70 was performed to develop the state-of-the-art comparison between the two vehicles, and the relative effort required to complete the XB-70 in relation to the RS-70. The results of this study shows that the RS-70, without the Bom/Nav, and Defensive Subsystems, would have required 1.78 times the effort required for the XB-70 program. The details of this study as well as an explanation of the application of the subsystem factors is contained in Volume I Section IV-8, page I-310.



B-70 AIR VEHICLE UNIT COST

NO.	WBS DESCRIPTION	FLIGHT UNITS COMPLETED	AIR VEHICLE COST				TOTAL	AVERAGE UNIT COST
			AV 1	AV 2	AV 3			
1.1	STRUCTURES	2.55	100,458,152	81,771,537	19,046,773		201,276,462	78,931,946
1.2	ECS	2.80	802,141	802,141	715,592		2,319,874	828,526
1.3	PROPULSION	2.71	2,523,197	1,863,270	910,841		5,297,308	1,954,726
1.4	SECONDARY POWER	2.73	9,531,632	7,174,762	5,237,992		21,944,386	8,038,230
1.5	AIR INDUCTION CONTROL	2.50	377,626	377,626	176,446		931,698	372,679
1.6	FLIGHT CONTROL	2.81	2,000,794	1,648,433	1,237,620		4,886,847	1,739,090
1.7	P/A & ESCAPE	3.00	722,637	722,637	722,636		2,167,910	722,637
1.8	ALIGNING & ARREST.	3.00	3,659,013	3,659,013	3,659,012		10,977,038	3,659,013
1.9	MISSION & TRAFFIC	3.00	-	-	-		-	-
1.10	FLIGHT INDICATION	3.00	380,778	380,778	380,778		1,142,334	380,778
1.11	TEST INSTRUMENTATION	2.60	404,192	404,192	242,515		1,050,899	404,192
1.12	ASSY, INST, & ACC. TEST	2.56	36,970,241	19,607,436	3,605,005		60,182,682	23,508,860
3.0	MAJOR AIRFRAME MATING	2.56	5,214,490	2,765,543	508,009		8,488,042	3,315,641
	AIR VEHICLE TOTAL	2.47	163,044,893	121,177,368	36,443,219		320,665,480	123,856,319

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#### Section IV-8: State-Of-The-Art and Percent Developed Summary

The state-of-the-art ratings and percent developed statuses for the air vehicle and each subsystem are presented by Exhibit 4, page I-311. Each of the subsystem values depicted by the summary table were brought forward from the Development Data Summary of that subsystem. The air vehicle values shown were derived by applying weight factors to each subsystem value to reflect the contributing scope of effort.

The state-of-the-art ratings assigned to each subsystem were established by comparing the B-70 configuration requirements to existing capabilities in January, 1958. All of the subsystem percentages were determined by comparing the XB-70 program level of effort achieved to that scheduled for the RS-70 program. For the "out-the-door" development stage, the status levels reflect air vehicle No. 1 installations, except for the Air Induction Subsystem (AIS) which compares the NR subsystem installed in air vehicle No. 2. As discussed in the AIS Development Data Summary, the AIS installed in air vehicle No. 2 was more representative of the XB-70 effort expended. There are no percentage values presented for Mission and Traffic Control since the XB-70 subsystem was essentially all GFP with the effort expended too insignificant to assess.

The "Program Confidence Level" percentages indicate the status level achieved for the configuration and the testing conducted on the configuration during the XB-70 program. The "Effort To Go" percentages indicate the effort remaining of the total required to attain a production level status at that specific development stage and includes both Engineering and Manufacturing requirements. The use of the "effort to go" percentages for cost determination should not be applied without consideration given to the following items:

- (1) All effort expended prior to 1960 was for the RS-70 program.
- (2) Essentially all expenditures associated with the YB-70 program (NA-274) were not in support of the XB-70 Development Program.
- (3) Essentially all expenditures associated with the design changes and modifications to XB-70 air vehicle No. 3 were not in support of the XB-70 Development Program.
- (4) The effort expended by several subcontractors was not 100 percent applicable to the XB-70 Development Program.
- (5) Air vehicle sharing should be considered in determining FIGSE and spares provisioning required to support a flight test program.

STATE-OF-THE-ART AND PERCENTAGE DEVELOPED SUMMARY  
 XB-70 PROGRAM COMPARED TO PRODUCTION STATUS

WBS CODE NO.	BASIC AIR VEHICLE AND SUBSYSTEMS	RS-70 STATE OF THE ART RATINGS	"OUT-THE-DOOR" TIME PERIOD						FLIGHT TEST PROGRAM	
			CONFIGURATION		GROUND TESTS		PROGRAM CONFIDENCE LEVEL ~ %	EFFORT TO GO PERCENT	PROGRAM CONFIDENCE LEVEL ~ %	EFFORT TO GO PERCENT
			PROGRAM CONFIDENCE LEVEL ~ %	EFFORT TO GO PERCENT	PROGRAM CONFIDENCE LEVEL ~ %	EFFORT TO GO PERCENT				
1.1	AIRFRAME STRUCTURES	5	80	44	80	44	28	89		
1.2	ENVIRONMENTAL CONTROL	4	40	82	72	53	15	90		
1.3	PROPULSION	5	70	56	80	44	20	93		
1.4	SECONDARY POWER	5	68	58	83	39	28	90		
1.5	AIR INDUCTION	4	80	44	76	49	29	89		
1.6	FLIGHT CONTROL	4	95	18	85	37	20	93		
1.7	PERS. ACCOM. AND ESCAPE	4	68	54	85	37	20	93		
1.8	ALIGHTING AND ARRESTING	5	95	18	90	29	32	87		
1.9	MISSION & TRAFFIC CONTROL	4	-	-	-	-	-	-		
1.10	FLIGHT INDICATIONS	3	95	18	66	60	28	90		
1.11	TEST INSTRUMENTATION	4	100	-0-	100	-0-	NA	NA		
1.0	AIR VEHICLE	4.8	78	44	81	42	24	90		

REMARKS:

1. State-of-the-art ratings were based on the B-70 configuration requirements in January 1958.
2. The "out-the-door" percentages compare the XB-70 No. 1 air vehicle to an RS-70 No. 1 air vehicle.
3. The Flight Test Program percentages compare the XB-70 test program to that scheduled for the RS-70.
4. Program Confidence Level indicates configuration status level at that development phase.
5. Effort To Go indicates required effort of total to attain production level status.
6. Air Vehicle numbers were determined by applying weight factors to subsystem values.
7. Mission and Traffic Control was essentially GFP on the XB-70 and was not assessed.

#### IV-9 Weight Summary

The B-70 Weight Summary table presented in this section essentially recaps the weight data included in the subsystem technical characteristics charts. The values displayed were calculated by the Engineering Weights group in direct support of the study and were derived from NR Weight Reports generated during the B-70 program. The weight summary table presents the detail weights of the B-70 at three specific development stages: (1) The RS-70 in October 1959; (2) the XB-70 No. 1 in July 1964; and (3) the XB-70 No. 2 in June 1966. The weights shown for air vehicles No. 1 and No. 2 are based on weight reports generated subsequent to actual pre-flight weighings while the RS-70 values are based on an estimated weight report.

The values shown in the weight summary table were calculated essentially down to the major assembly level (level 6) of the WBS. However, it was necessary to deviate from the WBS in some areas due to the B-70 weight report formats having a different weight breakdown structure. An example of the weight breakdown structure used during the B-70 program is also presented in this section. The example presents the weights for air vehicle No. 2 in June 1966 and covers weight empty summary, flight test instrumentation, ballast installations, useful load, most forward CG loading, and most aft CG loading.



## B-70 WEIGHT SUMMARY TABLE

WBS Item	RS-70 Weights Lbs	XB-70 A/V #1 Weights Lbs	XB-70 A/V #2 Weights Lbs
1.0 Air Vehicle			
Design Gross Weight (Dry)	207,571	250,817	253,601
Design Gross Weight (Wet)	554,609	519,878	542,029
Maximum Taxi Weight	562,609	542,029	542,029
Maximum Landing Weight	282,661	296,292	296,292
Payload	10,000	-0-	-0-
1.1 Airframe Structure Total	(89,022)	(124,203)	(125,422)
1.1.1 Horiz. Stab. & Flaps	2,240	3,244	3,285
1.1.2 Wing	25,494	27,399	31,133
1.1.3 Vertical Stabilizer	2,250	3,965	3,965
1.1.4 Forward Fuselage (to FS 856)	7,490	9,143	9,186
1.1.5 Interm. Fuselage (FS 856-2029)	40,699	64,992	62,626
1.1.6 Aft Fuselage (FS 2029 Aft)	7,412	11,166	10,768
- Misc. Items, Doors, Paint & Fairing	2,109	1,927	2,087
- Engine Mounts & Fire Shroud	1,328	2,367	2,372
1.2 Environmental Control Total	(4,770)	(11,306)	(11,393)
1.2.1 Cabin Air Recirculation(Wet)	2,069	2,336	2,441
Fluid (Glycol)	13	-	-
Gas (Freon)	70	75	75
1.2.2 Water Supply System (Wet)		5,682	5,696
Water (Normal Cooling)	(1) 1,515	(1) 4,076	(1) 4,076
Water (Emerg. Cooling)		(1) 324	(1) 324
1.2.3 Ammonia Supply System (Wet)		930	924
Ammonia (Normal)		(1) 200	(1) 200
Ammonia (Emergency)		(1) 340	(1) 340
1.2.9 Remote Equip. Cooling (Wet)	611	1,190	1,178
Fluid (Glycol)	89	98	98
Anti-icing	575	1,168	1,154
1.3 Propulsion Total	(37,630)	(39,166)	(39,189)
1.3.1 Engines	30,018	31,041	31,098
1.3.2 Engine Installation	270	301	312
1.3.3 Engine Compart. Cooling	179	-	-

(1) Useful Load

WBS Item	RS-70 Weights Lbs	XB-70 A/V #1 Weights Lbs	XB-70 A/V #2 Weights Lbs
1.3 (Continued)			
- Drain & Vents	-	87	87
- Fuel Pressure & Inerting (Dry)	489	716	716
- Nitrogen IN <sub>2</sub> (G-Load)	(1) 730	(1) 700	(1) 700
1.3.5 Fuel System	3,854	4,434	4,303
Volume	51,797 gal	43,646 gal	45,971 gal
Type Fuel	JP-6	JP-6	JP-6
Weight	6.7 lb/gal	6.55 lb/gal	6.55 lb/gal
1.3.6 Engine Thrust Control	288	(2) 581	(2) 581
1.3.7 Engine Indicating System	1,111	795	863
- Starting Subsystem (HYDR)	397	309	324
1.3.8 Fire Protection	294	202	205
Fire Detection Subsystem	94	194	197
Fire Extinguishing - Wet	185	(3)	(3)
Fire Extinguishing-Portable	15	8	8
1.4 Secondary Power Supply Total	(12,132)	(11,273)	(12,594)
1.4.1 Hydraulic Power Supply	8,618	6,455	7,145
Fluid - Type		Fluid 70	Fluid 70
Capacity		190 gal	190 gal
1.4.2 Accessory Drive System	1,367	(4) 1,504	(4) 1,510
1.4.3 Emergency Starting(Cartridge)	152	-	-
1.4.4 Constant Speed Drive	-	242	372
Number		#2	#3
1.4.5 Electrical Power Supply	1,995	3,072	3,567

- (1) Useful Load
- (2) Including Windmilling Brake
- (3) Flight Test Equipment (903 AV #1 - 904 AV #2)
- (4) Including Lube & Nitrogen System
- (5) Design Mission

WBS Item	RS-70 Weights Lbs	XB-70 A/V #1 Weights Lbs	XB-70 A/V #2 Weights Lbs
1.5 Air Induction Total	( 7,638)	(16,185)	(15,686)
1.5.1 Inlet Subsystem Engines Per Inlet	5,486 Three	3,372 Three	3,462 Three
1.5.2 By-Pass Section	1,648	3,055	3,124
1.5.3 Air Induction Control Subsystem	-	1,411	915
1.5.4 Controls & Displays	-	3,709	3,471
1.5.5 Boundary Layer Control	504	700	709
- Cooling & Control Package	-	3,938	3,971
- Cooling Nitrogen U.L.			(5) 1,050
- Fod Screens			34
1.6 Flight Control Total	( 7,751)	( 7,610)	( 7,705)
1.6.1 Primary Flight Controls	4,236	4,433	4,502
1.6.2 Secondary Flight Controls	3,145	2,818	2,842
1.6.3 Flight Augment. Control Subsystem (FACS)	370	359	361
1.7 Personnel Accom. & Escape Total	( 3,267)	( 1,830)	( 1,857)
1.7.1 Personnel Equip.	2,281	1,256	1,256
1.7.2 Liquid Oxygen Subsystem	136	110	109
1.7.3 Crew Station Accom.	850	464	492
1.8 Alighting & Arresting Total	(17,008)	(19,772)	(20,173)
1.8.1 Main Landing Gear	13,049	14,209	14,649
1.8.2 Nose Gear	1,794	1,978	1,988
1.8.3 Drag Chute Subsystem	450	516	512
1.8.4 Controls & Displays	1,715	2,769	3,024
1.9 Mission & Traffic Control Total	( 1,310)	( 1,096)	( 1,144)
1.9.1 Communication Equip.	632	304	352
1.9.2 Navigational Aids Equip.	146	308	309
1.9.3.2 IFF	308	100	100
1.9.4 Portable Tape Recorder	49	-	-
- Integrated Power Supply	65	-	-
- Racks & Supports	110	384	383

(5) Weight not included in Subsystem Wt. - Unuseable Load

WBS Item	RS-70 Weights Lbs	XB-70 AV #1 Weights Lbs	XB-70 AV #2 Weights Lbs
1.10 Flight Indication Subsystem. Total	(10,615)	( 665)	( 661)
1.10.1 Auxiliary Gyro Platform	315	169	169
1.10.2 Flight Instruments	168	341	337
1.10.3 Control Air Data Subsystem.	543	155	155
- Offense Electronics	2,848	-	-
- Defense Electronics	6,216	-	-
- Weapon Platform & Releases	525	-	-
1.11 Test Equip. & Instrumentation Total	-	(16,263)	(18,369)
Weight Empty	-	3,900	3,900
Alternate Load	-	10,161	11,989
Struct. Mod. for SST Instrum.	-	-	(6) 511
Special Flt. Test Equip.	-	1,152	1,430
Cooling Nitrogen U.L.	-	1,050	1,050
Misc. Items	( 100)	(12,179)	(11,287)
Auxiliary Gear (Tiedown & Jack Ftgs.)	100	30	30
Miscellaneous Instruments	-	71	107
Ballast (Design)	-	10,000	9,072
Ballast (Alternate)	-	2,078	2,078
Cost Reduction		3,047	7,877
Repairs		14,717	7,000

(6) Weight of Structural Mod of SST not included in subsystem total.

NOTES: RS-70 Design Gross Weight (wet) reflects total vehicle weight including military subsystems and miscellaneous items.

AV #1 and #2 Gross Weights (wet) reflect flight test conditions. Subsystem weights (including fuel) total more than the Gross Weight (wet) because of fuel off-loading for the flight test program.

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**WEIGHT EMPTY SUMMARY**

I T E M	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<u>WING GROUP</u>					
Basic Structure	(28181)		(55101475)		(5636200)
Inner Panel	20093	1895	38076235	200	4018600
Folding Tip	8088	2105	17025240	200	1617600
Secondary Structure	1011	1984	2005824	200	202200
Elevons	1841	2246	4134886	200	358200
<b>TOTAL - WING GROUP</b>	<b>31033</b>		<b>61242185</b>		<b>6206600</b>
<u>TAIL GROUP</u>					
Basic Structure	(6347)		(9814777)		(1666486)
Horizontal Stabilizer	2588	581	1503628	275	711700
Vertical Stabilizer	3759	2211	8311149	254	754786
Secondary Structure	303	1670	506010	256	80598
Flaps	600	638	382800	275	165000
<b>TOTAL - TAIL GROUP</b>	<b>7250</b>		<b>10703587</b>		<b>1912084</b>
<u>BODY GROUP</u>					
Basic Structure	75365	1534	115609910	190	14319350
Secondary Structure	(1862)		(2068898)		(424641)
Windshield	638	394	251372	267	170346
Radome Fairing	420	264	110880	217	91140
Control Tunnel	303	1937	586911	221	66963
Aspirator	501	2235	1119735	192	96192
Doors & Operating Mechanism	(4152)		(6489535)		(656210)
Main Landing Gear	1105	1765	1950325	135	149175
Nose Landing Gear	281	1223	343663	106	29786
Bomb	907	1549	1404943	120	108840
Escape Hatches	609	515	313635	292	177828
Compartment	39	545	21255	251	9789
Entrance	60	479	28740	249	14940
Drag Chute	160	2075	332000	219	35040
Engine	991	2114	2094974	132	130812
Non Structural Panels	59	1977	116643	197	11623
Nose Ramp & Controls	397	329	130613	258	102426
Fairing & Fillets	1048	1823	1910504	177	185496
Miscellaneous	1019	1597	1627343	187	190553
<b>TOTAL - BODY GROUP</b>	<b>83902</b>		<b>127953446</b>		<b>15890299</b>

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I T E M	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b><u>ALIGHTING GEAR GROUP</u></b>					
Main Gear	(16565)		(27970859)		(1304785)
Running Gear	6274	1704	10690896	37	232138
Sensing Wheels	56	1700	95200	28	1568
Drag Braces	391	1718	671738	158	61778
Struts (Including Oil)	4695	1694	7953330	107	502365
Bogie Beam	2044	1704	3482976	37	75628
Fuselage Supports	802	1681	1348162	153	122706
Controls	2303	1619	3728557	134	308602
Nose Gear	(2610)		(2973834)		(230625)
Running Gear	797	1151	917347	37	29489
Strut (Including Oil)	865	1145	990425	88	76120
Drag Brace	150	1182	177300	114	17100
Fuselage Supports	174	1163	202362	154	26796
Controls	624	1100	686400	130	81120
<b>TOTAL - ALIGHTING GEAR GROUP</b>	<b>19175</b>		<b>30944693</b>		<b>1535410</b>
<b><u>SURFACE CONTROLS GROUP</u></b>					
Cockpit Controls	(157)		(61463)		(37277)
Control Sticks	123	393	48339	237	29151
Rudder Pedals	34	386	13124	239	8126
Flight Augmentation	(361)		(453524)		(82425)
Equipment	215	1302	279930	217	46655
Installation	146	1189	173594	245	35770
Elevon Controls	(2990)		(5702610)		(611895)
Mechanical	365	1247	455155	215	78475
Electrical	55	965	53075	214	11770
Hydraulic & Pneumatic	1910	2138	4083580	201	383910
Bob Weights & Bungees	80	748	59840	221	17680
Supports	580	1812	1050960	207	120060
Wing Fold Controls	2771	2087	5783077	200	554200
Horizontal Stabilizer Controls	440	566	249040	241	106040
Stabilizer Flap Controls	71	593	42103	281	10951
Vertical Stabilizer Controls	(895)		(1760779)		(183004)
Mechanical	152	1737	264024	207	31464
Trim	11	1901	20911	217	2387
Hydraulic	408	2164	882912	201	82008
Feel Bungees	7	1877	13139	218	1526
Supports	317	1829	579793	207	65619
<b>TOTAL - SURFACE CONTROLS GROUP</b>	<b>7685</b>		<b>14052596</b>		<b>1594792</b>

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ITEM	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b>ENGINE SECTION</b>					
Engine Mounts	392	2138	838096	156	61152
Engine Removal Rails	125	2151	268875	195	24375
Shrouds & Seals	1855	2151	3990105	168	311640
<b>TOTAL - ENGINE SECTION</b>	<b>2372</b>		<b>5097076</b>		<b>397167</b>
<b>TOTAL - STRUCTURAL GROUPS</b>	<b>151417</b>		<b>249993583</b>		<b>27536352</b>
<b>PROPULSION GROUP</b>					
Engine Installation	31099	2121	65960979	166	5162434
Accessory Gear Boxes & Drives	1660	2006	3329960	139	230740
Air Induction System	(16121)		(25074321)		(2712687)
Inlet Guide & Fairing	312	2034	634608	166	51792
By Pass & Controls	3124	1990	6216760	192	599808
Variable Geometry Inlet	7642	1342	10255564	165	1260930
Control Package	3941	1626	6408066	150	591150
Master Controls	889	1281	1138809	200	177800
FOD Screens	34	1428	48552	165	5610
Engine Drain, Vent & Cooling	179	2078	371962	143	25597
Fuel System	(4926)		(7863379)		(1002095)
Tank Sealant	807	1673	1350111	200	161400
Boost and Transfer Pumps	692	1770	1224840	168	116256
Filling System	280	1593	446040	200	56000
Distribution System	582	1906	1109292	145	84390
Transfer System	567	1733	982611	185	104895
Vent System	503	1883	947149	234	117702
Pressurization System	716	911	652276	284	203344
Drain System	109	1712	186608	178	19402
Electrical Controls	414	1454	601956	199	82386
Cooling Loop	256	1416	362496	220	56320
Engine Controls	581	1514	879634	179	103999
Starting System	314	1702	534428	172	54008
<b>TOTAL - PROPULSION GROUP</b>	<b>54701</b>		<b>103642701</b>		<b>9265963</b>

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I T E M	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b><u>EQUIPMENT GROUPS</u></b>					
<b><u>Instruments</u></b>					
Flight	337	718	241966	231	77847
Engine	847	1311	1110417	209	177023
Miscellaneous	102	1445	147390	196	19992
<b>TOTAL - INSTRUMENTS</b>	<b>1286</b>		<b>1499773</b>		<b>274862</b>
<b><u>Hydraulic Group</u></b>					
Utility	2881	1837	5292397	161	463841
Primary	3799	1869	7100331	161	611639
<b>TOTAL - HYDRAULIC GROUP</b>	<b>6680</b>		<b>12392728</b>		<b>1075480</b>
<b><u>Electrical Group</u></b>					
AC-Power Supply	288	1583	455904	166	47808
Power Conversion	253	961	243133	208	52624
Distribution & Control	2178	1140	2482920	214	466092
Lights & Signal Devices	132	831	109692	217	28644
Supports	377	685	258245	238	89726
<b>TOTAL - ELECTRICAL GROUP</b>	<b>3228</b>		<b>3549894</b>		<b>684894</b>
<b><u>Electronics Group</u></b>					
UHF - AN/ARC-50	233	505	117665	238	55454
Intercom - AN/AIC-18	85	636	54060	205	17425
IFF - AN/APX-46	100	501	50100	239	23900
ILS - AN/ARN-58	105	519	54495	243	25515
TACAN - AN/ARN-65	172	520	89440	251	43172
Air Data System	155	628	97340	223	34565
Auxiliary Gyro Reference System	169	649	109681	229	38701
Flight Director Computer	32	540	17280	219	7008
Equipment Racks	383	524	200692	254	97282
<b>TOTAL - ELECTRONICS GROUP</b>	<b>1434</b>		<b>790753</b>		<b>343022</b>
<b><u>Furnishings &amp; Equipment Group</u></b>					
Accommodations for Personnel	1365	438	597870	252	343980
Miscellaneous Equipment	96	398	38208	246	23616
Furnishings	369	410	151290	249	91881
Emergency Equipment	227	1397	317119	198	44946
<b>TOTAL - FURNISHINGS &amp; EQUIPMENT GROUP</b>	<b>2057</b>		<b>1104487</b>		<b>504423</b>



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ITEM	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b><u>EQUIPMENT GROUPS (CONT'D)</u></b>					
<b><u>Air Conditioning &amp; Anti-Icing</u></b>					
Recirculation Flood Flow	(2045)		(1425252)		(528075)
Heat Exchangers	228	789	179892	249	56772
Pumps, Blowers & Ejectors	131	734	96154	281	36811
Tank & Supports	53	775	41075	270	14310
Scoops, Ducts, Insulation & Supports	956	706	674936	264	252384
Controls	179	673	120467	258	46182
Pressure Sealing	85	552	46920	250	21250
Defogging	29	400	11600	230	6670
Low Temp. Evaporation	384	662	254208	244	93696
Freon System	(690)		(613461)		(172625)
Equipment & Supports	559	877	490243	251	140309
Plumbing	69	836	57684	250	17250
Controls	62	1057	65534	243	15066
Glycol System	(1178)		(2028347)		(192963)
Waterwall & Supports	874	1701	1486674	156	136344
Drag Chute Compt. Insulation	53	2075	109975	211	11183
Equipment, Fluid Etc.	224	1751	392224	185	41440
Controls	27	1462	39474	148	3996
Water Cooling System	(1296)		(977336)		(315707)
Tanks & Supports	1105	725	801125	245	270725
Lines, Insulation & Supports	144	974	140256	236	33984
Pump & Controls	47	765	35955	234	10998
Engine Air Extraction	(1154)		(1289683)		(264662)
Ducting & Supports	1055	1112	1173160	229	241595
Controls	99	1177	116523	233	23067
<b>TOTAL - AIR CONDITIONING &amp; ANTI-ICING</b>	<b>6363</b>		<b>6334079</b>		<b>1474032</b>
<b><u>Auxiliary Gear Group</u></b>					
Handling Gear	30	1617	48510	168	5040
Deceleration Chute & Controls	413	2081	859453	214	88382
<b>TOTAL - AUXILIARY GEAR GROUP</b>	<b>443</b>		<b>907963</b>		<b>93422</b>
<b>TOTAL - EQUIPMENT GROUPS</b>	<b>21491</b>		<b>26579677</b>		<b>4450135</b>

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DATE: <b>28 May 1965</b>	<b>WEIGHT EMPTY SUMMARY</b>	MODEL NO. <b>XB-70A</b>

I T E M	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<u>RECAPITULATION:</u>					
TOTAL - STRUCTURAL GROUPS	151417		249993583		27536352
TOTAL - PROPULSION GROUP	54701		103642701		9265963
TOTAL - EQUIPMENT GROUPS	21491		26579677		4450135
FLIGHT TEST INSTR. (Wt. Empty)	3900		6197100		772200
UNACCOUNTABLE	- 633		- 709505	181	- 114573
<b>TOTAL - WEIGHT EMPTY</b>	<b>230876</b>	<b>1670.6</b>	<b>385703556</b>	<b>181.5</b>	<b>41910077</b>

Horizontal CG =  $\frac{1670.6 - 1386}{942} = 30.2\% \text{ MAC}$

Vertical CG =  $200.0 - 181.5 = 18.5 \text{ Inches Below FRL}$

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DATE: <b>28 May 1965</b>	<b>FLIGHT TEST INSTRUMENTATION</b>	MODEL NO. <b>XB-70A</b>

I T E M	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b><u>FLIGHT TEST INSTRUMENTATION</u></b>					
Fire Extinguisher Installation	904	1903	1720312	154	139216
Capsule Recovery Beacon Instl.	19	428	8132	240	4560
Capsule Emergency Chute Release	14	444	6216	272	3808
Crew Suit Cooling Instl.	194	458	88852	249	48306
Electrical Control Package	5812	1451	8433212	145	842740
Package Support & Wire Ladder	663	1461	968643	176	116688
Recording Equipment	300	469	140700	240	72000
Miscellaneous Parameters	8389	1566	13137174	212	1778468
Ldg. Gear Bogie Wear Plates	266	1704	453264	26	6916
SST Instrumentation	616	1428	879648	204	125664
Structural Modification	511	1883	962213	195	99645
<b>TOTAL FLIGHT TEST INSTRUMENTATION - FLIGHT TEST EMPTY WEIGHT</b>	<b>17688</b>		<b>26798366</b>		<b>3238011</b>
<b>Plus:</b> LN <sub>2</sub> for Cooling Flight Test Package	<b>+ 1050</b>	<b>1505</b>	<b>+1580250</b>	<b>145</b>	<b>+ 152250</b>
<b>TOTAL FLIGHT TEST INSTRUMENTATION</b>	<b>18738</b>		<b>28378616</b>		<b>3390261</b>
<b>Less:</b> *Instrumentation - Specification Weight Empty	<b>- 3900</b>	<b>1589</b>	<b>-6197100</b>	<b>198</b>	<b>- 772200</b>
<b>TOTAL INSTRUMENTATION - ALT LOAD</b>	<b>14838</b>		<b>22181516</b>		<b>2618061</b>

**\*NOTE:**  
3900 Pounds of instrumentation weight is included in the Model Specification Weight Empty. All instrumentation weight in excess of 3900 Pounds is treated as Alternate Load.

A detailed weight breakdown of Flight Test Instrumentation is shown on Page 37 of this report.

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CHECKED BY: <b>NEW</b>		REPORT NO. <b>NA-65-462</b>
DATE: <b>28 May 1965</b>	<b>BALLAST INSTALLATION</b>	MODEL NO. <b>XB-70A</b>

ITEM	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b><u>DESIGN BALLAST</u></b>					
<b><u>NOSE COMPARTMENT</u></b>	(1021)		(316510)		(231767)
Ballast					
Fwd Shelf	102	234	23868	226	23052
Center Shelf	293	312	91416	229	67097
Aft Shelf	308	340	104720	(227)	69946
Supports	318	(303)	96506	(225)	71672
<b><u>ELECTRONIC EQUIPMENT BAY</u></b>	(8979)		(6418706)		(2047139)
Ballast					
Walkway Step	204	623	127092	234	47736
Bay No. 1 (29)	565	655	370075	228	128820
Bay No. 2 (80)	1549	686	1062614	228	353172
Bay No. 3 (80)	1549	712	1102888	228	353172
Bay No. 4 (76)	1472	737	1084864	228	335616
Bay No. 5 (76)	1472	773	1137856	228	335616
Supports	2168	(707)	1533317	(227)	493007
<b>TOTAL - DESIGN BALLAST</b>	<b>10000</b>		<b>6735216</b>		<b>2278906</b>
<b><u>ALTERNATE BALLAST</u></b>					
<b><u>ELECTRONIC EQUIPMENT BAY</u></b>					
Fwd Ballast (22)	1094	627	685938	229	250526
Bay No. 1 (51)	984	655	644520	228	224352
<b>TOTAL - ALTERNATE BALLAST</b>	<b>∅ 2078</b>		<b>1330458</b>		<b>474878</b>
<b>TOTAL - BALLAST</b>	<b>12078</b>		<b>8065674</b>		<b>2753784</b>
<p>∅ NOTE: Installed as alternate load to facilitate early flights of the Air Vehicle</p>					

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DATE: <b>28 May 1965</b>		MODEL NO. <b>XB-70A</b>

ITEM	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b>USEFUL LOAD</b>					
<b>NON-EXPENDABLE ITEMS</b>					
Crew					
Pilot	215	416	89440	250	53750
Co-Pilot	215	416	89440	250	53750
Survival Gear	62	424	26288	244	15128
Unusable Fuel	2701	1695	4578195	180	486180
Unusable Engine Fluids	432	2067	892944	181	78192
Ballast and Supports	(10000)		(6735216)		(2278906)
Nose Section	1021	310	316510	227	231767
Electronic Bay	8979	(715)	6418706	(228)	2047139
Nitrogen - Fuel Tank Inerting and Pressurizing	700	874	611800	267	186900
<b>TOTAL NON-EXPENDABLE ITEMS</b>	<b>14325</b>		<b>13023323</b>		<b>3152806</b>
<b>EXPENDABLE ITEMS</b>					
Fuel (44439 gal at 6.55 lb/gal)	(291074)		(467492889)		(58257705)
Tank No. 1 Fus 6862 $\emptyset$	44946	1010	45395460	244	10966824
Tank No. 2 Fus 3919 $\emptyset$	25669	1269	32573961	219	5621511
Tank No. 3 Fus 5349	35036	1529	53570044	221	7742956
Tank No. 4 Fus 4477 $\emptyset$	29322	1834	53776548	158	4632876
Tank No. 5 Fus 4858	31820	1902	60521640	152	4836640
Tank No. 6 Wing 11050	72378	1633	118193274	189	13679442
Tank No. 7 Wing 3450	22598	1894	42800612	202	4564796
Tank No. 8 Wing 4474	29305	2070	60661350	212	6212660
Engine Oil	264	2064	544896	177	46728
Nitrogen - AICS Cooling	550	1677	922350	146	80300
Normal Coolant					
Water	4076	729	2971404	246	1002696
Ammonia	200	679	135800	250	50000
Emergency Coolant					
Water	324	729	236196	246	79504
Ammonia	340	679	230860	250	85000
<b>TOTAL EXPENDABLE ITEMS</b>	<b>296828</b>		<b>472534395</b>		<b>59601933</b>
<b>TOTAL USEFUL LOAD</b>	<b>311153</b>		<b>485557718</b>		<b>62754739</b>

$\emptyset$  Tanks No. 1, 2 & 4 have been off-loaded. See Page 25 for total capacities.

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DATE: <b>28 May 1965</b>		MODEL NO. <b>XB-70A</b>

<b>TAKEOFF GROSS WEIGHT</b>
<b>MOST FORWARD CG</b>

I T E M	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b><u>TAKEOFF GROSS WEIGHT</u></b>					
Weight Empty	230876		385703556		41910077
Useful Load	311153		485557728		62754739
<b>TAKEOFF GROSS WEIGHT-GEAR DOWN</b>	<b>542029</b>	<b>1607.4</b>	<b>871261274</b>	<b>193.1</b>	<b>104664816</b>
<u>Horizontal CG</u> = $\frac{1607.4 - 1386}{942} = 23.5\% \text{ MAC}$					
<u>Vertical CG</u> = 200 - 193.1 = 6.9 Inches below FRP					
MOMENT CHANGE-GEAR DOWN TO UP	-		+ 798331		+1470756
<b>TAKEOFF GROSS WEIGHT-GEAR UP</b>	<b>542029</b>	<b>1608.9</b>	<b>872059605</b>	<b>195.8</b>	<b>106135572</b>
<u>Horizontal CG</u> = $\frac{1608.9 - 1386}{942} = 23.7\% \text{ MAC}$					
<u>Vertical CG</u> = 200 - 195.8 = 4.2 Inches below FRP					
<b><u>MOST FORWARD CG</u></b>					
Takeoff Gross Weight-Gear Down	542029		871261274		104664816
Partial Fuel at 6.55 lb/gal	(-213466)		(-355429008)		(-440217862)
Tank No. 6	- 72378	1633	-118193274	189	-13679442
Tank No. 4	- 29322	1834	- 53776548	158	- 4632876
Tank No. 2	- 25669	1269	- 32573961	219	- 5621511
Tank No. 5	- 31820	1902	- 60521640	152	- 4836640
Tank No. 7	- 22598	1894	- 42800612	202	- 4564796
Tank No. 8	- 14665	2075	- 30429875	199	- 2918335
Tank No. 1	- 17014	1007	- 17133098	233	- 3964262
Cooling Water	- 1590	729	- 1159110	246	- 391140
<b>*MOST FORWARD CG - GEAR DOWN</b>	<b>326973</b>	<b>1574.1</b>	<b>514673156</b>	<b>195.9</b>	<b>64055814</b>
<u>Horizontal CG</u> = $\frac{1574.1 - 1386}{942} = 20.0\% \text{ MAC}$					
<u>Vertical CG</u> = 200 - 195.9 = 4.1 Inches below FRP					
* The most forward CG condition corresponds to the point at the end of Sequence Number 18, shown on the Gross Weight vs CG Diagram on Page 59, plus the moment change from Landing Gear Up to Landing Gear Down.					

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DATE: <b>28 May 1965</b>		MODEL NO. <b>XB-70A</b>
<b>MOST AFT CG</b>		
<b>PREDICTED EMPTY WEIGHT-FIRST FLIGHT</b>		

ITEM	WEIGHT LBS.	HORIZONTAL C. G.		VERTICAL C. G.	
		ARM	MOMENT	ARM	MOMENT
<b><u>MOST AFT CG</u></b>					
Takeoff Gross Weight-Gear Down	542029		871261274		104664816
Less:					
All expendable Useful Load Items listed on Page 53	- 296828		-472531645		-59601933
<b>MOST AFT CG - GEAR DOWN</b>	<b>245201</b>	<b>1626.1</b>	<b>398729629</b>	<b>183.8</b>	<b>45062883</b>
<u>Horizontal CG = <math>\frac{1626.1 - 1386}{942} = 25.5\% \text{ MAC}</math></u>					
<u>Vertical CG = <math>200 - 183.8 = 16.2</math> Inches below FRP</u>					
<b><u>PREDICTED EMPTY WEIGHT - FIRST FLIGHT</u></b>					
Weight Empty - Gear Down	230876		385703556		41910077
Plus:					
Flight Test Instrumentation	7944		12121654		1617503
Flight Test Package (Includes Insulation & Support Arm)	5844		8479612		848308
Less:					
Insulation - Flight Test Pkg	- 317		- 462503		- 45965
Insulation - AICS Pkg	- 352		- 572000		- 50688
<b>EMPTY WEIGHT - FIRST FLIGHT</b>	<b>243995</b>		<b>405270319</b>		<b>44279235</b>

