NASA Technical Memorandum 85650

Contracts, Grants, and Funding Summary of Supersonic Cruise Research and Variable-Cycle Engine Technology Programs 1972–1982

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Contracts, Grants, and Funding Summary of Supersonic Cruise Research and Variable-Cycle Engine Technology Programs 1972–1982

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CONTENTS

TABLES

INTRODUCTION

The cancellation of the United States Supersonic Transport Program in March 1971 created a void in the potential number of U.S. aircraft which could be offered for both domestic and foreign airline use. This fact in itself was a driving reason to start follow-on studies to assure that an expanded supersonic transport (SST) technology base would be available to proceed with the development of an advanced supersonic transport at a future date. In addition, the follow-on programs capitalized on the government funding already invested in SST technology and the Industrial Research and Development (IRAD) funds expended by Boeing, kept the design teams active, and performed research on major unsolved technology problems.

The defunct U.S. SST program had its beginnings in research conducted in the laboratories of NACA/NASA. NASA configurations were part of the mix of options available to Boeing, and a NASA configuration (SCAT-15F) was the closest contender to the finally selected prototype design (Boeing 2707-300). However, technological problems existed which directly related to factors which terminated the SST program in 1971; for example, concern for engine noise levels; upper atmospheric pollution; flutter characteristics; requirement for stability augmentation systems not within the state of the art; sonic boom characteristics; and low range/payload characteristics due to excessive structural weight fraction, high specific fuel consumption, a marginal configuration concept with insufficient lift-drag ratio, and economics.

The Supersonic Cruise Research (SCR) Program was initiated in fiscal year 1973 by the National Aeronautics and Space Administration at the direct request of the Executive Office of the President and Congress following termination of the U.S. SST program. Originally, the program was entitled Advanced Supersonic Technology (AST); this was later changed to Supersonic Cruise Aircraft Research (SCAR) and, finally, to SCR.

The SCAR Program was a focused Research and Technology (R&T) effort. The overall objectives may be summarized as follows:

1. To provide an expanded technology base for future civil and military supersonic aircraft

2. To provide the data needed to assess environmental and economic impacts on the United States of present and future supersonic transport aircraft

3. To define the potential benefits and trade-offs of advancements in aerodynamic efficiency, materials and structures, propulsion systems, and stability and control methods applied to promising advanced supersonic cruise aircraft concepts

This program included System Studies (SS) and the following disciplines:

Propulsion (P)
Stratospheric emissions impact (SEI)
Materials and structures (M&S)
Aerodynamic performance (A)
Stability and control (S&C)

The SCR Program was managed by the Office of Aeronautics and Space Technology (OAST), Aeronautical Systems Division, with Langley Research Center designated as the lead center. The Advanced Supersonic Technology (AST) Office was established at Langley for technical management and coordination of the program. Ames Research Center, Lewis Research Center, Dryden Flight Research Center, and Jet Propulsion Laboratory, in addition to Langley Research Center, implemented the program through contracts with the aircraft industry, research grants to universities, and in-house experimental and analytical work.

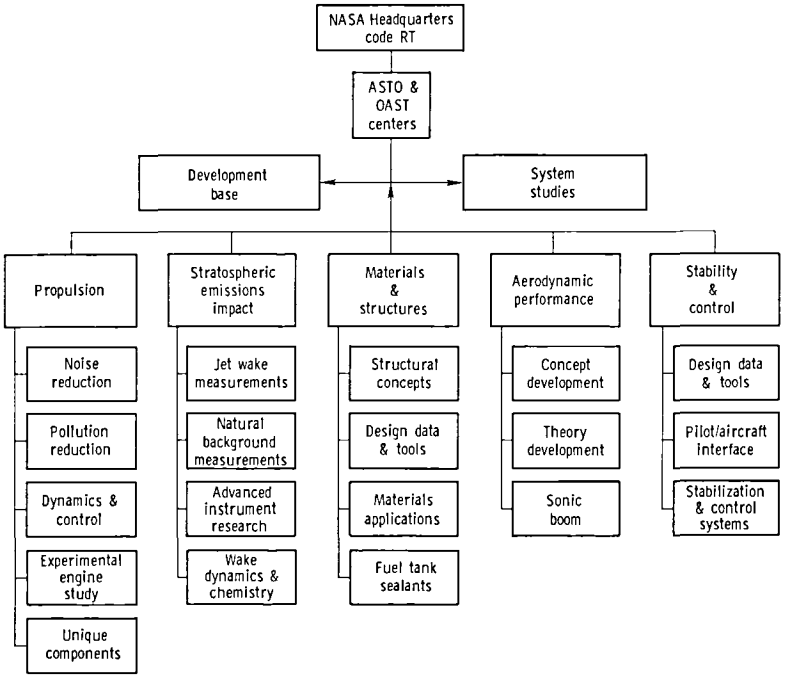
The NASA/Lewis Variable-Cycle Engine (VCE) Component Program was initiated in fiscal year 1976 to augment the overall SCR technology effort in the area of propulsion. Phase I provided for the initial development and evaluation of certain critical component technologies unique to VCE concepts for a supersonic cruise aircraft. VCE Phase II Technology Program was intended to build upon the results of the VCE Component Test Program and allow the evaluation of component/system performance and environmental characteristics of the General Electric Double-Bypass Engine (DBE), the Pratt & Whitney Variable-Stream Control Engine (VSCE), and the Turbine Bypass Engine (TBE). Phase II was restructured, beginning in mid fiscal year 1981, as the result of the elimination of funding for fiscal year 1982 and beyond. Large-scale test-bed engine activities were phased out and model nozzle testing and anlytical flow-field prediction code development were emphasized in the revised program. Work was completed with remaining fiscal year 1981 funds.

The YF-12 aircraft were utilized in the SCAR Program for demonstration of technological solutions to problems in high-temperature structures, control of engine performance, control for cruise Mach number, and control for altitude.

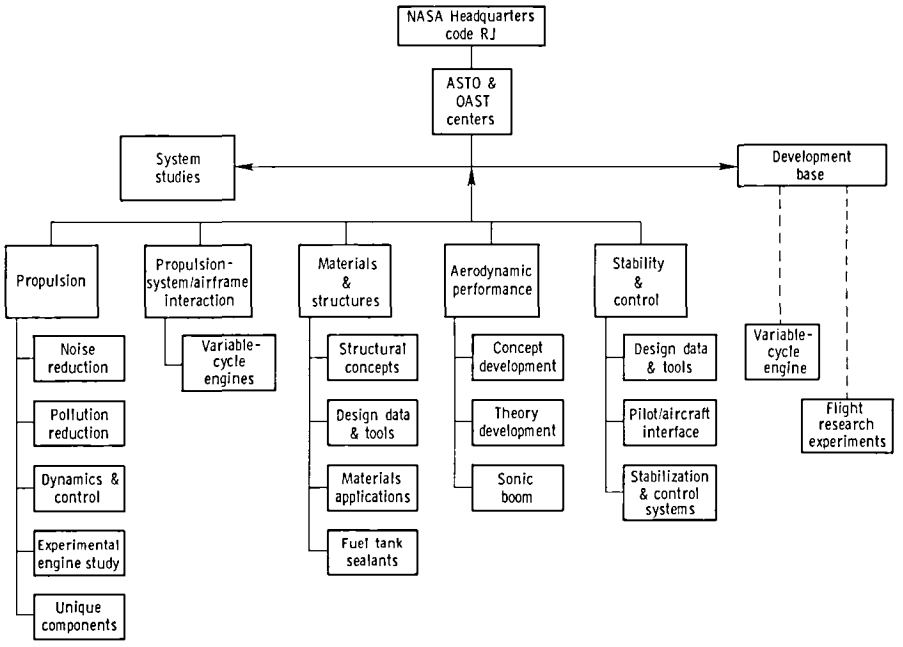
A block diagram showing the initial organization of SCR in fiscal year 1973 is shown in figure 1(a). As progress was made during the first 7 years, the program structure gradually changed to that shown in figure 1(b). The major disciplines (namely, propulsion, materials and structures, aerodynamic performance, and stability and control) plus system studies remained essentially the same. Stratospheric emissions impact was absorbed into propulsion, and a new discipline which addressed propulsion-system/airframe interaction was initiated in fiscal year 1978. The Variable-Cycle Engine Component Program and the flight research experiments shown in figure 1(b) are other OAST programs which provided technology data for the SCR development base. The relative level of effort expended for each discipline from fiscal year 1973 to fiscal year 1981 is presented in figure 2.

In order to keep the technical community informed of progress, two conferences were held and the proceedings published as NASA CP-001 (ref. 1), and NASA CP-2108 (ref. 2). The conference presentations only highlight the progress and one must turn to the more technical documents for details. All the NASA formal reports, articles, presentations, and contractor reports on record at the AST Office at mid-1980 are listed in two bibliographies, NASA RP-1003 (ref. 3) and NASA RP-1063 (ref. 4).

The purpose of this report is to document the contracts and grants of both programs in order to provide a subject and cost record which would be valuable in planning follow-on programs. This information may be used with the SCR Program bibliographies (refs. 3 and 4) to delineate the areas studied and the level of effort expended, to avoid duplicaton of effort, and to identify new technological areas for study. The funding data and money for awards have been rounded off and should be used only for technological planning.



(a) Fiscal year 1973.



(b) Fiscal year 1979.

Figure 1.- SCR Program structure.

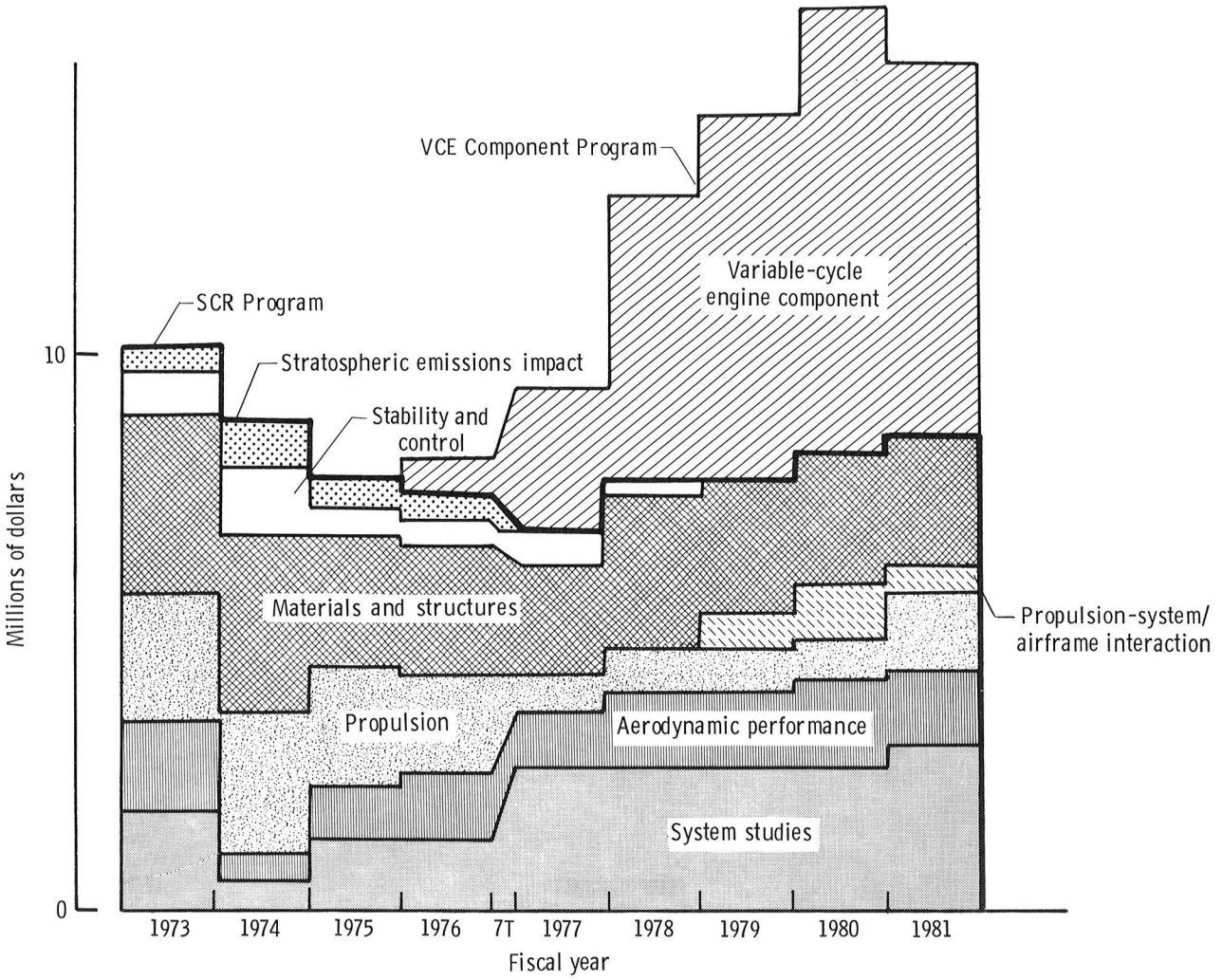


Figure 2.- Net R&D history for SCR and VCE Programs.

DISCUSSION

There were six major contractors[1] for SCR and VCE; namely, (1) Boeing Commercial Airplane Company, (2) McDonnell Douglas Corporation, (3) Lockheed-California Corporation, (4) Rockwell International for supersonic aircraft system studies, (5) General Electric Company Aircraft Engine Group, and (6) Pratt & Whitney Aircraft Group for engine studies. Kentron International, Inc. (Vought Corporation) provided engineering manpower support for in-house system studies for the lead center at Langley for the life of the program. The total number of contractors and grantees on record at the AST Office in 1982 was 101 for SCR and 4 for VCE.

Pages 7 to 48 of this document consist of a listing of all contracts and grants on record at the SCR Office (LaRC) at the end of 1982. The contracts and grants are

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[1]Over the history of the program, the names of some of the contractors may have changed. Contracts for a corporation having several subcompanies are all summarized under one name.

grouped together by fiscal year (FY) and a cost summary is given at the beginning of each FY tabulation. The data consist of NAS contract/grant number, name of contractor/grantee, a brief title, discipline, and the approximate amount for the contract. The cost or amount for each award was rounded off to the nearest $1000. In general, the awards were for 1 year and extensions or modificatons were made as new technologies were developed or identified for study.

The information given for each award serves as a key to the subject material which, in turn may be used with the SCR bibliographies (refs. 3 and 4) to identify the technical publications. The date and discipline of the contract/grant awards are similar to the date and discipline of the contractor reports in the references. For instance, the FY 1977 contract entitled "SCV Technology Assessment Study of an Over/Under Engine Concept," NAS1-14625 Lockheed-California, System Studies, produced a corresponding publication, report number 59, page 30 of reference 3, entitled "Supersonic Cruise Technology Assessment Study of an Over/Under Engine Concept," NASA CR-159003, 1978, Vols. I and II, Lockheed-California, contract NAS1-14625

The total amounts awarded to each contractor and grantee for all years of both programs are given in tables I and II. During approximately 9 years, the program year (PY) funding to support SCR Research and Development (net R&D), was about $73,227,000 (table III). The total amounts for contracts and grants were $63,174,000 and $3,015,000, respectively, out of a total program authority (506 W) of about $86,982,000. During approximately 6 years of funding, the amount of money spent on VCE Research and Development (table IV) was about $31,177,000. The total amounts for contracts and grants were $27,103,000 and $750,000, respectively, out of a total program authority (506 W) of about $31,730,000.

An important factor in the success of both programs was the support provided by company Industrial Research and Development (IRAD) funds, which was considerable in the major contracts and often matched or exceeded corresponding NASA SCR funds.

Table V summarizes the SCR net R&D for each discipline and for each program year. The costs for the first two disciplines, system studies and aerodynamic performance, are listed and then totaled. They were programed separately during the first several years and combined during the later program years. The propulsion and SEI subprograms are summed for convenience. The VCE support is the amount of this sum spent to support the VCE program. Funding for all of the disciplines is broken down by OAST center and program year in table VI. In general, Langley and Ames performed the aerodynamic efforts, Langley did the bulk of materials and structures, Lewis did virtually all of the Propulsion and engine technology efforts, Ames and Dryden performed the control system tasks, and the Jet Propulsion Laboratory conducted the stratospheric emissions impact studies.

The last funding breakdown is presented in table VII. Each page shows the Research and Technology Operating Plan (RTOP) number and title for each program year, OAST center, discipline, and net R&D amount. The large scope of this Supersonic Cruise Aircraft Research Program is evident, and it indicates the Herculean effort in planning, management, and research that was required in order to produce approximately 1000 technical publications consisting of NASA formal reports, NASA contractor reports, company reports, and articles.

CONCLUDING REMARKS

The Supersonic Cruise Research Program and Variable-Cycle Engine Technology Program were very successful in conducting advanced technology studies for future supersonic commercial and military jet transports. At the close of the program in 1982, the studies identified technologies for producing an efficient supersonic commercial jet transport which could transport 300 passengers nonstop from Los Angeles to Tokyo in about 4 hours. One major problem which has not been solved to date is "sonic boom." Future studies, however, should be conducted in order to optimize such aircraft and to develop transport airplanes for cruising at higher Mach numbers.

Funds expended by SCR between fiscal year 1973 and fiscal year 1981 on contracts and grants were $63,174,000 and $3,015,000, respectively. The SCR net R&D was $73,227,000 and total program authority (506 W) was $86,982,000. The corresponding level of effort for VCE was $27,103,000 for contracts and $750,000 for grants, out of a net R&D of $31,177,000 (506 W was $31,730,000).

The total number of contractors and grantees on record at the AST Office in 1982 was 101 for SCR and 4 for VCE.

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June 15, 1983

REFERENCES

1. Proceedings of the SCAR Conference - Parts 1 and 2. NASA CP-001, [1977].

2. Supersonic Cruise Research '79. NASA CP-2108, 1980.

3. Hoffman, Sherwood: Bibliography of Supersonic Cruise Aircraft Research (SCAR) Program From 1972 to Mid-1977. NASA RP-1003, 1977.

4. Hoffman, Sherwood: Bibliography of Supersonic Cruise Research (SCR) Program From 1977 to Mid-1980. NASA RP-1063, 1980.

SUPERSONIC CRUISE RESEARCH
AND
VARIABLE-CYCLE ENGINE TECHNOLOGY PROGRAMS

1972 to 1982

SUPERSONIC CRUISE RESEARCH - FY 1973

Cost Summary (in Thousands of Dollars)

RTOP	(a)
PY	74
Contracts:	Cost
Langley (NAS1-)	5 224
Ames (NAS2-)	880
Lewis (NAS3-)	2 059
Dryden (NAS4-)	0
JPL (NAS7-)	85
Johnson (NAS9-)	18
Suballotments	1 042
Subtotal	9 308
Grants	284
Total	9 592
Net R&D	10 310

[a]501-06, 08, 24, 31, and 32; 760-65.

ADVANCED SUPERSONIC TECHNOLOGY PROGRAM

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-10900	Ling-Temco-Vought	Nonpersonal Services Support	A, SS	274
NAS1-10992	Boeing	Analysis of the Jackass Flats Sonic Boom Flight Test Data	A	37
NAS1-11085	Microcraft, Inc.	Pressure Distribution and Propulsion Integration Model	A	166
NAS1-11820	Lockheed-California	Continuation of Real-Time Fatigue Testing (Extension)	M&S	41
NAS1-11847	Dynamic Engineering and Model Co.	Wind-Tunnel Models	A	368
NAS1-11877	Boeing	Low Sonic Boom SST Feasibility Study	A	65
NAS1-11938	Boeing	Study of Impact of Advanced Technologies Applied to Supersonic Transport Aircraft	SS	459
NAS1-11939	McDonnell Douglas	Study of Impact of Advanced Technologies Applied to Supersonic Transport Aircraft	SS	399
NAS1-11940	Lockheed-California	Study of Impact of Advanced Technologies Applied to Supersonic Transport Aircraft	SS	376
NAS1-11997	Boeing	Support of Flutter Model Tests at ONERA	M&S	86
NAS1-12020	Boeing	Study of Unsteady Aerodynamics Caused by Motions of Control Surfaces in Subsonic Flow	M&S	39
NAS1-12052	Boeing	Development of Extended Supersonic Aerodynamic Analysis System	A	94
NAS1-12079	General Electric	Improved Resins for AST Composites	M&S	100
NAS1-12121	Lockheed-California	Flutter Modules Applicable to Automated Structural Design	M&S	174
NAS1-12159	Arthur D. Little Co.	Tunable Diode Laser System	SEI	20
NAS1-12185	Boeing	Analytical Study for Predicting Wing Aerodynamic Loads of Supersonic Aircraft	M&S	70
NAS1-12245	Rockwell International	Study of Integrated Variable-Cycle Propulsion Concept in an Advanced Supersonic Transport	P	137
NAS1-12287	Boeing	Study of Structural Design Concepts for an Arrow-Wing Supersonic Transport Configuration	M&S	518

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-12288	Lockheed-California	Study of Structural Design Concepts for an Arrow-Wing Supersonic Transport Configuration	M&S	476
NAS1-12308	General Dynamics	Study of Time-Temperature-Stress Capabilities of Composite Materials	M&S	530
NAS1-12436	McDonnell Douglas	Storage Computer Study	M&S	50
NAS1-12501	Boeing	Acceleration of Fatigue Test Methods	M&S	207
NAS1-12875	Boeing	Transonic Loads Measurement and Prediction	M&S	137
NAS1-12900	Analytical Methods, Inc.	Aerodynamic Characteristics of Configurations Based on Local Mach Number Distribution	A	72
NAS1-12911	Boeing	Extension of the ATLAS Integrated Analysis and Design System	M&S	5
NAS1-12984	Lockheed-Georgia	Design, Fabrication, and Test of a Three-Dimensional Oscillating Pressure Wind-Tunnel Model	M&S	213
NAS1-13105	Rockwell International	Effects of Engine Size on the Drag of Supersonic Cruise Aircraft	A	70
NAS1-13145	McDonnell Douglas	Effect of Nominal Cabin Floor Angle on the L/D of a Typical SST Configuration	A	35
NAS1-13500	Ling-Temco-Vought	Nonpersonal Services Support	M&S	6
NAS2-5006	Boeing	Development of Computer Programs for Predicting Stability Characteristics of Elastic Aircraft	A	41
NAS2-5587	Applied Space Products	Support Services	A	17
NAS2-6006	LFE Corp.	Support Services	A	33
NAS2-6015	Univ. of Michigan	Infrared Atmospheric Model	SEI	6
NAS2-6947	Northrop	Support Services	A	44
NAS2-6969	Boeing	Noise Source and Footprint Program	A	21
NAS2-7112	Whittaker Corp.	Characterization of Polybenzimidole Composite Foams	M&S	18
NAS2-7331	Peninsula Chemical Corp.	Synthesis of Perfluorinated Polyethers for Sealant Applications	M&S	51

ADVANCED SUPERSONIC TECHNOLOGY PROGRAM - Continued

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS2-7332	Lockheed-California	Advanced LH_2 Supersonic Technology	A	107
NAS2-7341	Boeing	Design, Fabrication, and Operation of a Fuel Tank Sealant Exposure Apparatus	M&S	48
NAS2-7457	General Electric	Advanced Supersonic Technology Propulsion Noise Research	A	69
NAS2-7555	Mayer A. and Associates	Study of Propagation of Sound Around Barriers	A	28
NAS2-7571	Acurex Corp.	Potential Flow Program	A	58
NAS2-7653	Boeing	Redundant Actuator Development Study	S&C	24
NAS2-7729	Boeing	Development of Polyphenylquinoxaline Graphite Composites	M&S	89
NAS2-7981	Ultra Systems	Crosslinking and Degradation Mechanisms in Model Sealant Candidates	M&S	29
NAS2-8103	Stanford Research	Synthesis of Heterocyclic-Block Perfluorinated Polyethers	M&S	16
NAS2-8119	Lockheed Research	U-2 Pump System	A	20
NAS3-16799	Boeing	Development of Polyphenylquinoxaline Graphite Composites	M&S	89
NAS3-16829	Pratt & Whitney	Experimental Clean Combustor Program (Addition)	P	288
NAS1-16830	General Electric	Experimental Clean Combustor Program (Addition)	P	205
NAS3-16948	Pratt & Whitney	Advanced Supersonic Propulsion System Study	P	451
NAS3-16950	General Electric	Advanced Supersonic Propulsion System Study	P	500
NAS3-17216	Pan American World Airways	Airline Appraisal of Advanced Supersonic Technology Engines	P	28
NAS3-17559	Advanced Technology Lab.	Study of Unconventional Variable-Cycle Engine With a Supersonic Inflow Fan	P	97
NAS3-17770	TRW, Inc.	Development of Autoclavable Polyimides	M&S	98
NAS3-17866	Pratt & Whitney	Coannular Jet Noise	P	207
NAS3-18008	General Electric	Coannular Jet Noise	P	96
NAS7-100	Jet Propulsion Lab.	Prediction of Service Life of Sealant Materials	M&S	85

ADVANCED SUPERSONIC TECHNOLOGY PROGRAM - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS9-12087	National Academy of Sciences	National Research Fellowship	P	18
Suballotments:				
A-81652A	Dept. of Transportation	U2/YF-12 Wake Experiments	SEI	11
A-82433A	B&K Instruments	Microphones for Noise Measurement	A	15
A-89535A	Ampex Corp.	Tape Recorders	A	15
E-43149	USAF Logistics Command	YF-12 Services - Structural Test Panels	M&S	425
E-43149	USAF Logistics Command	YF-12 Services - Cooperative Control System	S&C	275
E-43149	USAF Logistics Command	YF-12 Services - Inlet Stability System	S&C	283
L-75054	Atomic Energy Commission	Bren Tower Testing Support	P	18
Grants:				
NGL-31-001-119	Princeton Univ.	Theoretical Problems Connected With Sonic Booms	A	15
NGL-33-016-119	New York Univ.	Sonic Boom Research	A	65
NGR-22-009-378	MIT	Air Pollution From Aircraft	SEI	114
NGR-39-011-161	Univ. of Pittsburg	Basic Chemistry of Aircraft Pollutants	SEI	40
NGR-52-012-008	Technion	Automated Wing Structure Design	M&S	10
NGR-52-134-005	York Univ.	Studies of Production Reaction Processes of Oxides of Interest in the Earth's Atmosphere	SEI	40

SUPERSONIC CRUISE RESEARCH - FY 1974

Cost Summary (in Thousands of Dollars)

RTOP	743
PY	74
Contracts:	Cost
Langley (NAS1-)	2731
Ames (NAS2-)	836
Lewis (NAS3-)	2218
Dryden (NAS4-)	0
Suballotments	1435
Subtotal	7220
Grants	349
Total	7569
Net R&D	8400

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-10900	Ling-Temco-Vought	Nonpersonal Services Support	A, SS	388
NAS1-11847	Dynamic Engineering and Model Co.	Fabrication of Dynamic Models	M&S	79
NAS1-11938	Boeing	Study of Impact of Advanced Technologies Applied to Supersonic Transport Aircraft (Extension)	SS	10
NAS1-11940	Lockheed-California	Study of Impact of Advanced Technologies Applied to Supersonic Transport Aircraft (Extension)	SS	274
NAS1-12052	Boeing	Development of Extended Supersonic Aerodynamic Analysis System (Extension)	SS	8
NAS1-12079	General Electric	Improved Resins for AST Composites (Extension)	M&S	220
NAS1-12121	Lockheed-California	Flutter Modules Applicable to Automated Structural Design (Extension)	M&S	65
NAS1-12287	Boeing	Study of Structural Design Concepts for an Arrow-Wing Supersonic Transport Configuration (Extension)	M&S	362
NAS1-12501	Boeing	Acceleration of Fatigue Test Methods (Extension)	M&S	28
NAS1-12861	Boeing	Analysis and Tests of Stability Augmentation Systems for Aeroelastic Wind-Tunnel Models	M&S	61
NAS1-12875	Boeing	Transonic Loads Measurement and Prediction (Extension)	M&S	183
NAS1-12911	Boeing	Extension of the ATLAS Integrated Analysis and Design System	M&S	299
NAS1-13002	Boeing	Solution of Transonic Flow Around Oscillating Wings	M&S	63
NAS1-13045	Arthur D. Little Co.	Study of Airborne Infrared Analytical Spectrometer	SEI	26
NAS1-13095	DWA Composite Specialties, Inc.	Fabrication of Structural Test Specimens	M&S	15
NAS1-13229	McDonnell Douglas	Engine/Airframe Compatibility Studies	M&S	99
NAS1-13259	McDonnell Douglas	Addition of Flexible Body Option to the TOLA Computer Program	M&S	60
NAS1-13306	United Aircraft Corp.	Composite Plate	M&S	12

ADVANCED SUPERSONIC TECHNOLOGY PROGRAM - Continued

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-13500	Ling-Temco-Vought	Nonpersonal Services Support	M&S	67
NAS1-13605	Lockheed-California	Fatigue Design Module	M&S	30
NAS2-7341	Boeing	Design, Fabrication, and Operation of a Fuel Tank Sealant Exposure Apparatus (Extension)	M&S	48
NAS2-7571	Acurex Corp.	Potential Flow Program (Extension)	A	26
NAS2-7729	Boeing	FLEXSTAB Computing Program (Extension)	S&C	225
NAS2-7861	General Motors Corp.	Study of Molecular Fluorescence	SEI	11
NAS2-7966	Boeing	Development of Handling Qualities Criteria for Large Supersonic Aircraft	S&C	217
NAS2-8071	Lockheed Research	Stratospheric Vehicle Wake Synthesis	SEI	94
NAS2-8125	Texas Instruments	Infrared Line Scanner System	SEI	13
NAS2-8156	Peninsula Chemical Corp.	Synthesis of Perfluorinated Polyethers	M&S	40
NAS2-8200	Univ. of Denver	Detectability of Atmospheric Species	SEI	20
NAS2-8213	Boeing	Nacelles for Noise Reduction Experiments	A	142
NAS3-16948	Pratt & Whitney	Advanced Supersonic Propulsion System Study (Extension)	P	844
NAS3-16950	General Electric	Advanced Supersonic Propulsion System Study (Extension)	P	468
NAS3-17824	TRW, Inc.	Autoclavable Type Polyimides	SEI	95
NAS3-17866	Pratt & Whitney	Coannular Jet Noise (Extension)	P	26
NAS3-18008	General Electric	Coannular Jet Noise (Extension)	P	223
NAS3-18028	SOLAR	Experimental Study of Advanced Combustor Concepts To Reduce Formation of Nitrogen Oxides in Gas Turbine Engines	P	249
NAS3-18539	Boeing	Effects of Motion on Jet Exhaust Noise From Aircraft	P	49
NAS3-18910	General Electric	Boron/Aluminum Fan Blades for Advanced Supersonic Technology Engines	P	143

ADVANCED SUPERSONIC TECHNOLOGY PROGRAM - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS3-18921	Westinghouse, Inc.	Fabrication Process Development of SiC Superalloy Composite Sheet for Exhaust System Components	P	97
NAS3-19544	General Electric	Advanced Supersonic Propulsion System	P	24
Suballotments:				
E-43149	USAF Logistics Command	YF-12 Services - Structural Test Panels	M&S	476
E-43149	USAF Logistics Command	YF-12 Services - Equipment for Stratospheric Wake Measurements	SEI	75
E-43149	USAF Logistics Command	YF-12 Services - Cooperative Control System	S&C	624
E-43149	USAF Logistics Command	YF-12 Services - Data for FLEXSTAB Analysis	S&C	25
E-43149	USAF Logistics Command	YF-12 Services - Inlet Stability System	S&C	213
A-1770B	Sargamo Electric	Equipment for Wind-Tunnel Tests	M&S	22
Grants:				
NGL-33-016-191	New York Univ.	Sonic Boom Research	A	65
NGR-22-004-030	Boston Univ.	Advanced Subsonic and Supersonic Unsteady Potential Flow Aerodynamics	A	53
NGR-22-009-618	MIT	Laboratory Study of Sonic Booms and Their Scaling Laws	A	47
NGR-22-012-031	Tufts Univ.	Study of Noise Measurements in Wind Tunnel	A	24
NGR-33-010-203	Cornell Univ.	Sonic Boom Research	A	25
NGR-39-011-161	Univ. of Pittsburg	Basic Chemistry of Aircraft Pollutants	SEI	40
NGR-52-012-008	Technion	Automated Wing Structural Design (Extension)	M&S	20
NSG-2007	Stanford Univ.	Support of Joint Institute on Acoustics	M&S	50
NSG-2007	Stanford Univ.	Research Program Associated With Joint Institute of Aeronautics	A	7
NASW-2567	National Academy of Sciences	National Research Fellowship	A	18

SUPERSONIC CRUISE RESEARCH - FY 1975

Cost Summary (in Thousands of Dollars)

RTOP	743
PY	75
Contracts:	Cost
Langley (NAS1-)	3751
Ames (NAS2-)	307
Lewis (NAS3-)	2288
Dryden (NAS4-)	0
Suballotments	354
Subtotal	6700
Grants	302
Total	7002
Net R&D	7788

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-10120	Kentron Hawaii, Ltd.	Software for Oscillating Pressure Measurements	M&S	80
NAS1-11085	Microcraft, Inc.	Wind-Tunnel Model Modifications	A	15
NAS1-11847	Dynamic Engineering and Model Co.	Wind Tunnel Models	A	114
NAS1-12052	Boeing	Development of Extended Supersonic Aerodynamic Analysis System (Extension)	A	66
NAS1-12079	General Electric	Improved Resins	M&S	100
NAS1-12287	Boeing	Study of Structural Design Concepts for an Arrow Wing (Extension)	M&S	207
NAS1-12308	General Dynamics	Time-Temperature Stress	M&S	184
NAS1-12506	General Dynamics	Program To Assess Impact of Fatigue and Fracture Criteria on Weight and Cost	M&S	40
NAS1-12675	McDonnell Douglas	Test Specimens	M&S	190
NAS1-12911	Boeing	ATLAS Analysis and Design	M&S	89
NAS1-12956	Honeywell, Inc.	F-8C Experimental Aircraft	M&S	10
NAS1-13095	DWA Composite Specialties, Inc.	Fabrication and Structural Test Specimens	M&S	15
NAS1-13229	McDonnell Douglas	Engine/Airframe Compatibility Studies (Extension)	M&S	34
NAS1-13306	United Aircraft Corp.	Borsic/Aluminum Panels	M&S	12
NAS1-13500	Ling-Temco-Vought	Nonpersonal Services Support	A, SS	573
NAS1-13557	Lockheed-California	Technology Assessment Studies Applied to Supersonic Cruise Vehicles	SS	342
NAS1-13559	Boeing	Advanced Supersonic Configurations Using Multicycle Engines	SS	398
NAS1-13612	McDonnell Douglas	Technology Application Studies for Advanced Supersonic Transports	SS	476
NAS1-13613	Lockheed-Georgia	Computer Program for Transonic Unsteady Aero Forces	M&S	27

SCR PROGRAM - Continued

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-13633	McDonnell Douglas	Supersonic Technology Cooperative Wind-Tunnel Test Program	A	270
NAS1-13681	Boeing	Performance of Aluminum-Brazed Titanium Honeycomb-Core Sandwich Construction	M&S	68
NAS1-13709	Bolt Beranek and Newman Inc.	Nonstationary Spectral Descriptions for Atmospheric Turbulence	M&S	16
NAS1-13732	Boeing	Development of Extended Supersonic Aerodynamic Analysis System (Extension)	A	67
NAS1-13833	Boeing	Prediction of Aero Load	M&S	80
NAS1-13861	Boeing	SNARK Language Compiler	M&S	35
NAS1-13897	Boeing	Evaluation of Aluminum-Brazed Titanium Spoilers on Boeing 737	M&S	33
NAS1-13906	Rockwell International	Parametric Analysis of Effects of Nacelle Shape on Drag and Weight of a Supersonic Cruise Aircraft	A	38
NAS1-13978	Lockheed-California	Sonic Environment for Aircraft Structure	M&S	32
NAS1-13986	Bell Aerospace Co.	Computer Program for Interacting Supersonic Configuration	A	59
NAS1-14094	Boeing	Development of Extended Supersonic Aerodynamic Analysis System (Extension)	A	66
NAS2-8156	PCR Ink	Synthesis of Perfluorinated Polyethers	M&S	40
NAS2-8213	Boeing	Study of Jet Noise Suppressors (Extension)	A	204
NAS2-8781	Lockheed-California	Minimum Energy Liquid Hydrogen Supersonic Cruise Vehicle Study	SS	63
NAS3-16829	Pratt & Whitney	Supersonic Cruise Combustion Pollution Technology (Extension)	SEI	30
NAS3-17866	Pratt & Whitney	Coannular Jet Noise (Extension)	P	548
NAS3-18008	General Electric	Coannular Jet Noise (Extension)	P	21
NAS3-18540	Lockheed-Georgia	Effects of Motion on Jet Exhaust Noise From Aircraft	P	172
NAS3-18563	General Applied Sciences Lab.	Development of Low NO_x Combustor	P	86

SCR PROGRAM - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS3-19431	Univ. of Mississippi	Atmospheric Attenuation of High-Frequency Noise	P	127
NAS3-19438	Advanced Technology Lab.	Supersonic Through Flow Fan Stage With ATL Design Program	P	109
NAS3-19540	Pratt & Whitney	Advanced Supersonic Propulsion Systems Study (Formerly NAS3-16948)	P	335
NAS3-19544	General Electric	Advanced Supersonic Propulsion (Extension)	P	358
NAS3-19737	General Electric	Augmentor Emissions Reduction Technology Program	SEI	500
Suballotments:				
E-43149	USAF Logistics Command	YF-12 Services - Structural Test Panels	M&S	129
E-43149	USAF Logistics Command	YF-12 Services - Cooperative Control System	S&C	225
Grants:				
NGL-33-016-191	New York Univ.	Sonic Boom Research (Extension)	A	65
NGR-22-004-030	Boston Univ.	Aero Flow - Lift Body	A	53
NGR-22-009-378	MIT	Air Pollution From Aircraft	SEI	79
NGR-33-010-203	Cornell Univ.	Sonic Boom Research (Extension)	A	37
NSG-1093	Old Dominion Univ.	Thermal Structural Analysis of SCRAM-JET Structures	M&S	18
NSG-1185	Univ. of Cincinnati	Thermal Studies	M&S	8
NSG-1266	Illinois Institute of Technology	Automated Sizing of Aerospace Structures Under Multiple Constraints	M&S	36
NSG-2101	Univ. of Texas	Exact Solution of Potential Flows Related to Flight Vehicles	A	6

SUPERSONIC CRUISE RESEARCH AND VARIABLE-CYCLE ENGINE PROGRAMS - FY 1976

Cost Summary (in Thousands of Dollars)

RTOP	743	511
PY	76	VCE 76
Contracts:	Cost	Cost
Langley (NAS1-)	3347	0
Ames (NAS2-)	0	0
Lewis (NAS3-)	2120	0
Dryden (NAS4-)	0	652
Suballotments	614	0
Subtotal	6081	652
Grants	478	0
Total	6559	652
Net R&D	6816	740

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-10120	Kentron Hawaii, Ltd.	Software for Oscillating Pressure Measurements (Extension)	M&S	20
NAS1-11847	Dynamic Engineering and Model Co.	Fabrication of Dynamic Models	M&S	458
NAS1-12288	Lockheed-California	Study of Structural Design Concepts for an Arrow Wing (Extension)	M&S	13
NAS1-12308	General Dynamics	Time-Temperature Stress (Extension)	M&S	306
NAS1-12675	McDonnell Douglas	Test Specimens	M&S	95
NAS1-12911	Boeing	ATLAS Analysis and Design (Extension)	M&S	72
NAS1-13500	Vought	Technical Support Services for Aerospace Research and Development	SS	237
NAS1-13557	Lockheed-California	Technology Assessment Studies Applied to Supersonic Cruise Vehicles	SS	350
NAS1-13559	Boeing	Advanced Supersonic Configurations Using Multicycle Engines (Extension)	SS	428
NAS1-13612	McDonnell Douglas	Technology Application Studies for Advanced Supersonic Transports	SS	275
NAS1-13649	Lockheed-California	Real-Time Fatigue Tests on Coupons (Formerly NAS1-11820)	M&S	18
NAS1-13809	IIT Research Inst.	Miniature Hydraulic System	M&S	13
NAS1-14094	Boeing	Repair Low-Speed SST Active Control Model (Extension)	S&C	26
NAS1-14108	Rockwell International	Spanwise Variations of Drag	M&S	59
NAS1-14141	Boeing	Loads Measurement	M&S	100
NAS1-14172	Midwest Research Inst.	Hot Fatigue Correlation	M&S	69
NAS1-14204	Boeing	Unsteady Transonic Aero	M&S	100
NAS1-14205	Boeing-Wichita	Arrow-Wing Flutter Suppression	M&S	97
NAS1-14206	Rockwell International	SCAR Titanium Fabrication Study	M&S	89
NAS1-14374	Amercom, Inc.	Composite Material	M&S	17

SCR AND VCE PROGRAMS - Continued

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-14397	Aeronca, Inc.	Titanium Honeycomb	M&S	10
NAS1-14413	Bolt Beranek and Newman Inc.	Non-Gaussian Turbulence Study (Extension)	M&S	14
NAS1-14435	Lockheed-California	Impact of Cruise Speed on Scheduling and Productivity	A	150
NAS1-14445	General Dynamics	Composite Stiffeners	M&S	46
NAS1-14459	Textron, Inc.	Active Landing Gear	M&S	113
NAS1-14488	McDonnell Douglas	Noise Impact	A	50
NAS1-14491	General Dynamics	Titanium-Clad Borsic/Aluminum Material	M&S	12
NAS1-14591	Amercom, Inc.	Titanium-Clad Borsic/Aluminum	M&S	24
NAS1-14601	McDonnell Douglas	Test of a Douglas Jet Noise Suppressor Under a Supersonic Technology Wind-Tunnel Program	A	74
NAS1-14671	Ferro Corp.	Graphite/Polyimide	M&S	12
NAS3-18563	General Applied Sciences Lab.	Development of Low NO_x Combustor (Extension)	P	29
NAS3-19431	Univ. of Mississippi	Atmospheric Attenuation of High-Frequency Noise (Extension)	P	2
NAS3-19438	Advanced Technology Lab.	Supersonic Through Flow Fan Stage With ATL Design Program (Extension)	P	20
NAS3-19540	Pratt & Whitney	Advanced Supersonic Propulsion System Study (Extension)	P	298
NAS3-19544	General Electric	Advanced Supersonic Propulsion System Study (Extension)	P	353
NAS3-19735	Westinghouse, Inc.	Lightweight Components	P	100
NAS3-19737	General Electric	Augmentor Emissions Reduction Technology Program (Extension)	SEI	20
NAS3-19770	SOLAR	Advanced Combustor Concepts To Reduce Nitrogen Oxides in Gas Turbine Engine (Extension)	P	250
NAS3-20360	TRW, Inc.	Lightweight Components	P	171

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS3-20361	General Electric	Lightweight Components	P	225
NAS3-19777	General Electric	Plug Nozzle Tests	VCE	[a]224
NAS3-20041	General Electric	Front Fan Design Study	VCE	[a]199
NAS3-20048	Pratt & Whitney	Test-Bed Engine Design and Development	VCE	[a]100
NAS3-20061	Pratt & Whitney	Nozzle Definition	VCE	[a]118
NAS3-20602	Pratt & Whitney	VSCE Duct Burner	VCE	[a]11
Suballotments:				
E-43149	USAF Logistics Command	YF-12 Services - Cooperative Control System	S&C	400
E-43149	USAF Logistics Command	YF-12 Services - Structures Test Panels	M&S	195
L-29067A	National Oceanographic and Atmospheric Admin.	Sonic Boom Studies	A	8
L-36218A		Lenses - Data Systems	A	5
L-42089A	National Oceanographic and Atmospheric Admin.	Sonic Boom Studies	A	6
Grants:				
NGL-33-016-119	New York Univ.	Sonic Boom Research (Extension)	A	31
NGR-09-010-078	George Washington Univ.	Structures and Dynamics	M&S	35
NGR-22-004-030	Boston Univ.	Grant E-SCAR Analysis	M&S	20
NGR-22-004-030	Boston Univ.	Aero Flow Lifting Body	M&S	55
NGR-33-010-203	Cornell Univ.	Sonic Boom Research (Extension)	A	11
NSG-1085	Virginia Polytechnic Institute	Kinetics of the Reaction of Acids and Hydrides (Shared)	SEI	1
NSG-1228	George Washington Univ.	Fracture-Resistant Composites	M&S	31
NSG-1248	New York Univ.	SCAR Analysis	A	38

[a]VCE Program contract amounts not included in SCAR totals.

SCR AND VCE PROGRAMS - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NSG-1260	Old Dominion Univ.	Thermally Loaded Stresses	M&S	56
NSG-1262	Virginia Polytechnic Institute	Vortex Flow Research	A	5
NSG-1297	Clemson Univ.	Orthotropic Material	M&S	32
NSG-1298	New York Univ.	SCV Emissions Study	SEI	20
NSG-2007	Stanford Univ.	Research Associated With Joint Institute of Aeronautics	M&S	103
NSG-2101	Univ. of Texas	Exact Solutions of Potential Flows to Flight Vehicles (Extension)	A	14
NSG-2186	San Jose State Univ.	Study of Fluorocarbon Ether Elastomer	M&S	26

SUPERSONIC CRUISE RESEARCH AND VARIABLE-CYCLE ENGINE PROGRAMS - FY 197T

Cost Summary (in Thousands of Dollars)

RTOP	743	511
PY	7T	VCE 7T
Contracts:	Cost	Cost
Langley (NAS1-)	904	0
Ames (NAS2-)	0	0
Lewis (NAS3-)	298	200
Dryden (NAS4-)	0	0
Suballotments	180	0
Subtotal	1382	200
Grants	50	0
Total	1432	200
Net R&D	1700	300

SCR AND VCE PROGRAMS

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-13500	Vought	Technical Support Services	M&S	30
NAS1-14623	Boeing	Advanced Concept Studies for Advanced Supersonic Transport	SS	275
NAS1-14624	McDonnell Douglas	Technology Application Study of a Supersonic Cruise Vehicle	SS	318
NAS1-14625	Lockheed-California	SCV Technology Assessment Study of an Over/Under Engine Concept	SS	275
NAS3-17866	Pratt & Whitney	Coannular Jet Noise (Extension)	P	6
NAS3-20048	Pratt & Whitney	Test-Bed Engine Design and Development	VCE	[a]0
NAS3-20061	Pratt & Whitney	Nozzle Definition, VCE	VCE	[a]200
NAS3-20810	General Electric	DBE Program Definition	P	149
NAS3-20811	Pratt & Whitney	VSCE Program Definition	P	149
Suballotments:				
E-43149	USAF Logistics Command	YF-12 Services - Cooperative Control System	S&C	100
E-43149	USAF Logistics Command	YF-12 Services - Structural Test Panels	M&S	80
Grants:				
NSG-1228	George Washington Univ.	Fracture-Resistant Composites	M&S	50

[a]VCE Program contract amounts not included in SCAR totals.

SUPERSONIC CRUISE RESEARCH AND VARIABLE-CYCLE ENGINE PROGRAMS - FY 1977

Cost Summary (in Thousands of Dollars)

RTOP	743	511	551
PY	77	VCE 77	VCE 77
Contracts:	Cost	Cost	Cost
Langley (NAS1-)	4268	0	0
Ames (NAS2-)	165	0	0
Lewis (NAS3-)	700	2302	777
Dryden (NAS4-)	0	0	0
Suballotments	525	0	0
Subtotal	5658	2302	777
Grants	342	0	0
Total	6000	2302	777
Net R&D	6000	3100	

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-12308	General Dynamics	Time-Temperature Stress (Extension)	M&S	225
NAS1-12675	McDonnell Douglas	Make Gr/Ep Tail Safe Specimens	M&S	32
NAS1-12900	Analytical Methods, Inc.	Computer Program for Wing-Body-Tail Configurations	A	41
NAS1-13500	Vought	Technical Support Services for Aerospace Research and Development	M&S	100
NAS1-13500	Vought	Technical Support Services for Aerospace Research and Development	A	224
NAS1-13557	Lockheed-California	Technology Assessment Study Applied to Supersonic Cruise Vehicles (Extension)	A	350
NAS1-13559	Boeing	Advanced Supersonic Configurations Using Multicycle Engines (Extension)	A	30
NAS1-13681	Boeing	Effects of Simulated and Flight Service Environment on Performance of Aluminum-Brazed Titanium Honeycomb	M&S	9
NAS1-14031	Boeing-Wichita	Model ACT Digital Control and Multimode Flutter Test Support	S&C	11
NAS1-14206	Rockwell International	SCAR Titanium Fabrication Study	A	15
NAS1-14445	General Dynamics	Borsic Aluminum Composite Stiffeners	M&S	50
NAS1-14564	Dynamic Engineering and Model Co.	Dynamic Free-Flight Model	M&S	70
NAS1-14564	Dynamic Engineering and Model Co.	Dynamic Free-Flight Model	A	136
NAS1-14580	Craft Engineering and Metal Corp.	Research Equipment	M&S	34
NAS1-14601	McDonnell Douglas	Cooperative Wind-Tunnel Test of a Douglas Jet Noise Suppressor	A	[a]16
NAS1-14623	Boeing	Advanced Concept Studies for Supersonic Vehicles	SS	859
NAS1-14624	McDonnell Douglas	Technology Application Study of a Supersonic Cruise Vehicle	SS	825

[a]Total contract $74,000, balance of $58,000 from RTOP 505-11-15.

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-14625	Lockheed-California	SCV Technology Assessment Study of an Over/Under Engine Concept	SS	825
NAS1-14837	Bolt Beranek and Newman Inc.	Non-Gaussian Turbulence Study	M&S	25
NAS1-14905	Lockheed-Georgia	Creep-Formed Stringer	M&S	17
NAS1-14962	Boeing	Cambered Wing Load Predictions	M&S	158
NAS1-14994	Wye Electric Co.	Raceway B-1265	M&S	11
NAS1-15030	MTS Systems Corp.	Electronic Hardware	M&S	129
L-24699A	Calspan	SCAR In-Flight Simulator	A	76
NAS2-7981	Ultra Systems	Cost Linking and Degradation Mechanism	M&S	59
NAS2-8156	PCR Ink	Synthesis of Perfluorinated Polyethers (Extension)	M&C	106
NAS3-20602	Pratt & Whitney	Duct Burner Rig Tests (VCE Support)	P	489
NAS3-20603	General Applied Sciences Lab.	Pre-Mix Fuel	P	0 [a](80)
NAS3-20616	SOLAR	Full Annular Low NO_x Emission Combustor	P	212 [b](393)
NAS3-20048	Pratt & Whitney	F100/Test-Bed Acoustic Program	VCE	[c]702
NAS3-20061	Pratt & Whitney	Aero/Acoustic Performance of Coannular Nozzles	VCE	[c]368
NAS3-20582	General Electric	Duct Burner Test-Bed Engine Definition	VCE	[c]1600
NAS3-20619	General Electric	Aero/Acoustic Performance of Annular Plug Nozzles	VCE	[c]409
Suballotments:				
E-43149	USAF Logistics Command	Support of YF-12 SCAR Co-Op Control Program	S&C	475
E-43149	USAF Logistics Command	Support of YF-12 SCAR Structural Test Panels	M&S	50

[a]Total not SCR.
[b]Total contract $393,000, balance of $181,000 from SCERP.
[c]VCE Program contract amounts not included in SCAR totals.

SCR AND VCE PROGRAMS - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Grants:				
NSG-1228	George Washington Univ.	Fracture of Advanced Composite Materials	M&S	50
NSG-1262	Virginia Polytechnic Institute	Vortex Flow Research	A	5
NSG-1266	Illinois Institute of Technology	Automated Sizing of Aerospace Structures Under Multiple Constraints	M&S	25
NSG-1297	Clemson Univ.	Fracture and Crack Growth in Orthotropic Laminates	M&S	9
NSG-1298	New York Univ.	SCV Emissions Study	A	29
NSG-1409	Univ. of Delaware	Concepts in Structural Synthesis	M&S	7
NSG-7373	Technion	Study of Active Control Systems in Application to Supersonic Cruise Aircraft	S&C	25
NGL-330-16-199	New York Univ.	Sonic Boom Research (Extension)	A	41
NGR-05-007-337	Univ. of California	Elevated Temperature Bolted Joint Composite Materials	M&S	5
NGR-09-010-078	George Washington Univ.	Structure and Dynamics	M&S	30
NGR-22-004-030	Boston Univ.	Unsteady Potential Flow of Arbitrary Lifting Bodies	M&S	76
NA 2357	Technology Development	Software for Flight Loads Research Facility	M&S	13
NA 2472	Optimization Software, Inc.	Calculation of Structural Response in Unsteady Aerodynamics of a Typical Section in Incompressible Flow	M&S	8
NG 4012	Univ. of Kansas	Interfacing Between Ground Computer and Fly-by-Wire Control System	M&S	19

SUPERSONIC CRUISE RESEARCH AND VARIABLE-CYCLE ENGINE PROGRAMS - FY 1978

Cost Summary (in Thousands of Dollars)

RTOP	743	511	551
PY	78	VCE 78	VCE 78
Contracts:	Cost	Cost	Cost
Langley (NAS1-)	5200	0	0
Ames (NAS2-)	81	0	0
Lewis (NAS3-)	1087	3557	2197
Dryden (NAS4-)	0	0	0
Suballotments	80	0	0
Subtotal	6448	3557	2197
Grants	360	0	0
Total	6808	3557	2197
Net R&D	7500	6030	

SCR AND VCE PROGRAMS

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-12308	General Dynamics	Time-Temperature-Stress Capabilities of Composites (Extension)	M&S	125
NAS1-12675	McDonnell Douglas	Test Specimens	M&S	12
NAS1-13500	Vought	Technical Support Services for Aerospace Research and Development	A	240
NAS1-13500	Vought	Technical Support Services for Aerospace Research and Development	A	345
NAS1-13681	Boeing	Effects of Simulated and Flight Service Environment of Aluminum-Brazed Titanium (Extension)	M&S	12
NAS1-13897	Boeing	DOT Spoilers	M&S	20
NAS1-13897	Boeing	Ti Spoilers	M&S	6
NAS1-14459	Textron, Inc.	Active Landing Gear	M&S	40
NAS1-14564, 15496	Dynamic Engineering and Model Co.	Dynamic Free-Flight Model	A	108
NAS1-14580	Craft Engineering and Metal Corp.	Research Equipment	A	7
NAS1-14601	McDonnell Douglas	Jet Noise Suppressor	A	10
NAS1-14623	Boeing	Advanced Concept Studies for Supersonic Aircraft	SS	957
NAS1-14623	Boeing	Inlet Study	A	3
NAS1-14623	Boeing	Multipurpose High-Speed Transports	A	73
NAS1-14624	McDonnell Douglas	Technology Application Study of a Supersonic Cruise Vehicle	SS	950
NAS1-14624	McDonnell Douglas	Inlet Study	A	104
NAS1-14624	McDonnell Douglas	Reference Aircraft for ICAO Working Group E	A	5 (50-DOT)
NAS1-14625	Lockheed-California	Supersonic Cruise Vehicle Technology Assessment Study of an Over/Under Engine Concept	SS	967
NAS1-14625	Lockheed-California	Inlet Study	A	102

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-14625	Lockheed-California	Common Case Study	A	0 (25-DOT)
NAS1-14837	Bolt Beranek and Newman Inc.	Characteristics of Non-Gaussian Turbulence (Extension)	M&S	22
NAS1-14962	Boeing	Arrow Wing Loads	M&S	40
NAS1-14972	College of William & Mary	Physical Life Sciences	M&S	5
NAS1-15275	Boeing	Critical Design Loads	A	81
NAS1-15296	CVI	Nitrogen Piping	M&S	11
NAS1-15314	McDonnell Douglas	Supersonic Cruise Vehicle Wing Design Program	M&S	255
NAS1-15455	Textron, Inc.	Active Control Gear	M&S	166
NAS1-15492	Boeing	Composite Panel	M&S	25
NAS1-15527	McDonnell Douglas	Superplastic-Formed Ti6Al	M&S	370
NAS1-15534	Boeing	Boeing Aero System	A	74
L75228A (AF F33-615-78-C-3602)	Calspan	In-Flight Simulations	A	65
NAS2-9779	Ultra Systems	Study of Cross Linking and Degradation Mechanisms in Sealant Candidates	M&S	40
NAS2-9863	Stanford Research Institute	Study of Heterocyclic Perfluorinated Polyethers	M&S	41
NAS3-20061	Pratt & Whitney	VCE Nozzle	P	185
NAS3-20602	Pratt & Whitney	VSCE Duct Burner	P	482
NAS3-20603	General Applied Sciences Lab.	Effects of Flame Holder Geometry	P	33
NAS3-21388	General Electric	VCE Propulsion System Features	P	245
NAS3-21389	Pratt & Whitney	Engine Cycle-Propulsion System Studies	P	142

SCR AND VCE PROGRAMS - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS3-20582	General Electric	Early Acoustic Test	VCE	[a]2197
NAS3-20048	Pratt & Whitney	Test-Bed Engine - Design and Development	VCE	[a]3557
Suballotment:				
E-43149	USAF Logistics Command	YF-12 SCR Support	A	80
Grants:				
NSG-1248	New York Univ.	SCAR Analysis Supersonic Flow	A	20
NSG-1266	Illinois Institute of Technology	Wing Structures	M&S	26
NSG-1289	New York Univ.	Structure Material	M&S	29
NSG-1297	Clemson Univ.	Fracture and Crack Growth in Orthotropic Laminates	M&S	31
NSG-1409	Univ. of Delaware	Composite Joint Test	M&S	15
NSG-1449	George Washington Univ.	3-D Laminate Analysis	M&S	20
NSG-1507	Old Dominion Univ.	Photoelastic Joint Research	M&S	12
NSG-2186	San Jose State Univ.	Study of Fluorocarbon Ether Elastomers	M&S	15
NSG-2273	San Jose State Univ.	Synthesis of Fluorocarbon Ether Elastomers	M&S	12
NSG-4003	Purdue Univ.	Handling and Ride Qualities of Large, Flexible Control Configured Aircraft	S&C	25
NGL-330-16-119	New York Univ.	Sonic Boom Research	A	36
NGR-09-010-074	George Washington Univ.	Research in Flight Sciences	A	15
NGR-22-004-030	Boston Univ.	Unsteady Potential Flow Around Arbitrary Lifting	M&C	80
NGR-23-005-528	Univ. of Michigan	Fiber-Reinforced Solid	M&S	24

[a]VCE Program contract amounts not included in SCAR totals.

SUPERSONIC CRUISE RESEARCH AND VARIABLE-CYCLE ENGINE PROGRAMS - FY 1979

Cost Summary (in Thousands of Dollars)

RTOP	517	743	511
PY	79	78	VCE 79
Contracts:	Cost	Cost	Cost
Langley (NAS1-)	5122	833	0
Ames (NAS2-)	65	121	0
Lewis (NAS3-)	709	0	7162
Dryden (NAS4-)	200	0	0
Suballotments	716	40	0
Subtotal	6812	994	7162
Grants	320	25	0
Total	7132	1019	7162
Net R&D	7706		6792

SCR AND VCE PROGRAMS

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-13500	Vought	Technical Support Services	M&S	154
NAS1-13500	Vought	Technical Support Services	A	283
NAS1-14564	Dynamic Model	SCR Wind-Tunnel Models	A	85
NAS1-14564	Dynamic Model	SCR Wind-Tunnel Models	M&S	84
NAS1-14580	Craft Engineering and Metal Corp.	Engineering Service	P	10
NAS1-14601	McDonnell Douglas	Jet Noise Suppressor	M&S	15
NAS1-14623	Boeing	SCV Concepts Study	SS	988
NAS1-14624	McDonnell Douglas	SCV Technical Application Study	SS	1027
NAS1-14625	Lockheed-California	SCV Technical Assessment Study	SS	1015
NAS1-14837	Bolt Beranek and Newman, Inc.	Aircraft Response to Turbulence	M&S	12
NAS1-15183	Rockwell International	Aero Applications Systems	M&S	70
NAS1-15183	Rockwell International	Design, Fabrication, and Test GR/PI	M&S	25
NAS1-15183	Rockwell International	Fiber-Reinforced Solid	M&S	24
NAS1-15416	Microcraft, Inc.	SCR Wind-Tunnel Models	A	184
NAS1-15416	Microcraft, Inc.	Wind-Tunnel Models	P	75
NAS1-15527	McDonnell Douglas	Superplastically Formed Ti-6Al	M&S	98
NAS1-15527	McDonnell Douglas	Compression Panels	M&S	250
NAS1-15568	Lockheed-California	Forming Beta Ti	M&S	250
NAS1-15605	Boeing	Adhesive Contract	M&S	132
NAS1-15608	Kentron	Modifications to DAS Amplifier	M&S	11
NAS1-15644	Boeing	Design, Fabricate, and Test GR/PI Joints	M&S	322
NAS1-15667	Modular Computer Systems, Inc.	Computer Systems	M&S	8

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-15675	General Electric	SCAR Exhaust System Study	P	98
NAS1-15678	Boeing	Aero Load Arrow Wing	M&S	133
NAS1-15686	Hodges and Bryant	Fume Hood	M&S	10
NAS1-15720	Rockwell International	Advanced Supersonic Blended Wing/Body Study	A	94
NAS1-15720	Rockwell International	Supersonic Jet ARCF	A	19
NAS1-15720	Rockwell International	Blended Wing/Body	A	23
NAS1-15788	Rockwell International	SPF/DB Sandwich Study	M&S	267
NAS1-15792	Analytical Methods, Inc.	General Triplet Singularities	A	52
NAS1-15932	McDonnell Douglas	Test Specimens	M&S	36
NAS1-15943	Atmospheric and Environmental Research Co.	Turbulence Study	A	31
NAS1-15998	Hex Col.	CELION/LaRC-160 (YF-12) and Brazing Platens	M&S	28
NAS2-3239	Technochemi GBH	Synthesis of Ether Diacielfluoride	M&S	45
NAS2-9779	Ultra Systems	Crosslinking and Degradation in Sealant Candidates	M&S	35
NAS2-9863	Stanford Research Institute	Study of Heterocyclic Perfluorinated Polyethers	M&S	41
NAS2-10334	Hughes Aircraft	Studies on New Perfluoroether Elastometer Fuel Tank Sealants	M&S	65
NAS3-20048	Pratt & Whitney	Test-Bed/Coannular Noise	VCE	[a]3053
NAS3-20061	Pratt & Whitney	VCE Nozzle Definition	VCE	[a]127
NAS3-20061	Pratt & Whitney	VCE Nozzle Definition	P	100

[a]VCE Program contract amounts not included in SCAR totals.

SCR AND VCE PROGRAMS - Continued

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS3-20582	General Electric	Test-Bed Definition/Early Acoustic	VCE	[a]3100
NAS3-20602	Pratt & Whitney	VSCE Duct Burner Testing	P	79
NAS3-20619	General Electric	Acoustic Coannular Plug Nozzle	P	71
NAS3-21388	General Electric	Propulsion System Studies, VCE Features (Extension)	P	0
NAS3-21608	General Electric	Coannular Plug Nozzle Suppressor	VCE	[a]482
NAS3-22000	General Electric	GE Inlet Study and Technology Evaluation	P	176
NAS3-22111	Pratt & Whitney	Noise and Economic Study for SCR	P	283
NAS4-2651	Rockwell International	SPF of a Primary Structure for a Supersonic Aircraft (T-38 Tail)	M&S	[b]200
A/F F33-615-78-C-3602	Calspan	Handling Qualities of SST's	A	42
Suballotments:				
3110-0144		Suballotment to DFRC as of April 30, 1979	A	15
3110-0163		Suballotment to LeRC as of April 30, 1979	P	100
2512-0210		Suballotment to DFRC as of April 30, 1979	A	25
NAS1-15720	Rockwell International	SSX Jet Studies - Suballotment to LaRC	P	76
NAS1-14623	Boeing	Supersonic Inlet Fan Noise - Suballotment to LaRC	P	210
NAS1-14624	McDonnell Douglas	Supersonic Inlet Fan Noise - Suballotment to LaRC		
NAS1-14625	Lockheed-California	Supersonic Inlet Fan Noise - Suballotment to LaRC		
NAS1-14623	Boeing	SCR Inlet Studies - Suballotment to LaRC	P	330
NAS1-14624	McDonnell Douglas	SCR Inlet Studies - Suballotment to LaRC		
NAS1-14625	Lockheed-California	SCR Inlet Studies - Suballotment to LaRC		

[a]VCE Program contract amounts not included in SCAR totals.
[b]Also $320,000 from 533-01-14 and $450,000 from A/F.

SCR AND VCE PROGRAMS - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Grants:				
NSG-1248	Polytechnic Institute of New York	Supersonic Flow	A	20
NSG-1576	New York Univ.	Sonic Boom	A	36
NSG-1615	Del Mar College	Atmospheric Turbulence	M&S	12
NSG-2186	San Jose State Univ.	Fluorocarbon Ether Elastomers	M&S	145
NSG-2367	Univ. of Idaho	Perfluoroether Triazine Elastomers	M&S	6
NSG-4018	Oklahoma State Univ.	Flying Qualities of Large Flexible Aircraft	A	25
NGR-4030	Boston Univ.	Aero Flow Lift Body	M&S	101

SUPERSONIC CRUISE RESEARCH AND VARIABLE-CYCLE ENGINE PROGRAMS - FY 1980

Cost Summary (in Thousands of Dollars)

RTOP	533	517	743	535
PY	80	79	78	VCE 80
Contracts:	Cost	Cost	Cost	Cost
Langley (NAS1-)	6618	-10	0	0
Ames (NAS2-)	106	13	0	0
Lewis (NAS3-)	1211	0	0	6769
Dryden (NAS4-)	200	176	0	0
Suballotments	30	100	15	0
Subtotal	8165	279	15	6769
Grants	223	111	0	0
Total	8388	290	15	6769
Net R&D	8396			7915

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-14564	Dynamic Model	Model Fabrication	A	150
NAS1-14623	Boeing	SCR Nozzle Integration Test	P	160
NAS1-14623	Boeing	P-Inlet Model	P	94
NAS1-14624	McDonnell Douglas	2.2 M High-Speed Tests	A	30
NAS1-15084	Lockheed-California	Computer Program	P	20
NAS1-15183	Rockwell International	GR/PI Specifications and Elements	M&S	63
NAS1-15416	Precision Model	Model Construction	P	176
NAS1-15455	Textron, Inc.	Active Control Gear	M&S	14
NAS1-15527	McDonnell Douglas	Superplastically Formed Ti-6Al	M&S	238
NAS1-15527	McDonnell Douglas	Superplastically Formed Ti-6Al	M&S	[a](59)
NAS1-15534	Boeing	Boeing Aero System	A	150
NAS1-15568	Lockheed-California	Forming Beta-Ti	M&S	82
NAS1-15605	Boeing	Adhesive Contract	M&S	160
NAS1-15720	Rockwell International	Market Business Jet	A	87
NAS1-15788	Rockwell International	SPF/DB Study	M&S	102
NAS1-15792	Analytical Methods, Inc.	General Triplet Singularity	A	60
NAS1-15876	Advex Corp.	Material Specifications	M&S	16
NAS1-15886	Hew Es Co., Inc.	SCR Bibliography Typing	A	1
NAS1-15927	Lockheed-California	Multibody Aircraft	A	50
NAS1-15932	McDonnell Douglas	Test Specimens	M&S	13
NAS1-15998	Hex Col.	Materials	M&S	1
NAS1-16000	Kentron	Technical Support Services	A	670
NAS1-16000	Kentron	Technical Support Services	A	[a](6)

[a]Prior FY.

SCR AND VCE PROGRAMS - Continued

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-16000	Kentron	Technical Support Services	M&S	350
NAS1-16000	Kentron	Technical Support Services	M&S	[a](41)
NAS1-16048	Lockheed-California	Integration Technology Study Advanced SCR	SS	1010
NAS1-16048	Lockheed-California	Integration Technology Study Advanced SCR	P	150
NAS1-16147	McDonnell Douglas	Technology Application Study for SCR	SS	1000
NAS1-16147	McDonnell Douglas	Technology Study for Advanced SCR	P	150
NAS1-16150	Boeing	Technology Study for Advanced SCR	SS	979
NAS1-16150	Boeing	Technology Study for Advanced SCR	P	150
NAS1-16150	Boeing	Support of P-Inlet Tests	A	42
NAS1-16150	Boeing	Support of P-Inlet Tests	P	46
NAS1-16150	Boeing	SCV Flutter Research (SCAT-15 Model)	M&S	16
NAS1-16152	Burtek, Inc.	Controller for Simulator	A	50
NAS1-16319	Boeing	Arrow Wing Models	M&S	83
NAS1-16403	TRW, Inc.	Sic/Ti Development	M&S	121
NAS1-16457	Precision Model	Model Construction	A	96
L-75228A (A/F F33-6179-C-3618)	Calspan	SCR Flying Quality Study	A	38
L-75228A (A/F F33-6179-C-3618)	Calspan	SCR Flying Quality Study	A	[a](2)
NAS2-9741	Computer Sciences Corp.	Concorde Math Model Document	A	30
NAS2-10334	Hughes Aircraft	Elastomeric Sealants	M&S	[a](13)
NAS2-10334	Hughes Aircraft	Study of New Perfluorether	M&S	54

[a]Prior FY.

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS2-10789	S.A.R., Inc.	Quantum Calculation of Fluoroether Polymers	M&S	10
NAS2-10804	Printronic, Inc.	Line Printer for D.B.	M&S	12
NAS3-12512	General Electric	JP-4 Fuel	P	6
NAS3-19442	Pratt & Whitney	VSCE Nozzle Definition Program	P	30
NAS3-20048	Pratt & Whitney	Test-Bed Noise	VCE	[b]1403
NAS3-20048	Pratt & Whitney	Supersonic Jet Shock Noise Reduction	VCE	[b]22
NAS3-20048	Pratt & Whitney	Test-Bed Noise	P	200
NAS3-20048	Pratt & Whitney	Turbine Bypass Propulsion Study	P	190
NAS3-20048	Pratt & Whitney	VSCE Test-Bed Definition Program	VCE	[b]53
NAS3-20582	General Electric	VCE Test-Bed Definition, Acoustic	VCE	[b]2884
NAS3-20582	General Electric	JP-5 Fuel	VCE	[b]67
NAS3-20582	General Electric	Test-Bed Definition, DBE	VCE	[b]1200
NAS3-22111	Pratt & Whitney	Noise and Economic Study	P	30
NAS3-22111	Pratt & Whitney	Propulsion System Study	P	158
NAS3-22137	General Electric	Acoustic Shielding of Supersonic Jet Noise	VCE	[b]831
NAS3-22137	General Electric	Thermal Acoustic Shield	VCE	[b]750
NAS3-22509	General Applied Sciences Lab.	Supersonic Fan	P	137
NAS3-22514	General Electric	Supersonic Jet Shock Noise Reduction	P	460
NAS3-22738	Pratt & Whitney	REL/VP Suppressor Ejector Nozzles Program	VCE	[b]600
NAS3-22738	Pratt & Whitney	VSCE Nozzle Program Definition	VCE	[b]165
NAS3-22773	General Electric	Suppressed Coannular Ejector Nozzles	VCE	[b]93
38908D	General Electric	Fuel	VCE	[b]37

[b]VCE Program contract amounts not included in SCAR totals.

SCR AND VCE PROGRAMS - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
85598C	General Electric	Fuel-DBE Test-Bed Definition	VCE	[b]35
88303C	General Electric	Turbine Engine	VCE	[b]32
E-43149	USAF Logistics Command	Documentation of SCR Wing Panel Program and Fuel Tank Sealant Research	M&S	150
NAS4-2651	Rockwell International	SPF/DB of a Primary Structure for Supersonic Aircraft	M&S	200 [a](626)
Suballotments:				
		Concorde Math Model (Suballotment from LaRC to ARC as of April 30, 1980)	A	30
3110-0163		Suballotment from LaRC to LeRC as of April 30, 1980	P	[a](100)
3110-0144		Suballotment from LaRC to DFRC as of April 30, 1980	M&S	[a](15)
Grants:				
NSG-1248	Polytechnic Institute of New York	Supersonic Flow Study	A	20
NSG-1297	Clemson Univ.	Micro Fracture	M&S	16
NSG-2367	Univ. of Idaho	Perfluoroether Triazine Elastomers	M&S	[a](11)
NCC1-24	George Washington Univ.	Aero Fellowship	A	23
NCC2-00081	San Jose State Univ.	Synthesis Characterization of Fluorocarbon Ether Elastomers	M&S	63
NGR-2200-4030	Boston Univ.	Aero Flow Lift Body	M&S	101

[a]Prior FY.
[b]VCE Program contract amounts not included in SCAR totals.

SUPERSONIC CRUISE RESEARCH AND VARIABLE-CYCLE ENGINE PROGRAMS - FY 1981

Cost Summary (in Thousands of Dollars)

RTOP	533	535
PY	81	VCE 81
Contracts:	Cost	Cost
Langley (NAS1-)	3815	0
Ames (NAS2-)	10	0
Lewis (NAS3-)	631	3500
Dryden (NAS4-)	0	0
Suballotments	642	750
Subtotal	5098	4250
Grants	307	0
Total	5405	4250
Net R&D	8611	6300

SCR AND VCE PROGRAMS

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-14623	Boeing	Refurbishment of P-Inlet	A	12
NAS1-15080	Virginia Polytechnic Institute	GR/EP Tests	M&S	11
NAS1-15416	Precision Model	SCR Models	P	15
NAS1-15605	Boeing	Adhesive Contract	M&S	71
NAS1-15605	Boeing	High-Temperature Adhesives	M&S	11
NAS1-15678	Boeing	Aero Loads, Arrow Wing	M&S	40
NAS1-16000	Kentron	Technical Support Services	M&S	248
NAS1-16000	Kentron	Technical Support Services	A	211
NAS1-16048	Lockheed-California	SCR Advanced Aluminum Alloys	M&S	50
NAS1-16048	Lockheed-California	FRAT for SCV	A	150
NAS1-16048	Lockheed-California	SCR-Lockheed-Test SPT	P	223
NAS1-16147	McDonnell Douglas	SCR System Studies, Inlets	SS	163
NAS1-16150	Boeing	SCR System Studies	SS	1103
NAS1-16150	Boeing	Advanced SCR Configuration Concepts	A	250
NAS1-16150	Boeing	SCR System Studies, Propulsion	P	180
NAS1-16150	Boeing	Advanced SCR Configurations Concepts	P	100
NAS1-16150	Boeing	Aero Acoustic Report	P	18
NAS1-16369	Dynamic Model	SCR Models	A	218
NAS1-16403	Lockheed-California	Titanium Composites	M&S	70
NAS1-16408	Lockheed-California	SCR Advanced Aluminum Alloys	M&S	75
NAS1-16424	Lockheed-California	Aluminum Alloy Evaluation	M&S	11
NAS1-16463	ABAR Corp.	Vacuum Furnace	M&S	190
NAS1-16596	ICARUS	Viscous Unsteady Flow at Transonic Speeds	M&S	25

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS1-16647	McDonnell Douglas	Military Supersonic Cruise	A	250
NAS1-16696	General Electric	SCR Exhaust System Analysis	P	50
NAS1-16740	Boeing	Aero Loads, Arrow Wing	A	5
L-75228A (A/F F33-6179-C-3618)	Calspan	SCR Flying Qualities Study	A	65
NAS2-10789	S.A.R., Inc.	Quantum Calculation of Fluoroether Polymers	M&S	10
NAS3-22111	Pratt & Whitney	Propulsion System Study	P	30
NAS3-22137	General Electric	Acoustic Shielding of Supersonic Jet Noise	VCE	[a]52
NAS3-22243	General Electric	VSCE Nozzle Definition Program	VCE	[a]25
NAS3-22244	General Electric	TAS Aero Performance	VCE	[a]33
NAS3-22254	General Dynamics	Remote Augmented Lift, Turbine Bypass	VCE	[a]264
NAS3-22700	General Electric	Design and Test of VCE Nozzles	VCE	[a]30
NAS3-22738	Pratt & Whitney	VSCE Nozzle Definition Program	VCE	[a]42
NAS3-22749	General Electric	Propulsion System Study	P	201
NAS3-22773	Pratt & Whitney	REL/VP Suppressor Ejector Nozzles	VCE	[a]57
NAS3-23038	General Electric	DBE Model Nozzle, Aero Performance	VCE	[a]537
NAS3-23039	Pratt & Whitney	Nozzle Performance	VCE	[a]674
NAS3-23050	Pratt & Whitney	Turbine Bypass Engine Study	VCE	[a]245
NAS3-23150	Digital Electronic Corp.	VCE Nozzle Definition Program	VCE	[a]17
NAS3-23166	Pratt & Whitney	Coannular Jet Shock Noise Reduction	VCE	[a]400
NAS3-23166	General Electric	Supersonic Jet Shock Noise Reduction	VCE	[a]63

[a]VCE Program contract amounts not included in SCAR totals.

SCR AND VCE PROGRAMS - Concluded

Number	Contractor/grantee	Descriptive title	Discipline	Amount, thousands of dollars
Contracts:				
NAS3-23221	General Electric	VSCE Nozzle Definition	VCE	[a]359
NAS3-23275	General Electric	Outer Stream Suppressor/Ejector for VCE Application	VCE	[a]771
Suballotments:				
		Aero/Acoustic Tests Using SCR Inlet - Suballotments to LaRC	P	642
		Coannular Nozzle - Suballotments to LaRc	VCE	[a]750
61057D	Digital Electronic Corp.	VSCE Nozzle Definition	VCE	[a]65
55682D	Pratt & Whitney	Fuel - VSCE Nozzle	VCE	[a]10
58145D	Digital Electronic Corp.	Fuel - Test of VCE Nozzles	VCE	[a]17
88303C	General Electric	Fuel - DBE Test Bed	VCE	[a]32
38918D	General Electric	Shock II Fuel	VCE	[a]32
3815D	General Electric	Shock I Fuel	VCE	[a]16
38920D	General Electric	Suppressor Ejector	VCE	[a]19
38908D	General Electric	Fuel	VCE	[a]70
Grants:				
NSG-1248	Polytechnic Institute of New York	Supersonic Flow Study	A	12
NSG-1570	Univ. of Maryland	Research in General Aviation Aerodynamics	A	12
NCC1-24	George Washington Univ.	Flight Sciences	A	49
NCC2-0081	San Jose State Univ.	Synthesis Characterization of Fluorocarbon Ether Elastomers	M&S	108
NGR-2200-4030	Boston Univ.	Aero Flow Lifting Body	A	76
R3-256	Univ. of Washington	High-Speed Inlet Code Verification	A	50

[a]VCE Program contract amounts not included in SCAR totals.

TABLE I.- SUMMARY OF SCR[a] CONTRACTORS, GRANTEES, AND AMOUNTS

Contractor/grantee	Amount, thousands of dollars
ABAR Corporation	190
Acurex Corporation	84
Advanced Technology Laboratories (ATL)	226
Advex Corporation	16
Aeronca, Inc.	10
Amercom, Inc.	41
Ampex Corporation	15
Analytical Methods, Inc. (AMI)	225
Applied Space Products	17
Arthur D. Little Company	46
Atmospheric and Environmental Research Company	31
Atomic Energy Commission	18
B&K Instruments	15
Bell Aerospace Company	59
Boeing (Commercial Airplane Company and/or Wichita)	13 738
Bolt Beranek and Newman Inc.	89
Boston University	615
Burtek, Inc.	50
Calspan (Advanced Technology Center, Arvin)	288
Clemson University	88
College of William and Mary	5
Computer Sciences Corporation	30
Cornell University	73
Craft Engineering and Metal Corporation	51
CVI	11
Del Mar College	12
Department of Transportation	11
DWA Composite Specialties, Inc.	30
Dynamic Engineering and Model Company	1 333
Dynamic Model	537
Ferro Corporation	12
General Applied Sciences Laboratory (GASL)	365
General Dynamics	1 518
General Electric Company	5 081

[a]Includes prior designations of AST and SCAR.

TABLE I.- Continued

Contractor/grantee	Amount, thousands of dollars
General Motors Corporation	11
George Washington University	303
Hew Es Co., Inc.	1
Hex Col.	20
Hodges and Bryant	10
Honeywell, Inc.	10
Hughes Aircraft	132
ICARUS	25
Illinois Institute of Technology (IIT)	100
Jet Propulsion Laboratory	85
Kentron International[b]	1 607
LFE Corporation	33
Ling-Temco-Vought, Vought	2 945
Lockheed (California Company and/or Georgia Company)	8 729
Massachusetts Institute of Technology (MIT)	240
Mayer A. and Associates	28
McDonnell Douglas	8 297
Microcraft, Inc.	455
Midwest Research Institute	69
Modular Computer Systems, Inc.	8
MTS Systems Corporation	129
National Academy of Sciences	36
National Oceanographic and Atmospheric Administration	14
New York University	475
Northrop Services	44
Oklahoma State University	25
Old Dominion University	86
Optimization Software, Inc.	8
Pan American World Airways	28
PCR Ink	146
Peninsula Chemical Corporation	91
Polytechnic Institute of New York (PINY)	52
Pratt & Whitney, United Aircraft Corporation	5 504
Precision Model	287

[b]Associated.

TABLE I.- Concluded

Contractor/grantee	Amount, thousands of dollars
Princeton University	15
Printronic, Inc.	12
Purdue University	25
Rockwell International	2 284
San Jose State University	369
Sargamo Electric	22
S.A.R., Inc.	20
SOLAR	1 104
Stanford Research Institute	98
Stanford University	160
Technion, Israel	55
Technochemi GBH	45
Technology Development	13
Texas Instruments	13
Textron, Inc.	333
TRW, Inc.	485
Tufts University	24
Ultra Systems	163
University of California	5
University of Cincinnati	8
University of Delaware	22
University of Denver	20
University of Idaho	17
University of Michigan	30
University of Mississippi	129
University of Pittsburgh	80
University of Texas	20
University of Washington	50
Virginia Polytechnic Institute (VPI)	22
Westinghouse, Inc.	197
Whittaker Corporation	18
Wye Electric Company	11
York University	40

TABLE II.- SUMMARY OF VCE CONTRACTORS AND AMOUNTS

Contractor/grantee	Amount, thousands of dollars
Digital Electronic Corporation	99
General Dynamics	264
General Electric Company	16 179
Pratt & Whitney, United Aircraft Corporation	12 779

TABLE III.- R&D (IN THOUSANDS OF DOLLARS) FOR SCR PROGRAM, CONTRACTS, AND GRANTS

PY	73	74	75	76	7T	77	78	79	80	81	Total
RTOP	(a)	743	743	743	743	743	743	517	533	533	
Net R&D	10 310	8 400	7788	6816	1700	6000	7500	7706	8396	8 611	73 227
Support (IMS[b])	1 424	1 694	1206	1840	380	2000	1500	1294	982	1 435	13 755
Total (506 W)	11 734	10 094	8994	8656	2080	8000	9000	9000	9378	10 046	86 982
Contracts	9 308	7 220	7002	6081	1382	5658	6448	6812	8165	5 098	63 174
Grants	284	349	302	478	50	342	360	320	223	307	3 015
Other work and carry-in	718	831	484	257	268	0	692	574	8	3 206	7 038
Total	10 310	8 400	7788	6816	1700	6000	7500	7706	8396	8 611	73 227

[a] 501-06, 08, 24, 31, 32; 760-65.
[b] Internal Management Services.

TABLE IV.- R&D (IN THOUSANDS OF DOLLARS) FOR VCE COMPONENT PROGRAM, CONTRACTS, AND GRANTS

PY	76	7T	77	78	79	80	81	Total
RTOP	511	511	511/551	511/551	511	535	535	
Net R&D	740	300	3100	6030	6792	7915	[a]6300	31 177
Support (IMS[b])	200	10	30	20	108	85	100	553
Total (506 W)	940	310	3130	6050	6900	8000	6400	31 730
Contracts	652	200	3079	5754	7162	6769	3487	27 103
Grants	0	0	0	0	0	0	750	750
Other work and carry-in	88	100	21	276	-370	1146	2063	3 324
Total	740	300	3100	6030	6792	7915	6300	31 177

[a]Reduced to 5117 on 6/30/82, and reduced again to 4980 on 9/30/82 during closeout in FY 1982.
[b]Internal Management Services.

TABLE V.- SCR NET R&D (IN THOUSANDS OF DOLLARS) BY DISCIPLINE

PY	73	74	75	76	7T	77	78	79	80	81	Total
Discipline:											
System studies	1 746	747	1463	1465	1070	2900	3000	3000	3000	3000	21 391
Aerodynamic performance	1 659	192	772	697	0	320	1150	920	1585	1322	8617
Total	3 405	939	2235	2162	1070	3220	4150	3920	4585	4322	30 008
Materials and structures	3 237	2971	2280	2130	230	1480	2350	2150	1871	2524	21 223
Propulsion and SEI	2 820	3150	2758	1985	300	700	900	1636	1940	1765	17 954
VCE support[a]					149	489	430	179	30	201	1 478
Stability and control	848	1340	515	539	100	600	100	0	0	0	4 042
Grand total	10 310	8400	7788	6816	1700	6000	7500	7706	8396	8611	73 227

[a]Amounts not to be added in determining grand total.

TABLE VI.- SCR NET R&D (IN THOUSANDS OF DOLLARS) BY DISCIPLINE AND CENTER

PY 1973

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames		286	350	225	210	450	1 521
Lewis			192	1663	587		2 442
Langley	1746	1373	2695		20	88	5 922
Dryden					5	310	315
JPL					110		110
Total	1746	1659	3237	1888	932	848	[a]10 310

[a]Total program authority (506 W) = 11 734.

TABLE VI.- Continued

PY 1974

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames		220	106	148	500	560	1534
Lewis			96	2381	65		2542
Langley	587	192	2735		31	102	3647
Dryden			29		25	623	677
JPL							
Total	587	412	2966	2529	621	1285	[a]8400

[a]Total program authority (506 W) = 10 094.

TABLE VI.- Continued

PY 1975

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames		170	150	50	230	250	850
Lewis			100	2220	65		2385
Langley	1463	690	2000		50	40	4243
Dryden			30			225	255
JPL					55		55
Total	1463	860	2280	2270	400	515	[a]7788

[a]Total program authority (506 W) = 8994.

TABLE VI.- Continued

PY 1976

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames		75	200		180		455
Lewis				1780			1780
Langley	1465	647	1875		25	139	4151
Dryden			30			400	430
JPL							
Total	1465	722	2105	1780	205	539	[a]6816

[a]Total program authority (506 W) = 8656.

TABLE VI.- Continued

PY 197T

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames			30				30
Lewis				300			300
Langley	1070		200				1270
Dryden						100	100
Total	1070	0	230	300	0	100	[a]1700

[a]Total program authority (506 W) = 2080.

TABLE VI.- Continued

PY 1977

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames			200				200
Lewis				700			700
Langley	2900	320	1240			100	4560
Dryden			40			500	540
Total	2900	320	1480	700	0	600	[a]6000

[a]Total program authority (506 W) = 8000.

TABLE VI.- Continued

PY 1978

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames			200				200
Lewis				900			900
Langley	3000	1150	2100			50	6300
Dryden			50			50	100
Total	3000	1150	2350	900	0	100	[a]7500

[a]Total program authority (506 W) = 9000.

TABLE VI.- Continued

PY 1979

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames			250				250
Lewis				1306			1306
Langley	3000	920	1700	330			5950
Dryden			200				200
Total	3000	920	2150	1636	0	0	[a]7706

[a]Total program authority (506 W) = 9000.

TABLE VI.- Continued

PY 1980

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames			150				150
Lewis				1540			1540
Langley	3000	1585	1700	400			6685
Dryden			21				21
Total	3000	1585	1871	1940	0	0	[a]8396

[a]Total program authority (506 W) = 9378.

TABLE VI.- Continued

PY 1981

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames			186				186
Lewis				1500			1500
Langley	3000	[a]1322	1700	265			6287
Dryden			638				638
Total	3000	1322	2524	1765	0	0	[b]8611

[a]Includes $340,000 reserves.
[b]Total program authority (506 W) = 10 046.

TABLE VI.- Concluded

PY 1982

Center	System studies	Aerodynamic performance	Materials and structures	Propulsion	Stratospheric emissions impact	Stability and control	Total
Ames Lewis Langley Dryden							0
Total	0	0	0	0	0	0	[a]0

[a]Total program authority (506 W) = 0.

TABLE VII.- RTOP, DISCIPLINE, AND NET R&D BY PROGRAM YEAR
FOR EACH OAST CENTER

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	501-31-71	Fuel Tank Sealants	M&S	350
	501-24-20	Pollution Reduction	SEI	210
	501-24-19	Propulsion Noise	P	225
	760-65-01	Option Aero Design	A	250
	760-65-04	Low-Speed Aero Methods	A	12
	760-65-06	FLEXSTAB	S&C	250
	760-65-07	Handling Quality Criteria	S&C	200
	760-65-08	Control System Mechanization	S&C	0
	501-06-11	Sonic Boom	A	25
Total				1 522
Lewis	501-31-72	AST Materials	M&S	192
	501-24-19	Propulsion Noise	P	303
	501-24-20	Pollution Reduction	↓	587
	501-24-21	Integrated Propulsion Control	↓	283
	501-24-22	Experimental Engine Study	↓	1 077
Total				2 442
Langley	501-32-01	Structure Design Concepts	M&S	680
	501-32-02	Flutter Design Models	↓	174
	501-32-03	Loads and Aeroelastic Technology	↓	436
	501-32-05, 06	Titanium and Composites Structures	↓	1 267
	501-08-11	Atmospheric Measurements for AST	↓	138
	501-24-20	Pollution Reduction	SEI	20
	760-65-09	AST System Studies	SS	1 746
	760-65-03	Aero Performance Concepts	A	935
	760-65-04	Low-Speed Performance Prediction	A	238
	501-06-11	Sonic Boom	A	200
	501-32-07	ACT Wind-Tunnel Techniques	S&C	87
Total				5 921
DFRC	501-32-04	Materials and Structures Components	M&S	35
	760-65-05	Co-Op Controls	S&C	275
	501-24-20	Pollution Reduction	SEI	5
Total				315
JPL	501-24-20	Pollution Reduction	SEI	110
Total (SCR)				10 310

TABLE VII.- Continued

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	743-31-01	Fuel Tank Sealants	M&S	106
	743-34-22	Stratospheric Emissions Impact	SEI	500
	743-34-11	Noise Reduction	P	148
	743-61-11	AST Optimum Design	A	92
	743-65-21	Aero Performance Theory	A	128
	743-36-01	FLEXSTAB	S&C	300
	743-36-11	ACT Handling Quality Criteria	S&C	137
	743-36-12	Control System Mechanization	S&C	123
Total				1534
Lewis	743-31-24	AST Materials	M&S	96
	743-34-22	Stratospheric Emissions Impact	SEI	65
	743-34-11	Noise Reduction	P	294
	743-34-21	Pollution Reduction	↓	250
	743-34-31	Inlet Stability System		363
	743-34-41	Experimental Engine Study		1360
	743-34-51	Low-Noise Engine Study		114
Total				2542
Langley	743-32-01	Structural Concepts Advanced Configurations	M&S	1054
	743-32-11	Structural Design Methods	↓	147
	743-32-12	Loads and Aeroelastic Technology		324
	743-32-13	Atmospheric Turbulence Measurement Technology		209
	743-32-21, 22	Titanium and Composites Technology		1006
	743-34-22	Stratospheric Emissions Impact	SEI	31
	743-60-01	Aero Performance System Studies	SS	587
	743-65-12	Aero Performance Concepts	A	54
	743-65-21	Aero Performance Theory	A	0
	743-65-31	Sonic Boom	A	138
	743-36-04	ACT Wind-Tunnel Techniques	S&C	96
Total				3646
DFRC	743-32-23	Materials and Structures Technology	M&S	29
	743-36-22	Co-Op Controls	S&C	624
	743-34-22	Stratospheric Emissions Impact	SEI	25
Total				678
Total (SCR)				8400

TABLE VII.- Continued

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	743-01-02	Fuel Tank Sealants	M&S	150
	743-02-22	Stratospheric Emissions Impact	SEI	230
	743-03-11	Propulsion Noise Technology	P	50
	743-04-11	Optimum Aero Design	A	75
	743-04-21	Aero Performance Theory	A	95
	743-05-01	FLEXSTAB	S&C	175
	743-05-11	Handling Qualities Criteria	S&C	75
	743-05-12	Control Systems Mechanization	S&C	0
Total				850
Lewis	743-01-24	Materials	M&S	100
	743-02-22	Stratospheric Emissions Impact	SEI	65
	743-03-11	Noise Reduction	P	743
	743-03-21	Pollution Reduction	↓	575
	743-03-31	Inlet Stability System	↓	0
	743-03-41	Engine Study	↓	800
	743-03-51	Unique Components Technology	↓	100
Total				2383
Langley	743-01-01	Structures Concept Study	M&S	520
	743-01-11	Computer-Aided Design	↓	100
	743-01-12	Loads and Aeroelasticity Technology	↓	320
	743-01-13	Atmospheric Turbulence	↓	180
	743-01-22	Materials Applications	↓	880
	743-02-22	Stratospheric Emissions Impact	SEI	50
	743-04-01	Aero Performance System Studies	SS	1553
	743-04-12	Aero Performance Concepts	A	350
	743-04-21	Aero Performance Theory	A	150
	743-04-31	Sonic Boom	A	102
	743-05-04	ACT Aeroelastic Response	S&C	40
Total				4245
DFRC	743-01-23	Materials and Structures Technology	M&S	30
	743-05-22	Co-Op Controls	S&C	225
Total				255
JPL	743-02-22	Stratospheric Emissions Impact	SEI	55
Total (SCR)				7788

TABLE VII.- Continued

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	743-01-02	Fuel Tank Sealants	M&S	200
	743-02-22	Stratospheric Emissions Impact	SEI	180
	743-03-11	Propulsion Technology	P	0
	743-04-21	Aero Performance Theory	A	75
Total				455
Lewis	743-03-11	Noise Reduction Technology	P	170
	743-03-21	Pollution Reduction	↓	290
	743-03-31	Inlet Stability System		0
	743-03-41	Engine Study		820
	743-03-51	Unique Components Technology		500
Total				1780
Langley	743-01-01	Structural Concepts	M&S	550
	743-01-11	Computer-Aided Design	↓	160
	743-01-12	Loads and Aeroelasticity Technology		300
	743-01-13	Atmospheric Turbulence		145
	743-01-22	Materials Applications		720
	743-02-22	Stratospheric Emissions Impact	SEI	25
	743-04-01	Aero Performance System Studies	SS	1465
	743-04-12	Aero Performance Concepts	A	534
	743-04-21	Aero Performance Theory	A	71
	743-04-31	Sonic Boom	A	42
	743-05-04	ACT Aeroelastic Response	S&C	40
	743-05-31	Active Flutter Suppression	S&C	99
Total				4151
DFRC	743-01-23	Materials and Structures Technology	M&S	30
	743-05-22	Co-Op Controls	S&C	400
Total				430
Total (SCR)				6816
Lewis	511-56-01	Variable-Cycle Engine Program	VCE	740

TABLE VII.- Continued

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	743-01-02	Fuel Tank Sealants	M&S	30
	743-02-22	Stratospheric Emissions Impact	SEI	0
Total				30
Lewis	743-03-11	Noise Reduction Technology	P	0
	743-03-21	Pollution Reduction		0
	743-03-31	Inlet Stability System		0
	743-03-41	Engine Study		0
	743-03-51	Unique Component Technology		300
Total				300
Langley	743-01-01	Structural Concepts	M&S	50
	743-01-11	Computer-Aided Design		0
	743-01-12	Loads and Aeroelastic Technology		0
	743-01-13	Atmospheric Turbulence		30
	743-01-22	Materials Application		120
	743-04-01	Aero Performance System Studies	SS	1070
	743-04-12	Aero Performance Concepts	A	0
	743-04-21	Aero Performance Theory	A	0
	743-04-31	Sonic Boom	A	0
	743-05-04	ACT Aeroelastic Response	S&C	0
	743-05-31	Active Flutter Suppression	S&C	0
Total				1270
DFRC	743-01-23	Materials and Structures Technology	M&S	0
	743-05-22	Co-Op Controls	S&C	100
Total				100
Total (SCR)				1700
Lewis	511-56-01	Variable-Cycle Engine Program	VCE	300

TABLE VII.- Continued

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	743-01-02	Fuel Tank Sealants	M&S	200
	743-02-22	Jet Wakes	SEI	0
Total				200
Lewis	743-03-11	Noise Reduction Technology	P	0
	743-03-21	Pollution Reduction	↓	400
	743-03-31	Inlet Stability System	↓	0
	743-03-51	Unique Component Technology	↓	300
Total				700
Langley	743-01-01	Structural Concepts	M&S	200
	743-01-11	Computer-Aided Design	↓	125
	743-01-12	Loads and Aeroelastic Technology	↓	200
	743-01-13	Atmospheric Turbulence	↓	100
	743-01-22	Materials Application	↓	615
	743-04-01	Aero Performance System Studies	SS	2930
	743-04-12	Aero Performance Concepts	A	140
	743-04-21	Aero Performance Theory	A	150
	743-04-31	Sonic Boom	A	0
	743-05-04	ACT Aeroelastic Response	S&C	100
	743-05-31	Arrow Wing Flutter Suppression	S&C	0
Total				4560
DFRC	743-01-23	Materials and Structures Technology	M&S	40
	743-05-22	Co-Op Controls	S&C	500
Total				540
Total (SCR)				6000
Lewis	511-56-01	Variable-Cycle Engine Program	VCE	3100

TABLE VII.- Continued

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	743-01-02	Fuel Tank Sealants	M&S	200
Lewis	743-03-22	SCAR Propulsion Technology	P	900
Langley	743-01-03 743-04-13 743-05-03	Materials and Structures Technology Aero Performance Technology ACT Aeroelastic Response	M&S A, SS S&C	2050 4150 100
Total				6300
DFRC	743-01-04 743-05-04	Materials and Structures Technology Stability and Control Technology	M&S S&C	50 50
Total				100
Total (SCR)				7500
Lewis	511-56-01	Variable-Cycle Engine Program	VCE	6030

TABLE VII.- Continued

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	517-53-11	Fuel Tank Sealants	M&S	250
Lewis	517-53-32 517-53-62	Propulsion Technology Propulsion Airframe Integration	P P	976 330
Total				1306
Langley	517-53-13 517-53-43 517-53-63	Materials and Structures Technology Aero Performance Technology Airframe Propulsion System Interaction	M&S A, SS P	1700 3920 330
Total				5950
DFRC	517-53-14	Materials and Structures Flight Research	M&S	200
Total (SCR)				7706
Lewis	511-56-02	Variable-Cycle Engine Program	VCE	6792

TABLE VII.- Continued

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	533-01-11	Materials and Structures Technology	M&S	150
Lewis	533-01-32 533-01-62	Propulsion Technology Propulsion System Airframe Integration	P P	900 640
Total				1540
Langley	533-01-13 533-01-43 533-01-63	Materials and Structures Technology Aero Performance Technology Propulsion System Airframe Integration	M&S A, SS P	1700 4585 400
Total				6685
DFRC	533-01-14	Materials and Structures Technology	M&S	21
Total (SCR)				8396
Lewis	535-02-12	Variable-Cycle Engine Technology	VCE	7915

TABLE VII.- Concluded

Center	RTOP	Title	Discipline	R&D, thousands of dollars
Ames	533-01-11	Materials and Structures Technology	M&S	186
Lewis	533-01-32 533-01-62	Propulsion Technology Propulsion System Airframe Integration	P P	900 600
Total				1500
Langley	533-01-13 533-01-43 533-01-63	Materials and Structures Technology Aero Performance Technology Propulsion System Airframe Integration	M&S A, SS P	1700 4322 265
Total				6287
DFRC	533-01-14	Materials and Structures Technology	M&S	638
Total (SCR)				8611
Lewis	535-02-12	Variable-Cycle Engine Technology	VCE	[a]6300

[a]Reduced to 5117 on 6/30/82, and reduced again to 4980 on 9/30/82 during closeout in FY 1982.

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15. Supplementary Notes

Sherwood Hoffman: Langley Research Center, Hampton, Virginia.
Mary C. Varholic: Lewis Research Center, Cleveland, Ohio.

16. Abstract

The NASA-SCAR (AST) program was initiated in 1972 at the direct request of the Executive Office of the White House and Congress following termination of the U.S. SST program. The purpose of SCR was to conduct a focused research and technology program on those technology problems which contributed to the SST termination and, also, to provide an expanded data base for future civil and military supersonic transport aircraft. Funding for the Supersonic Cruise Research (SCR) Program was initiated in fiscal year 1973 and terminated in fiscal year 1981. The program was implemented through contracts and grants with industry, universities, and by in-house investigations at the NASA/OAST centers. The studies included system studies and five disciplines: propulsion, stratospheric emissions impact, materials and structures, aerodynamic performance, and stability and control. The NASA/Lewis Variable-Cycle Engine (VCE) Component Program was initiated in 1976 to augment the SCR program in the area of propulsion. After about 2 years, the title was changed to VCE Technology Program. The total number of contractors and grantees on record at the AST office in 1982 was 101 for SCR and 4 for VCE. This paper presents a compilation of all the contracts and grants as well as the funding summaries for both programs.

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