CONTRACTS - MSFC - 1962 X-9

R & D Dir for 62

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AEC, P.O. BOX 550, HANFORD, WASH.

Battelle Memorial Institute-metallurgical services, $30,000
Norfin, Inc.-d gn, fabricate, and test extracting and overboring machines, $56,656
Washington, Un rsity of-60-inch cyclotron development and research program, and theoretical nuclear physics research, $390,000
" laboratory research on radiation biology, $280,000

NATIONAL AERONAUTICS & SPACE ADMINISTRATION

NASA, GEORGE C MARSHALL FLIGHT CENTER, HUNTSVILLE, ALA.

Aberdeen Proving Ground-provide wind tunnel teses for Saturn force tests, $37,200
Air Research and Development Command-technical feasibility study on use of various Centaur components in Saturn C1 launch vehicle, $120,000
" design, development and fabrication of the Centaur upper stages of Saturn and associated equipment, $10,430,000
" research, development and manufacture of 17,500 lb. thrust liquid hydrogen engine for third stage of Saturn, $8,000,000
" research, development and manufacture of XLR-115 Pratt & Whitney 15,000 lb. thrust liquid hydrogen engines for third stage of Saturn, $12,000,000
" design and manufacture of components and support equipment for Agena program, $1,084,000
Air Force Logistics Command-development of F-1 1500K liquid propellant rocket engine, $167,000
" development of J-2 200 K liquid propellant rocket engine, $318,050
Arnold Air Force Station-provide 5 days of testing time in the propulsion wind tunnel facility to consist of approximately 25 shots at Mach numbers .7 to 1.5, $100,000
Air Products, Inc.-design, documentation and liaison's services for a liquid hydrogen transfer and storage system, $349,687
Alabama, University of-research in topological dynamics and related fields, $64, 329
American Optical Co.-design and development of a precision three axis sidereal test stand for Project Saturn, $139,000
American Science and Engrg., Inc.-study of the venting and disposal of hydrogen from Saturn C-1 vehicle, $57,809
Auburn Research Foundation, Inc.-research on telemetering, measuring and radio frequency systems for Saturn, $49,999
Avco Corp.-engineering services and support fabrication work for Saturn, $29,954
" engineering, fabrication and related services for Saturn, $440,004
Battelle Memorial Institute-evaluation of solid propellants and solid propellant system for space application, $198,200
Bechtel Corp.-criteria on liquid hydrogen, liquid oxygen and blockhouse facilities, $132,226
Boeing Aircraft Corp.-study of large launch vehicles utilizing solid propellant engines, $98,503
Bolt, Beranek and Newman, Inc.-investigation of accoustic environment, large booster systems, $59,742
Brown Engineering Co., Inc.-engineering, fabrication and related services for Saturn, Centaur, Mercury and Juno programs, $5,719,534
" design, development and manufacture of ground equipment test set for Saturn, $49,996
Chrysler Corp.-conduct investigation of corrosion and corrosion prevention in various components and materials in the Saturn vehicle, $79,220
" engineering services for Saturn, Mercury and Juno programs, $7,637,730
" engineering, fabrication and associated services in support of experimental, developmental and research work under various space programs-109,821 man hours for a period of one year beginning 8/1/60, $7,609,987
" investigation of the age deterioration of lubricants subsequent to storage on launch vehicle valves, $58,492
U.S. Department of Commerce-to investigate the total and spectral emissivities of materials at very high temperatures, $43,000

NASA -- Cont.

Cook Technological Center-research and development to determine wind shears at high altitudes, $67,216

Cornell Aeronautical Lab., Inc.-research relative to the development of equipment for acquiring high resolution measurements of wind velocity and vertical wind shear in the troposphere, $180,000

" conduct a research program on the application of shock tube techniques to the study of base heating of tocket motor vehicles, $194,442

Douglas Aircraft Co., Inc.-conduct Study of orbital launch operations from an orbiting space station and resulting space exploration potentials, $92,165

" conduct study of operational requirements of Saturn C-2 system, $84,634

Dynametrics Corp.-design, develop, fabricate and check-out automatic calibration system for pressure transducers, $96,411

Electro Optical Systems, Inc.-perform ionizer development and surface physics studies, $74,941

Electronic Communications, Inc.-development and fabrication of two prototype flight control computers for Saturn, $128,000

Federal-Mogul-Bower Bearings, Inc.-development and testing of components of vent pressurizing and propelland feed lines used on Saturn, $99,846

Fexonics Corp.-engineering, design, fabrication and related services for testing various items of vent, pressurizing and propelland feed lines for Saturn, $750,000

Filtron Co., Inc.-research and development of advanced radio frequency interference control systems and techniques for application to Saturn program, $74,173

Franklin System-development of liquid hydrogen densitometer, $29,999

Frebank Co.-design and manufacture of Saturn thrust, hydraullic, fuel tank, and LOX tank pressure-switches, $77,621

General Dynamics Corp.-design study for Saturn D vehicle, $112,636

" study of sputtering mechanisms under ion propulsion conditions, $73,281

" perform study of principles of meteroid protection of launch vehicles, $54,015

" perform conceptual design studies of both liquid and solid fueled launch vehicles in the 6 to 12 million pound thrust class, $130,017

" perform conceptual design studies of a liquid fueled launch vehicle in the 2 to 3 million pound thrust class, $115,565

" study of orbit launched vehicles, $53,322

" research and development in prevention of corrosion of metals used in the Saturn space vehicle, $80,232

General Electric Co.-development of a cryogenic gyro, $135,977

" development of a cryogenic accelerometer for future guidance systems, $119,613

" computer evaluation of ion engine configurations, $42,500

" research and development on electrical conduction in cesium vapor to determire likelihood of electric current malfunction in presence of cesium, $42,500

" research and development of coatings for conductors, $88,655

General Precision, Inc.-perform design and development work necessary to complete design detail for modifying ASN-24 computer to meet the requirements of the Saturn vehicle, $60,000

" perform, design and development work required to modify the memory drum of the ASN-24 computer to meet the requirements of the Saturn vehicle, $107,516

" research and development resolver chain for Saturn guidance, $65,000

Goodrich High Voltage Astronautics, Inc.-conduct cathode development studies for application in electric propulsion, $26,308

Goodyear Aircraft Corp.-research and development of materials for Saturn paraglider recovery system, $65,000

Grumman Aircraft Engrg. Corp.-perform study to obtain optimum trajectory of space vehicle using low-thrust engines, with minimum expenditure of fuel and energy, $50,020

NASA -- Cont.

Hayes Aircraft Corp.-engineering, fabrication and related services in support of experimental, Development and Research Work under various space programs, CPFF Contract No. NAS8-18, 621,400 manhours for a period of 1 year, $4,251,400

" fabrication, engineering and other related services for Juno, Mercury, and Saturn programs, $7,023,121

Hayes Corp.-testing, checkout and related services for Asturn launch facility at Cape Canaveral, Fla., $1,087,692

Hughes Aircraft Co.-development of organic sealants, $68,652

International Business Machines Corp.-perform automatic data processing study for application to Saturn project, $77,271

" advanced technology studies and investigation for digital computer, Project Saturn, $150,000

Arthur D. Little, Inc.-study of blast effect of Saturn vehicle, $440,140

Lockheed Aircraft Corp.-design study for Saturn D vehicle, $128,804

" perform early rendezvous demonstration study involving possible methods and hardware which might be used, $100,000

" study space shielding problems, $69,787

" engineering, fabrication and related services for Saturn, $1,382,540

Marquardt Corp.-investigation of exhaust nozzle flow phenomena in Arc Jet Engines, $59,945

Martin Co.-perform conceptual design studies of a liquid fueled launch vehicle in the 2 to 3 million pound thrust class, $163,040

" study of Saturn C-3 launch facilities, $99,500

" conduct conceptual study of best possible earth-lunar transportation system for future programs, $74,191

" study of operational requirements of Saturn C-2 system, $114,814

Mechman Instruments, Inc.-design, development and fabrication of automatic doppler cycle counter for use with advanced computer systems, $97,631

Michigan, University of-conduct investigation and study of transient heat transfer to determine temperature limits of pressurizing gases and the amount of heat transfer occurring in liquids in free gravity or reduced gravity fields, $40,000

✓Midwest Research Institute-determination of thermal properties of materials ranging from 250° to 1500° C, $92,945

" conduct research on bearings for use in high vacuum conditions, $72,732

" theoretical research on loading of missiles due to atmospheric turbulence and wind shear, $40,047

Minneapolis Honeywell-Furnish necessary engrg. and mfg. services to adapt the Centaur guidance set to meet Saturn requirements and fabricate modified set (Less Computer) including ground support equipment, $384,547

" development of a ceramic gas bearing spin motor and gimbal assembly for use in AB-5 stabilizing gyro for future vehicles, $143,439

Narmco Industries, Inc.-development of adhesives for very low temperature application, $59,703

Navy, Bureau of Yards & Docks-design and construction of an addition to missile assembly building; also modification to Range users building, $234,500

" for design and construction of Scout launch facility, Pacific Missile Range, Point Arguello, Calif., $326,000

North American Aviation-conduct stability rating program for large liquid rocket engine systems, $282,950

" development of 200,000lb. thrust liquid hydrogen-fueled engine for upper stages of advance configurations of Saturn, $44,700,000

" research of a bipropellant plasmajet device, $59,338

" perform conceptual design studies of a liquid fueled launch vehicle in the 2 to 3 million pound thrust class, $148,487

" perform conceptual design studies of both liquid and solid fueled launch vehicles in the 6 to 12 million pound thrust class, $160,041

Northrop Corp.-redesign and modification of three angle of attack transducers for Project Saturn, $51,946

NASA -- Cont.

Northwestern University-research and development work on the application of electronic image conversion techniques to the tracking of space probes and other astronomical objects, $34,975

Parker Hannifin Corp.-conduct a Study of Torque determination of flared tube syle fittings for use with low pressure gases, $68,436

" research and development of Saturn booster preliminary and fill and drain valves, $194,487

Plasmadyne Corp.-condust re-combination study using plasma arc for application to electric propulsion technology, $66,552

Progressive Welder and Machine Co.-engineering, desing, fabrication and related services for the mfg. of tooling in connection with various space programs, $150,000

" engineering, design, fabrication, installation and related services for tooling manufacture for Saturn, $150,000

Radiation, Inc.-design, development and fabrication of a function generator, $71,013

Radio Corp. of America-development of a Saturn ground computer compex, $316,611

Redstone Arsenal-perform a research and development program of spectrographic analysis of the exhaust products of a spectroscopically clean plasma arc jet, $40,000

Resdel Engrg. Corp.-design and development and fabrication of UDOP VHF phale lock converter, $80,580

Republic Aviation Corp.-fabrication of access door assemblies for Project Saturn, 56,861

Resdel Engineering Corp.-design, development and fabrication of radio frequency multipliers for Saturn, $58,566

Reynolds Electrical and Engineering Co., inc.-continuous check-out and periodic maintenance and/or modification of electrical equipment at Nasa-Marshall Center, $154,000

Rust Engineering Co.-engineering and Drafting services Contract No. NAS 8-1671 (RFQ ENG 91-61) Sub-Par C. over 5 Month period. Sub-Par.D. Services at Marshall Center, $36,723

Ryan Aeronautical Corp.-development of techniques for explosive-forming 70-inch-diameter bulkheads for rocket tanks and other parts. Development of methods for high-energy forming of hemispherical and cylindrical shapes used in space exploration programs will be studies, $75,000

A.O. Smith Corp.-design, development and qualification of metallic high pressure spherical container for Project Saturn, $179,517

Smithsonian Institution-performance by the Smithsonian Astrophysical Observatory of a program of research on the motion of an artificial satellite around its center of mass, $50,000

Space Technology Labs, Inc.-conduct investigation of ion beam diagnostics, $86,500

" study of the control and dymanic stability problem of the Saturn vehicle, $69,968

Sperry Rand Corp.-engineering and fabrication services for testing, evaluation, refinement, re-work, and/or manufacturing of various guidance, control and instrumentation systems and components for Saturn, $234,993

Staffer Chemical Co.-research and development of high temperature resistance of polymeric film forming material for advanced space application,

Temco Electronics and Missile Co.-engineering services on Project Saturn, $73,398

Texas Instruments, Inc.-research and development of Peltier coolers in elec. propulsion systems for operation in space environment, $35,000

" design, development and fabrication of prototypes of a small, solid circuit, microelectronic Binary Fli-Flop (electronic switch), $50,557

Thompson Ramo Wooldridge, Inc.-research and development of porous tungsten ion emitters for use in electrostatic propulsion, $96,432

" research and development of arc ion sources for electronic propulsion, $86,432

Vought Astronautics-conduct study of orbital launch operations from an orbiting space station and resulting space exploration potentials, $112,156

Westinghouse Electric Corp.-design, development and fabrication of small, low frequency micro electronic semiconductor amplifier for general application, $76,028