

CSM SUBCONTRACTORS

More than \$1,078,000,000 has been funded by North American Rockwell's Space Division to Apollo subcontractors and suppliers throughout the United States. Funding to subcontractors with contracts in excess of \$500,000 (values are approximate):

Company	Product	Value
Accessory Products Co. Whittier, California	Helium transfer unit, valves, and assemblies	\$ 3,469,567
Aerojet General Corp Space Propulsion Division Sacramento, California	Service propulsion engine	99,780,000
Aeronca Manufacturing Co. Middletown, Ohio	Stainless steel honeycomb panels	15,411,779
Air Products & Chemical Co., Inc. Allentown, Pa.	Liquid hydrogen storage units	599,523
Amecom Division Litton Systems, Inc. College Park, Maryland	C-band (Block I) and S-band antennas	2,348,600
Applied Electronics Corp. of New Jersey Metuchen, N.J.	Pulse-code modulation systems	1,185,000
Astrodata, Inc. Anaheim, Calif.	Integrated computer complex	783,000
Avco Corp. Space Systems Division Lowell, Mass.	CM ablative heat shield	47,272,900
Avien, Inc. Woodside, N.Y.	2-gigacycle deep-space antenna	2,628,000
Beckman Instruments, Inc. Scientific & Process Instruments Division Fullerton, Calif.	Data acquisition system and water conditioning	2,838,000
Beech Aircraft Corp. Boulder, Colo.	Cryogenic gas storage system	30,855,876
Bell Aerosystems Company Division of Textron, Inc. Buffalo, N.Y.	Positive expulsion reaction control subsystem propellant tanks	23,084,000
Bendix Corp. Davenport, Iowa	Instrumentation	552,000
Borg-Warner Controls (Formerly Electroplex) Los Angeles, Calif.	Modules and amplifiers	706,781

Company	Product	Value
Calmech Los Angeles, Calif.	Helium pressure relief valves	\$ 854,000
Collins Radio Co. Cedar Rapids, Iowa	Communications and data subsystems	130,317,000
Control Data Corp. Government Systems Division Minneapolis, Minn.	Digital test command system spare parts	9,900,000
Cosmodyne Corp. Torrance, Calif.	Liquid hydrogen, liquid oxygen ground support equipment and unique detail spares of liquid hydrogen and liquid oxygen transfer units	4,348,440
Dalmo Victor Co. (Division of Textron) Belmont, Calif.	S-band high-gain (deep space) antenna	13,072,000
McDonnell Douglas Corp. Douglas Aircraft Div. Long Beach, Calif.	Parachute subsystem testing	904,000
Eagle Picher Joplin, Mo.	Post-entry and storage batteries	720,000
Eckel Valve Co. San Fernando, Calif.	Valves	783,958
Electro-Optical Systems, Inc. Micro Systems, Inc. Pasadena, Calif.	Temperature and pressure transducers, signal conditioners, and electronic control units	8,772,000
Garrett Corp. AiResearch Manufacturing Co. Los Angeles, Calif.	Environmental control subsystem	78,308,748
General Motors Corp. Allison Division Indianapolis, Ind.	Service propulsion fuel and oxidizer tanks	13,389,658
General Precision, Inc. White Plains, N.Y.	Mission simulator trainer, control sequence, heat flux sensor	42,083,340
General Time Corp. Aeronetics Division Rolling Meadows, Ill.	Central timing equipment	6,515,023
Giannini Controls Corp. Pasadena, Calif.	Quantity gauging system	11,073,000
B.H. Hadley Co. Pomona, Calif.	Pressure helium regulator unit and liquid hydrogen tank vent disconnects	1,686,085
Hammond Organ Co. Gibbs Manufacturing and Research Corp. Janesville, Wis.	Mechanical timers and clocks	3,065,151

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Honeywell, Inc. Minneapolis, Minn.	Stabilization and control subsystem	\$134,145,781
ITT Kellogg Chicago, Ill.	In-flight test systems	2,049,872
Kinetics Corp. Solana Beach, Calif.	Power transfer and motor driver switches	1,804,000
Leach Corp. Azusa, Calif.	Flight qualification recorder	1,286,578
Ling Tempco Vought Dallas, Texas	Selective stagnation indicator system	5,398,542
Lockheed Propulsion Co. Redlands, Calif.	Launch escape motor and pitch control motor	10,011,582
Marquardt Corp. Van Nuys, Calif.	SM reaction control engines	37,894,790
McGraw Edison Daven Division Livingston, N.J.	Rotary switches	1,454,263
Metals & Controls, Inc. A Division of Texas Instruments, Inc. Hollywood, Calif.	Toggle switches	931,585
Microdot, Inc. Instrumentation Division South Pasadena, Calif.	Stress measurement system	1,447,098
Motorola, Inc. Military Electronics Division Scottsdale, Ariz.	Link, digital system, spare parts for up-data link equipment, test equipment, pseudo-random noise ranging test set and digital test command system	13,155,449
National Water Lift Co., Div. Pneumo Dynamics Kalamazoo, Mich.	Solenoid latching valves	1,987,153
Northrop Corp. Ventura Division Newberry Park, Calif.	Earth landing subsystem (parachute canopies) and associated GSE, intercommunication system, pressure measurement system, and ordnance assemblies	51,906,846
Opcalite Santa Ana, Calif.	Panels	1,185,377
Parker Aircraft Los Angeles, Calif.	Cryogenic valve modules	1,742,463
Philco Corp. Western Development Lab. Palo Alto, Calif.	Nuclear particle detection system	1,756,522

Company	Product	Value
Radiation, Inc. Melbourne, Fla.	Single-channel decommutator and time accumulator display (CM) and data processing system	\$ 3,529,000
Radio Corporation of America Astro Division Princeton, N.J.	Television equipment	4,216,038
Remanco, Inc. Santa Monica, Calif.	Rocket engine test set	1,000,000
Rosemount Engineering Co. Minneapolis, Minn.	Transducers and mass flowmeter	1,260,000
Sargent Industries (Formerly Electrada Corp.) El Segundo, Calif.	Pressure vessel	1,335,296
Sciaky Brothers, Inc. Chicago, Ill.	Design, fabrication and installation on weld fixtures for Apollo; heavy duty positioners and carriage fixtures	1,729,000
Scientific Data Systems Santa Monica, Calif.	Real-time simulation system	936,119
Simmonds Precision Products Vergennes, Vt.	Propellant quantity indicating and mixture control system	19,350,154
Stratos Div., Fairchild Stratos Corporation Manhattan Beach, Calif.	Reaction control subsystem helium regulators	1,169,072
Systems Engineering Laboratories, Inc. Ft. Lauderdale, Fla.	Channel data	717,767
Thiokol Chemical Corp. Elkton, Md.	Tower jettison motor	4,550,145
Transco Products, Inc. Venice, Calif.	Telemetry antenna system (R&D)	1,260,000
United Aircraft Pratt & Whitney Aircraft Hartford, Conn.	Fuel cell powerplants	81,123,482
Weber Aircraft Burbank, Calif.	Apollo foldable crew couch system	2,200,000
Westinghouse Electric Corp. Aerospace Electrical Division Lima, Ohio	Static inverters	8,060,695
Weston Instruments, Inc. Newark, N.J.	Electrical indicating meters	2,026,579