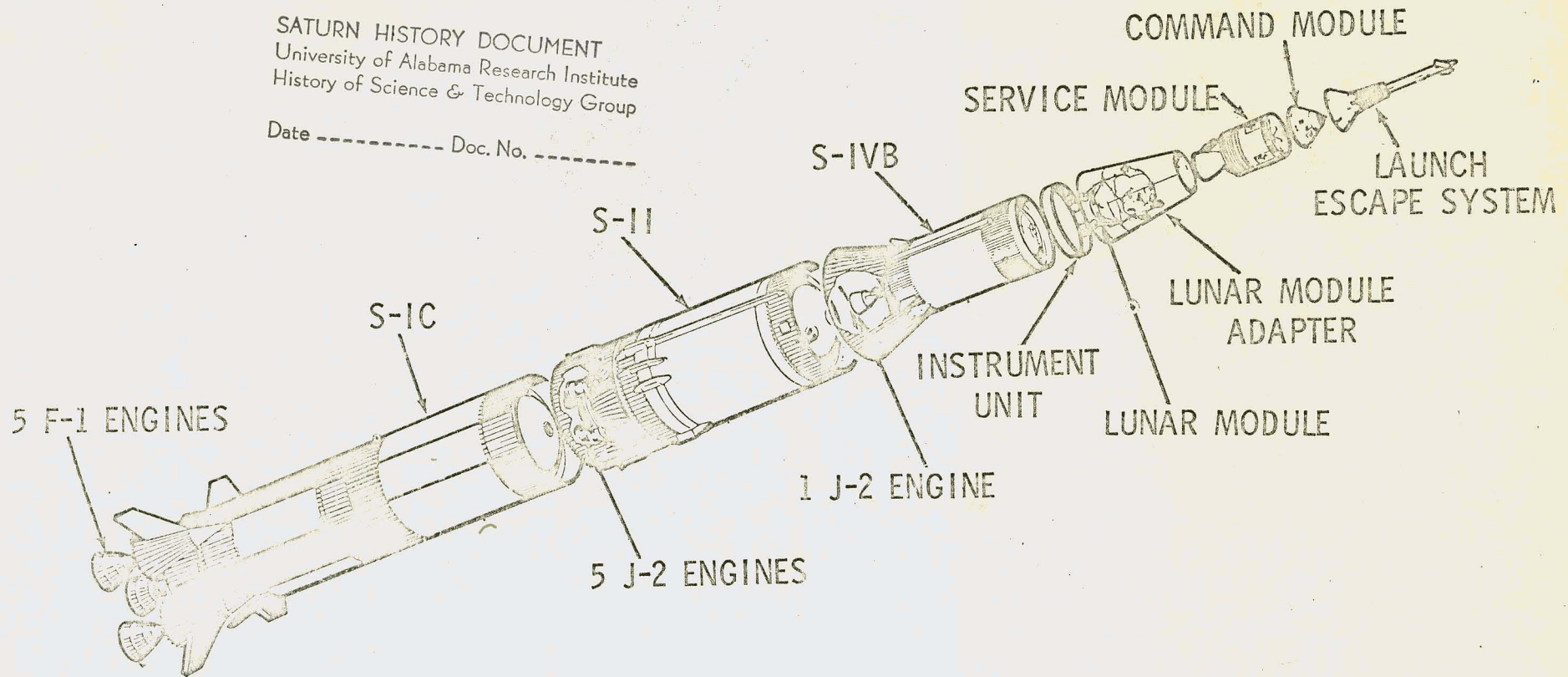


APOLLO 12

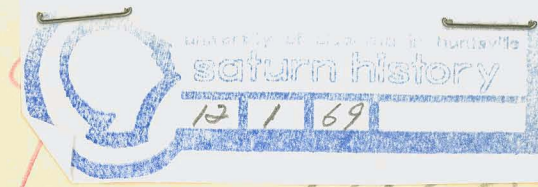
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

SATURN HISTORY DOCUMENT
University of Alabama Research Institute
History of Science & Technology Group

Date ----- Doc. No. -----



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION



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INTRODUCTION

This booklet lists the principal prime contractors and subcontractors that are directly involved in the flight hardware, launch support, mission control and communications and data acquisition associated with the Apollo 12 lunar landing mission. It does not include the additional thousands of firms that have contributed to the development of preceding spacecraft and launch vehicles such as Mercury, Gemini and Saturn IB nor does it include those firms associated entirely with test and simulator equipment and support services utilized in the development of the Apollo/Saturn V.

The selection of the few hundred names that appear in this publication necessarily represents some degree of subjective judgment on the part of NASA and prime contractor personnel in the identification of the "principal" prime contractors and subcontractors.

Other reports available for inspection at NASA Headquarters cover all of NASA's principal prime contractors and subcontractors.

National Aeronautics and Space Administration
Procurement Office
Staff Operations Division
Washington, D. C. 20546

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

LAUNCH ESCAPE SYSTEM

System Contractor

North American Rockwell Corp.
Space Division
Downey, Calif.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

Lockheed Aircraft Corp. Propulsion Co. Division Redlands, Calif.	Launch Escape and Pitch Control Motors
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North American Rockwell Corp. Los Angeles Division Inglewood, Calif.	VHF Antenna, Boost Cover, LES Tower, Canards, Radial Beams, Forward Heat Shield.
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Thiokol Chemical Corp. Elkton, Md.	Tower Jettison Motors
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COMMAND AND SERVICE MODULE AND LUNAR ADAPTER

System Contractor

North American Rockwell Corp.
Space Division
Downey, Calif.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

Aerojet-General Corp. Propulsion Division; Liquid Rocket Operations Sacramento, Calif.	Service Propulsion Engine
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Aeronca, Inc. Middletown, Ohio	Honeycomb Panels
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Air Products & Chemicals, Inc. Allentown, Pa.	Liquid Hydrogen Storage Units
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Applied Electronics Corp. of N.J. Metuchen, N.J.	Pulse Code Modulation Systems
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COMMAND AND SERVICE MODULE AND LUNAR ADAPTER (CONT'D)

Avco Corporation Space Systems Division Lowell, Mass.	Ablative Heat Shield
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Avien, Inc. Woodside, N.Y.	Gigacycle Deep - Space Antenna
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Beckman Instruments, Inc. Scientific & Process Instru- ments Division Fullerton, Calif.	Data Acquisition System and Water Con- ditioning
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Beech Aircraft Corp. Boulder, Colo.	Cryogenic Gas Storage System
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Bell Aerospace Corp. Bell Aerosystems Co. Division Buffalo, N.Y.	Positive Expulsion Reaction Control Sub- system Propellant Tanks
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Bendix Corp. Navigation & Control Division Teterboro, N.J.	Inertial Reference Integrating Gyros
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Carleton Controls Corp. East Aurora, N.Y.	Regulators for Environmental Control System
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Clevite Corp. Cleveland, Ohio	Electrode Assembly
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Collins Radio Co. Cedar Rapids, Iowa	Communications and Data Subsystems
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Conrac Corp. Pasadena, Calif.	Quantity Gauging System
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Control Data Corp. Government Systems Minneapolis, Minn.	Digital Test Command System Spare Parts
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Cosmodyne Corp. Torrance, Calif.	Liquid Hydrogen, Liquid Oxygen Ground Support Equipment & Unique Detail Spares of Liquid Hydrogen & Liquid Oxygen Transfer Units
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APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

COMMAND AND SERVICE MODULE AND LUNAR ADAPTER (CONT'D)

ESB, Inc. Raleigh, N.C.	Pyro Storage Batteries
Eagle-Picher Industries, Inc. Joplin, Mo.	Entry and Post-Landing Entry Batteries
Ex-cell-o Corp. Cadillac Gage Co. Division Costa Mesa, Calif.	Gimbal Actuators
Fairchild Hiller Corp. Stratos Division Manhattan Beach, Calif.	Reaction Control Subsystem Helium Regulators
The Garrett Corp. AiResearch Mfg. Division Los Angeles, Calif.	Environmental Control System
General Motors Corp. AC Electronics Division Milwaukee, Wisc.	Guidance Computer System
General Motors Corp. Allison Division Indianapolis, Ind.	Service Propulsion System Fuel & Oxidizer Tanks
General Time Corp. Aeronetics Division Rolling Meadows, Ill.	Central Timing Equipment
Gibbs Mfg. & Research Corp. Janesville, Wisc.	Digital Events Timer
Honeywell, Inc. Minneapolis, Minn.	Stabilization and Control Subsystem
ILC Industries, Inc. Dover, Del.	Space Suits
International Telephone & Telegraph Corp. Industrial Products Division San Fernando, Calif.	Battery Changer

COMMAND AND SERVICE MODULE AND LUNAR ADAPTER (CONT'D)

International Telephone & Telegraph Corp. Kellogg Division Chicago, Ill.	In-Flight Test Systems
Kidde, Walter & Co., Inc. Weber Aircraft Division Burbank, Calif.	Foldable Crew Couches
Kollsman Instrument Corp. Syossett, N.Y.	Guidance and Navigation System Components
Leach Corp. Azusa, Calif.	Data Storage Equipment
Lear Siegler, Inc. Elyria, Ohio	Mechanical Equipment
Ling-Temco-Vought, Inc. Dallas, Texas	Flow Proportioning Valves for Environmental Control System
Ling-Temco-Vought, Inc. Dallas, Texas	Selective Stagnation Indicator System
Litton Systems, Inc. Amecom Division College Park, Md.	C-Band (Block I) and S-Band Antennas
The Marquardt Corp. Van Nuys, Calif.	Service Module Reaction Control Engines
Mass. Institute of Tech. Cambridge, Mass.	Research and Development of Guidance and Navigation System
McGraw-Edison Co. Daven Division Livingston, N.J.	Rotary Switches
Microdot, Inc. Instrumentation Division South Pasadena, Calif.	Stress Measurement System
Motorola, Inc. Military Electronics Division Scottsdale, Ariz.	Digital Up-Date Link

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

COMMAND AND SERVICE MODULE AND LUNAR ADAPTER (CONT'D)

North American Rockwell Corp. Autonetics Division Anaheim, Calif.	Guidance and Navigation System Components
North American Rockwell Corp. Autonetics Division Anaheim, Calif.	Sequential Events Control System
North American Rockwell Corp. Los Angeles Division Los Angeles, Calif.	Structure
North American Rockwell Corp. Rocketdyne Division Canoga Park, Calif.	Command Module Reaction Control System
North American Rockwell Corp. Tulsa Division Tulsa, Okla.	LM Adapter Structure
Northrop Corp. Ventura Division Newbury Park, Calif.	Earth Landing Subsystem (Parachute Canopies) and Associated GSE, Inter- communication System, Pressure Measurement System, and Ordnance Assemblies
Opcalite, Inc. Santa Ana, Calif.	Main Display Panels
Parker-Hannifin Corp. Parker Aircraft Co. Division Los Angeles, Calif.	Cryogenic Valve Module
Philco-Ford Corp. Western Development Lab. Palo Alto, Calif.	Nuclear Particle Detection System
Pneumo Dynamics Corp. National Water Lift Co. Division Kalamazoo, Mich.	Solenoid Latching Valves

COMMAND AND SERVICE MODULE AND LUNAR ADAPTER (CONT'D)

RCA Corporation Astro Electronics Division Princeton, N.J.	Television Cameras (Block I)
Radiation, Inc. Melbourne, Fla.	Single-Channel Decommunators and Time Accumulator Display and Data Process- ing System
Raytheon Company Sudbury, Mass.	Guidance and Navigation System Components
Rosemount Engineering Co. Minneapolis, Minn.	Transducers and Mass Flowmeter
Royal Industries Pomona, Calif.	Pressure Helium Regulator Unit and Liquid Hydrogen Tank Vent Disconnects
Sargent Industries, Inc. Airite Division Los Angeles, Calif.	Helium Tanks
Sciaky Brothers, Inc. Chicago, Ill.	Weld Fixtures, Heavy Duty Positioners and Carriage Fixtures
Simmonds Precision Products, Inc. Tarrytown, N.Y.	Propellant Gaging & Mixtures Control System
Space Ordnance Systems El Segundo, Calif.	Electrical Initiators
Sperry Rand Corp. Sperry Gyroscope Division Great Neck, N.Y.	Pulse Integration Pendulum for Navi- gation and Guidance
Teledyne, Inc. Kinetics Division Solana Beach, Calif.	Power Transfer and Motor Driver Switches
Textron, Inc. Accessory Products Co. Division Whittier, Calif.	Helium Transfer Unit, Valves and Assemblies

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

COMMAND AND SERVICE MODULE AND LUNAR ADAPTER (CONT'D)

Textron, Inc. Dalmo Victor Division Belmont, Calif.	Main Communications (Deep Space) Antenna Systems
Transco Products, Inc. Venice, Calif.	Telemetry Antenna System (R&D)
United Aircraft Corp. Hamilton Standard Division Windsor Locks, Conn.	Portable Life Support System
United Aircraft Corp. Pratt & Whitney Aircraft Division Hartford, Conn.	Fuel Cell Powerplants
Westinghouse Electric Corp. Aerospace Electrical Division Lima, Ohio	Static Inverters
Westinghouse Electric Corp. Baltimore, Md.	Television Camera (Block II)
Weston Instruments, Inc. Newark, N.J.	Electrical Indicating Meters
Whittaker Corp. North Hollywood, Calif.	Earth Landing Subsystem Equipment
Xerox Corp. Electro-Optical Systems, Inc. Pasadena, Calif.	Temperature and Pressure Transducers, Signal Conditioners and Electronic Control Units

LUNAR MODULE

System Contractor

Grumman Aerospace Corp.
Bethpage, N.Y.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

AMPAC Industries, Inc. Arma Division Garden City, N.Y.	Caution & Warning Electronics Assembly Signal-Conditioning Electronics Assembly Stabilization & Control Assembly
Aerojet-General Corp. Downey Plant Downey, Calif.	Ascent Propellant Tanks

LUNAR MODULE (CONT'D)

Avco Corporation Electronics Division Cincinnati, Ohio	Digital Control Assembly Digital Uplink Assembly
Bell Aerospace Corp. Bell Aerosystems Co. Division Buffalo, N.Y.	Reaction Control System - Tanks Valves for Ascent Engine
Collins Radio Co. Dallas, Texas	Signal Processor Assembly
Conrac Corp. Duarte, Calif.	Propellant Quantity Gaging
Corning Glass Works Corning, N.Y.	Windows
Dynamics Corp. of America Reeves Instrument Division Garden City, N.Y.	Exterior Tracking Light Lighting Control Assembly
Eagle-Picher Industries, Inc. Electronics Division Joplin, Mo.	Batteries
Eastman Kodak Co. Rochester, N.Y.	Lunar Surface Close-Up Camera
Edo Corp. College Point, N.Y.	Lunar Surface Sensing Probes
Farrand Optical Co., Inc. New York, N.Y.	External Visual Display Equipment
The Garrett Corp. AIResearch Mfg. Co. Division Los Angeles, Calif.	Cryogenic Tanks Gimbal Drive Actuator Supercritical Helium Tanks
General Electric Co. Specialty Control Division Waynesboro, Va.	Electrical Control Assembly

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

LUNAR MODULE (CONT'D)

General Motors Corp. AC Electronics Division Milwaukee, Wisc.	Primary Guidance & Navigation
General Motors Corp. Allison Division Indianapolis, Ind.	Descent Tanks
HITCO Los Angeles, Calif.	Thrust Chambers
Honeywell, Inc. Aeronautical Division Minneapolis, Minn.	Meters
ILC Industries, Inc. Dover, Del.	Space Suits
Kollsman Instrument Corp. Syossett, N.Y.	Optical Subsystem Primary Guidance & Navigation
Leach Corp. Controls Division Azusa, Calif.	Data Storage Electronic Assembly
Lear Siegler, Inc. Instrument Division Grand Rapids, Mich.	Attitude Indicator
The Marquardt Corp. Rocket Systems Division Van Nuys, Calif.	Reaction Control Subsystem
Mass. Institute of Tech. Cambridge, Mass.	Primary Guidance & Navigation
Motorola, Inc. Scottsdale, Ariz.	S-Band Transceiver
North American Rockwell Corp. Rocketdyne Division Canoga Park, Calif.	Ascent Engine

LUNAR MODULE (CONT'D)

RCA Corporation Aerosystems Division Burlington, Mass.	Attitude & Translation Control Assembly Descent Engine Control Assembly Landing Radar and Rendezvous Radar Subsystem
RCA Corporation Communications Division Camden, N.J.	Communications Subsystem
Radiation, Inc. Palm Bay, Fla.	Pulse Code Modulation/Timing Electronic Assembly
Raytheon Company Lexington, Mass.	Computer Subsystem Guidance & Navigation S-Band Power Amplifiers
Ryan Aeronautical Co. San Diego, Calif.	Landing Radar
Sargent Industries, Inc. Airite Division El Segundo, Calif.	Helium Storage Tanks
Sylvania Electric Products, Inc. Electronic Systems Needham Heights, Mass.	Digital Event Timer Mission Clock
TRW, Inc. TRW Systems Group Redondo Beach, Calif.	Abort Guidance System Descent Engine
Textron, Inc. Dalmo Victor Division Belmont, Calif.	S-Band Steerable Antenna
Trans-Sonics, Inc. Lexington, Mass.	Propellant Quantity Gaging Section
United Aircraft Corp. Hamilton Standard Division Windsor Locks, Conn.	Abort Sensor Assembly Environmental Control Subsystem General Purpose Inverters Portable Life Support System

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

LUNAR MODULE (CONT'D)

United Aircraft Corp. Pratt & Whitney Aircraft Division East Hartford, Conn.	Fuel Cell Assembly
Westinghouse Electric Corp. Pittsburgh, Pa.	Lunar TV Camera

INSTRUMENT UNIT

System Contractor

International Business Machines Corp.
Federal Systems Division
Gaithersburg, Md.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

Aerodyne Controls Corp. Farmingdale, N.Y.	First Stage Regulator Gas Bearing Pressure Regulator
Avco Corp. Nashville, Tenn. Huntsville, Ala.	Cable Trays Gas Bearing Mounting Panel Measuring Range Cards & Software Thermal Conditioning Panels
Bendix Corp. Navigation & Control Division Teterboro, N.J.	ST-124M Stabilized Platform
→ Brown Engineering Co., Inc. Huntsville, Ala.	Acquisition System Alternating Current Amplifier Assembly Measuring Rack Selector & Assembly Pulse Code Modulated Digital Data Radio Frequency Analog & Pulse Code Modulated Telemetry Assemblies, Calibrators & Pulse Code
Chrysler Corp. Huntsville, Ala.	Q-Ball Vehicle Plate Assembly
Eagle-Picher Industries, Inc. Joplin, Mo.	Primary Battery

INSTRUMENT UNIT (CONT'D)

Electro Development Corp. Seattle, Wash.	Amplifier Direct Current Channel Selector S
Electronic Communications, Inc. St. Petersburg, Fla.	Control Computer
Fansteel, Inc. Airtek Division Compton, Calif.	2-Cubic-Foot Bottle 165-Cubic-Inch Sphere
Hayes International Corp. Huntsville, Ala.	Network Cables
International Harvester Co. Solar Division San Diego, Calif.	Gas Bearing Heat Exchanger Manifold Assembly Water Methanol Accumulator
International Telephone and Telegraph Corp. ITT Wire and Cable Division Clinton, Mass.	Wire & Cables
Martin Marietta Corp. Orlando Division Orlando, Fla.	Control Signal Processor
Motorola, Inc. Scottsdale, Ariz.	C-Band Transponder Command Receiver
North American Rockwell Corp. Tulsa Division Tulsa, Okla.	Structure Segments
Northrop Corp. Nortronics Division Norwood, Mass.	Rate Gyro Package
Space Craft, Inc. Huntsville, Ala.	Command Decoder Frequency DC Converter Multiplexers Servoaccelerometer Unit
TRW, Inc. Cleveland, Ohio	Coolant Pump

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

INSTRUMENT UNIT (CONT'D)

United Aircraft Corp.
Hamilton Standard Division
Windsor Locks, Conn.

Preflight Heat Exchanger

SATURN S-IVB (THIRD STAGE)

System Contractor

McDonnell Douglas Corp.
Astronautics Division
Huntington Beach, Calif.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

Adel/Vinson
Burbank, Calif.

Cryogenic Valves & Modules

Aeroquip Corp.
Marman Division
Los Angeles, Calif.

Clamps

Airdrome Parts Co.
Inglewood, Calif.

Fittings

American Machine & Foundry
Co.
Potter & Brumfield Division
Princeton, Ind.

Switches, Relays

Ametek, Inc.
Calmec Mfg. Division
Los Angeles, Calif.

Valves

Anaconda American Brass Co.
Anaconda Metal Hose Division
Los Angeles, Calif.

Metal Hose

Avnet Electronics Corp.
Culver City, Calif.

Electrical Connectors

Barry Wright Corp.
Barry Controls Division
Watertown, Mass.

Electronic Controls

SATURN S-IVB (THIRD STAGE) (CONT'D)

Bell Aerospace Corp.
Bell Aerosystems Co. Division
Buffalo, N.Y.

Fuel & Oxidizer APS Tanks

Bell & Howell Co.
Electronic Instrumentation Division
New York, N.Y.

Electronic Equipment

Bertea Products
Irvine, Calif.

Hydraulic Valves

Borg-Warner Corp.
Pesco Products Division
Bedford, Ohio

Pumps

Bourns, Inc.
Riverside, Calif.

Electronic Components

→ Brown Engineering Co., Inc.
Huntsville, Ala.

Telemetry Equipment

Bunker-Ramo Corp.
Amphenol Division
Chicago, Ill.

Connectors

Carlton Industries
Hawthorne, Calif.

Instrumentation

Data Sensors, Inc.
Gardena, Calif.

Transducers

The Deutsch Company
Los Angeles, Calif.

Fittings

Eagle-Picher Industries, Inc.
Joplin, Mo.

Batteries

Fairchild Camera & Instrument
Corp.

Valves

Fairchild Controls Division
Montebello, Calif.

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

SATURN S-IVB (THIRD STAGE) (CONT'D)

Fairchild Camera & Instrument Corp.	Semiconductors
Fairchild Semiconductor Division Hollywood, Calif.	
Fairchild Hiller Corp. Manhattan Beach, Calif.	Valves and Modules
Fairchild Hiller Corp. Stratos Division Bayshore, N.Y.	Valves
Fansteel, Inc. Airtex Division Compton, Calif.	Tank Assemblies
Flexible Metal Hose Mfg. Co. Costa Mesa, Calif. Northridge, Calif.	Metal Hose
Frebank Co. Glendale, Calif.	Switches
The Garrett Corp. AirResearch Mfg. of Ariz. Division Phoenix, Ariz.	Valves
Grove Valve & Regulator Co. El Segundo, Calif. Oakland, Calif.	Valves
Gulton Industries, Inc. Electra Scientific Division Fullerton, Calif.	Transducers
Honeywell, Inc. Minneapolis, Minn.	Temperature Controls, Gyros, Sensors
Leonard, Wallace O., Inc. Pasadena, Calif.	Valves

SATURN S-IVB (THIRD STAGE) (CONT'D)

Litton Industries, Inc. Beverly Hills, Calif.	Transducers
Magnesium Alloy Prods. Co. Compton, Calif.	Castings
Magnetika, Inc. Venice, Calif.	Batteries
Marotta Scientific Controls, Inc. Santa Ana, Calif.	Valves
Menasco Mfg. Co. Burbank, Calif.	Fabricated Assemblies
Moog, Inc. East Aurora, N.Y.	Valves
Motorola, Inc. Semiconductor Products Division Hollywood, Calif.	Semiconductors
Parker-Hannifin Corp. Parker Aircraft Co. Division Los Angeles, Calif.	Fittings/Valves
Purolator Products, Inc. Western Division Van Nuys, Calif.	Filters
Rosemount Engineering Co. Minneapolis, Minn.	Signal Conditioning Amplifiers
Royal Industries Pomona, Calif.	Relays
Sealol, Inc. Providence, R.I.	Valves
Signet Scientific Co. Burbank, Calif.	Ovens

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

SATURN S-IVB (THIRD STAGE) (CONT'D)

Sperry Rand Corp. Vickers Division Troy, Mich.	Pumps
Stainless Steel Products Burbank, Calif.	Flexible Ducts
Statham Instruments, Inc. Los Angeles, Calif.	Transducers
TRW, Inc. Cleveland, Ohio	Attitude Control Rocket Engines
Technology Instrument Corp. Newbury Park, Calif.	Potentiometers
Teledyne, Inc. Kinetics Division Solana Beach, Calif.	Electronic Equipment
Teledyne, Inc. Precision Casting Division Costa Mesa, Calif.	Castings
Textron, Inc. Accessory Products Co. Division Whittier, Calif.	Valves/Heaters
Texas Instruments, Inc. Dallas, Texas	Resistors/Transistors
Thiokol Chemical Corp. Elkton Division Elkton, Md.	Retrorocket Motor
Trans-Sonics, Inc. Lexington, Mass.	Temperature Controls
Vacco Industries Valve Division South El Monte, Calif.	Valves

SATURN S-IVB (THIRD STAGE) (CONT'D)

Vinson Mfg. Co., Inc. Van Nuys, Calif.	Valves
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J-2 ENGINE (THIRD STAGE)

System Contractor

North American Rockwell Corp.
Rocketdyne Division
Canoga Park, Calif.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

A&M Castings, Inc. South Gate, Calif.	Aluminum Castings
Anaconda American Brass Co. Detroit, Mich.	OFHC Copper
Anaconda American Brass Co. Anaconda Metal Hose Division Los Angeles, Calif.	Flexible Hoses
Arcturus Manufacturing Co. Oxnard, Calif.	Forgings
Bell & Howell Co. Electronic Instrumentation Division Pasadena, Calif.	Connectors and Transducers
Bendix Corp. Sidney, N.Y.	Connectors
Bunker-Ramo Corp. Amphenol Division Broadview, Ill.	Connectors
Calif.-Doran Heat Treating Co. Los Angeles, Calif.	Thermal Processing of Various Major Engine Components

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

J-2 ENGINE (THIRD STAGE) (CONT'D)

Cam Car Company Rockford, Ill.	RD Bolts
Chicago Rawhide Mfg. Co. Chicago, Ill.	Seals
Clevite Corp. Cleveland Graphite Bronz Division Cleveland, Ohio	Seals
Fairchild Camera & Instrument Corp.	Bellows, Ducts, Gimbals, and Line Assemblies
Fairchild Precision Metal Pro- ducts Division El Cajon, Calif.	
L. A. Gauge Co., Inc. Sun Valley, Calif.	Valves
General Laboratory Associates Norwich, N.Y.	Exciters and Igniters
Howmet Corp. Austenel Division Dover, N.J.	Castings
Industrial Tectonics, Inc. Ann Arbor, Mich.	Actuators, Bearings
International Harvester Co. Solar Division San Diego, Calif.	Valves
International Nickel Co. Huntington Alloys Division Huntington, W. Va.	Inco Sheet and Plate
International Telephone and Telegraph Corp. General Controls Division Boston, Mass.	Actuators, Bearings

J-2 ENGINE (THIRD STAGE) (CONT'D)

Kentucky Metals, Inc. Louisville, Ky.	Honeycomb
Keystone Engineering Co. Western Arc Welding Division Los Angeles, Calif.	Welded Assemblies
Langley Corp. San Diego, Calif.	Seals, Gimbals, Machined Assemblies
LeFiell Mfg. Co. Santa Fe Springs, Calif.	Tubing-Thrust Chamber
MSL Industries, Inc. DK Aerospace Division Batavia, Ill.	Flex Lines, Bellows and Gimbals
MSL Industries, Inc. Globe Aerospace Division North Hollywood, Calif.	Machined Metal Parts, Fittings and Elbows
McWilliams Forge Co. Rockaway, N.J.	Forgings
National Banner Turbo Cast Division Los Angeles, Calif.	Castings
Parker Seal Company Culver City, Calif.	O-Rings, Seals, and Orifice Plates
Quadrant Engrg. Company Gardena, Calif.	Valves and Components
Reisner Metals, Inc. South Gate, Calif.	Forgings
Scientific Data Systems Pomona, Calif.	Circuit Boards
Southwestern Industries, Inc. Los Angeles, Calif.	Switches

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

J-2 ENGINE (THIRD STAGE) (CONT'D)

Standard Pressed Steel Co. Santa Ana, Calif. Jenkinstown, Pa.	RD Bolts
Statham Instruments, Inc. Los Angeles, Calif.	Transducers, Connectors, Electronic Assemblies
Texas Instruments, Inc. Dallas, Texas	Transistors
Union Carbide Corp. Kokomo, Ind.	Castings, Hastelloy C, Rene 41
Viking Forge & Steel Co. Albany, Calif.	Forgings
Western Way, Inc. Van Nuys, Calif.	Ducts, Line Assemblies, Heat Exchangers
Wyman-Gordon Company N. Grafton, Mass.	Forgings

SATURN S-II (SECOND STAGE)

System Contractor

North American Rockwell Corp.
Space Division
Downey, Calif.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

Abex Corp. Oxnard, Calif.	Hydraulic Pumps
Acoustica Associates, Inc. Los Angeles, Calif.	Transducers
Ametek, Inc. Calmec Manufacturing Div- ision Los Angeles, Calif.	Liquid Propellant Tank Vent Valves

SATURN S-II (SECOND STAGE) (CONT'D)

Ametek, Inc. Straza Industries Division El Cajon, Calif.	LOX & LH2 Recirculating Line Assemblies
Anaconda American Brass Co. Anaconda Metal Hose Division Los Angeles, Calif.	Flexible Hose Assemblies
Babcock Electronics Babcock Relay Division Costa Mesa, Calif.	Relays Generator
Barry Wright Corp. Barry Controls Division Glendale, Calif.	Shock Mounts
Borg-Warner Corp. Pesco Products Division Bedford, Ohio	Hydraulic Pumps
✓ Brown Engineering Co., Inc. Lewisburg, Tenn.	Telemetry Instrumentation Data Handling Equipment
The Deutsch Company Electronic Components Div- ision Banning, Calif.	Connectors
Eagle-Picher Industries, Inc. Joplin, Mo.	Primary Silver-Zinc Battery
Explosive Technology Fairfield, Calif.	Ordnance Devices
Futurecraft Corp. City of Industry, Calif.	Solenoids
Goodyear Aerospace Corp. Litchfield Park, Ariz.	Engine Compartment Conditioning System
Gulton Industries, Inc. Engineered Magnetics Division Hawthorne, Calif.	Static Converters

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

SATURN S-II (SECOND STAGE) (CONT'D)

International Harvester Co. Solar Division San Diego, Calif.	Cryogenic Lines
Lord Corp. Lord Manufacturing Division Erie, Pa.	Mounts
North American Rockwell Corp. Rocketdyne Division McGregor, Texas	Ullage Rocket Motors
Parker-Hannifin Corp. Parker Aircraft Co. Division Los Angeles, Calif.	Hydraulic Systems Propellant Shut-Off Valves
RdF Corp. Hudson, N.H.	Transducers
Resistoflex Corp. Roseland, N.J.	Hydraulic Hose Assemblies
Servonic Instruments, Inc. Costa Mesa, Calif.	Transducers
Snap-Tite, Inc. Union City, Pa.	Disconnects
Space Craft, Inc. Huntsville, Ala.	Multiplexers & Remote Control Calibration Systems
Stainless Steel Products Burbank, Calif.	Cryogenic Lines
Teledyne, Inc. Kinetics Division Solana Beach, Calif.	Transfer Switches
Transco Products, Inc. Venice, Calif.	Power Dividers
UMC Industries, Inc. Unidynamics/Phoenix Goodyear, Ariz.	Ordinance Devices

J-2 ENGINE (SECOND STAGE)

See Third Stage Above.

SATURN S-IC (FIRST STAGE)

System Contractor

The Boeing Company
Seattle, Wash.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

Aircraft Porous Media, Inc. Glen Cove, N.Y.	Filter Element Assembly
Allen-Bradley Co. Milwaukee, Wis.	Resistors
Babcock Electronics Babcock Relays Division Costa Mesa, Calif.	Relays
Bell Aerospace Corp. Hydraulic Research Division Burbank, Calif.	Servoactuators and Filter Manifolds
Bendix Corp. Pioneer-Central Division Davenport, Iowa	Loading Systems and Cutoff Sensors
Bourns, Inc. Instrument Division Riverside, Calif.	Pressure Transducers
Brown Engineering Co., Inc. Lewisburg, Tenn.	Multiplexer Equipment
Calumet & Hecla, Inc. Flexonics Division Bartlett, Ill.	Ducting System
The J. C. Carter Co. Costa Mesa, Calif.	Solenoid Valves

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

SATURN S-IC (FIRST STAGE) (CONT'D)

Consolidated Controls Corp. Bethel, Conn. Los Angeles, Calif.	Pressure Switches, Transducers, and Valves
The Deutsch Company Deutsch Filtrors Relay Div- ision Long Island, N.Y.	Relays
Dickson Electronics Corp. Scottsdale, Ariz.	Diodes
Dynasciences Corp. Chatsworth, Calif.	Valves and Gyros
Eagle-Picher Industries, Inc. Electronics Division Joplin, Mo.	Batteries
Electro Development Corp. Seattle, Wash.	AC and DC Amplifiers
Federal-Mogul Corp. Arrowhead Products Div- ision Los Alamitos, Calif.	Ducts
Flexible Tubing Corp. Anaheim, Calif.	Ducts
The Garrett Corp. AiResearch Manufacturing Co. Division Phoenix, Ariz.	Valves
General Electric Co. Auburn, N.Y.	Rectifiers
Hayes International Corp. Birmingham, Ala.	Auxiliary Nitrogen Supply Units
International Harvester Co. Solar Division San Diego, Calif.	Ducts

SATURN S-IC (FIRST STAGE) (CONT'D)

International Telephone and Telegraph Corp. ITT Cannon Electric Division Los Angeles, Calif.	Connectors
Johns-Manville Sales Corp. Manville, N.J.	Insulation
LTV Aerospace Corp. Dallas, Texas	Skins, Emergency Drains, and Heat Shield Curtains
Marotta Scientific Controls, Inc. Boonton, N.J.	Valves
Martin Marietta Corp. Baltimore, Md.	Helium Bottles
Mepco, Inc. Morristown, N.J.	Resistors
Methode Electronics, Inc. Chicago, Ill.	Connectors
Moog, Inc. East Aurora, N.Y.	Servoactuators
Navan, Inc. El Segundo, Calif.	Seals
Parker-Hannifin Corp. Parker Aircraft Co. Division Los Angeles, Calif.	Valves
Parker Seal Company Culver City, Calif.	Seals
Parsons Corp. Traverse City, Mich.	Tunnel Assemblies
Purolator Products, Inc. Western Division Newbury Park, Calif.	Umbilical Couplings

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

SATURN S-IC (FIRST STAGE) (CONT'D)

Raytheon Company Wayland, Mass. Mountain View, Calif.	Cathode Ray Tube Display System and Transistors
Resistoflex Corp. Roseland, N.J.	High Pressure Lines
Rohr Corp. Chula Vista, Calif.	Heat Shields
Sargent Industries, Inc. Airite Division El Segundo, Calif.	Nitrogen Bottle
Servonic Instruments, Inc. Costa Mesa, Calif.	Pressure Transducers
Sprague Electric Co. North Adams, Mass.	Capacitors
Stainless Steel Products Burbank, Calif.	Ducts
Sterer Engineering and Man- ufacturing Co. Los Angeles, Calif.	Valves
Teledyne, Inc. Kinetics Division Solana Beach, Calif.	Power Transfer Switches
Thiokol Chemical Corp. Elkton Division Elkton, Md.	Retrorockets
Trans-Sonics, Inc. Burlington, Mass.	Measuring Systems and Thermometers
UMC Industries, Inc. Unidynamics/St. Louis St. Louis, Mo.	Spools, Harnesses and Ducts

SATURN S-IC (FIRST STAGE) (CONT'D)

Westinghouse Air Brake Company Union Switch & Signal Division Pittsburgh, Pa.	Relays
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Wright, Fred D. Co. Nashville, Tenn.	Support Assemblies and Measuring Racks
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F-1 ENGINE (FIRST STAGE)

System Contractor

North American Rockwell Corp.
Rocketdyne Division
Canoga Park, Calif.

OTHER PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS

A&M Castings, Inc. South Gate, Calif.	Aluminum Castings
Ace Industries Santa Fe Springs, Calif.	Machined Assemblies, Nozzels, Rotors, Stators, and Bearing Supports
Adept Manufacturing Co. Los Angeles, Calif.	Inducers
Anaconda American Brass Co. Detroit, Mich.	OFHC Copper
Anaconda American Brass Co. Anaconda Metal Hose Division Los Angeles, Calif.	Flexible Hoses
Arcturus Manufacturing Co. Oxnard, Calif.	Forgings
Bell & Howell Co. Electronic Instrumentation Division Pasadena, Calif.	Connectors and Transducers

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

F-1 ENGINE (FIRST STAGE) (CONT'D)

Bendix Corp. Sidney, N.Y.	Connectors
Beuhler Corp. Indiana Gear Works Indianapolis, Ind.	Gears and Shafts
Borg-Warner Corp. Borg-Warner Mech. Seals Division Vernon, Calif.	Seals
Bunker-Ramo Corp. Amphenol Division Broadview, Ill.	Connectors
Calif.-Doran Heat Treating Co. Los Angeles, Calif.	Thermal Processings of Various Major Engine Components
Cam Car Company Rockford, Ill.	RD Bolts
Chicago Rawhide Mfg. Co. Chicago, Ill.	Seals
Clevite Corp. Cleveland Graphite Bronz Division Cleveland, Ohio	Seals
Fairchild Camera & Instrument Corp.	Bellows, Ducts, Gimbals, and Line Assemblies
Fairchild Precision Metal Products Division El Cajon, Calif.	
L. A. Gauge Co., Inc. Sun Valley, Calif.	Valves
General Laboratory Associates Norwich, N.Y.	Exciters and Igniters

F-1 ENGINE (FIRST STAGE) (CONT'D)

Howmet Corp. Austenel Division Dover, N.J.	Castings
Industrial Tectonics, Inc. Ann Arbor, Mich.	Actuators, Bearings
International Harvester Co. Solar Division San Diego, Calif.	Valves
International Nickel Co., Inc. Huntington Alloys Division Huntington, W. Va.	Inco Sheet and Plate
International Telephone and Telegraph Corp. General Controls Division Boston, Mass.	Actuators, Bearings
Keystone Engineering Co. Western Arc Welding Division Los Angeles, Calif.	Welded Assemblies
Langley Corp. San Diego, Calif.	Seals, Gimbals, Machined Assemblies
LeFiell Manufacturing Co. Santa Fe Springs, Calif.	Tubing-Thrust Chamber
MSL Industries, Inc. DK Aerospace Division Batavia, Ill.	Flex Lines, Bellows and Gimbals
MSL Industries, Inc. Globe Aerospace Division North Hollywood, Calif.	Machined Metal Parts, Fittings and Elbows
McWilliams Forge Co. Rockaway, N.J.	Forgings
National Banner Turbo Cast Division Los Angeles, Calif.	Castings

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

F-1 ENGINE (FIRST STAGE) (CONT'D)

Parker Seal Company Culver City, Calif.	O-Rings, Seals, and Orifice Plates
Paragon Tool Die & Engrg. Pacoima, Calif.	Stators, Bearing Supports
Precision Sheet Metal, Inc. Los Angeles, Calif.	Major Sheet Metal Subassemblies, Jackets
Quadrant Engrg. Company Gardena, Calif.	Valves and Components
Reisner Metals, Inc. South Gate, Calif.	Forgings
Rohr Corp. Chula Vista, Calif.	Major Sheet Metal Subassemblies
Southwestern Industries, Inc. Los Angeles, Calif.	Switches
Standard Pressed Steel Co. Santa Ana, Calif. Jenkinstown, Pa.	RD Bolts
Statham Instruments, Inc. Los Angeles, Calif.	Transducers, Connectors, Electronic Assemblies
Texas Instruments, Inc. Dallas, Texas	Transistors
Union Carbide Corp. Kokomo, Ind.	Castings, Hastelloy C, Rene 41
Viking Forge & Steel Co. Albany, Calif.	Forgings
Western Way, Inc. Van Nuys, Calif.	Ducts, Line Assemblies
Wyman-Gordon Company N. Grafton, Mass.	Forgings

ORDNANCE VENDORS

Aerojet-General Corp.
Sacramento, Calif.

Ensign-Bickford Co.
Simsbury, Conn.

Explosive Technology
Fairfield, Calif.

General Laboratory Associates
Norwich, N.Y.

Teledyne, Inc.
McCormick Selph Division
Hollister, Calif.

LAUNCH SUPPORT

Air Products & Chemicals, Inc. Allentown, Pa.	Fabrication, Installation & Check- out of Cryogenic Servicing Systems
Akwa-Downey Construction Co. Milwaukee, Wisc.	Construction of Cable Terminator Building Modifications & Additions to Electrical Substation & Ordnance Storage Facility
American Elcon, Inc. Cape Canaveral, Fla.	Construction of Instrumentation Building
American Machine & Foundry Co. Santa Barbara, Calif.	Hardware & Engineering Service for Crawler Transporters
Ametek, Inc. Straza Division El Cajon, Calif.	Vacuum Jacketed Fuel Transfer System
Ampex Corp. Redwood City, Calif. Cocoa Beach, Fla.	Magnetic Tape Recorder Reproducer System, Tracking Assembly & Picture Monitors
Astrodata, Inc. Anaheim, Calif.	Doppler Digitizing Systems Camera Control Timing & Sequencing System

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

LAUNCH SUPPORT (CONT'D)

Automatic Retailers of
America, Inc.
Philadelphia, Pa.

Bechtel Corp.
San Francisco, Calif.

Beckman Instruments, Inc.
Fullerton, Calif.

Bell & Howell Co.
Electronic Instrumentation
Group
Pasadena, Calif.

Bendix Corp.
Cocoa Beach, Fla.

Big Three Industrial Gas
& Equipment Co.
Houston, Texas

Blount Brothers Corp. and
M. M. Sundt Construction
Co. - Joint Venture
Montgomery, Ala.

Boeing Co.
Seattle, Wash.

Brevard Engineering Co.
Cape Canaveral, Fla.

~~Brown Engineering Co., Inc.~~
Huntsville, Ala.

Carrier Corp.
Syracuse, N.Y.

Catalytic Construction Co.
Philadelphia, Pa.

Management & Services for Astronauts'
Quarters at KSC

Installation, Maintenance of NASA Launch
Complex Facilities

Spectrophotometer Systems and Components
E Put/Timer Converter & Counter
Analog Recorders

Recorder
Reproduction System, Oscillograph,
Galvanometers, Pressure Transducers

Launch Support Services

Liquid Gases

Construction of Launch Pad A and Craw-
lerway

Launch Support S-IC Stage

Design of Instrumentation Building

Engineering, Fabrication and Related
Services

Spacecraft Air Conditioning

Fabrication and Installation of Cryogenic
Propellant System

LAUNCH SUPPORT (CONT'D)

Catalytic-Dow, Joint Venture
Titusville, Fla.

Chicago Bridge & Iron Co.
Chicago, Ill.

R. E. Clarson, Inc.
St. Petersburg, Fla.

Collins Radio Co.
Richardson, Texas

Cosmodyne Corp.
Torrance, Calif.

Data-Control Systems, Inc.
Danbury, Conn.

Arnold M. Diamond, Inc.
Great Neck, N.Y.

Dow Chemical Co.
Midland, Mich.

Dyna-Therm Corp.
Los Angeles, Calif.

Ernst/Smith, Joint Venture
Orlando, Fla.

Howard P. Foley Co.
Washington, D.C.

Gahagan Dredging Corp.
Tampa, Fla.

Facilities Support Services

Propellant Storage Facilities

Barge Terminal Unloading Area

Communication Equipment

Nitrogen Rechargers
Compressed Gaseous Hydrogen Semi-
trailers

FM Demodulator, Discriminator
Analog Data Transmission System
Wideband VCO Assemblies
HFV System

Barge Terminal Facilities

Facilities Engineering Support

Insulation Materials

Mechanical and Electrical Installation
for Mobile Launcher

Electrical Work on Mobile Launchers and
Pad

Barge Terminal Dredging
Site Preparation for Vehicle Assembly
Building

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

LAUNCH SUPPORT (CONT'D)

General Dynamics Corp. Convair Division San Diego, Calif.	Development and Installation of Operational Television System
General Electric Co. Huntsville, Ala.	Technical Support to the Computer Lab
Giffels and Rossette Detroit, Mich.	Design of Launch Pad A
Greening and Sayer Daytona Beach, Fla.	Design of Cable Terminal Building
Grumman Aerospace Corp. Bethpage, N.Y.	Launch Support - Lunar Module
Gulton Industries, Inc. Albuquerque, N.M.	Data Transmission System
Hayes International Corp. Birmingham, Ala.	Construction of Swing Arms for Mobile Launcher Pneumatic and Electrical Distribution System for Launch Complex
Heyl & Patterson, Inc. Cocoa, Fla.	Flame Deflectors Parts for Launch Umbilical Towers
Honeywell, Inc. Orlando, Fla.	Memory System, Recorder Systems & Oscillographs Propellant Tanking Computer, Potentiometer Recorder, Oscillograph Recorder, Strip Chart Recorder System
Ingalls Iron Works Co. Birmingham, Ala.	Launch Umbilical Towers
International Business Machines Corp. Gaithersburg, Md.	Launch Support Instrument Unit
International Telephone and Telegraph Corp. Federal Electric Division Cocoa Beach, Fla.	Instrumentation Operation and Maintenance Support Services

LAUNCH SUPPORT (CONT'D)

Kahn & Co. Hartford, Conn.	Distribution Panels and Associated Hardware
Kaminer Construction Corp. Chamblee, Ga.	Fuel Transfer System
Litton Industries, Inc. Rust Engineering Pittsburgh, Pa.	Design of Mobile Service Structure
Marion Power Shovel Co. Marion, Ohio	Crawler Transporter
C. A. Meyer Paving & Construction Co. Orlando, Fla.	Embankment for Ordnance Storage Facility Site Preparation for PAD Water Pumping Station
McDonnell Douglas Corp. Santa Monica, Calif.	Launch Support S-IVB Stage
McGregor and Warner, Inc. Washington, D.C.	Reproduction Services
Molecular Research, Inc. West Palm Beach, Fla.	System Design of Operational Television System
Monitor System, Inc. Fort Washington, Pa.	Monolithic Integrated Digital Logic and Hardware Digitizing System Data Core Telemetry System Pulse Code Modulation Sub-system
Morrison-Knudsen Co., Inc., Perini Corp., Paul Hardeman Inc. - Joint Venture South Gate, Calif.	Construction of Mobile Service Structure, Propellant Systems Components Laboratory, Vehicle Assembly Building and Launch Control Center
Natkin & Company Kansas City, Mo.	Construction of PAD Water Pumping Station Loading and Vent Systems
North American Rockwell Corp. Downey, Calif.	Launch Support-S-II Stage Saturn Program
Otis Elevator Company New York, N.Y.	Install Elevator Launch Complex 39

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

LAUNCH SUPPORT (CONT'D)

Pacific Crane & Rigging Co. Paramount, Calif.	Outfitting of Launch Umbilical Towers
W. V. Pangborne Co., Inc., and Lowry Electric Co., Inc. - Joint Venture Philadelphia, Pa.	Construction of Electrical Substation
Philpott, Ross & Saarinen, Inc. Fort Lauderdale, Fla.	Design of PAD Water Pumping Station
RCA Corporation Camden, N.J.	Technical Support Services Planning, Maintenance and Operation of MILA Base Communication System
RCA Corporation Van Nuys, Calif.	1101 Computer - Saturn Checkout
Remler Company San Francisco, Calif.	Intercom System, OIS Equipment
Reynolds, Smith & Hills Jacksonville, Fla.	Design of Mobile Launcher Umbilical Towers
Rogers, Lovelock and Fritz Winter Park, Fla.	Design of Propellant Systems Components Laboratory
Rosemount Engineering Co. Minneapolis, Minn.	Transducers, Temperature Sensors and Thermometers
Sanders Associates, Inc. Nashua, N.H.	Operational Display Systems - Saturn Checkout
Scientific Data Systems Orlando, Fla.	Digital Acquisition System and Com- ponents
Service Technology Corp. Dallas, Texas	Range System Reports, Graphics and Information Services
Smith & Sapp Construction Co. Orlando, Fla.	Construction of Launch Equipment Shop

LAUNCH SUPPORT (CONT'D)

Space Corp. Dallas, Texas	Engine Servicing Equipment, Launch Complex 39
Statham Instruments, Inc. Los Angeles, Calif.	Transducers
Symetrics Engrg. Corp. of Florida Satellite Beach, Fla.	Meteorological Data Acquisition System Operational Intercom System (Audio) for Launch Complex 39
Technicolor Corp. Cocoa Beach, Fla.	Photo Services
Tektronix, Inc. Orlando, Fla.	Oscilloscopes and Accessories Preamplifiers
Trans World Airlines, Inc. Titusville, Fla.	Base Support Services Occupational Health Service
Union Carbide Corp. Linde Co. Division Tonawanda, N.Y.	Liquid Oxygen and Helium Vacuum Jacketed Fuel Systems for Launch Complex 39A
United States Steel Corp. American Bridge Division Pittsburgh, Pa.	Steel Fabrication and Erection of Vehicle Assembly Building
Urbahn-Roberts-Seelye-Morgan New York, N.Y.	Design of Electrical Substation, Launch Control Center and Vehicle Assembly Building
Western Electric Co., Inc. New York, N.Y.	Telephones, A2A Hardware, Wideband Distri- bution System
Weston Instruments, Inc. EMR Division Sarasota, Fla.	Modify Telemetry System Vibration Acquisition System FM/FM Demultiplexing Equipment

MISSION CONTROL AND EVALUATION

Bendix Corp.
Aerospace Systems Division
Ann Arbor, Mich,

Apollo Lunar Surface Experiments Package
(ALSEP) Integration

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

MISSION CONTROL AND EVALUATION (CONT'D)

Bendix Corp. Research Laboratories Division Southfield, Mich.	Charged Particle Lunar Environment Experiment - Apollo Lunar Surface Experiments Package
Brown & Root/Northrop Houston, Texas	Lunar Receiving Laboratory
Cohu Electronics, Inc. San Diego, Calif.	Video Switching Matrix
General Dynamics Corp. Houston, Texas	Digital to TV Converter
General Dynamics Corp. Dynamatronics Division Orlando, Fla.	Central Station Components - Apollo Lunar Surface Experiments Package
International Business Machines Corp. Federal Systems Division Houston, Texas	Development, Operation and Maintenance of the Real Time Computer Complex
Ling-Temco-Vought, Inc. Dallas, Texas	Plotting Projector
Little, A. D. Co. Cambridge, Mass.	Heat Flow Experiment - Apollo Lunar Surface Experiments Package
Lockheed Aircraft Corp. Lockheed Electronics Co. Division Plainfield, N.J.	General Electronics, Instrumentation, Computer Programming and Engineering Support
Melpar, Inc. Falls Church, Va.	Mobile Quarantine Facility
Philco-Ford Corp. Space & Re-Entry Systems Division Palo Alto, Calif.	Receivers & Transmitters for Apollo Lunar Surface Experiments Package
Philco-Ford Corp. Western Development Lab. Division Palo Alto, Calif.	Development, Installation and Engineering Support - MSC Mission Control Center

MISSION CONTROL AND EVALUATION (CONT'D)

Sperry Rand Corp. Univac Division Philadelphia, Pa.	Programming and Maintenance for the Communication Command and Telemetry Systems
TRW, Inc. TRW Systems Group Redondo Beach, Calif.	Mission Trajectory Control Program and Spacecraft Systems Analysis Program
Teledyne, Inc. Garland, Texas	Development of Lunar Geophones - Apollo Lunar Surface Experiment Package
Teledyne, Inc. Earth Sciences Co. Division Pasadena, Calif.	Passive Seismic Experiment - Apollo Lunar Surface Experiment Package

COMMUNICATIONS AND TRACKING AND DATA ACQUISITION

Amalgamated Wireless Australasia Carnarvon, Australia	Maintenance and Operation of the Carnarvon Tracking Station
Australia, Commonwealth of Department of Supply Melbourne, Australia	NASA Communications Network Support Maintenance and Operation of Tracking Stations 210' Antenna Pedestal
Australia, Commonwealth of Department of Works Canberra, Australia	Construction of Tracking Stations
Australia, Commonwealth of Postmaster General Canberra, Australia	Communication Network in Australia
American Telephone & Telegraph Co. Washington, D.C.	Communication Circuits for NASA Communi- cations Network
Ampex Corp. Redwood City, Calif.	Wide & Narrow Band Recorders
Avondale Shipyard, Inc. Algiers, La.	Re-Entry Ships

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

COMMUNICATIONS AND TRACKING AND DATA ACQUISITION (CONT'D)

Bell & Howell Co. Electronic Instrumentation Division Arlington, Va.	Wide & Narrow Band Recorders
Bendix Field Engineering Corp. Owings Mills, Md.	Operation & Maintenance of the Manned Space Flight Network & Deep Space Net- work
Blaw-Knox Co. Pittsburgh, Pa.	30 Foot Antenna Structures for Unified S-Band System 85 Foot Antenna Structures
Cable and Wireless Limited London, England	NASA Communications Network Support
Canoga Electronics Corp. Chatsworth, Calif.	MPS - 26 Radar
Chesapeake & Potomac Tele- phone Co. Washington, D.C.	Communication Circuits for NASA Communi- cations Network
Clevite Corp. Brush Instruments Division Cleveland, Ohio	Wide & Narrow Band Recorders
Collins Radio Co. Dallas, Texas	Unified S-Band System 85 Foot Antenna Drive System & Electronics 210' Antenna Mechanical Subsystem
Commonwealth and Industrial Scientific Research Organ- ization Parkes, Australia	TV Down-Link 210' Antenna
Communications Satellite Corp. Washington, D.C.	Communication Circuits for NASA Communi- cations Network
Compania Telefonica Nacional De Espana Madrid, Spain	NASA Communications Network Support

COMMUNICATIONS AND TRACKING AND DATA ACQUISITION (CONT'D)

Computing and Software, Inc. Panorama City, Calif.	On-site Operations and Maintenance of Back-up 360-75 and 360-95 Computers for Apollo Missions
DBA Systems, Inc. Melbourne, Fla.	Programming and Analysis Services for the Flight Dynamics Function of Apollo Instrumentation Ships
Dynamics Corp. of America Reeves Instrument Co. Division Garden City, N.Y.	Satcom Antennas for Insertion & Injection Ships
Electrica Newbery del Guaymas Sonora, Mexico	Operation & Maintenance of the Guaymas, Mexico Manned Space Flight Network Station
Emerson Electric Co. Rantec Division Calabasas, Calif.	Antenna Feeds for Unified S-Band System
Energy Systems, Inc. Palo Alto, Calif.	Power Amplifiers for Unified S-Band System
Extreme Telecommunications Executive London, England	NASA Communications Network Support
Federal Electric Corp. Paramus, N.J.	Maintenance and Operation of Apollo In- strumentation Ships and Aircraft
General Dynamics Corp. Electronics Division Orlando, Fla.	Pulse Code Modulation Decommuation System
General Dynamics Corp. Electric Boat Division Quincy, Mass.	Insertion & Injection Ships
General Dynamics Corp. Electronics Division San Diego, Calif.	Data System for Insertion & Injection Ships

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

COMMUNICATIONS AND TRACKING AND DATA ACQUISITION (CONT'D)

General Instrument Corp. Westwood, Mass.	Bathymetric Navigation Equipment
Hawaiian Telephone Co. Honolulu, Hawaii	Communication Circuits for the NASA Communications Network
Hewlett-Packard Co. Palo Alto, Calif.	Frequency Standards
ITT World Communications, Inc. Washington, D.C.	Communication Circuits for the NASA Communications Network
Institute Nacional de Tecnica Aeroespacial Madrid, Spain	Operation & Maintenance of the Manned Space Flight Network Station at Madrid, Spain 210' Antenna Pedestal
International Business Machines Corp. Poughkeepsie, N.Y.	Manned Space Flight Network Control Center Processor
International Business Machines Corp. Gaithersburg, Md.	Tracking & Data Real Time Computation System
Jet Propulsion Laboratory Pasadena, Calif.	Ranging/Exciter/Receiving Systems Operation & Logistics - Deep Space Network
Johns Hopkins University Applied Research Laboratory Silver Spring, Md.	Technical Data Correlation
LTV Aerospace Corp. Kentron Hawaii, LTD. Division Honolulu, Hawaii	Operation & Maintenance of the Hawaii Manned Space Flight Network Station
Ling-Temco-Vought, Inc. Dallas, Texas	Re-Entry Ships
3 M Company Mincom Division Camarillo, Calif.	Wide & Narrow Band Recorders

COMMUNICATIONS AND TRACKING AND DATA ACQUISITION (CONT'D)

Milgo Electronic Corp. Miami, Fla.	Digital-to-Analog Converter
Motorola, Inc. Scottsdale, Ariz.	Receiving Exciting Ranging Equipment Systems
Motorola, Inc. Scottsdale, Ariz.	Data Demodulators
Overseas Telecommunications Commission Sydney, Australia	NASA Communications Network Support Satellite Communications Link in Australia
Philco-Ford Corp. Fort Washington, Pa.	Engineering and Technical Services for NASA Communications Network
Potter Instrument Co., Inc. Plainview, N.Y.	Digital Data Systems
Precision Fabricators Paramount, Calif.	Alidade Assembly Group & Building for Two 210' Antennas
RCA Corporation Morrestown, N.J.	C-Band Radar
RCA Corporation Princeton, N.J.	TV Scan Converters
RCA Corporation RCA Global Communications, Inc. Division New York, N.Y.	Communication Circuits for the NASA Communications Network
RCA Corporation RCA Service Co. Division Cherry Hill, N.J.	Logistics Support for STADAN, MSFN, and NASCOM
Raytheon Company Waltham, Mass.	Data Consoles & Displays
Space Track Limited Canberra, Australia	Maintenance & Operation of TTDBINBILLA Tracking Station

APOLLO 12
PRINCIPAL PRIME CONTRACTORS AND SUBCONTRACTORS (CONT'D)

COMMUNICATIONS AND TRACKING AND DATA ACQUISITION (CONT'D)

Sperry Rand Corp. Univac Division St. Paul, Minn.	Digital Data Processor Systems - Ship- board & Land Stations Computer & Maintenance for NASA Communications Network
Sperry Rand Corp. Gyroscope Co. Division Great Neck, N.Y.	Inertial Navigation System for Insertion & Injection Ships
Standard Telephones & Cables, Ltd. Essex, England	Maintenance and Operation of Honeysuckle Creek Tracking Station
Stellarmetrics, Inc. Santa Barbara, Calif.	PAM/PDM Converters
TRW, Inc. Redondo Beach, Calif.	Signal Data Demodulator for Unified S-Band System
Teletype Corp. Skokie, Ill.	Radio Teletype Facility
Varian Associates Palo Alto, Calif.	Frequency Standards
Vitro Corp. of America Silver Spring, Md.	Telemetry Receivers
Western Gear Corp. Heavy Machinery Division Everett, Wash.	Hydrostatic Bearing Group & Aximuth Radial Bearing Truck Assembly for 210' Antennas
Western Union International, Inc. New York, N.Y.	Communication Circuits for the NASA Communications Network
Westinghouse Electric Corp. Baltimore, Md.	Receiving Exciting Ranging Equipment
Weston Instruments, Inc. EMR Division College Park, Md.	Pulse Code Modulation Telemetry System

SYSTEMS INTEGRATION, ANALYSIS AND CHECKOUT

Bellcomm, Inc. Washington, D.C.	Systems Analysis, Study, Planning and Technical Support for Manned Space Flight Programs
Boeing Co. Space Division Seattle, Wash.	Apollo/Saturn V Technical Integration and Evaluation
General Electric Co. Command Systems Division Daytona Beach, Fla.	Apollo Checkout Equipment, and Related Engineering Design, Quality and Data Management and Engineering Support