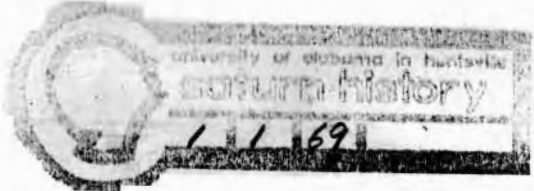


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POTENTIAL INTERVIEWS  
(BIOGRAPHICAL DATA).

IV. A



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

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

Aberg, John O.

Chief, Requirements Integration  
Division, Central Systems  
Engineering

MSEC

Mr. Aberg is a top technical expert who directed and contributed personally to conceptual design, project engineering, and systems engineering of the Saturn launch vehicles. As chief of the Vehicle Systems Division, Mr. Aberg directed the systems analysis and integration efforts of the launch vehicle mechanical equipment. He served as chairman of the Vehicle Mechanical Design Integration Working Group which assured proper interfacing between center and contractor disciplines. Mr. Aberg was instrumental in defining and combining the total program requirements for the Saturn V Launch Vehicle Specification.

Mr. Aberg has been associated with the missile and rocket development in industry and Government since 1950 when he joined the Guided Missile Development Division at Redstone Arsenal. He has been associated with and made major contributions to the Redstone, Jupiter, Jupiter-C, Explorer, Sergeant, Pershing, Mercury Redstone, and the Saturn launch vehicles.

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

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

Able, Robert M.

Chief, Personnel Management Branch  
Manpower Office, A&TS

MSFC

Mr. Robert M. Able has worked in direct support of the chief of personnel in accomplishing the staffing of a highly complex scientific and technical work force whose primary mission has been to design the space vehicle that will place a man on the moon in this decade. He has continuously assisted management and operating officials in directing the personnel responsible for the research, design, development, manufacture and test of these large aerospace launch vehicles. In his capacity as Personnel Management Specialist, Mr. Able has capably interpreted policies and procedures involving personnel activities throughout the Center. He has developed an excellent working relationship with the various levels of Center management as well as with elements of the work force.

Mr. Able was born in St. Louis, Missouri, June 25, 1923, where he graduated from Roosevelt High School. He began his career with civil service in 1942. From 1943 to 1945 he served in the U.S. Army and resumed his Federal career upon completion of this military service. In October 1950 he became a personnel administrator with the Army Finance Center in St. Louis. In February 1952 he transferred to the St. Louis Ordnance District where he served as a personnel representative. From 1954-1960 Mr. Able was an employee management relation specialist with the Aeronautical Chart and Information Center in St. Louis. He joined NASA's Marshall Space Flight Center in May 1960 where he continued in the field of personnel management and administration. He currently serves as Chief, Personnel Management Branch of the Manpower Office.

Ackerman, John E.

Deputy Chief, Technical  
Operations Office,  
Astrionics Laboratory,  
S&E

MSFC

Mr. Ackerman directed and contributed personally to the execution of all Astrionics Laboratory's research and development contractual procurements in support of the Apollo program. He provided direction and guidance to professional and scientific personnel in the development of scopes of work for research and development contracts involving new and unique techniques in support of the Saturn Launch Vehicle. Mr. Ackerman's exceptional ability and understanding of all facets involved in preparation of complex technical procurement requirements has played a vital role in the successful development and delivery of Astrionics hardware for the Saturn Launch Vehicle.

NAME	ORGANIZATION	POSITION
ADEN, Robert M.	Chief, Electrical Division (Chief, Electrical Support Equip. Branch, Elec Systems Integration Div.)	S&E-ASTR-E

Mr. Aden has initiated design concepts for ground support equipment for Launch Vehicles since 1951. He has successfully carried out these concepts in such programs as: Redstone, Jupiter, Mercury and Pershing.

Mr. Aden was charged with the responsibility to establish the Apollo launch site check-out and firing equipment from conception through detail design and fabrication. He introduced a new module concept for electrical support equipment for SAT I which enabled the Center to design and manufacture standard modules before the detail circuits of the system were defined. With patch distributors and the standard modules, a very flexible checkout system was achieved which could easily accommodate electrical changes.

Mr. Aden was Technical Director of the contract for the layout, design, manufacture and installation of the Saturn IB and Saturn V Electrical Support Equipment.

The successful operation of the Electrical Support Equipment on Saturn I, IB and V is testimony to his vital contribution to the Apollo Program.

Allen, Leon B.

Chief, Systems Requirements Branch

MSFC

Mr. Allen is known for his work on launch vehicle definitions and for establishing vehicle performance improvements in the Saturn IB and V to meet mission requirements. Under his direction, the detailed Saturn IB and Saturn V Baseline Configurations documents were compiled to be used as a basis for advanced vehicles studies.

Mr. Allen has continually helped define necessary performance improvements in the Saturn V vehicle for the Apollo mission. Such improvements had to be made without seriously disrupting design and manufacturing schedules and costs and, hence, required careful and astute examination and analysis. In 1969 he was selected to serve on the POGO Working Group.

Mr. Allen received his B. S. degree in Mechanical Engineering from Oklahoma State University in 1957. He has done post-graduate work at the University of Alabama since 1962. He was employed by Marshall Space Flight Center in 1960 as an aerospace engineer and later became Chief, Systems Engineering Section, then Deputy Chief, Space Vehicle Systems Branch in the P&VE Laboratory. In August 1968 he was selected as Technical Coordinator for the Nuclear Rocket Program for P&VE. Mr. Allen has received numerous Letters of Appreciation and Accommodation from Headquarters as well as MSFC Management. He received a Superior Achievement Certificate for contributions toward the successful launch of AS-203. He has authored and co-authored many NASA reports on various launch vehicle subjects.

Anderson, A. W.

Engineering Section

MSFC

Instrumentation Systems Branch

Vehicle Systems Checkout Division

Quality and Reliability Assurance Laboratory, S&E

An expert on launch vehicle instrumentation, telemetry, and data recording, Mr. Anderson has directly contributed to the assurance of reliability of the Saturn stages. As a Test Engineer for the S-II checkout, he developed a radically improved system for producing calibration tapes that have been adopted program-wide and reduced Government costs approximately 60 percent.

Mr. Anderson served as Instrumentation Checkout Coordinator on the Redstone and Jupiter programs with the Army Ballistic Missile Agency. Since joining MSFC in 1960, he has participated in Mercury and Saturn programs, making major contributions to launch vehicle systems checkout.

Andressen, Christian E., Jr.

Manager, Planning & Resources Office,  
Program Management

MSFC

Mr. Andressen has been involved in the Apollo/Saturn program since his appointment as Deputy Director of the Executive Staff in February 1962. In May, 1965, he was selected as a member of the special task force for activation of the Center's Mississippi Test Facility. Mr. Andressen returned to Alabama and Marshall Center in October 1965 to accept his present position. He has demonstrated his ability by consolidating into a package for the Director, Program Management, meaningful information in the areas of resources management matters such as programming, scheduling, funding, manpower, management control systems, and techniques that have a direct bearing on the success of the Apollo program.

Born in Auburn, California, Mr. Andressen is a graduate of the University of California. He holds an AB degree in physics; did post graduate study in electrical engineering and business administration at Princeton University, Massachusetts Institute of Technology, and the University of California Extension Division. An administrator with both technical and business education, Mr. Andressen has served in many capacities, several of which were held concurrently in companies where he was co-founder.

Angele, Wilhelm

Chief, Prototype Development Branch . MSFC  
Manufacturing Engineering Laboratory, S&E

Mr. Angele is widely known for his expertise concerning Electrical, Electronic, and Mechanical Manufacturing Technology; especially ultra-precision instruments and optical hardware. In addition to many personal contributions, he directed his organization in providing valuable pilot manufacturing and manufacturing technology to the Astrionics Laboratory during the design and development of the Saturn Instrument Unit. As Chairman of the Astrionics Reliability and Review Team, he has heavily contributed to the SATURN and APOLLO Programs. Mr. Angele is recognized nationally and internationally as a leading designer and proponent in the field of Flat Conductor Cables and Connectors. He has directed the MSFC (formerly ABMA) activity concerning Flat Conductor Cables since it began in 1956.

Mr. Angele received his Electrical Engineering degree, in 1928, at the Gauss Polytechnic Institute in Nuernburg, Germany. He gained much valuable experience in the research and development of precision mechanical, electrical, and optical instruments prior to joining the von Braun team at Fort Bliss, Texas, in 1945. He holds many patents and is the recipient of numerous awards in the fields of Electrical Design, Mechanical Design, Optical Design, and Manufacturing. He has authored many papers concerning Flat Conductor Cable Technology and Astronomical Telescope Concepts.



NAME

POSITION

ORGANIZATION

Arenstorf, Richard, Professor, Dr. Staff Scientist, Computation MSFC  
Laboratory

Professor Dr. Richard Arenstorf is internationally known for his fundamental contributions in the field of orbital mechanics. They include new mathematical approaches to the restricted and the full problem of three bodies. Dr. Arenstorf also contributed to the mathematical formulation of the guidance scheme for the Saturn-Apollo project. He is also internationally known for break-throughs in the field of periodic orbits.

Dr. Arenstorf studied at the Universities of Hamburg, Goettingen, and Mainz, Germany, where he received his PhD in 1956. He joined the Army Ballistic Missile Agency in 1957, and transferred to MSFC in 1960. He received the NASA medal for Exceptional Scientific Achievement in 1966.

uter, Henry F.

Deputy Manager, MTF, PM

MSFC/MTF

In the role of Deputy Manager, Mr. Auter has contributed greatly to the efficient management of the Facility's organization, development and operation. MTF has the responsibility for ground testing of engines and stages of NASA's large launch vehicles. Mr. Auter has furthered the accomplishment of the test functions at MTF, a vital link in the Apollo program, since the very beginning.

Prior to his coming to MTF, Mr. Auter served as Chief of the Electronics Systems Engineering Branch, Test Laboratory, MSFC, Huntsville, Alabama for 12 years. His professional engineering ability, coupled with a mastery of sound management, has enabled him to provide those elements requisite to the successful accomplishment of MTF's mission. Mr. Auter graduated from Mississippi State University in 1949, with a degree in Electrical Engineering.

Bailey, Wilbur M.      Deputy Chief, Plant Engineering Branch  
                                 Manufacturing Engineering Laboratory, S&E      MSFC

Mr. Bailey has served as Deputy Chief of Plant Engineering for the Manufacturing Engineering Laboratory for the past nine years. In this capacity he has been responsible for the development, design and acquisition of the major facilities and equipment used by this Laboratory in the development and prototype manufacture of major systems for the Apollo Program. He has also served as consultant on facility problems to the major contractors associated with the Apollo Program.

Mr. Bailey attended the University of Alabama. He was employed by the Decatur Iron and Steel Company prior to coming to the Army Ballistic Missile Agency in 1951. He was transferred to NASA when the MSFC was organized in 1960.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Baker, Clyde D.	Chief, Astrodynamics and Guidance Theory Division	MSFC

As Chief of the Astrodynamics and Guidance Theory Division, Mr. Baker directs a staff in the performance of trajectory optimization and analysis and advanced optimal guidance systems research for space vehicles and spacecraft. In this role and as former deputy chief of the Dynamics and Flight Mechanics Division, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. Accordingly, he is directly responsible for the initiation and development of the mathematical theory which has led to a considerable advance in the design of control systems for Saturn-type launch vehicles. He directed the effort to expand and apply this theory, called the "Chebyshev Minimax Control Theory" to the control problems of the Saturn V as a multi-purpose launch vehicle. This new approach considerably outdistances the trial-and-error or approximation method by directly solving the control problem, enabling accurate and simplification results. In addition, he supervised the development of several load relief control systems which have been successfully simulated for use on various Saturn V missions including a system designed for interplanetary launching during extremely high wind conditions. The development of this system will save a costly and major redesign of the vehicle's structure for interplanetary flight.

Mr. Baker has been with NASA since the Saturn and Apollo program inception prior to 1960. Since 1952, he has been engaged in missile and vehicle control system design and analysis. He served as Deputy Chief of the Dynamics and Flight Mechanics Division from 1959 to 1964 when he assumed his present position. In 1960 he received a M.A. degree in mathematics from the University of Alabama.

Balch, Jackson M.

Manager, Mississippi Test Facility, P.M.

MSFC

Jackson M. Balch, Manager of the Marshall Space Flight Center's Mississippi Test Facility, has been deeply involved in the Apollo/Saturn program since he accepted a key management position in Center Director's Office in the summer of 1962. He made invaluable contributions to the program as Assistant to the Deputy Director, Technical, in the area of developing special transportation systems for launch vehicles and associated hardware.

Mr. Balch, however, distinguished himself when he was given one of the most challenging and significant management assignments in the entire Apollo Program -- directing the final construction, activation and operation of the Mississippi Test Facility.

Because of programmatic decisions, and additional missions, Saturn V second stage (S-II) facilities at MTF had to be completed and in readiness for performing research and development testing and flight worthiness testing months ahead of original schedules.

The management of this concurrent work of construction, activation and operation on an accelerated basis was one of the most difficult tasks in the entire Apollo program. At the peak of this endeavor, over 6,000 persons working for as many as 250 different industrial firms and the government were involved in the vital, accelerated program to ready MTF.

His efforts were instrumental in NASA's accomplishment of the research and development testing of S-II and operational flight certification testing of Saturn V stages now used in Project Apollo.

His sincere and dedicated concern for this major national resource and the communities impacted by it has now brought credit to this Agency as well as the Nation.

Barr, Thomas A.

Chief, RF Systems Development  
Branch,

MSFC

As Chief of the RF Systems Development Branch he has been responsible for the Tracking, Communication, Command, Antenna and TV Systems of the Saturn vehicle. Some of these systems were developed from concept to application and flight under his direct supervision and contribution. Mr. Barr has been an active member of the Instrumentation and Communication Working Group and Panel, he chaired special committees and devoted substantial time and effort in coordination of the RF systems with MSC, KSC, and GSFC. His genial contribution and the development and application of the missile borne TV systems requires special mentioning. The excellent results of TV pictures received from the Saturn vehicle orbiting the earth represented a first at the time.

Mr. Barr has been associated with launch vehicles and satellite communication systems since 1948, when he joined the Army Missile Research group in Ft. Bliss, Texas. In 1950 he was transferred to Huntsville as Chief, Antenna Development Group. In 1961 he was promoted to Chief, RF Systems Branch. June 1969 assigned as Senior Systems Engineer with Space Station Task Team.

Received education in Electrical Engineering at Bluefield College, Bluefield, Va.

Bates, James P.

Saturn V Liaison Engineer

MSFC

Quality and Reliability Assurance Laboratory, S&E

Mr. Bates' coordination of quality and reliability requirements among the industrial and governmental organizations concerned has done much to promote these efforts in the Saturn program. In addition, he was a prime influence in developing a practical approach in reliability techniques. In particular were his efforts on a system to assure that priority efforts were placed on single failure points and high criticality hardware.

After attending Louisiana Polytechnic Institute, Mr. Bates received his B. S. in Mechanical Engineering from the University of Alabama in 1948. He was with the Corp of Engineers for six years prior to joining ABMA - NASA in 1957.

Batty, Frank R.

Chief, Applied Technology Branch

MSFC

Analytical Operations Division

Quality and Reliability Assurance Laboratory, S&E

Mr. Batty has been responsible for the development of test and checkout methods of the mechanical, electromechanical, hydraulic, and propellant feeding systems in the Saturn vehicle, for the development of the procedures therefor, and for the integration of them into the overall test and checkout. He also directed the early development of a data reading system used in MSFC on Saturn I and Saturn V which was later largely adopted by the prime contractor and has been instrumental in the development of improved inspection methods, such as the eddy current gage used to measure thickness of SOFI on the S-II stage. Through his service on several working groups and committees, such as the Static Firing Working Group, he influenced the development of much of the Center's test and checkout policies. His experience is presently utilized to formulate the approaches for the Saturn follow-on procurement where a considerable reduction in costs is to be accomplished without sacrificing the quality and reliability.

Mr. Batty attended the University of Virginia and received his degree, B. S. in Mechanical Engineering, in 1952. He joined ABMA in 1957.



Becker, Harold S.

Director, Advanced Projects Office

MSFC

Mr. Becker headed a Configuration Task Team investigating overall space systems concepts for launch on a Saturn V for the Office of Manned Space Flight. Team members included NASA Headquarters and Center personnel from all elements of NASA. Numerous presentations were given to the Associate Administrator for Manned Space Flight, Director of the Apollo Applications Program, and other scientific and advisory groups within and consulting to NASA. He is also a member of a working group for future program plans and budget requirements for the Extension of Manned Space Flight Capability.

Mr. Becker received his Bachelor's degree from Georgia Tech and his Master's from UCLA. He has had extensive experience in responsible positions in private industry. Mr. Becker is in demand as a speaker and has published several significant papers in the aerospace field. He is an Associate Fellow of the AIAA, and has served as the Director, American Institute of Aeronautics and Astronautics (AIAA), Alabama Section, and Chairman of Publicity Committee of Program Committee for Alabama Section of AIAA.

Belew, Leland F.

Manager, Apollo Applications  
Program Office, Program Management

MSFC

Leland F. Belew is Manager of the Apollo Applications Program (AAP) with the responsibility to direct the planning and execution of the AAP consisting of the Manned Orbital Workshop, the Manned Astronomy Telescope (ATM) and associated space hardware to be flown in the 1972 to 1974 timeframe.

Prior to assuming his present position in July 1966, he served as Manager, Engine Program Office, Industrial Operations, with program management responsibility for development and manufacture of the engines in the first three stages of the Saturn V vehicle and engines for the Saturn I/IB vehicles.

Belew has been the recipient of several awards including the NASA Exceptional Service Award for his outstanding contributions to the Saturn Program and in recognition of his outstanding technical and managerial ability. He is the author of several papers and reports in the field of liquid propulsion. He is a senior member of the American Institute of Aeronautics and Astronautics (AIAA), American Society of Mechanical Engineers (ASME) and registered member of the Missouri Architect and Professional Engineers. A native of Missouri, Belew was born in Salem, on 2/25/25. He served in the Army from 1943 to 1946, and was graduated from The Missouri School of Mines and Metallurgy, University of Missouri, in 1950 with a BS degree in Mechanical Engineering.

Bell, Lucian B.

Chief, Program Engineering Office  
Saturn Program

MSFC

Mr. Bell is Chief of the Program Engineering Office, Saturn Program, at Marshall Space Flight Center in Huntsville, Alabama. He served as Chief of the Saturn V Systems Engineering Office from December 1964 until January 1969. As a result of the merger of the Saturn IB and Saturn V Programs, he assumed the additional responsibility for management of the total Saturn Systems Engineering function for both the Saturn IB and V Programs.

His outstanding managerial and technical ability enable him to effectively carry out the highly complex responsibilities of this position. His contribution to the space program can be measured by the success to date of these various systems. Mr. Bell has had 13 years experience in the missile and space programs including the assignment of Deputy Chief, Instrumentation and Communications Division, Astrionics Laboratory, MSFC, for more than four years and as Chief, Planning and Engineering Branch, Instrumentation and Communications Division, Astrionics Laboratory, Army Ballistic Missile Agency in Huntsville.

He is a native of Kentucky and holds a Bachelor of Science Degree in Electrical Engineering from the University of Alabama. His honors include a Superior Achievement Award and a Certificate of Achievement.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Bell, Robert A.	Chief, Assembly Dev. Branch Manufacturing Dev. Division Manufacturing Engr. Lab., S&E	MSFC

Mr. Bell has been responsible for directing and coordinating the branch activities in development and assembly of parts and components for the Apollo program. As a result of Mr. Bell's outstanding ability in analyzing the complete assembly picture and through relentless effort, he has alleviated many of the technical and assembly problems threatening the Apollo assembly schedules. He has done this by: (a) Proposing redesign to be more compatible with manufacturing processes and specifications (b) Recommending different methods and techniques of manufacture which contributed to improved design criteria.

Mr. Bell received his BS in Industrial Engineering from the University of Pittsburgh in 1947. He has been associated with the fabrication and assembly of space flight vehicles when he joined the Manufacturing Engineering Laboratory since 1962 and became Chief of the Assembly Development Branch in 1966.

Bethay, Joseph A.

Deputy Director, Center  
Plans and Resources Office

MSFC

As Deputy Director, Center Plans and Resources Office, Mr. Bethay shares responsibility with the Director for direct support to center management in the areas of budgeting, resources management, organization planning, special studies, congressional affairs, and management systems. Additionally, this office is responsible at the specific request of the Center Director to provide the highest calibre staff support to the Center Director's office. Under the direction of Mr. Bethay, as Chief, Technical Programs Office, Executive Staff, the Apollo Cost Study was developed and used as a basis for determining the basic hardware values for the Saturn/Apollo program. This complex technique involving all of the project offices of Program Management, elements of MSF and NASA Headquarters, MSFC prime contractors, is still in use. Also, methods for analysis of Apollo incentive contract provisions were developed and used by MSFC and MSF.

Mr. Bethay received his BS degree in 1956 and has completed some of his graduate work in Mechanical Engineering from Mississippi State University. He was employed by ABMA prior to January 1962 when he came to work for MSFC as a project engineer in the Technical Program Coordination Office. In October 1963 he was promoted to chief of a major organizational element of Executive Staff where he served until May 1969 when he became Deputy Director, Center Plans and Resources Office. For his outstanding accomplishments he has received the Sustained Superior Performance award.

Technical Assistant for Guidance & Control  
Systems, Flight Dynamics Branch, Astrionics MSFC  
Lab. (Deputy Chief, Application & Integration Div., CSE)

Blackstone, John H.

Mr. Blackstone has been deeply involved in the design, development and finalization of the Saturn launch vehicles' guidance and control system. In particular he was leading the stability investigations generating the dynamic flight characteristics by flight simulation techniques and instrumental in obtaining optimum results. Because of his extensive experience and thorough knowledge in this field he served as a member of the Flight Mechanics Panel and of the Dynamics and Control Working Group. As cochairman and Astrionics Laboratory's representative of the POGO Working Group he personally contributed extensively to derive the conclusions applied to the most recently flown vehicles.

Mr. Blackstone obtained his BSEE from the University of Alabama in 1950. He joined the Army Ballistic Missile Agency in 1956 and was transferred in 1960 to the newly established MSFC. Since that time he has been one of the most active members of Astrionics Laboratory's Flight Dynamics Branch.

Blevins, Calvin B.

Chief, Engineering Branch  
S-IB/IC Stage Project Office  
Saturn Program

MSFC

As Chief of the S-IC Stage Project Engineering Branch, Mr. Blevins has demonstrated the highest degree of managerial ability in supervising his employees in the direction of the stage contractor to meet assigned flight mission objectives. His superior capabilities contributed significantly to the highly successful S-IC Stage of the Saturn V Launch Vehicle.

Mr. Blevins received his BSME from the University of Alabama in 1952. He began his government career in 1954 with the U. S. Army Ordnance Corps, Redstone Arsenal, Alabama and has been a Saturn Program employee since September 1963.

Mr. Blevins has received a Superior Achievement Award and a Sustained Superior Performance Award.

Blumrich, Josef F.

Chief, Systems Layout Branch

MSFC

Mr. Blumrich has specialized in several areas during his life. One of them is advanced structures for boosters and spacecraft. His contributions to the welding of aluminum date back to 1940 and forward to a current U. S. patent on tank construction for space vehicles. In addition, he holds three patents on shock absorber assemblies and landing pad assemblies for aerospace vehicles intended for lunar landings. His work on design and structure, which includes multicell structure, has been significant to the earlier programs as well as to Apollo.

Born in Austria, most of his work has been done in Germany or the U. S. He received his B. S. in Aeronautical Engineering from Ingenieurschule Weimar in 1934 and began his career doing stress analysis and design requirements for plywood and wooden aircraft structures. After World War II he worked as the deputy chief of a hydraulic structures department and specialized in sluice gates testing and design, a field in which he holds foreign patents. He began his space career when he came to work for the ABMA as an aeronautical research engineer in 1959.



Boehm, Josef

Chief, Electro-Mechanical Engineering  
Division, Astrionics Laboratory, S&E

MSFC

Mr. Josef Boehm is nationally known for his many contributions to the Field of Aerospace Mechanisms and the science of Kinematics related to the space program. He was responsible for the mechanical design of complete satellites such as Explorer VII. His most recent contribution has been in directing the packaging of electronic components, development of miniaturized subcomponents and resolution of heat dissipation problems within electronic packaging.

Mr. Boehm recieved his M.S. in Mechanical Engineering from Technical University Dresden in 1935. He was Assistant Professor in Kinematics at Dresden, Germany until 1939 when he joined the von Braun Missile Team as a Guided Missile Development Engineer. He has been continuously associated with missile development since then and is now Chief of the Electro-Mechanical Engineering Division of Astrionics Laboratory. Mr. Boehm has many patents and has authored many publications such as "Considerations to the Development of Explorer VII Satellite," published in IRE Preceedings, in 1960. He has been honored with numerous professional recognitions and awards, including Sustained Superior Performance.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Bolton, Thomas R.	Aerospace Engineer	S&E-ASTR-GS

Mr. Bolton was assigned to the design and development of test procedures and test and auxiliary equipment for the Saturn V, ST124-M Stabilized Platform system. His long years of experience at Redstone Arsenal with Redstone, Jupiter, and Pershing missile systems allowed him to contribute significantly to the Saturn/Apollo program. He developed procedures and equipment for the platform systems that assured the extreme care and cleanliness required for manned space flight. He also made lasting contributions in the development of sidereal test stands that were used in flight qualification of the ST124-M platform systems. He was killed July 19, 1967, in a plane crash while enroute to investigate problems being encountered by the manufacturer of precision slip rings for the ST124-M platform.

Bowden, Donald R.

Chief, Test Branch, Airlock  
Module Project, Apollo Applications  
Program

MSFC

As Chief of the Saturn Program Configuration Management Branch from November 1965 to January 1969, Mr. Bowden was singularly effective in developing, establishing and managing the Program level configuration management function. This exceptional technical and managerial ability is reflected in the adeptness of his direction and guidance to the separate Program/Project Offices, S&E, and other NASA Centers. Under the direction of Mr. Bowden, a "closed loop" configuration management system was refined and implemented which made a most significant contribution to overall configuration management and culminated in a vastly improved, identifiable Launch Vehicle configuration management posture.

Mr. Bowden obtained his BS in Mechanical Engineering from Tennessee Tech. He has received two Group Achievement Awards, in July 1967 and June, 1968.

Boyd, Billy J.

Chief, Personnel Management Branch  
Manpower Office, A&TS

MSFC

Mr. Billy Boyd has worked in direct support of the chief of personnel in accomplishing the staffing of a highly complex scientific and technical work force whose primary mission has been to design the space vehicle that will place a man on the moon in this decade. Mr. Boyd was actively involved in the initial staffing of this unique scientific and technical staff needed to develop the complex programs assigned to this Center. He has continuously assisted management and operating officials in directing the personnel responsible for the research, design, development, manufacture and test of these large aerospace launch vehicles. In his capacity as Supervisory Personnel Management Specialist, he has capably interpreted policies involving personnel activities throughout the Center.

A native of Boaz, Alabama, Mr. Boyd graduated from Walnut Grove High School. He actually began his Federal career in 1943 as an employee at the Gadsden Air Force Depot. After serving in the United States Navy, he attended the University of Alabama and Jacksonville University, from which he received his Bachelor of Science degree in 1951. He then returned to the Federal service and in 1958 he joined the Army Ballistic Missile Agency in Huntsville, Alabama. In 1960 he was one of the original employees of ABMA who transferred to the newly formed MSFC.

Bradford, James E.

Assistant Director, Operations  
Program Management

MSFC

Mr. Bradford is Assistant Director, Operations, Program Management, at the Marshall Space Flight Center.

Mr. Bradford served in the Office of Systems Engineering (Duty station Huntsville), Office of Manned Space Flight, Washington, D. C. from January 1962 to August 1963. There, he was instrumental in the development of the first Flight Mission Assignments Document and its according essential definitions and, further, the establishment of Apollo schedules.

At the inception of the Saturn V Program in August 1963, he was assigned Assistant Manager, participating in the overall technical and managerial direction of the Saturn V launch vehicle system development. He exercised the highest degree of executive and managerial ability in relationships with all organizational levels throughout NASA. He began his career in the missile and space industry with the Army Ordnance Missile Command in September 1958 and has a total of 11 years in the missile industry.

A native of Trenton, Tennessee, he obtained a BS in Industrial Engineering from the University of Tennessee. He has received such honors as Superior Achievement Award (NASA); Sustained Superior Performance Award (NASA); and Department of the Army Award for Sustained Superior Performance.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Jesse N. Bradley	Chief, Electrical Systems Control Branch	Test Division Astronautics Laboratory

Mr. Bradley is currently Chief of the Electrical Systems Control Branch in Test Division at Marshall Space Flight Center and is responsible for the design, installation, and operation of the power and control systems used for ground testing space vehicles, rocket engines and allied components. Since 1955 Mr. Bradley has worked for the Corps of Engineers, the Army Ballistic Missile Agency (ABMA) and NASA, in the design, construction, and operation of test facilities at Redstone Arsenal, Marshall Space Flight Center, Mississippi Test Facility, Santa Susanna, California, and Jackass Flats, Nevada. Mr. Bradley has worked on REDSTONE, JUPITER, CENTAUR, PERSHING, SATURN I, SATURN IB, SATURN V, RIFT, NERVA, and other related weapon and space programs.

Mr. Bradley graduated from Vanderbilt University in 1949 with a B.S. in Electrical Engineering. Early experience includes short periods with a crude oil pipeline company, a structural steel fabricator, a municipal electrical distribution system, and other Tennessee Valley Authority.

Bramlet, James B.

Deputy Manager, Saturn Program

MSFC

James B. Bramlet is Deputy Manager of the Saturn Program Office at Marshall Space Flight Center. From October 1961 to October 1963, as Saturn V Project Manager, he did an outstanding job in directing the early development phases of the Saturn V Launch Vehicle.

Mr. Bramlet became associated with the Wernher von Braun research and development team in 1946 while working on the development of long range optical instrumentation systems for the Ballistic Research Laboratory at White Sands Proving Ground, New Mexico. He came to Huntsville with that group in early 1950 as a part of the Army Guided Missile Development Group. Since then he has held responsible positions in the engine development for Redstone and Jupiter systems and in design coordination for the Pershing weapon system. When first joining NASA in July 1960, he was assigned as S-IVB Stage Manager. Mr. Bramlet's exceptional capability and knowledge have enabled him to make significant contributions to all of his assignments in the aerospace field.

A native of Harrisburg, Illinois, he earned his Bachelor of Science Degree in Engineering from the University of Illinois.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
BRAMLET, JAMES B.	DEPUTY MANAGER SATURN PROGRAM	SATURN PROGRAM

James B. Bramlet is Deputy Manager of the Saturn Program at the George C. Marshall Space Flight Center, Huntsville, Alabama. He has served as Deputy Manager, Saturn V Program, since its inception in August 1963, and from October 1961 to August 1963 as Saturn V Project Manager. He did an outstanding job in directing the early development phases of the Saturn V launch vehicle system and contributed greatly to the Saturn V successes.

Mr. Bramlet became associated with the Wernher von Braun research and development team in 1946 while working on the development of long range optical instrumentation systems for the Ballistic Research Laboratory at White Sands Proving Ground, New Mexico. He came to Huntsville with that group in early 1950 as a part of the Army Guided Missile Development Group. Since then he has held responsible positions in the engine development for Redstone and Jupiter systems and in design coordination for the Pershing weapon system. When first joining NASA in July 1960, he was assigned as S-IVB Stage Manager. Mr. Bramlet's exceptional capability and knowledge have enabled him to make significant contributions to all of his assignments in the aerospace field.

A native of Harrisburg, Illinois, he earned his Bachelor of Science degree in engineering from the University of Illinois.

(see reverse)

Mr. Bramlet was awarded the Certificate for Superior Achievement in November 1965.



Brien, William L.

Chief, Quality & Reliability Engineering Division

MSFC

Quality and Reliability Assurance Laboratory, S&E

Mr. Brien personally directed the development of a quality and reliability engineering system for the Saturn program which significantly contributed to the overall success of the program. His concepts for contractual requirements, program planning, and monitoring of implementation by the contractors have been widely recognized and influenced other NASA and industry quality and reliability organizations. As a result of his proven capabilities, he was selected and performed instrumentally in the initial establishment of the quality organization at MTF.

Mr. Brien attended Vanderbilt University and graduated with a B. S. in Electrical Engineering from Tennessee Technological University in 1950. He became associated with the Army at Redstone Arsenal in 1951 and transferred to NASA in 1962.

Brooks, Charles O., Jr.

Chief, Verification Engineering Division,  
Central Systems Engineering, S&E (Formerly  
Chief, Vehicle Systems Checkout Division,  
Quality & Reliability Assurance Lab, S&E)

MSFC

As an Engineering Manager, Mr. Brooks has planned, developed, and implemented the Acceptance Test Program for the Saturn I, IB and V launch vehicle stages. He was one of the pioneers in the automatic checkout systems that are used in the complex systems, verification and launch of the Saturn V launch vehicles. Mr. Brooks has maintained surveillance of the stage contractors' implementation of the acceptance test program and ensured proper adjustments were made when required. Mr. Brooks has been active in many investigative boards, management reviews, special task teams for systems safety, and others.

Mr. Brooks earned his BSEE degree at Alabama Polytechnic Institute (Now Auburn University) in 1951. He joined Dr. von Braun's team in 1951, which in 1961 became the nucleus of the George C. Marshall Space Flight Center. Mr. Brooks is also a member of the Civil Service Board.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Brooks, Melvin	Chief, Guidance and Control Systems Branch	S&E-ASTR-SG

Mr. Brooks has been a key individual in the development and implementation of the Saturn guidance, control, navigation, and computation systems. He translated the theoretical guidance schemes (PGM and IGM) into implementation requirements and worked closely with the programming contractor and the theoretical guidance people to define the preparation, implementation, and verification procedures for the guidance and navigation programs being flown on the Saturn vehicles. He developed and implemented a scheme for controlling the direction of the acceleration vector of the Saturn vehicles to correct for thrust misalignment and other hardware errors (SMC). He participated in formulating the technical concept of variable azimuth capability on the Saturn vehicles and supervised the implementation in the flight computer. He serves on many working groups, panels, and committees chartered to do business in his specialty. He received a Performance Awards Certificate from NSFC for sustained superior performance on February-15, 1965. He has published several papers in his area of endeavor.

Mr. Procks has held the position of Chief, G&C Systems Branch since June 1967. After receiving a BA Degree in Physics from Mercer University in 1949, he held various training positions at Keesler Air Force Base, Mississippi. He came to Huntsville in April 1958 as an aeronautical research engineer in AFMA, working on the Jupiter and Pershing missile systems. He transferred to NASA in July 1960 and has served as Chief, Guidance Theory Unit, Chief, Aerospace Physics Unit, Chief, Systems Design Section, Deputy Chief, Guidance and Control Systems Branch until his appointment to his present position.

BROOKSBANK, William A., Jr.

Chief, Engineering Management Office  
Astronautics Laboratory, S&E

MSFC

Mr. Brooksbank served as the Laboratory Engineering Manager for Saturn Projects assigned to the Laboratory. During the critical design and manufacturing periods, Mr. Brooksbank coordinated all phases of the Saturn programs as Chief of the Projects Office. His technical and managerial competence contributed immeasurably in reducing engineering problems at the stage contractor plants.

Mr. Brooksbank received his MS degree in Chemistry from the University of Tennessee in 1956. He was employed by the Army Ballistic Missile Agency in 1958 and his nuclear experience gained at AEC, Oak Ridge, Tennessee, was immediately utilized by assigning nuclear power propulsion research to him. In 1960, he transferred to MSFC and continued as the Deputy Chief, Nuclear Vehicles Project Office. After the suspension of nuclear testing, he was transferred to Chief, Projects Office, Propulsion and Vehicle Engineering Laboratory at which time he became involved with all engineering aspects of the Saturn I and V programs.

Brown, William D.

Manager, Engine Program Office  
Program Management

MSFC

As one of the most outstanding cryogenic liquid propulsion authorities in the nation, Mr. Brown has made many significant contributions to the outstanding performance Apollo Program. As the Manager of the Engine Program Office for the past 3 years he was responsible for planning, directing, and managing the composite MSFC/industry performance of MSFC engines and for assuring technical adequacy and successful integration regarding all phases of these engine projects with the ultimate objective of a successful lunar landing. Prior to his present position, was responsible for the same duties as a deputy in a secondary capacity for 8 years. He has directed efforts to assure proper consistency in all large liquid propellant work performed at MSFC, other government installations, and industry in support of MSFC.

Mr. Brown has been associated with MSFC since its inception and has played a major role in the propulsion industry for eighteen years. Before his association with the Engine Office he was employed as a civilian with the Army in Huntsville where he was associated with the Redstone, Jupiter, and Juno propulsion activities and worked on research programs for rocket and ramjet power plants.

Mr. Brown's outstanding contributions are recognized by his having received several special and exceptional service awards and medals, and letters of commendation and appreciation. He has served on MSFC/NASA evaluation committees such as the Space Technology Panel of the President's Scientific Advisory Committee. He was selected to conduct a survey, together with Dr. Dorman, of the capability of the entire propulsion industry.

A native Huntsvillian, Mr. Brown received his BS degree in Chemical Engineering from Auburn University in 1951.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Buckelew, Volis L.	Chief, Guidance Section	MSFC

As Chief of the Guidance Section in the Aero-Astroynamics Laboratory, Mr. Buckelew performs and supervises the conceptual design of the Saturn guidance scheme. In this role he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs.

Mr. Buckelew has been personally involved with the mathematical development of the Saturn I, IB, and V guidance schemes. He has designed and developed models of the scheme to assess its performance characteristics and sensitivities. Modifications to vehicle configuration are continually assessed to assure scheme compatibility with all mission requirements. Adaptation of the lunar targeting "hypersurface" concept to the guidance scheme was performed under Mr. Buckelew's direction, which significantly contributed accurate injection conditions achieved on the Saturn V Apollos 8 and 10 translunar flights.

Mr. Buckelew has been associated with the Saturn and Apollo programs of the National Aeronautics and Space Administration since their inception prior to 1960. He received a B. S. degree in mathematics and chemistry from Jacksonville State University in 1950 and an M. A. degree in mathematics from Peabody College in 1954. He has served in his present position since early 1967.

BUCKNER, GARLAND G.

Director, Purchasing Office Marshall Space Flight Center  
Administration & Technical Services

Mr. Buckner acts for and is responsible to the Director, Marshall Space Flight Center, serving as the principal advisor to the Office of the Director and top management for those procurement and contracting activities within the purview of the Purchasing Office during the Apollo Program.

Mr. Buckner, a designated Marshall Space Flight Center Contracting Officer, has been associated with procurement since 1951 when he began his career with the Department of the Army. Transferring to the National Aeronautics and Space Administration in May 1960, he became Chief of the Procurement Branch, and in April 1963, Deputy Chief of Purchasing and Contracting Office. He assumed his present position in September 1963, with responsibility to plan and administer a complete range of purchasing and contracting operations in support of Marshall Space Flight Center's mission.

Bunn, Wiley C.                      Deputy Chief, Quality & Reliability Engineering Division                      MSFC  
Quality and Reliability Assurance Laboratory, S&E

Mr. Bunn has made outstanding contributions to the MSFC quality and reliability programs through his planning and implementation. While serving in his present capacity, he performed as the Laboratory Project Engineer for qualification testing to provide a single R&D Operations position for qualification testing on all MSFC programs. In this position, he was responsible for assuring that all tests were adequately monitored, data collected and evaluated, and status reported from all space system contractors. He also during this period served as Special Assistant to the Laboratory Director in providing overall management of the quality maintenance program. Mr. Bunn's expert knowledge of quality, reliability, and testing has earned the respect of personnel of NASA and its contractors.

Mr. Bunn attended Auburn University and graduated in 1950 with a degree in Mechanical Engineering. Prior to joining NASA in 1961, he was employed by the Army Rocket and Guided Missile Agency's Test and Evaluation Laboratory and private industry.



Burns, Howard D.

Chief, Test Management Office  
Saturn Program

MSFC

Mr. Burns is Chief of the Saturn Test Management Office at Marshall Space Flight Center, responsible for the planning, integration and approval of the overall Saturn test and checkout program which included establishing and controlling the interfaces and commitments with KSC for test, checkout and launch of the first Saturn V launch vehicles. Mr. Burns has applied new management techniques and methods in fulfilling his responsibilities which encompass complex technical tradeoffs and many organizational interfaces including OMSF, inter-Center, intra-Center and contractor. He has been selected for special assignments such as a member of the OMSF Working Group to establish the requirements for preparation and control of test and checkout plans and procedures at KSC. As a result of the above, he has made a substantial contribution to the success and timeliness of the Saturn Program.

Mr. Burns, a native of Ethelsville, Alabama, obtained a BBSE in 1946 and a LLB in 1950, both from the University of Alabama, and was admitted to the Alabama Bar in 1950. He has had approximately 18 years in the missile field.

His honors included a Sustained Superior Performance Award and an Achievement Award.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
BURNS, HOWARD DEWITT	CHIEF, TEST MANAGEMENT OFFICE, SATURN PROGRAM	SATURN PROGRAM

Mr. Burns is Chief of the Saturn Test Management Office at Marshall Space Flight Center. His assignment entails the planning, integration and approval of the overall Saturn test and checkout program. He was also responsible for establishing and controlling the interfaces and commitments with KSC for test, checkout and launch of the first Saturn V launch vehicles. Mr. Burns has applied new management techniques and methods in fulfilling his responsibilities which encompass complex technical tradeoffs and many organizational interfaces including OMSF, inter-center, intra-center, and contractor. He has been selected for special assignments such as a member of the OMSF Working Group to establish the requirements for preparation and control of test and checkout plans and procedures at KSC. As a result of the above, he has made a substantial contribution to the success and timeliness of the Saturn Program.

Prior to his current assignment in August 1963, Mr. Burns served as Chief, Systems Integration and Evaluation Office, Systems Engineering, Office of Manned Space Flight (Duty Station Huntsville), where he developed the initial Apollo Test Requirements document. He has also served as Redstone Project Manager, Industrial Directorate; and as Deputy Director, Test, Evaluation and Firing Laboratory, Research and Development Directorate; both in the Army Ballistic Missile Agency.

(see reverse)

Mr. Burns, a native of Ethelsville, Alabama, obtained a BSEE in 1946 and an M.S. in 1950. He has had approximately 18 years in the missile field.

His honors include a Sustained Superior Performance Award and an Achievement Award.

NAME

POSITION

ORGANIZATION

Burton, Thomas L.

Chief, Engines Branch, Contracts Office

MSFC

As Chief, Engines Branch, Contracts Office, Mr. Burton has directed a Contract Management Program, encompassing the planning, directing, and coordination of all phases of contractual acquisition of engine systems, associated equipment, facilities and services at MSFC and contractor plants. Mr. Burton has responsibility for negotiation and administration of contracts in the multi-million dollar range, multi-year tenures, to provide research, design, development, fabrication, facilities, and other services relative to the H-1 Engine, J-2 Engine, and F-1 Engine.

Born in Clayton, Georgia, Mr. Burton attended the University of Dayton and Wittenbert College studying Business Administration. Mr. Burton began his procurement career in April 1946 with responsibility for the procurement of landing gear components for bombers, fighters, trainers, cargo and liaison aircraft and as Supervisory Contract Specialist, directed the procurement and production aspects of the Thor, Atlas, Titan I and II and Minuteman Propulsion Systems. During his tenure at MSFC, Mr. Burton has demonstrated initiative, sound judgment and high degree of leadership so essential in guiding the contractual activities for procurement of engine systems.

Bush, Robert A.

Chief, S-II Branch  
Test and Quality Evaluation Office,  
MTF, PM

MSFC/NTF

Mr. Bush, as a Special Assistant to the Manager, is assigned as S-II Project Manager is responsible for supervising the S-II Branch in the performance of stage acceptance requirements identification, reliability and quality engineering, systems safety, configuration activity, performance evaluation and other factors of the S-II acceptance test program. He met a most pressing need in developing and directing the many phases of the test program, especially during its earlier stages. His professional skill and guidance in utilization of resources have been of immeasurable benefit to this critical operation.

Mr. Bush received a B.S. degree in Architecture from Georgia Institute of Technology in June, 1956. He was the S-II Facility Project Manager, MSFC, for three years prior to coming to MTF.

Butler, George                      Chief, Quality & Reliability Engineering Analysis Branch                      MSFC  
   Quality and Reliability Engineering Division  
   Quality and Reliability Assurance Laboratory, S&E

Mr. Butler has contributed in great measure to the overall success of the MSFC reliability program. His many contributions to the Saturn reliability program have earned him recognition throughout NASA and industry. While a member of the Astronaut Crew Safety Panel, Mr. Butler personally contributed to the establishment of criteria for the items to be monitored by the Emergency Detection System and in the establishment of ground rules to be utilized in the event of an abort. The MSFC "Failure Reporting and Corrective Action System," which has been of significant help to program management when making flight readiness decisions as well as advances in the science of reliability predictions, was accomplished under his leadership.

Mr. Butler attended Auburn University and graduated in 1948 with a degree in Engineering. Prior to joining NASA in 1962, he was employed by the Army Ballistic Missile Agency and the Allis Chalmers Manufacturing Co.

Carr, Arthur M.

Chief, Stage, AAP & Future Program Office

MSFC

Quality and Reliability Engineering Division

Quality and Reliability Assurance Laboratory, S&E

Mr. Carr has made outstanding contributions to the development, implementation, and evaluation of the MSFC quality and reliability assurance programs of major space systems contractors. He has personally spearheaded the implementation of essential parts of the NASA quality and reliability program plans and has devoted considerable effort to conduct quality and reliability surveys of MSFC prime contractors and vendors and to continuously improve the approaches for a more efficient operation in this area. Under his leadership, many deficiencies in prime contractor and vendor plants were identified and corrected before flight hardware could be adversely affected.

Mr. Carr attended Mississippi State University and graduated in 1954 with a degree in Mechanical Engineering. Prior to joining NASA in 1962, he was employed by the Army Ballistic Missile Agency and private industry.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Caruso, Vincent P.	Chief, Planning & Engineering Branch, Manufacturing Engineering Laboratory, S&E	MSFC

Mr. Caruso directed and contributed personally to the establishment of manufacturing procedures and assembly sequences utilized for in-house building of Apollo Saturn Stages. His planning and assembly procedures were later transferred to Michoud and utilized by both Boeing Company for Saturn V and Chrysler for Saturn IB Stage manufacture. Other Apollo projects in which Mr. Caruso directed the planning effort include his service as Laboratory Project Engineer for the Mini-Stage Assembly, and his planning and coordination of the fabrication of the Saturn V Damper System. Mr. Caruso also served as Manufacturing Consultant to prime contractors such as North American, IBM, Douglas, etc.

Mr. Caruso received a BS Degree from the University of Alabama in 1951 and has had ten years Industrial Manufacturing experience before joining Marshall in 1960. He is a Registered Professional Engineer in the State of Alabama and very active in professional and civic activities.

Cataldo, Charles E.

Deputy Chief, Materials Division  
Astronautics Laboratory

MSFC

Charles Eugene Cataldo is one of the really outstanding long time contributors in the science of rocketry at MSFC. His career at Huntsville spans almost two decades, and includes outstanding contributions to all the programs during that period, but more especially in the Saturn V program. He enjoys an unexcelled reputation for technical excellence in metals and alloys, and has contributed personally and specifically to the successful design and fabrication of Saturn V by his knowledge and experience in the 2014 and 2219 aluminum alloy research and development done on Saturn V in the Materials Division. In addition to his personal technical contributions, he has contributed enormously to the Saturn V development by virtue of his leadership and ability to inspire his co-workers and subordinates.

Mr. Cataldo received his BS in Chemistry in 1950 from the University of Alabama and has since done graduate work at the University of Alabama, Huntsville. The vast majority of contractors and MSFC personnel who have developed Saturn V are familiar with Mr. Cataldo's many contributions to the vehicle.



CAVALIERE, BENJAMIN A.      Chief, Operations Support Branch    Marshall Space Flight Center  
   Purchasing Office  
   Administration & Technical Services

Mr. Cavaliere plans and directs the activities of several highly technical support elements furnishing administrative support such as contract review, contract pricing and etc. to branches directly involved in procurement of advanced space vehicles and ground support equipment.

Mr. Cavaliere received his B.A. Degree in 1952 from Duke University, Durham, North Carolina. His career in procurement started in August 1955 when he was employed by Redstone Arsenal, Huntsville, Alabama. He transferred to Marshall Space Flight Center in May 1960 as a Contract Specialist and became a Special Assistant to the Chief, Purchasing and Contracting in September 1960. He assumed his present position of Branch Chief in January 1961.

NAME

Chandler, Doris C.

POSITIONActing Deputy Chief, Astrodynamics and  
Guidance Theory DivisionORGANIZATION

MSFC

As Acting Deputy Chief of the Astrodynamics and Guidance Theory Division, Mrs. Chandler assists in directing a staff in the performance of advanced optimal guidance studies for launch vehicles and spacecraft. In this role and as former Chief of the Guidance Branch, she has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. Accordingly, she personally performed the preliminary conceptual studies to ascertain the calculus of variations for developing the steering equations necessary for the implementation of the explicit guidance scheme which is incorporated into the Saturn V vehicle's on-board guidance computer, and she supervised the formulation and simulation of the equations to insure consistency with the guidance hardware.

The implementation of this explicit guidance scheme, known as the iterative guidance mode, was necessary to minimize fuel consumption by the vehicle and achieve essential vehicle accuracy while maintaining maximum flexibility to adapt to mission changes. By use of this scheme in the vehicle's on-board guidance computer, the vehicle is directed in such a way that the required velocity magnitude, velocity direction, and altitude are attained to any desired accuracy of the end state variables with a negligible loss in propellant consumption. In addition, changes in terminal points can be achieved while the vehicle is in flight in the event of a catastrophe such as failure of a complete stage to ignite, thus providing maximum astronaut safety.

Mrs. Chandler has been with NASA since the Saturn and Apollo program inception prior to 1960. In 1953, after receiving a BA degree in mathematics from Tulane University, she became engaged in guidance theory applications research and development. She has served as a Section, Branch and Deputy Division Chief and assumed her present position in May 1969.

Chase, John B. E.

Deputy Director,  
Research Planning Office, S&E

MSFC

Mr. John Chase is widely known for his numerous contributions to supporting development and technology for the Saturn program. As Technical Assistant to the Director of the Astrionics Laboratory he was vitally involved in the development of the electrical/electronic systems of the Saturn launch vehicle. He has served in a managerial capacity to coordinate this supporting development into a well-rounded program.

Mr. Chase has graduated from the Citadel in Charleston; S. C. in 1949 with a B. S. degree in electrical engineering. He was formerly with the CAA, the Tennessee Valley Authority and ABMA before coming to NASA in 1960 as Technical Assistant to the Director of the Astrionics Laboratory. As Deputy Director of the Research Planning Office, a position he has held since 1966, Mr. Chase participates extensively in the planning and management of supporting research and technology aimed at future space missions including lunar exploration.

CHESTEEN, JAMES H.

DEPUTY CHIEF, PLANNING & TOOL ENGINEERING  
DIVISION, MANUFACTURING ENGINEERING  
LABORATORY, S&E

MSFC

On the offset of the Saturn V Program, Mr. Chesteen served as the Chief, Planning and Engineering Branch. In this capacity he established the basic manufacturing plans for the S-IC stage, through coordination with the Boeing Company he helped establish their manufacturing sequences. He also worked with the S-IC Program Office in phasing S-IC manufacturing from in-house to out-house, reviewing design changes for schedule impact, work-arounds, and as a Manufacturing Consultant during contract negotiations and feasibility studies. He served as Manufacturing Consultant to S-II, S-IVB, and IU Program Offices.

Mr. Chesteen received his Bachelor Science in Mechanical Engineering from Mississippi State University in 1955. In 1957 he joined ABMA and worked in the manufacturing area on such items as the Spin Launcher for the earliest satellites, Juno II, Project Hardtact, S-1. He transferred to NASA in 1960 where he has worked in the engineering planning and tooling area for in-house manufacturing and research programs. He is a Registered Professional Engineer in the State of Alabama.

Cholewinski, Victor H.      Chief, Systems Support Section  
   Manufacturing Engineering Laboratory, S&E      MSFC

Mr. Cholewinski supervises the activity of Aerospace Engineers and Industrial Specialists responsible for phasing work from the Manufacturing Engineering Laboratory to industry. He provided technical liaison and technical assistance to aerospace contractors in the development and manufacturing of space vehicle propulsion and mechanical systems. He coordinated the various technical problems during the manufacturing development and qualification program and assured a timely delivery of systems essential to the build up of the space vehicle. These actions contributed to the successful flight performance of the S-IC Stage of the Saturn V Vehicle.

Mr. Cholewinski received his B. S. degree from the University of Bridgeport, Bridgeport, Conn., in 1950. He initiated his engineering career in 1951 with Army Ordnance at Springfield Armory. In 1958, he joined the Army Ballistic Missile Agency at Huntsville. There he performed contract technical liaison on the Redstone and Jupiter missiles.

Chumley, James F.

Chief, Test and Transportation  
Design Branch, Engineering  
Division, Astronautics Laboratory,  
S&E

MSFC

Mr. Chumley directed and contributed personally to the design, construction, and operation of test facilities and test fixtures required to develop and qualify the Saturn V launch vehicle. Of particular importance is his participation in the design of the booster flame deflectors and thrust mounts. Mr. Chumley's most recent achievement was the design of a test stand for structural and longitudinal vibration testing to man rate the S-II stage.

Mr. Chumley received his B.S. degree from the University of Louisville in 1947. He was employed with the TVA in Knoxville, Tennessee in a supervisory design position until 1949. Transferring to ABMA and subsequently to MSFC he worked in the area of heavy structural and mechanical design engineering. He has recently been appointed as chief of the Test and Transportation Design Branch.

COLDWATER, Harold R.

Chief, Strength Analysis Branch  
Astronautics Laboratory  
S&E

MSFC

Mr. Coldwater directed and contributed personally to the strength analyses of the Saturn V launch vehicle, and was instrumental in shaping the configuration of the vehicle. In particular, his efforts in the S-II Tiger Team activity and the Apollo Integrated Shell Static Structure Test Program have proven of utmost importance in the Saturn launch program leading up to and including the Apollo 11 launch.

Mr. Coldwater received his B.S. degree from the University of Illinois, Urbana, Illinois in 1954. His career in the analyses and testing of flight systems, both aeronautical and in the missile/launch vehicle field, spans more than 14 years. An expert in the field of launch vehicle structures, he has significantly contributed to the Apollo 11 flight.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Edward J. Connor	Deputy Division Chief	Test Division Astronautics Laboratory

Mr. Connor as Deputy Division Chief was responsible for Saturn Component and Sub-Systems Testing at MSFC. One of his special assignments during this period was the function of the Mechanical GSE Testing Program Manager. In this capacity he was responsible for all Mechanical Launch GSE Tested at MSFC.

Mr. Connor received his BS degree in Engineering Physics from Maine University, Orono, Maine in 1953. His career in the development of missile/launch vehicle systems was initiated in 1955 when he was associated with the Test Laboratory at the Army Ballistic Missile Agency. Thereafter, Mr. Connor has contributed to the development of in-flight and GSE Systems by conducting and/or supervising various component, sub-system and system hazardous test programs for the REDSTONE, JUPITER, PERSHING and SATURN Programs.



Constan, George N.

Manager  
Michoud Assembly Facility, PM

MSFC

Dr. Constan successfully established and operated a unique government-industry team to build the first stages of the Apollo/Saturn space vehicle as Manager of the Michoud Assembly Facility of MSFC. He converted the 20-year-old idle plant to the production of space vehicles, administered multi-million dollar contracts, and welded a multi-contractor/NASA staff into a harmonious and effective working group which effectively completed program goals on time, and led to the record of successful firings of Michoud-built boosters.

Dr. Constan received the degree of Bachelor of Science in Chemistry from Clemson College, Clemson, South Carolina, in 1933, and in 1960 received an honorary doctorate from Clemson. His career of federal service began in 1941, and he has served with distinction in progressively responsible positions. As Chief of the Program Coordination Office, Development Operations Division of the Army Ballistic Missile Agency, he made a significant contribution to the nation's military ballistic missile systems, and began his notable contribution to the nation's space goals as Chief of the Technical Program Coordination Office of MSFC.

Dr. Constan was awarded the Army Commendation Ribbon for performance between 1942 and 1945, and received the Department of Army Commendation for Meritorious Civilian Service for the period 1953-1955.

Cook, John E.

Assistant IU Project Engineer

MSFC

Quality and Reliability Assurance Laboratory, S&E

Mr. Cook, through his engineering and management versatility, has contributed significantly to the Saturn quality and reliability program in several areas. Earlier, as an S-IC Project Engineer, he was instrumental in reducing many hardware problems by establishing cause of failures and initiating corrective actions in areas such as pre-valve failures and propellant feed line failures. His experience made him particularly effective in his activities on the Quality Maintenance Program for both the S-IC and the IU.

After working several years in industry, Mr. Cook joined NASA in 1963. He earned his B. S. in Electrical Engineering at the University of South Carolina in 1955.

Lewis J. Cook - Chief, Acceptance Test & Mission Support Section - S&E-ASTR-GS

Mr. Cook performed and supervised the development of methods, procedures, and equipment for flight qualification and launch operation of the very successful ST124-M stabilized platform for the Saturn launch vehicle guidance system. He serves as the responsible engineer for the ST124-M system at the Huntsville Operations Support Center (HOSC) during each Saturn launch.

Mr. Cook received his Electrical Engineering degree from the University of Alabama in 1953. He joined this organization (ABMA Guidance and Control Lab at that time) in 1956. He was assigned to design and development effort on the Redstone missile stabilized platform system. He soon assumed a responsible position, and has played an important role in the subsequent development of stabilized platform systems for the Jupiter and Pershing missiles, and for the Saturn launch vehicles.

Cook, Richard W.

Deputy Director, Operations  
Science & Engineering

MSFC

As Deputy Director, Operations, in Science and Engineering, Mr. Cook is a key figure in managing and directing the operations of the S&E technical laboratories and offices. His personal guidance and direction in the management of overall resources allocated to S&E have been significant factors in augmenting organizational capability and enhancing responsiveness to technical program requirements. His planning and guidance have been of first importance in maintaining strong laboratory competence and effective organizational interaction and response to Saturn program requirements.

Mr. Cook, formerly a corporate vice president of American Machine and Foundry, was, before that assignment, a deputy general manager of the Atomic Energy Commission. He has also served as the AEC area manager at Oak Ridge, Tennessee; and, for the AEC in Washington, as Assistant General Manager for Manufacturing and Director of Production. A registered Professional Engineer in Wisconsin and Illinois, he has received the Legion of Merit for outstanding service with the Manhattan District and the AEC's Distinguished Service Award.

WEEY COPPOCK, Hues

CHIEF, FLIGHT SYSTEMS SIMULATIONS BRANCH

Mr. Coppock directed and contributed to Simulation & Data Systems Development for Saturn Control & Guidance System Analysis Design and Verification. His contributions and planning provided Simulation Systems built around Digital Computers, Analog Computers, Analog to Digital, and Digital to Analog Linkage Equipment that interface with Flight Control and Guidance Hardware. Due to the effectiveness of Flight Simulations, many flight hardware problems were identified and resolved prior to flight.

Mr. Coppock received a B.S. in Electrical Engineering from Auburn University in 1949, and has taken advantage of extra technical courses, symposiums, and management training for self-improvement. He has acquired 10 years of experience in Computer Systems in areas of Electronics Engineering, Technical Management, and Development of Hybrid Simulation Systems.

NAME	POSITION	ORGANIZATION
COUNTER, Duane N.	Chief, Engineering Analysis Office (Chief, Systems Analysis Section)	S&E-ASTR-MA

Mr. Counter has performed and directed dynamical, thermal, stress, and kinematical engineering analysis and general engineering mechanics of mechanical and electro-mechanical systems and components for Astrionic flight hardware, simulators, ground test equipment, and Spacecraft since 1958. He was charged with the responsibility of this activity in 1963.

Mr. Counter excelled in verifying design criteria and in executing exhaustive conceptual and optimization studies by applying advanced mathematical methods, analysis techniques, and experimental techniques.

His excellent contributions to Astrionic assignments extend to the early Explorer satellite program, Saturn I, IB, V programs and the Apollo Telescope Mount Project.

Mr. Counter's most recent outstanding thermal and dynamical analysis of the ATM experiment S-056 (GSFC-X-Ray Telescope) was of vital importance for its reliable mechanization.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Cozelos, Charles L.	Chief, Systems Management Branch, Computation Laboratory	MSFC

Mr. Charles L. Cozelos directed and contributed personally to the design and implementation of placing in-line a digital computer for structural testing. At that time, this was the most extensive use made of a digital computer in the area of structural testing. He directed the use and training for continuous contouring numerical control techniques (APT, Automatically Programmed Tool) at Marshall. Mr. Cozelos was instrumental in the design and development of AFOLL (Automatic Test or Launch Language), a computer language used extensively in the area of testing and checkout of Saturn systems and subsystems.

Mr. Cozelos received his BS degree from Athens College, Athens, Alabama in 1958. His career in the design and development of computer software systems in the missile/launch vehicle field began in 1952 when he first joined the Dr. von Braun team at Huntsville, Alabama.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Craig, Elbert B.	Chief, Instrument Unit, Ground Support Equipment Branch, Contracts Office	MSFC

As Chief of the Instrument Unit, Ground Support Equipment Branch, Contracts Office, since December 1963, Mr. Craig has directed a Contract Management Program, encompassing the planning, directing, and coordination of all phases of contractual acquisition of Instrument Unit, Ground Support Equipment, facilities, and services. Mr. Craig has responsibility for negotiation and administration of contracts in the multi-million dollar range, multi-year tenures, continuous configuration changes requiring contract revisions and encompassing complete flight instrument unit stages, individual major critical components thereof, and launch vehicle ground support equipment including complete computer systems.

Born in Birmingham, Alabama, Mr. Craig received a B. S. Degree in Industrial Engineering in 1951 from the University of Alabama. Mr. Craig began his procurement career in September 1956, supervising Industrial Engineers and Contract Specialists in the negotiation and administration of contracts and industrial engineering activities, negotiation and administration of all types of contracts for U. S. Army Ordnance and also serving as Ordering Officer. The contributions of Mr. Craig during his tenure at MSFC has been outstanding, having consistently guided the contractual activities for procurement of Instrument Unit and Ground Support Equipment.



NAME

POSITION

ORGANIZATION

Cremin, Joseph W.	Chief, Mission Development Branch	MSFC
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As Chief of the Mission Development Branch in the Aero-Astrodynamics Laboratory. Mr. Cremin directs and performs the establishment and development of flight profiles for launch vehicles and spacecraft. In this role, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. Accordingly, he is directly responsible for the establishment and optimization of the first flight profile for the Saturn V which demonstrates the launch vehicle's capability to perform a manned lunar landing mission. The profile encompasses the vehicle's capability to inject a manned Apollo onto a specified circumlunar conic with the launch occurrence of the vehicle restricted to a variable azimuth and the translunar injection occurring at either the first or second possible opportunity after the spacecraft completes one revolution in an earth parking orbit. The profile also includes the adequacy of all Apollo systems to achieve translunar and transearth flight, navigation and guidance system accuracy to achieve translunar and transearth midcourse corrections where the motion of the spacecraft is co-rotational with the earth on its free-return perigee, and acceptable spacecraft propulsion system performance and guidance during the lunar orbit insertion boost and the boost for transearth injection.

Mr. Cremin has been associated with the Saturn and Apollo programs of the National Aeronautics and Space Administration since 1963, after transferring from the Agency's Langley Research Center to the Aero-Astrodynamics Laboratory, where he has been engaged in guidance system and trajectory studies as a section and branch chief. He has held his current position since late 1968. He received his M.S. degree in physics and mathematics from the Georgia Institute of Technology in 1958.

*Attache*

CRIDER, DURON (NMN)

Chief, Engineering & Support      Marshall Space Flight Center  
Services Branch  
Purchasing Office  
Administration & Technical Services

Mr. Crider as a Branch Chief and Contracting Officer plans and directs the negotiation and execution of all types of contracts for the research, design, development, and/or fabrication of equipment utilized in the development of advanced space vehicles and ground support equipment.

Mr. Crider majored in Business Administration at the University of Alabama. He was employed by Redstone Arsenal in 1957 as a Procurement Analyst and Contract Specialist. Transferring to Marshall Space Flight Center in 1963, serving as a Section Chief and becoming Branch Chief with procurement responsibility encompassing all types of services utilizing incentive, cost, time and material and fixed price contracts. He has served as Contracting Officer within this area since May 1965.

CROUCH, LOUIS C.

Technical Materials Division  
Technical Services Office  
Admin. & Technical Services

MSFC

Mr. Crouch is well known in logistical circles for his part in the inauguration of the on-line computerized inventory management system for property and supply at MSFC. Mr. Crouch has participated in several seminars of national prominence where he gave presentations on the system to assembled representatives of the Space Industry and Government. The most significant accomplishment attained through the use of this new system has been the continual improvement in supply support to the Apollo Program, while reducing the overall inventory. At present, the inventory has been reduced to an all-time low of less than one-third dollarwise of that required under the old system, thus saving much needed Apollo funds.

Mr. Crouch received his Bachelor of Science degree from the University of Georgia in 1930. He was commissioned a 2nd Lieutenant in the Army Reserves upon graduation. His military career extended over a period covering two wars during which he progressed to the grade of Colonel. He was widely known for his accomplishments in the logistics field and upon his retirement from the Army in 1964, he was awarded the Legion of Merit for outstanding service. He was employed as chief of the Technical Materials Division in late 1964.

Crumpton, Walter G.      Technical Assistant to Director,  
   Manufacturing Engineering Laboratory, S&E      MSFC

Mr. Crumpton's contributions to the Saturn Launch Vehicle in the area of manufacturing date back to 1958 when the Advanced Research Projects Agency (ARPA) assigned to ABMA the task of developing a 1.5 million pounds thrust rocket booster. He was primarily responsible for the engineering planning for the manufacture of this booster. As manufacture project engineer for the Saturn I and IB, S-IB stage and the Saturn V & IB Instruments Units, was fully responsible for the coordination of all manufacturing activities related thereto as well as serving as a liaison engineer to Program Management and prime contractors.

Mr. Crumpton received his BS Degree in Mechanical Engineering from Auburn University in 1947. His career in manufacturing beginning as an apprentice machinist with U. S. Steel, Birmingham, Alabama in 1939, spans more than 30 years.

Curran, Lyle C.

S-II Sr. Laboratory Representative

MSFC

Quality and Reliability Assurance Laboratory, S&E

Mr. Curran has exerted a profound influence on the S-II stage quality and reliability through his leadership as the Senior Laboratory Representative at Seal Beach where he had to integrate technical talents placed at his disposal by the Q&RA Laboratory, the meanwhile defunct NASA Office, and the Air Force and bring them to bear on a stage which had not then received the proper technical and managerial attention by the contractor. His efforts led to a continuously improving cooperation between his team, the Resident Manager's Office, and the contractor and resulted in the conversion of stages of sub-standard quality into flightworthy ones with a proven flight record. He played a major role in the failure tracking system on S-II and helped assure successful completion of the Quality Maintenance Program as well as of major improvements on cable routing techniques, welding techniques, and streamlining of checkout operations.

Mr. Curran began his NASA career with the Western Operations Office in 1962. He joined MSFC in 1968.

Curry, James E.

Chief, Non-Metallic Materials Branch  
Astronautics Laboratory

MSFC

Mr. Curry enjoys an unexcelled national reputation in the area of high performance insulation, polymer chemistry, rubber, plastics, adhesive and potting compound technology. His contributions in this area span well over a decade of outstanding activity. He was personally responsible for direction of a sizable portion of the MSFC insulation activities in all the stages of Saturn V and is credited with significant savings and with crucial technical input to the final insulation designs in all the Saturn V stages.

Laboratory diagnostics activities under his direction have been invaluable in rendering assistance and in trouble shooting problems to assist the various contractors engaged in the Saturn V development.

Mr. Curry received his BS and MS degrees in Chemical Engineering from Georgia Tech in 1949 and 1951, and is currently well advanced in graduate work leading to the PH D degree from the University of Alabama. As one of the more senior members of the Saturn team, he is generally acknowledged as having made telling contributions to the success of the Saturn program.

D'Agostino, Alex J.

Resident Senior S-II Project Engineer, MSFC  
Astronautics Laboratory, Seal Beach,  
California

Mr. D'Agostino served as the Senior S-II Resident Project Engineer at Seal Beach and Downey, North American Rockwell plants during the critical design phases of the S-II stage. During this tenure, Mr. D'Agostino contributed to the solution of the critical design problems such as the structural redesign, fracture mechanics, insulation and cryoproof testing. In addition to his routine duties as S-II Project Engineer for the Astronautics Laboratory, he was a member of an ad hoc Task Team formed to give management attention to the program.

Mr. D'Agostino joined the von Braun team in 1963, where he worked as an Aerospace Engineer (materials and structures) in the Astronautics Laboratory, after previously working for Chrysler Corporation on the Jupiter and Redstone Programs. Mr. D'Agostino holds an ME degree from Illinois Institute of Technology, Chicago, Illinois.

NAME

Dahm, Werner K.

POSITION

Chief, Aerophysics Division

ORGANIZATION

MSFC

As chief of the Aerophysics Division, Mr. Dahm directs aerodynamic and thermodynamic theoretical and experimental studies for space vehicle and spacecraft development. Under his direction significant contributions to the Apollo program were made, such as the design of nose shroud envelops, stage transition flares and trapezoidal fins. The nose shroud design represents an optimization of weight, drag, dynamic response and payload packaging considerations. The trapezoidal fins effectively reduce vehicle instability and emergency power-off divergence rates. Another significant development is a controlled damper system which protects the vehicle from excessive induced oscillations due to ground winds. During the Saturn V and predecessor vehicle development several unique techniques were suggested by Mr. Dahm and successfully applied under his direction. Most noteworthy are the "short duration base heating technique," which serves to predict base heating rates by means of inexpensive small scale testing and the conceptualization of a High Reynolds Number Test Facility which exceeds the Reynolds number simulation capability of all known general purpose wind tunnels in the USA. Advancements were also achieved in theoretically founded research work such as Monte Carlo computation techniques for rarefied gas dynamics and turbulent flow analysis by remote optical means (laser-doppler and crossed-beam techniques).

Mr. Dahm has been with NASA since the inception of the Apollo program in 1960. His employment history dates back to 1941 when he started as an aerodynamicist in the German V-2 development program. He began his professional career in the USA in 1947 with the Army Ordnance Corps where he held several key positions, the last being chief of the Aerodynamic Analysis Section. Mr. Dahm received an MS degree in aeronautical engineering in 1947 from the Technical University of Aachen, Germany.



Daly, Arthur V.

Assistant to Director for Facilities,  
Program Management

MSFC

Mr. Daly, Assistant to the Director for Facilities, has been deeply involved in providing staff direction and control of all Program Management facilities matters as they relate to individual stage or engine development, manufacturing and test programs. Mr. Daly assures that the overall facility program is consistent with the present and future Saturn/Apollo requirements. His efforts were instrumental in NASA's accomplishment of completing the facilities used in support of testing Saturn Apollo hardware. At the peak of supplying the facilities in support of the Saturn Apollo hardware, Mr. Daly successfully motivated employees in the program to give their best efforts for the successful completion of the projects.

Mr. Daly recently distinguished himself when he was assigned to the MSFC retrenchment study team and is currently key MSFC contact for outside activities - Barbados Oceanographic Meteorological Experiment (BOMEX).

Mr. Daly continuously contributes ideas which have improved efficiency of operations in the facilities management area. His contact with the public, Marshall officials, and high level NASA management officials reflect credit upon himself and MSFC.

Mr. Daly's background includes supervision of military construction while serving as an officer in the Army to project engineer on the Ballistic Missile Early Warning System, Thule, Greenland. He received a Sustained Superior Performance Award and an Outstanding Performance Appraisal for the work on this project.

Daniel, Gene E.

Chief, Budget Group, Planning  
& Resources Office, S&E

MSFC

Mr. Daniel has contributed greatly to the Saturn/Apollo Program by providing fiscal and budgetary administration of technical program requirements for S&E's eight major Laboratories. Under his direct supervision a continuing analysis of S&E's funding resources in terms of significance, availability and use for the Saturn Program was accomplished. This included supervision of plans and procedures for budget and cost analysis, program planning and contract evaluation.

Mr. Daniel received his B. S. degree from the University of Tennessee, Knoxville, Tennessee, in 1951 majoring in finance, accounting and economics. He has been a government employee since 1951 joining MSFC in February 1961 as a Financial Program Specialist in the Financial Management Office. From December 1965 to present Mr. Daniel has been Chief of the S&E Planning and Resources Office, Budget Group.

Dannenberg, Konrad K. Deputy Director, Mission & Payload Planning Office MSFC

From July 1960 to November 1963, Mr. Dannenberg served as Deputy Director, Saturn Systems Office, George C. Marshall Space Flight Center, Huntsville, Alabama. In this position, he was responsible for the planning and control for the industrial effort required for research and development, fabrication, testing, and utilization of the large Saturn launch vehicles required in the lunar landing Saturn/Apollo Program. Later, as Chief of the Systems Office, he had the responsibility for planning, managing, and controlling efforts of panels and working groups engaged in configuration management, in-flight experiments and similar systems problems.

Mr. Dannenberg received an MS Degree in Mechanical Engineering in 1937 from Technische Hochschule Hannover, He had further advanced study at Goethe University, Frankfurt/Main, Germany, in 1939, in the areas of mechanical automotive engineering, fuel and combustion. After a short tour of duty in the German Army, he became Deputy Director for Design and Development, Peenemuende, Germany and was charged with the responsibility for research and design supervision in rocket motor development, including combustion chambers and entire power plants. He was later involved in the layout, design and development of the German V-2 Rocket. Since 1945 he has held a variety of demanding positions both with the Army and NASA.

Davis, Richard A.

Projects Office, Materials Division  
Astronautics Laboratory

MSFC

Mr. Davis has the sole project responsibility for Saturn V in the Materials Division. In this capacity, he speaks for the Division in negotiations with Saturn contractors. His contributions, particularly on the S-II Stage, are well known by those engaged in that program. He has been vitally instrumental in incorporating the Materials Division knowhow in welding, bonding, and insulation technology in helping to solve S-II problems at Seal Beach as well as at MTF. His basic education in welding, coupled with above average interpersonal capability, has proved invaluable to MSFC during the entire S-II Stage development cycle.

Mr. Davis received the Bachelors in Welding Engineering degree from Ohio State University in 1958. He has since advanced steadily in proficiency and in technical stature by virtue of his Saturn V contributions.

DAVIS, WILBUR S.

Director, Procurement Policy and Review

MSFC

Mr. Davis serves as the principal advisor to the Office of the Director and MSFC top management for the Center's procurement and contracting activities. In this capacity he has had a major influence in contracting for Apollo hardware and program research and development covering the full scope of the Marshall Center's mission.

Mr. Davis, a veteran of 31 years in purchasing and contracting, studied Business Administration at Limestone College in Gaffney, South Carolina. He began his career with the Government in 1938, with the Army Civilian Conservation Corps in Charleston, South Carolina. In November 1942, Mr. Davis was sent to Huntsville Arsenal as Contracting Officer for the Army Chemical Corp. He transferred from there to Tooele, Utah, for a two year tour of duty and then to New York for two years before returning to Huntsville in July 1953 to become Contracting Officer for the Army's Ordnance Corps at Redstone Arsenal. He became a member of the Marshall Space Flight Center staff on April 10, 1960 when he became Chief, Purchasing and Contracts for the newly established Marshall Space Flight Center. In September 1963, he assumed his present position as Assistant Director for Procurement and Contracting.

DeNeen, Carl D.

Chief, Transport Branch,  
Project Logistics Office, PM

MSFC

An expert in the transportation field, Mr. DeNeen has made significant contributions in the movement of the many stages of the Saturn launch vehicles. As Chief of the Transport Branch, Project Logistics Office, he is responsible for all logistic functions related to the transportation of launch vehicles and major components for which the Center has overall jurisdiction. He is responsible for determining the requirements for specialized equipment to support the Center's programs, design and development, and acquisition of specialized equipment; and the procurement of services for the operation and maintenance of the assigned equipment.

Mr. DeNeen managed and directed the design, development, and acquisition phases for specialized equipment that supported MSFC requirements for the transportation of stages and major components.

Mr. DeNeen came to Redstone Arsenal, ABMA, in 1956 from Detroit Automotive Industry. He transferred to NASA/MSFC in 1960, doing extensive travel for the Light and Medium Vehicle Office. When Industrial Operations was activated in 1963, Mr. DeNeen headed the Transport Branch, Project Logistics Office. Mr. DeNeen, a native of Hancock, Maryland, received a Sustained Superior Performance Award in 1966. He received a direct commission in the Army Ordnance Corps in 1943 and is a member of AIAA, SOLE.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Diamond, Ralph G.	Chief, Fabrication Dev. Branch Manufacturing Dev. Division Manufacturing Engr Lab., S&E	MSFC

Mr. Diamond has been responsible for directing and coordinating the branch activities of Machining, Metal Forming, Surface Treating, Heat Treating, Composite Structures, Wood and Plastics areas of manufacturing during the fabrication of parts and components to prototype and flight certified Apollo program specifications. By constant surveillance and conscientious analysis of the complete fabrication picture, Mr. Diamond assured the optimum use of personnel and equipment toward achieving the Apollo program schedules of the Manufacturing Engineering Laboratory.

Mr. Diamond started his government career at Brookly Air Force Base in 1941 and transferred to Redstone Arsenal in 1956. Upon transferring to Redstone Arsenal, Mr. Diamond started working in the Manufacturing Engineering Laboratory and has served in different positions all associated with the fabrication of space vehicles. Mr. Diamond has been Chief of the Fabrication Development Branch since 1966.

Digesu, Fred E.      Chief, Electronics & Control Division

MSFC

Mr. Digesu, as Deputy Chief of the Flight Dynamics Branch and later Chief of the Advanced Studies Office of Astrionics Laboratory, had a considerable influence on the design and development of the guidance and control systems of the Saturn vehicles. His contributions to the Apollo program also included analyses of the problems of manned lunar landings and publications of these problems and approaches to solutions.

He is a graduate of Auburn University, Auburn, where he earned his Bachelor of Science degree in electrical engineering in 1950. Post graduate study toward a Master of Science degree has been done at the University of Alabama, Huntsville, and Washington University, St. Louis, Missouri. He is an Associate Fellow member of the American Institute of Aeronautics and Astronautics. Mr. Digesu began his engineering career in 1957 when he accepted a position with the Army Ballistic Missile Agency at Redstone Arsenal, Alabama. Research fields in which he specializes are guidance and control, system design, and analysis. He was granted a patent in 1958 for invention of the "Ramrod" method of missile control and is the author of several publications in the field of aerospace research.



Downey, James A., III      Director, Mission and Payload Planning Office      MSFC

Mr. Downey has been involved in program planning activities associated with the preparation and implementation of the Center's overall research program, investigations of neutron and gamma radiation effects on electronic components, and space radiation problems associated with manned space flight. In July 1963 Mr. Downey was selected to direct a newly formed Special Projects Office which was established as the result of some preliminary payload planning activity which Mr. Downey and other persons in RPL performed on their own initiative during definition studies of a proposed lunar logistics vehicle system. Initially the Special Projects Office was only concerned with the planning of lunar surface missions and experiments, but this activity later grew to include experiments and payloads for earth orbital and deep space missions.

Mr. Downey attended North Carolina State College and received an M.S. degree in Nuclear Engineering in June 1955. He completed all graduate course work undertaken with a "straight A" record. While serving with the U.S. Air Force, Mr. Downey served as Project Engineer responsible for the development of various systems, including support equipment for the Matador and other missile systems. Since joining NASA, he has held positions of increasing responsibility and importance, including Acting Director of the Space Sciences Laboratory and his current assignment.

DRISCOLL, Daniel H., Jr.

Technical Assistant to Director  
Astronautics Laboratory, S&E

MSFC

A top technical expert on static testing of all Saturn Stages and stage engines, Mr. Driscoll has made significant contributions to the outstanding performance of the Saturn launch vehicle. As Chief of the Systems Test Division, Test Laboratory, R&D Operations, he was responsible for the development of test procedures for Saturn launch vehicle stages and engines, and for conducting the tests in accordance with these procedures.

Mr. Driscoll received his BS degree in Chemical Engineering from St. Edward's University in 1943. He has been associated with launch vehicle testing since July 1953 when he joined the Redstone Arsenal Test Laboratory as a Test Engineer. He has since progressed through various levels of responsible supervisory positions to Chief, Systems Test Division and finally as a Technical Assistant to the Laboratory Director.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Driver, Orville E.	Aerospace Engineer (Flight Systems)	Systems Safety

Mr. Driver serves as a Senior Systems Engineering Specialist in the systems engineering function of the Safety Office. He applies scientific and engineering principals to the identification and elimination of system safety hazards. Has responsibility for investigating and appraising system safety hazards in diversified technical area from design through completion of a program. Prior to this position Mr. Driver was Chief, Booster Test Branch. In this position he was responsible for the design, construction, and activation of the Saturn S-IC Static Test Facility. This responsibility involved two static test stands, support facilities, mechanical, propellant and cryogenic systems. Served as the Contracting Officer's Representative responsible for coordination of the combined efforts of the Construction Contractor, Corps of Engineers and Test Laboratory personnel during construction, installation and activation of the test facility. Had the responsibility for conducting S-IC static tests, evaluating test data and reporting the results for all Research and Development test and the flight stages, S-IC-1 and S-IC-2. Served as the S-IC Project Engineer for Test Laboratory having responsibility for review and approval of all engineering changes effecting the stage systems and ground support equipment. Furnished technical information and data to the Boeing Company to support engineering in design of S-IC stage ground support equipment. Trained the Boeing Test Operations personnel in the method and techniques of successfully checking out an S-IC stage, propellant loading and stage static firing. Mr. Driver received a BS degree in Mechanical Engineering from the University of Alabama in 1949. He has worked in the field of Rockets and/or Space Vehicles since 1951.

Drummond, Floyd M.

Manager, Airlock Module Project,  
Apollo Applications Program Office,  
Program Management

MSFC

Mr. Drummond, Manager of the Airlock Module Project for the Apollo Applications Program, has responsibility to plan and direct the execution of all project activities as they relate to the airlock module project. Prior to assuming his present position in August, 1967, he was Manager of the J-2 Engine Project where he was responsible for the research, development and production of the J-2 liquid rocket propulsion engine. The J-2 engines powered the S-II and S-IVB stages of the highly successful Saturn V vehicle and the S-IVB stage of the flawless Saturn IB vehicle. Mr. Drummond has made significant contributions to the Saturn program and received a Superior Achievement Award for S-IVB Battleship static tests which marked the first time a fully automatic system was used to perform a complete checkout, propellant loading and static firing test on a space vehicle.

A native of Salem, Missouri, he earned his B.S. degree in electrical engineering at the University of Missouri School of Mines and Metallurgy. He joined the research and development team at Redstone Arsenal in June 1959 when he accepted a position as project engineer with the Army Ballistic Missile Agency. Shortly after joining NASA in July 1960, he became Manager of the J-2 Engine Project. Mr. Drummond has been the recipient of several awards and is the co-author of a publication on liquid hydrogen engines. He is a registered member of the Missouri Architect and Professional Engineers.

Duerr, Friedrich

Manager, Instrument Unit Project Office  
Saturn Program

MSFC

Mr. Duerr is Manager of the Saturn Instrument Unit Project Office which entails particularly difficult problems of management interfaces between MSFC research laboratories, the various program and project management offices, and the various levels of management of the contractor organizations. Since becoming the IU Project Manager in October 1963, he has developed organization systems and communications alignments which provide real time status of the IU Project. On the basis of this, he has been able to make on-the-spot resolutions of IU problems which otherwise could have had adverse impact on the project.

Mr. Duerr, a native of Germany, earned his Bachelor of Science Degree in Electrical Engineering at the Institute of Technology in Stuttgart and his Master of Science Degree in Electrical Engineering at the Institute of Technology in Munich. He came to the United States in November 1945 when the Department of the Army brought the von Braun team to America and stationed them at Fort Bliss, Texas. Since that time, he has worked for the U. S. Army at Fort Bliss and Huntsville, Alabama. He joined MSFC in 1960 as the Agena Systems Manager, then served as Assistant to the Director, Special Assignments Office for OSS Missions before becoming the Instrument Unit Project Manager for Saturn in 1963.

Dunlap, Porter (NMN)

Manager, GSE Project  
Apollo Applications Program

MSFC

Mr. Dunlap was Manager of the Vehicle Ground Support Equipment Project of the Saturn I/IB Program at Marshall Space Flight Center, from October 1963 to December 1968. He is currently Manager of the GSE Project, Apollo Applications Program at MSFC.

As Manager of Saturn I/IB GSE Project, he demonstrated outstanding technical and managerial ability in accomplishing his responsibilities. He constantly insured that the GSE was compatible with each vehicle stage and he contributed significantly to the overall system compatibility and the logistic support program.

He has 11 years experience in the missile and space industry including the position of Chief, Missile Support Equipment Section, Engineering Branch, General Support Weapon Systems Division, Army Ordnance Missile Command for three years.

A native of McKenzie, Tennessee, he holds a Bachelor of Science Degree in Electrical Engineering from Vanderbilt University. He has received two Superior Achievement Awards, one in 1965 and one in 1960.

Duren, Olin K.

GSE Systems Engineer  
Vehicle & Ground Systems Engineering  
Division, Central Systems Engineering  
Science & Engineering

MSFC

Mr. Duren directed and contributed to the conceptual design of Complex 39 at KSC, the launch facility for the Saturn-Apollo space vehicle. He directed the contractor effort to make engineering, operational & cost comparisons leading to the specification and criteria for the final design of the complex facility. In particular, he envisioned the application of large crawler track systems to transfer the Saturn-Apollo from the VAB to the Pad and supervised feasibility and design studies for the crawler transporter that takes the Apollo on its first step to the moon.

Mr. Duren received his B.S. degree in mechanical engineering from Alabama Polytechnic Institute, now Auburn University, in 1951. His career in the development of ground support systems in the missile/launch vehicle field, spans more than 18 years. An expert in the field of GSE, he has significantly contributed to the advancement of safe and reliable ground systems to launch the Saturn Apollo space vehicle.

Dyer, Morris K.

Assistant to the Director

MSFC

Quality and Reliability Assurance Laboratory, S&E

Mr. Dyer came to MSFC after 18 years with the Air Force. His understanding of DOD operations contributed to his unusual effectiveness in coordinating the MSFC inspection requirements with the three services and later DCAS. The excellent support MSFC has received from these inspection agencies is in large part due to Mr. Dyer's planning. His public speaking ability has made him particularly effective in public relations activities, and, coupled with his thorough understanding of our quality and reliability programs, he has contributed genuinely through the Manned Flight Awareness and other motivation programs.

Mr. Dyer attended the University of Georgia. He joined MSFC in 1961.



Edwards, Robert C.

Deputy Chief, Space Vehicle  
& Ground Systems Engineering  
Division, Central Systems  
Engineering, Science & Engineering

MSFC

Mr. Edwards directed and contributed personally to the design, testing, improvement, and finalization of the Saturn Launch vehicle propulsion systems. As chief of the Propulsion Control Section, P&VE Laboratory, R&D Operations, he was responsible for the development of propulsion systems and subsystems. As a member of the Systems Engineering Office, R&D Operations, he made significant contributions in developing system engineering planning, criteria and concepts.

Mr. Edwards received his B.S. degree in chemical engineering from Louisiana Polytechnic Institute in 1951. His career in the missile/launch vehicle field began in 1954 with the Ordnance Missile Laboratory, Redstone Arsenal, conducting research on solid propellant. He joined ABMA in 1956 and contributed to the development of propulsion systems for Redstone, Jupiter, Jupiter C, Juno II and Saturn I programs. He transferred to MSFC in 1960, and was instrumental in the development of the Saturn IB and Saturn V launch vehicles.

EDWARDS, Thomas E.

Technical Assistant to Director  
Astronautics Laboratory

MSFC

Mr. Edwards was selected to assist in the activation of the Mississippi Test Facility by serving as a member of the working group. The experience Mr. Edwards gained at a similar test facility at MSFC contributed materially to the successful completion and final acceptance of the Mississippi Test Facility.

Mr. Edwards received his BS degree in Civil Engineer at Tennessee Polytechnic Institute June 1936. He has been associated with the missile and launch vehicle field since October 1957 when he was employed by the Army Ballistic Missile Agency. He later transferred to MSFC where he continued to contribute to the testing of large launch vehicle boosters, engines and ground support equipment and facilities.

Eisenhardt, Otto K.      Chief, Manufacturing Development Division  
                                 Manufacturing Engineering Laboratory, S&E      MSFC

Mr. Eisenhardt has been instrumental in the resolution of the many manufacturing problems encountered in building the prototype boosters for the Apollo program. He made major contributions to the use of vacuum tooling and the advancement of the state-of-the-welding-art in the fabrication of the S-I and S-IC boosters. As project engineer his contribution to the Mini-tank foam insulation program enhanced its successful completion. The methods and techniques from this program were directly applicable to the solution of the S-II stage insulation problems.

Mr. Eisenhardt began working with missile in 1937 at Pennemuende, Germany in the development and manufacture of engines and flight structures of V-2's. In 1945 he joined the Army team flight testing V-2's and developing ram jets. He moved to Army Ballistic Missile Agency in Huntsville in 1950. After transferring to NASA in 1960 he has held progressively more responsible shop supervisory positions until becoming Chief, Manufacturing Development Division in 1963.

Emens, Frank H.

Chief, Data Management Systems      MSFC  
Section, Telemetry & Data Technology  
Branch, Instrumentation & Communication  
Division, Astrionics Laboratory, S&E

Mr. Emens directed the design and development of several elements of the Saturn V vehicle telemetry system. These included the single-sideband/FM equipment, a new data transmission technique which provided several times the transmission capacity of earlier techniques and without which it would not have been possible to acquire sufficient vibration and acoustic data in a small number of R&D launches. In addition Mr. Emens guided the development of several types of time-division multiplexing equipment. The flexibility of this equipment allowed it to be used on all stages of the Saturn V vehicle, and its performance has been such that no significant loss of data has occurred on a Saturn V launch.

Mr. Emens graduated from Auburn University in 1956. After graduation he joined ABMA and in 1960 became a charter member of MSFC. During this period, he has contributed to numerous space vehicle and satellite programs and has gained recognition as an outstanding technical authority on telemetry and data systems.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Eubanks, Earl H.	Chief, Stages Branch, Contracts Office	MSFC

As Chief, Stages Branch, Contracts Office, since October 1963, Mr. Eubanks has directed a Contract Management Program, encompassing the planning, directing, and coordinating of all phases of contractual acquisition of Launch Vehicle Stages, and associated equipment and facilities and services at contractor plants. Mr. Eubanks manages and directs the negotiation and administration of contracts necessary to provide research, design, development, fabrication, and other services relative to the S-II Stage and S-IVB Stage.

Born in Spartanburg, South Carolina, Mr. Eubanks attended The Citadel studying Business Law. Mr. Eubanks began his procurement career in May 1951 with responsibility for conducting the technical phases of the contracting and procurement work which included Architect-Engineer designs, construction, supply and service, small business interdepartmental procurements and property disposals, and as a Contracting Officer, executed contracts for administrative and technical facilities. Mr. Eubanks' contributions during his tenure at MSFC has been outstanding, having consistently guided the contractual activities for planning, directing, and administering multi-million dollar and multi-year research, development, fabrication, test, and launch contracts for Saturn-class Launch Vehicle Stages.

Farish, Preston T., Dr.

Manager, Systems Safety and  
Manned Flight Awareness Office

MSFC

Dr. Farish developed the original systems safety and manned flight awareness programs for the Marshall Center over five years ago. The Manned Flight Awareness program has since been adopted by MSF and is now being implemented in all MSF field centers. His work in codifying systems safety criteria, approaches, and management for the Saturn vehicles has been widely acclaimed in the aerospace industry, and his numerous publications in the field are widely quoted.

Dr. Farish received his PHD in 1958 from Auburn University, and became an employee of the Marshall Center in 1961, as a bioscientist in the Structures and Mechanics Laboratory. He later transferred to the Saturn Systems Office, and in 1969 became manager of the newly created Systems Safety and Manned Flight Awareness Office of the Center's Program Management Directorate.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Fehlberg, Erwin, Dr.	Staff Scientist, Computation Laboratory	MSFC

Dr. Erwin Fehlberg is internationally known for his contributions in the area of computational mathematics. He devised new numerical integration methods ideally suited for modern high speed automatic computing equipment. Besides providing automatic stepsize control, minimization of truncation and round-off errors, his methods also allow computations to be done in a fraction of the time necessary for conventional methods. The Runge-Kutta-Fehlberg integration methods, as they are internationally known, have been used successfully in computing orbital trajectories for the Apollo project and have thus contributed to its success.

Dr. Fehlberg received his PhD from the Technical University Berlin, and joined the Army Ballistic Missile Agency in 1956. Transferring to MSFC in 1960, he worked on the optimization of numerical integration methods for the computation of space trajectories.

Ferguson, William A.      Project Manager, Orbital Workshop      MSFC  
Apollo Applications Program

Mr. Ferguson held the position of S-IV Project Manager, Saturn I/IB Program from November 1961 to June 1965. While in this position, his personal initiative and dedication through all phases of planning, funding, design, development, integration, production, testing, delivery and prelaunch checkout resulted in the success of the S-IV Stage.

Mr. Ferguson holds a BS in Industrial Engineering from the University of Oklahoma and is a native of Hattiesburg, Mississippi. He received a Sustained Superior Performance Award for his efforts on the Jupiter Missile Test Program and a Superior Achievement Certificate of Appreciation for his efforts on the S-IV Stage Project.



Fichtner, H. J.

Chief, Space Vehicle & GSE Division  
Central Systems Engineering, S&E  
(Formerly Chief, Electrical Systems  
Integration Division, Astrionics Lab, S&E)

MSFC

Mr. Hans Fichtner directed and contributed personally to design, improve continuously and finalize the Saturn launch vehicle onboard and ground support electrical network system, which demonstrated on all Saturn vehicle launches an extreme reliability and dependability. His schemes in particular for the automatic computerized checkout of the complex overall network system which includes the guidance and control, the measuring and RF, the power and command subsystems proved to be excellent and optimized solutions to complex requirements. To accomplish his work, Mr. Fichtner served as Cochairman of the Saturn Electrical Panel and the Emergency Detection System Subpanel and also as Chairman of the Saturn Electrical Working Group and the Marshall Automation Board.

Mr. Fichtner received his BS degree in Electrical Engineering from HTL Ilmenau/Germany in 1939. His career in electrical systems development for flight and ground support systems spans more than 30 years. As an expert in the field of electrical flight and GSE systems for space vehicles, he has significantly contributed to the state-of-the-art.

Field, Elmer L.

Deputy Manager, Saturn I Workshop  
Apollo Applications Program

MSFC

Mr. Field served as Deputy Manager of the S-II Stage Project, Saturn V Program, at Marshall Space Flight Center from January 1964 to November 1966. He also served at different intervals as Manager and Acting Manager of the S-II Stage Project. He is currently Deputy Manager of the Saturn I Workshop, Apollo Applications Program at MSFC.

Mr. Field has been with the rocket research and development team in Huntsville since April 1958. He has made significant contributions not only to the Saturn V Program but to the Redstone and Jupiter Programs. His technical know-how and his dedication in the constant surveillance and analysis of contractor and NASA activities, which resulted in the redirection of design and development, successfully enabled him to accomplish the integration of the S-II system into the complete launch vehicle.

A native of Ramsey, New Jersey, he obtained a Bachelor of Science Degree in Industrial Engineering from Georgia Institute of Technology.

He was awarded the Alfred P. Sloan Fellowship Award in 1965, which resulted in his obtaining a Master of Science Degree in Industrial Management.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
FIELD, ELMER L. DOB: 11-22-28	DEPUTY MANAGER SATURN I WORKSHOP	APOLLO APPLICATIONS PROGRAM

Mr. Field served as Deputy Manager of the S-II Stage Project, Saturn V Program, at Marshall Space Flight Center from January 1964 to November 1966. He also served at different intervals as Manager and Acting Manager of the S-II Stage Project. He is currently Deputy Manager of the Saturn I Workshop, Apollo Applications Program at MSFC.

Mr. Field has been with the rocket research and development team in Huntsville since April 1958. He has made significant contributions not only to the Saturn V Program but to the Redstone and Jupiter Programs. His technical know-how and his dedication in the constant surveillance and analysis of contractor and NASA activities, which resulted in the redirection of design and development, successfully enabled him to accomplish the integration of the S-II system into the complete launch vehicle.

A native of Ramsey, New Jersey, he obtained a BS Degree in Industrial Engineering from Georgia Institute of Technology.

He was awarded the Alfred P. Sloan Fellowship Award in 1965 which resulted in his obtaining a Master of Science Degree in Industrial Management.

*OK A.P.*

FLETCHER, JAMES W.

Chief, Flight Hardware and      Marshall Space  
Plant Support Branch              Flight Center  
Purchasing Office  
Administration & Technical Services

Mr. Fletcher serves as a designated Contracting Officer and Branch Chief, plans and directs the negotiation, formal advertisement and execution of all types of contracts relative to Flight Hardware and Ground Support Equipment utilized in the development of advanced space vehicles.

Mr. Fletcher attended Lockyears Business College in Evansville, Indiana. He was employed by the Corp of Engineers in 1946, assigned to field administration on construction contracts. He became a Contracting Officer in 1950 with the Purchasing Office at Camp Breckinridge, Kentucky, and has since served as a Contracting Officer at numerous Government installations. He transferred to Marshall Space Flight Center in 1961, serving first as a Section Chief and then becoming Branch Chief with procurement responsibility encompassing all types of contracts.

Fikes, Joseph E.

Space Shuttle Task Team Member  
Program Development

MSFC

Mr. Fikes served as Chief, Test Office, Saturn I/IB Program Office from October 1965 to January 1969. He is currently serving as a member of the Space Shuttle Task Team.

As Chief of the Test Office, he was responsible for those phases of the overall vehicle program management which concerned the development, operational implementation, maintenance, and coordination of ground and flight test plans of stage and Instrument Unit managers; the assurance that stage managers and other responsible elements have provided or planned for adequate and compatible launch checkout facilities and GSE systems; and the evaluation of all test programs for continued overall balance.

Mr. Fikes was awarded a Certificate of Merit by the Director, Marshall Space Flight Center, in January 1969, for his service and contributions to the outstanding achievement of the Saturn I/IB Program.

Prior to his assignment in the Saturn I/IB Program, he held several positions with MSFC: Saturn I Systems Engineer; Staff Engineer, Saturn I/IB Program; Saturn I Payload Engineer in the Saturn Systems Office; and Chief, Flight Instrumentation Section, Aeroballistics Division.

A native of Mississippi, Mr. Fikes obtained a Bachelor of Science Degree in Aeronautical Engineering from the University of Alabama. His honors include a Superior Achievement Award and a Sustained Superior Performance Award.

Foster, Joyce N.

Deputy Director, Administration  
and Technical Services

MSFC

As Deputy Director, Administration and Technical Services, one of the four major line elements of the Center, Mr. Foster shares responsibility with the Director for overall management and direction of the Center's institutional program. During the Apollo Program years Mr. Foster contributed heavily to the design and manufacture of Apollo hardware and center-level management of overall Apollo activities. His contributions were instrumental in meeting our goal of landing a man on the moon in this decade.

Mr. Foster received his MS in Mechanical Engineering from the Illinois Institute of Technology in 1959. He was employed by ABMA in 1958 as a supervisory mechanical engineer and later became a special assistant to Mr. Hans H. Maus, Director of the Lunar Program Planning Office/Central Planning Office. In 1962 he became Chief, Program Planning and Resources Office, Executive Staff. In May 1965 he became Deputy Director, Executive Staff and served until May 1969 when he became Deputy Director, Administration and Technical Services. For his many accomplishments Mr. Foster has received a Sustained Superior Performance award and a Quality Increase.

Foxworthy, Davis E.

Director, Technical Services Office  
Administration and Technical Services

MSFC

Mr. Foxworthy is responsible for providing a variety of technical services and support to the Apollo Program at Huntsville. Under his direction all materials and supplies for local use are received, stored, and issued. He is also responsible for providing transportation support and services, photographic services, and plant operation and maintenance support to all elements of the program. Mr. Foxworthy has made important contributions to the program by providing these services on a timely basis at a minimum cost.

Mr. Foxworthy has been employed at Redstone Arsenal since 1948. He transferred to MSFC in 1960 as chief of the Maintenance Branch. He was promoted to his present position in 1962.

Franklin, William J.      Chief, Planning & Tool Engineering Division  
                                 Manufacturing Engineering Laboratory, S&E      MSFC

A technical expert on manufacturing and tooling techniques, Mr. Franklin has made significant contributions in the manufacturing of the Saturn launch vehicle. As Chief of the Planning & Tool Engineering Division, he was responsible for the process planning and tooling required in the manufacture of the Saturn launch vehicle.

Mr. Franklin received his B. S. degree in Mechanical Engineering from the University of Oklahoma in 1950. His career in launch vehicle manufacturing started in 1950 when he joined the Army at Redstone Arsenal. He has made significant contributions in manufacturing on the Redstone, Jupiter, Jupiter C, Saturn S-I and the Saturn V boosters.

Because of his background and knowledge in aerospace manufacturing, he has been called on many times as a manufacturing consultant by industry when problems have been encountered.



Frye, William G.

Aerospace Engineer

Mr. Frye served as the Launch Vehicle Manager at MSFC for the initial flight of the Saturn V Launch Vehicle, AS-501. In this capacity he planned, managed, and integrated all activities relating to the assembled launch vehicle at KSC, acting for the Program Manager in making decisions, establishing policy and resolving problems. He planned and completed technical program operations staff work in an outstanding manner, and performed studies and made tradeoffs when test progress and results were not compatible with overall Saturn V launch vehicle objectives and schedules. His outstanding managerial and technical ability in performing his duties was a most significant and outstanding contribution to the success of the AS-501 launch.

Prior to coming to MSFC in 1964, Mr. Frye was head of the Operations Test Branch, Engineering Office at White Sands Missile Range. He has 12 years experience with the government. A native of Bemis, Tennessee, he holds a BS degree in Math from Arkansas A&M College in College Heights, Arkansas.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
FRYE, WILLIAM G.	AEROSPACE ENGINEER	WHITE SANDS MISSILE RANGE, U.S. ARMY

Mr. Frye served as the Launch Vehicle Manager at MSFC for the initial flight of the Saturn V Launch Vehicle, AS-501. In this capacity he planned, managed and integrated all activities relating to the assembled launch vehicle at KSC.

He acted for (and only occasionally through) the Program Manager in making decisions, establishing policy and resolving problems. He planned and completed technical program operations staff work in assigned areas of responsibility in an outstanding manner. He integrated and controlled all commitments relating to KSC activities required to determine that the launch vehicle was ready for launch and would fulfill mission requirements; he kept the Program Manager advised of problems, status, progress and impacts of actions on schedules, cost and mission success. He performed studies and made tradeoffs when test progress and results were not compatible with overall Saturn V launch vehicle objectives and schedules. His outstanding managerial and technical ability in performing his duties was a most significant and outstanding contribution to the success of the AS-501 launch.

Prior to coming to MSFC in 1964, Mr. Frye was head of the Operations Test Branch, Engineering Office at White Sands Missile Range. He has 12 years experience with the government.

(see reverse)

A native of Bemis, Tennessee, he holds a BS degree in Math from Arkansas A&M College in College Heights, Arkansas.

Fuhrmann, Herbert W.

Chief, Mechanical Development  
Branch, Engineering Division,  
Astronautics Laboratory, S&E

MSFC

Mr. Fuhrmann is nationally known for numerous contributions to design and development of vehicle components. Under his direction, the Augmented Spark Ignition lines for Saturn V-502 were successfully redesigned in 14 days. Mr. Fuhrmann has made important contributions in the development of volume-pressure compensators for the booster propellant systems. His work in the area of zero leakage connectors has been invaluable in the design of Saturn V liquid hydrogen systems.

Mr. Fuhrmann received his B.S. degree from the Engineering School, Dresden, Germany in 1939. He participated in the German V2 rocket program in a supervisory capacity. Coming to the United States in 1945 as part of the original von Braun team, he was associated with the U. S. Army development of the Redstone and Jupiter vehicles. Mr. Fuhrmann transferred to MSFC in 1960 and continued in the mechanical systems design of the Saturn IB and Saturn V as chief of the Mechanical Design Section. He was recently appointed as Chief, Mechanical Development Branch.

Garrett, Henry S.

Chief, Documentation Repository Division  
Management Services Office, A&TS

MSFC

Mr. Garrett has been responsible for providing engineering drawings and related technical documentation required by the design and production activities of the Center and its contractors involved in the Saturn Apollo effort. As Manager of the Documentation Repository program and Technical Representative for the contractor-operated Repository, he oversees the acquisition, microfilming, storage, retrieval, reproduction and distribution of drawings, specifications, reports and related documentation needed in design, fabrication, testing and launch mission operations. By keeping abreast of the latest technology, Mr. Garrett has been able to plan the use of improved ADP, micro-reproduction, storage and retrieval equipment for economy in providing this vital support. He has also been instrumental in planning of data management programs by advising stage and program managers concerning the documentation services.

Mr. Garrett's background in the fields of administration and engineering design spans more than 25 years. He first became associated with the Saturn Apollo development team in 1955 with the Army Ballistic Missile Agency and assumed his present role in 1960.

GARRISON, LAWRENCE (NMN)

Chief, Program R&D  
and Studies Branch  
Purchasing Office  
Administration & Technical Services

Marshall Space Flight Center

Mr. Garrison, as a designated Contracting Officer and Branch Chief, plans and directs procurement activities pertaining to supporting advanced research and technology studies involving pressing technological problems encountered in space vehicle systems presently under development, and advanced studies to further the state of art.

Mr. Garrison received his A.B., LLB, and JD Degrees from the University of Illinois. He is licensed to practice law before Supreme Court of Illinois and all local courts. He began his career with the Government as a Lawyer with the Veterans Administration in 1941. After serving with numerous Government agencies, he came to Redstone Arsenal in 1954. He became Deputy Chief, Procurement Division, Army Ord Missile Command in 1962. Transferring to Marshall Space Flight Center in 1963 as a Supv Contract Specialist and Branch Chief charged with procurement responsibility encompassing all types of contracts. Since 1959, he has been a member of Government Contracts Committee of the Federal Bar Association.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Gassaway, Gilbert G.	Deputy Chief, Systems Division, Astrionics Lab.	S&E-ASTR-S

Mr. Gassaway began his career in the field of guided missiles and space vehicle development in 1951. Since that date, he has made important contributions to guidance and control system design of the Saturn and earlier vehicles. Under his direction and supervision, problems relating to guidance and control systems were studied and solutions were concluded involving complex and important issues.

Mr. Gassaway was the Deputy Chief of a division with a mission to perform research and development of guidance and control systems for multistage vehicles. In this position, his duties and responsibilities were in the technical management area being concerned with all phases of division activities. He served as the Acting Chief of the Systems Division from April 1, 1969 to June 23, 1969.

ORGANIZATION  
MSFC

POSITION

Geissler, Ernst D. Director, Aero-Astrodynamic Laboratory

NAME

Geissler, Ernst D.

Dr. Geissler directs the activities of the Aero-Astrodynamic Laboratory in widespread areas of aerodynamics, control and dynamics, guidance and trajectory optimization, and mission analysis. His unique leadership traits of creative imagination and idea reception combined with an uncompromising analytical mind made possible the many invaluable contributions to the concept and development of the Apollo and Saturn programs. His ability to place his staff in the position of exercising a maximum effort while maintaining individual personalities and responsibility for their actions has resulted in engineering and scientific achievements otherwise unattainable. The optimization of the aerodynamic shape of the Saturn Apollo with respect to controllability, drag, performance, and emergency abort response is just one contribution attributed to his leadership. Another is the analysis of the Saturn Apollo systems dynamics including the interactions of propulsion, controls, structure and propellants; and the development of mathematical models, solving lateral stability problems, and analyzing and simulating longitudinal coupling (like "POGO"). Thirdly, the trajectory optimization for performance and flight environment, involving the development and implementation of new methods, assures adequate performance to carry the lunar vehicles to lunar injection; and resulted as a real-time, on-board optimization in the Saturn guidance scheme, the "Iterative Guidance Mode", which has proven itself on all Apollo flights. While the successful management of his organization is his major concern, he has a deep insight into technical subjects and an uncanny gift for identifying the essentials. As an outstanding scientist, he makes personal contributions. A typification is the addition of the fifth engine, making the Saturn IV the Saturn V which overcomes severe tail heating and increases the payload capability by 25%. Since 1940 Dr. Geissler has been engaged in missile and vehicle concepts and development as a section chief and Laboratory Director. He arrived in the U.S. in 1945 as a member of the "von Braun Team" and has served in his present position since 1950. In 1959 he received the Army's Decoration for Exceptional Civilian Service, in 1963 the NASA's Exceptional Scientific Achievement Award and in 1968 the NASA's Exceptional Service Award. He obtained his Ph.D degree in Applied Mathematics in 1951 from the Technical University of Darmstadt, Germany.



Gengelbach, Werner K.    Manager, S-II Resident Office  
Saturn Program

MSFC

Mr. Gengelbach is Manager of the S-II Resident Office at North American Rockwell Corporation, Seal Beach, California. His assignment entails particularly difficult problems of management interfaces between MSFC research laboratories, the various program and project management offices, and the various levels of management of the contractor organization. Since Mr. Gengelbach became the S-II Resident Manager in May 1964, he has developed organization systems and communications alignments which provide real time status of the S-II Stage Project. On the basis of this, he has been able to make on-the-spot resolutions of the S-II Stage problems which otherwise could have had adverse impact on the project.

Mr. Gengelbach, a native of Germany, began his career in rocketry 27 years ago. His first interest was while he was an assistant instructor at Darmstadt Federal Institute of Technology where he obtained a Masters Degree. In 1942 he was invited to join the von Braun team and was involved in the initial formation of what became the Army Redstone Missile Team. Since that time he has worked for the Air Force, Curtiss-Wright Corporation, Avco-Crosley Division, and Advanced Technology Corporation. He joined MSFC in 1962 as MSFC Resident Engineer at the Jet Propulsion Laboratory, the position he held until coming to the S-II Resident Office.

Genter, John C.

Chief, Assembly Section, Layout  
& Assembly Engineering Branch,  
Engineering Division, Astronautics  
Laboratory, S&E

MSFC

Mr. Genter contributed personally to many diversified aspects of vehicle assembly including the T.V. and camera arrangements and installations which gave a clearer insight into the behavior of liquid hydrogen in a zero gravity environment. His personal engineering judgment weighed heavily in the solution of vehicle cabling problems.

Mr. Genter received his B.S. degree from the University of Alabama in 1953. Following a brief service in the U.S. Air Force, he joined ABMA in 1956. Transferring to MSFC in 1960, he continued his participation in developing the Saturn vehicles. His most recent assignment is Chief of the Assembly Section of the Engineering Division.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Gibbons, John D.	Chief, Industrial Systems Branch Computation Laboratory	MSFC

Mr. Gibbons is Chief of the Industrial Systems Branch, Computation Laboratory and is responsible for designing and implementing the administrative and program management computer systems for the Administrative and Technical Services and Program Management Directorates of MSFC. Some of the systems implemented under his control include the on-line inventory control system, systems in support of purchasing and contracts, configuration and data management, Saturn change and integration and tracking system, and Program Evaluation and Review Technique (PERT). These and other computer-based systems supervised by Mr. Gibbons have made significant contributions to the success of the Apollo Program.

Mr. Gibbons joined NASA when it was created from ABMA and has 21 years federal service.

Charles R. Glass, Senior Project Engineer, Astrionics Projects Office, Saturn Branch

S&E-ASTR-BV

Mr. Glass represents the laboratory and acts as the official contact point and spokesman to groups such as laboratories, program managers and Saturn contractors. In this capacity he has demonstrated a very high degree of initiative, enthusiasm and effectiveness in resolving problems which occurred in the Saturn vehicle. He was required to make on the spot decisions, and worked under time pressure while supporting the last Saturn V checkout and launch preparations and spent long, odd hours coordinating the laboratory effort for this event reviewing deadlines, last minute changes and participating in the LIEF operation during CDDT and launch.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Glass, James W.	Deputy Chief, Design & Development Branch, (Chief, Propulsion Stages ESE Section, ES Branch)	S&E-ASTR-EA Electrical Div.

Mr. Glass has participated in design concepts for ground support equipment for launch vehicles since 1956. He has successfully carried out these designs in such programs as Jupiter, Juno, Pershing, Saturn I, IB and V.

Mr. Glass was charged with the responsibility to establish the ESE design necessary to checkout and launch the propulsion stages used in the Apollo program. During the Saturn I program he developed, by example and training, a group of system design engineers thoroughly and intimately familiar with the propulsion systems design and operational characteristics. This expertise allowed Mr. Glass and his engineers to meet every operational demand as soon as the needs arose.

Mr. Glass expanded his technology and capabilities on the Saturn IB and V and through the ESE mission contractor established a group of MSFC civil service and contractor engineers capable to meet every challenge.

Godfrey, Roy E.

Deputy Manager, Saturn Program

MSFC

Mr. Godfrey is Deputy Manager of the Saturn Program at the Marshall Space Flight Center in Huntsville, Alabama.

Mr. Godfrey served previously as S-IVB Stage Project Manager from January 1964 to December 1967, and as S-II Stage Project Manager from December 1967 to July 1968. He served in a dual capacity as Deputy Program Manager and S-II Stage Project Manager from July to December 1968. Mr. Godfrey was very successful in establishing and organizing his program in line with NASA's concept of stage management. He demonstrated exceptional technical and managerial direction of the S-IVB Project during the transition period from near completion of initial design to the manufacturing and testing phase. He has applied himself aggressively and effectively in carrying out his new assignment as Deputy Manager of the Saturn Program and has performed in an exceptional manner. Prior to his assignment in the Saturn Program, Mr. Godfrey held key positions during his 17 years in the missile industry which include: Deputy Director, Quality Assurance Laboratory; Guided Missile Development Division, ABMA; and as Deputy Chief, Mechanical Branch, Systems Analysis and Reliability Laboratory, ABMA.

A native of Tennessee, he holds a Bachelor of Science Degree in Mechanical Engineering and attended graduate school at the University of Tennessee from 1950 to 1953. Among his many honors are the NASA Exceptional Service Medal (1969); Superior Achievement Award (1965); and nomination for Presidential Citation by General O'Connor, Director of Program Management, MSFC.

Goerner, Erich E.      Director, Preliminary Design Office, Program Development   MSFC

Mr. Goerner has had over three decades of experience in furthering the state-of-the-art of space science. He transferred to the Marshall Space Flight Center when it was established in July 1960, as Deputy Chief, Structure Branch, Propulsion and Vehicle Engineering Laboratory. Responsibilities included development of complete airframes for space vehicles, including structural design for the Mercury Redstone, Saturn I, IB, and V vehicles. The structural integrity and reliability of these space vehicles are due, in no small part, to the work of Mr. Goerner.

Mr. Goerner graduated from the Technical University of Darmstadt, Germany in 1934 with a Master of Science Engineering degree. He became an Aeronautical Research Engineer in the field of structural analysis and materials, and in this respect directed the load and stress analysis work on the first delta-wing rocket-powered operational aircraft in aeronautical history. As a member of the "von Braun team", he supervised structural research on such projects as the improved Redstone Missile, Jupiter IRBM, Explorer Earth Satellite vehicles, the Juno II Launch Vehicle and the Pershing Medium Range Ballistic Missile.

Goldston, R. Lamonte

Installation Data Manager  
Planning & Resources Office  
Program Management

MSFC

Mr. Lamonte Goldston has made significant contributions in the field of Data Management and is nationally recognized as a leader in his field. In his role of functional manager for the Center he has been instrumental in the development, establishment, and implementation of an effective Data Management System for MSFC programs. This system has proved of utmost importance to the Saturn launch program by providing greater management visibility and control to the program. In addition, use of developed techniques has resulted in meaningful reductions of total paperwork output from Saturn contractors.

Mr. Goldston received his BS degree in Mechanical Engineering from North Carolina State College in Raleigh, North Carolina in 1948. He is presently engaged in the Advanced Program in Governmental Studies, University of Oklahoma, leading to a Masters Degree in Public Administration. From 1953 to 1961, Mr. Goldston was employed as an Engineer at Redstone Arsenal and Army Ballistic Missile Agency and worked with the Redstone, Jupiter and Pershing Missile Programs. Transferring to MSFC in 1963, he has served as Saturn V Documentation Manager (1963), Center Apollo Data Manager (1964), Center Program Data Manager (1967) and as Installation Data Manager (1969).



Goodrum, John C.

Director, Advanced Program Support Office

MSFC

As the Assistant Director for Industrial Operations, Mr. Goodrum directed all industrial and support activities of the office for the Saturn Launch Vehicle Program, including facilities, manufacturing, procurement and logistics. He served in the role of Chief Engineer for Industrial Operations and was responsible for investigating trouble areas and recommending corrective action in all aspects of Industrial Operations, including contracting, with considerable emphasis on configuration management and cost reduction programs.

Later, he served as Chief, Project Logistics Office with the responsibility for the direction of all program logistics support to MSFC (spares, supply systems, maintenance, training, support documentation, transportation, packaging propellants, and pressurants.) Scope included all outsized and overweight transportation for all NASA Centers and supply of all liquid hydrogen for NASA and Air Force for east coast of U. S.

Mr. Goodrum was the founder and national board member of the Society of Logistics Engineers, a Chapter Board Member of the American Ordnance Association, and is a member of the National Society of Professional Engineers. He has extensive experience in the field of hydrology and hydraulics, and his prior rocketry efforts include work on the Redstone, Jupiter, and Pershing missiles. He served as the Project Manager for the Honest John.

Gorman, Harry H.

Deputy Director, Management

MSFC

As Deputy Director, Administrative, Mr. Gorman has had the lead role in managing the complex resources necessary for the Marshall Center's Saturn/Apollo effort. In this capacity, he has had the chief responsibility for budgeting and administering the funds, human resources, facilities, and support services required for the accomplishment of the Center's mission. In particular, he has made a major personal contribution to Apollo in the negotiation and management of Marshall's multi-million dollar industrial contracts. Mr. Gorman was highly instrumental in the conversion of cost-plus-fixed-fee contracts to incentive-fee contracts, resulting in greater economy for the government. As a key member of the MSFC top management team, he has had a decisive influence in charting the Center's course throughout the Apollo Program.

Mr. Gorman's title was changed to Deputy Director, Management, in February 1969. Prior to becoming a member of the MSFC staff in 1960, he served as manager of the Atomic Energy Commission's Lockland (Ohio) Operations Office. Including ten years with AEC, he has had over twenty years experience in business management. In addition to his post at MSFC, he is the Chairman of the NASA Personnel Management Review Committee at NASA Headquarters, and is former Chairman of the Interagency Board of Civil Service Examiners for Northern Alabama. In honor of his contributions to the space program Mr. Gorman received the NASA Medal for Outstanding Leadership in 1967.

GRAFTON, William L.

Chief, Test Division  
Astronautics Laboratory, S&E

MSFC

During the activation of the Mississippi Test Facility, Mr. Grafton contributed very valuable assistance in the design, construction and checkout of the S-II Stage Test Stand. The experience Mr. Grafton gained from similar test facilities at MSFC was a determining factor in solving problems and eliminating bottlenecks in the construction and final acceptance of this test facility at MTF.

Mr. Grafton received his BS degree in Aeronautical Engineering from Mississippi State College in 1949. He was employed by Redstone Arsenal in August 1952 as a Propellant Specialist. During the ensuing years he progressed from a Unit Chief to a Division Chief, being involved in the testing of many types of components, and sub-systems of launch vehicles. When the Army Ballistic Missile Agency and the MSFC became separate organizations in 1960, Mr. Grafton was promoted to Chief, Test Laboratory, ABMA. In 1962 he transferred to MSFC where his skill and capabilities have been utilized in experimental and developmental testing of launch vehicle systems and components.



NAME

Graham, Arlie H.

POSITION

Industrial Specialist

ORGANIZATION

MSFC

Mr. Graham is an Engineering Planner in the Planning & Engineering Branch of the Manufacturing Engineering Laboratory. Mr. Graham is considered to have made a highly significant contribution to the Apollo Program during his assignment as Engineering Planner for the Saturn V Dampers System. Three Damper Systems were fabricated at MSFC to serve all Saturn V launches. The magnitude and scope of the Damper System Program was increased many times during the manufacturing period due to additional engineering requirements being incorporated into the program. Mr. Graham performed the engineering planning, including component and system qualification, checkout, modification and repair. He also provided logistics engineering services on components for both MSFC and KSC.

Mr. Graham has been an Engineering Planner since his transfer to NASA upon the formation of MSFC in 1960. His Civil Service career began in 1951 when he joined the Ordnance Missile Laboratory's Apprentice Program at Redstone Arsenal.

Grau, Dieter

Director

MSFC

Quality and Reliability Assurance Laboratory, S&E

As Director of the Q&RA Laboratory, Mr. Grau has been the prime mover for NASA in establishing the quality and reliability assurance concepts which have furthered the Apollo successes. Early in the Saturn program, he recognized the inadequacies of then existing systems for space flight application and embarked on an effort to develop a system that would meet the requirements. His task was complicated greatly by the many divergent concepts and theories prevalent in industry and government. From his singular talents and directive ability came the concepts and philosophies that serve as the foundation of not only NASA's programs but many quality and reliability systems that demand operational mission success. His outstanding contributions have gained international interest.

Mr. Grau received his B. S. and M. S. in Electrical Engineering from the Institute of Technology, Berlin, Germany. He became associated with Dr. von Braun's V-2 team in 1943 and came to the United States during "Project Paperclip" in 1945. His unique technical and management abilities twice resulted in his selection for important posts in DOD special programs - "Operation Hard Tack" and "Project Willow."

Gresham, Albert E.

S-II Laboratory Project Engineer

MSFC

Mr. Gresham served as the Chief S-II Project Engineer for Astronautics Laboratory during the critical phases of the S-II design and testing. He contributed immensely to the solution of the insulation, spray foam, fracture mechanics, cryoproof, and structural redesign problems. In addition, he supported an ad hoc Task Team formed to give management attention to the program at North American Rockwell. Prior to the above, Mr. Gresham was the Laboratory S-IC Project Engineer during the early S-IC design and testing at MSFC. He was instrumental in expediting prototype hardware to allow MSFC to meet early static firings.

Mr. Gresham joined the von Braun team in 1956, and has contributed to the Redstone, Jupiter, Pershing, Saturn IB, as well as the Saturn V program. He holds a BS degree in Physics from Texas A&I, graduating in 1948.

Guilian, W. E. (Ed)

Chief Counsel  
Office of Chief Counsel

MSFC

Since 1960, Mr. Guilian has served as the principal legal adviser for the Marshall Space Flight Center. He has served as Chief of an Office consisting of a highly qualified professional staff of more than a dozen other attorneys, and librarians and secretaries. During some part or all of that period he was employed also as Chief Counsel for remote locations such as Launch Operations Directorate (now Kennedy Space Center), Michoud Assembly Facility, and Mississippi Test Facility. In addition to assuming ultimate responsibility for legal advice given from any of these quarters, Mr. Guilian has served as counsel to investigation boards for major accidents, consultant to the ad hoc board investigating the Apollo fire at Kennedy Space Center, adviser and principal legal liaison with the National Labor Relations Board during the period of labor strife in the early days of the heavy construction program at the Cape, and as a member of the Activation Task Force charged with bringing the Mississippi Test Facility on stream.

A native of Birmingham, Alabama, Mr. Guilian attended the University of Alabama and the University of Tennessee. He graduated from the latter institution in 1951, receiving his law degree summa cum laude. While at school he enrolled in Phi Kappa Phi and the Order of the Coif Honorary Legal Society and he also served on the Editorial Board for the Tennessee Law Review. Prior to joining Marshall as its first (and only) Chief Counsel in 1960, Mr. Guilian had been employed for nine years in various capacities with the U. S. Atomic Energy Commission.

Haeussermann, Walter

Director, Central Systems  
Engineering, S&E (Formerly  
Director, Astrionics Laboratory)

MSFC

Dr. Haeussermann directed the development of the astrionics system for the Saturn-class vehicles, comprising the navigation, guidance and control, the onboard and ground support electrical, and the instrumentation and communication subsystems. His aim for straightforward solutions and simplified hardware and his support in using redundancy has been rewarded by the flawless flights and excellent accuracy of all the Saturn vehicles launched, including Apollo 11.

Dr. Haeussermann received his BSEE from the Institute of Technology, Stuttgart, Germany, in 1935, and his MSEE and Ph.D. in Physics and Mathematics from the Institute of Technology, Darmstadt, Germany, in 1938 and 1944 respectively. Dr. Haeussermann came to the U.S. to join the von Braun team and transferred with most of them in 1960 from the Army Ballistic Missile Agency to the newly-formed George C. Marshall Space Flight Center. He was the director of the Astrionics Laboratory until May 1969 when he became director of Central Systems Engineering.



Hagood, Carlos C.

Chief, Mission Definition & Development Div.,  
Central Systems Engineering, S&E (Formerly  
Chief, Flight Evaluation Branch and Systems  
Engineering/Projects Office, Aero-Astrodynamics  
Laboratory, S&E)

MSFC

Mr. Hagood, as Chief of the Flight Evaluation Branch and the Systems Engineering/Projects Office, Aero-Astrodynamics Laboratory, served on various panels, subpanels, and working groups involved in the mission planning for Apollo flights. As Co-chairman of the Flight Limits Subpanel, he developed an inter-Center basis the flight mission rules for crew action due to launch vehicle system failures and established abort limit settings for both automatic and manual abort. He was instrumental in planning a yaw maneuver for increasing crew safety by eliminating or drastically reducing the probability of tower collision due to malfunctions and vehicle drift, and he supervised the development and planning of abort and alternate missions. He also was responsible for post-flight analysis of trajectories, vehicle dynamics, guidance and control systems performance. Furthermore, he served on the Flight Evaluation Working Group, Flight Mechanics Panel, and Crew Safety Panel.

Mr. Hagood received his B.S. in Mathematics and Chemistry at Florence State University, Florence, Alabama, in 1952. He has also done graduate work at the University of Alabama in Engineering Mechanics.

Haley, Foster A.

Deputy Director of Public Affairs

MSFC

As Deputy Director of Public Affairs for the Marshall Space Flight Center, Mr. Haley has made significant contributions to the development of the Center's comprehensive public information program and in keeping the public fully informed on the Center's mission to develop and test large space flight vehicles for lunar and interplanetary travel. His efforts have enhanced considerably the Center's efforts in providing the public with complete and up-to-date information on NASA, MSFC; and the Saturn/Apollo program.

Prior to joining the Marshall Space Flight Center staff in 1960, Mr. Haley was the Public Information Officer for the U. S. Army at Redstone Arsenal from 1952 until 1956. From 1956 until 1960, he was the Chief of Special Projects in the Public Information Office of the Army Ordnance Missile Command. Mr. Haley is a graduate of Auburn University where he earned his bachelor of science degree. He also attended the University of Alabama Graduate School and Birmingham Southern College.

Hall, L. B., Jr.

Chief, Vehicle Systems Integration Branch  
Vehicle Systems Checkout Division  
Quality and Reliability Assurance Laboratory, S&E

MSFC

Mr. Hall has played a major role in developing and improving the techniques, methods, and equipment by which the Saturn stage systems are checked out and accepted by the Government. His technical competence and managerial skill were amply displayed when this Center was called upon to assist MSC during a critical peak load in spacecraft checkout. Though required to deal with hardware outside his previous experience, Mr. Hall successfully headed a task team that assured the timely delivery of flightworthy spacecraft to the launch site.

He earned a B. S. degree in Electrical Engineering from Alabama Polytechnic Institute (Auburn) in 1951. Since 1957, he has been directly involved with all phases of sub-systems and systems checkout planning and performance, particularly in the practical application of automated techniques.

Hamiter, Leon C.

Chief, Parts Technology

MSFC

Future Programs and Technology Office

Quality and Reliability Assurance Laboratory, S&E

Mr. Hamiter has made many contributions toward improvement of the engineering management of the Saturn electrical parts program. His experience and knowledge in this area have established him as an authority. Among his numerous accomplishments are the development of a high-reliability specification and the development of usage standardization techniques using approved parts lists. His influence on the industry streamlined several manufacturing processes and promoted cross fertilization between contractors. He developed new screening methods, and his devising a parts traceability system enabled action to be taken when defects were discovered before the problem could spread or create potential new failures.

Mr. Hamiter began work at MSFC in 1961. He earned his B. S. in Electrical Engineering from the University of Alabama in 1956.

Hammers, Fred

Chief, Application & Integration Division,  
Central Systems Engineering, S&E (Formerly  
Chief, Saturn Systems Manager, Systems  
Engineering Office, Astrionics Lab, S&E)

MSFC

Mr. Hammers contributed very considerably to solve systems engineering problems in the Astrionics area; this included service on the Saturn/Apollo Flight Operations Panel, Flight Mechanics Panel, G&C Implementation Subpanel and Guidance & Performance Subpanel. As MSFC's co-chairman of the Simulation Subpanel, he directed the development of the Saturn vehicle simulation programs used in the Mission Control Center for flight controller and astronaut training. He contributed directly in the mission planning of all Saturn/Apollo flights and served as a principal briefer of astronaut crews prior to each manned Saturn flight.

Mr. Hammers received his B.S. degree from Tennessee Technological University, Cookeville, Tenn., in 1957. He has been associated with launch vehicle design and development since 1957 when he joined Thiokol Chemical Corporation in the design of solid propellant propulsion systems. In 1959 he joined the Martin-Marietta Company supporting the Army Ballistic Missile Agency at Huntsville which was at that time developing the Pershing missile system. Since 1962 he has been engaged in the development of the astrionics systems of the Saturn launch vehicles at MSFC.

HAMNER, R. SCOTT

Manager, Flight Control Office  
Mission Operations Office, PM

MSFC

In February of 1968, Mr. Hamner was selected to manage the activities of the MSFC Flight Control Office at MSC. This organization is part of the MSFC Mission Operations Office and actually controls the flights of the Saturn Launch Vehicles designed and developed at MSFC. Mr. Hamner assumed this responsibility at a time in the Apollo Program when several flights had been flown and the previous flight control team had been largely dispersed because of illness of the former manager and resignations of several of the flight controllers. Mr. Hamner vitalized the flight control team by establishing new objectives and re-emphasizing old goals. He personally recruited several outstanding flight controllers and in so doing acquired resources which brought to the MSFC Flight Control Office valuable background experience which strengthened MSFC's role in Saturn Launch Vehicle Flight Control. Mr. Hamner has very ably brought the MSFC Flight Control Team to peak proficiency and has skillfully applied his personal ability to the task of bringing contractor and civil service personnel together to support Apollo flight in real time control of big boosters.

Mr. Hamner received his BS in Physical Sciences and Engineering from the United States Military Academy, West Point, New York in 1957.

Hancock, Fredella  
(Miss)

Management Technician  
Propulsion and Power Branch  
Propulsion and Thermodynamics Division  
Aeronautics Laboratory, S&E

MSFC

Miss Hancock contributed significantly in the Saturn stages development test programs, especially in planning of the various stage, engine and component tests. Her participation, in reducing the multitude of test data, aided in the evaluation of the performed tests and proved of great importance to the successful Saturn launch vehicle test activities.

Miss Hancock has been associated with test activities since 1955, when she joined the Ordnance Missile Laboratory and transferred to NASA with the inception of the Marshall Space Flight Center.

NAME

Hardage, Onice M., Jr.

POSITION

Chief, Flight Mechanics Branch

ORGANIZATION

MSFC

As Chief of the Flight Mechanics Branch of the Aero-Astrodynamics Laboratory, Mr. Hardage directs and participates in the establishment of the operational trajectory, lunar targeting, and guidance pre-settings for the Saturn V vehicle. This activity includes the assessment of the performance margin, guidance and navigation accuracy, trajectory envelope, and the generation of the trajectory input to the Eastern Test Range for use in establishing range safety limits. In this role, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. The operational trajectory is the baseline detailed trajectory simulation of the total launch vehicle characteristics and provides flight performance and environment data from lift-off through S-IVB slingshot maneuver. These data are forwarded to all NASA Centers and major contractors who support the Apollo missions. The Saturn steering and cutoff criteria--lunar targeting and earth orbit hypersurface--are generated over the period of launch opportunity using lunar arrival conditions which are specified by mission constraints. The Saturn is therefore capable of accurate translunar injection anytime during the launch opportunity.

Mr. Hardage has been associated with the Saturn and Apollo programs of the National Aeronautics and Space Administration since prior to the launch of the first Saturn I in 1957. He has held his current position since 1966. He received a B. S. degree in aeronautical engineering from Georgia Institute of Technology in 1957.



Hardee, Marion S.

Assistant Manager  
Michoud Assembly Facility, PM

MSFC

Mr. Hardee's outstanding contribution to the Apollo program has been primarily in his highly effective performance in the negotiation and administration of multi-million contracts for space program activities, both as contracting officer, and contract review official. He has also contributed materially in his capacity as Assistant to the Manager of Michoud in management of the overall administration of the organization. Contracts involved have not only been high in dollar value, but also wide in scope, and complex in content.

Mr. Hardee graduated from the University of Florida with a degree in Industrial Engineering in 1950. Before being assigned to Michoud in 1963, he was chief of the Contract Branch, Purchasing and Contracting Division, MSFC, and earlier served as Contracting Officer of the U. S. Army Redstone Arsenal, MSFC.

\*Mr. Hardee was reassigned to the position of Deputy Manager, Program Management Contracts Office, with additional duty as Chief, Booster and Systems Engineer Branch, MSFC, Huntsville, effective June 15, 1969.

Hardeman, T. U.

Director, Financial Management Office  
Administration and Technical Services

MSFC

Mr. Hardeman is well known in financial and program management circles as an authority on financial management, budgeting, and programming matters. He has 27 years of government experience in production control and resources management and has served as an advisor to top management since MSFC was organized. His participation in programs leading to Apollo began as early as 1958 when as a representative of the Army Ordnance Missile Command he presented the initial Saturn budget at Headquarters, Army Research Projects Agency and received the initial funding of \$15 million. Under his direction, the MSFC Financial Management Office has consistently been recognized as a leader within NASA on development and implementation of effective financial systems for resources and controls, accounting, and reporting. Effective management of resources, under the leadership of Mr. Hardeman, has contributed to the successful accomplishment of the Apollo mission and other preceding missions.

Mr. Hardeman graduated from Los Gatos Union High School in California and attended the University of Georgia. He was employed by private industry from 1937 to 1942, at which time he joined the government as Chief of Production Control, Redstone Arsenal. He moved to Joliet, Illinois in 1947 as Chief of Production Control, National Production Control Branch, Ordnance Ammunition Command and returned to Redstone Arsenal in 1956 as Chief of the Army Ballistic Missile Agency's Control Office, Programs Branch. In July 1960, he transferred to NASA as Chief of the Plans and Programs Branch, Technical Program Coordination Office and was assigned to his present position in 1963. His efforts were recognized with a Sustained Superior Performance Award in 1964 and a Quality Increase Award in 1965.

Hardy, George B.

Manager, Program Engineering and  
Integration Project  
Apollo Application Program

MSFC

Mr. Hardy served as the Assistant Manager, Saturn I/IB Program, from March 1965 to July 1966. He is currently Manager, Program Engineering and Integration Project, Apollo Applications Program.

As Assistant Manager, Saturn I/IB Program, Mr. Hardy developed and executed plans to provide for the design, development, test, and delivery of major aerospace hardware items and systems for use in the national space program, insuring that the plans and timely execution thereof were consistent with program and technical requirements and restraints of the overall mission plans and objectives. While serving in this position, Mr. Hardy did a dynamic job in planning, overseeing, and expediting the entire Saturn IB Program. Based on his intimate knowledge of the Saturn IB Program, he did a superior job in studying the overall effects on the Saturn IB from design through launch and planned uniform shipping dates, launch dates, and reorder dates.

His major contributions made a substantial contribution to the success and timeliness of the Saturn I/IB Program. Prior to this time, he served as the Deputy Manager of the S-I/IB Stage Project of the Saturn I/IB and as a Project Engineer in the Saturn Systems Office.

A native of Kentucky, Mr. Hardy obtained a Bachelor of Science Degree in Civil Engineering from Georgia Institute of Technology. His honors include Sustained Superior Performance Awards in 1961 and 1965, and a Group Achievement Award in 1965.

HAUFF, CHRISTIAN, JR.  
CHRISTIAN-HAUFF, JR.

ENGINEER, GROUND COMPUTER & APPLICATIONS BRANCH

Mr. Hauff has been directly responsible for the design, development, and productions of all digital cathode-ray-tube display systems provided by MSFC as ground support equipment for the checkout of Saturn I, Saturn IB, and Saturn V Launch vehicles. The Saturn V Display System was considered by a major display system consultant at the time of initial deployment as "state-of-the-art." More recently, Mr. Hauff participated in the conceptual development and was technically responsible for the implementation of a modification at Complex 39 at KSC that provided complete display system redundancy by switching between the three firing rooms.

Mr. Hauff received his B.S. degree from Vanderbilt University, Nashville, Tennessee in 1960. He served two years in the U. S. Navy assigned to the National Security Agency. Mr. Hauff has worked in the Digital Ground Support Equipment group within Astrionics since joining MSFC in 1962.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Guenther H. F. Haukohl	Chief, Components Test Branch	Test Division Astronautics Laboratory

Mr. Haukohl is responsible for Development Testing on many Components of the Saturn V Vehicle and Model Testing of the Launch site configuration in support of the Saturn V Vehicle. This contributed significantly to the design of static test and launch facilities. On flight hardware many critical problems were solved on such items as gas generators, heat exchangers, turbopumps, valves, etc. The most recent one, the S-II center engine oscillators were tested and documented under his supervision. Mr. Haukohl has been associated with rocket development since January 1936. He came to the United States as a member of the original von Braun team in 1945. Under the U. S. Army, he contributed to the development of the Jupiter missile and supervised various other development programs, advancing the knowledge in the rocket propulsion field.

NAMEPOSITIONORGANIZATION

Haussler, Jonathan B. Deputy Chief, Tracking & Orbital Analysis Branch MSFC

As Deputy Chief of the Tracking and Orbital Analysis Branch in the Aero-Astrodynamic Laboratory, Mr. Haussler directs and participates in the establishment of the postflight trajectory. In this role, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. The postflight trajectory is one of the basic tools used in flight evaluation. The postflight trajectory, which is obtained primarily from radar tracking data, is a time history of the path the vehicle traveled. By comparing this to the corresponding predicted parameters, anomalies or deviations can be uncovered and corrected on subsequent flights. This leads to a much more accurate prediction capability which adds confidence and certainty to the successful accomplishment of a lunar landing mission.

Mr. Haussler has been associated with the Saturn and Apollo programs of the National Aeronautics and Space Administration since 1960, after transferring from the Army Ballistic Missile Agency when the George C. Marshall Space Flight Center was created. In the Aero-Astrodynamic Laboratory, he has been engaged in the postflight trajectory determination as a section chief and deputy branch chief. He has held his current position since early 1969. He received his A. B. degree in physics and mathematics from Susquehanna University in 1959.

HEIMBURG, Karl L.

Director, Astronautics Laboratory, S&E

MSFC

Mr. Heimburg is nationally known for his contributions in perfecting the captive testing of large space boosters, components and ground support equipment. He was instrumental in determining the type of test stands required to static test the Saturn I and V stages, instrumentation required during test and dissemination of test results to appropriate MSFC Organizations.

Mr. Heimburg received his MS degree in Mechanical Engineering in Germany. He was a member of the original von Braun team at Peenemunde, Germany. He came to the United States in 1945 and moved from Fort Bliss to Redstone Arsenal in July 1952, at which time he was assigned to the Test Laboratory. He remained in the testing field, functioning as the Director of the the Test Laboratory until his reassignment as Director, Astronautics Laboratory.

HELLEBRAND, Emil A.

Technical Assistant to Director  
Astronautics Laboratory, S&E

MSFC

Mr. Hellebrand has made major contributions in the appreciation of the most up-to-date theory in the solution of unprecedented problems of advanced structural analysis and design and to the advancement of knowledge in these fields. He is a recognized leader in structural development in the Aerospace Industry. His knowledge in his field has gone far in the solution of structural problems encountered in the Saturn Program.

Mr. Hellebrand was educated in Austria and Germany where he received his BS degree in 1934 and his MS degree in 1938. He has been associated with rocketry since 1940 when he joined the V-2 team at Peenemuende, Germany. In 1946 he came to the United States and has served in various responsible positions in the field of advanced structural research with the Department of Army and NASA.



Heller, Gerhard B.

Director, Space Sciences Laboratory,  
S&E-SSL

MSFC

Mr. Heller has participated in the Saturn-Apollo project since its inception. As Deputy Director and Director of the Space Sciences Laboratory, he has applied leadership, guidance and direction to theoretical and experimental research in such fields as: scientific support for lunar exploration projects, lunar and planetary thermal physics, radiation shielding, meteoroid environment, flight experiments, etc. He made extensive studies in the electromagnetic radiation aspects of the space environment and its effects on the upper stages of the Saturn vehicle and the spacecraft. Mr. Heller has over 40 publications to his credit, and has contributed much to the advancement of space science and technology.

Mr. Heller received his M.S. degree from the Institute of Technology, Darmstadt, Germany and has been engaged in the advancement of space technology for almost 30 years. His career began in 1940 when he joined the German Guided Missile Center at Peenemunde. He came to the United States in 1945 and advanced through numerous key positions to his present assignment, this year, as Director of the Space Sciences Laboratory.

Henritze, Richard M.

Chief, Analytical Operations Division

MSFC

Quality and Reliability Assurance Laboratory, S&E

Mr. Henritze, through his diversified engineering knowledge, made innumerable contributions to the quality techniques of the Saturn program. His work in the failure analysis and corrective action on problems with cracked solder joints, batteries, and ducting, plus his contributions to improved NDT of weldments to ascertain criticality of small cracks have benefited not only the Saturn vehicle but hardware throughout the Apollo program. He has been instrumental in developing experts in various fields of engineering and technology, and he has been successful in applying these talents toward the solution of the upcoming problems.

Mr. Henritze graduated from the University of Tennessee in 1950 with a B. S. in Mechanical Engineering. He joined the TVA until transferring to the Ordnance Missile Labs in 1955. In 1958, he came to ABMA.

Herring, J W

Deputy Director, Technical Services Office  
Administration and Technical Services

MSFC

Mr. Herring assists the director of Technical Services Office in providing various support and services to Apollo Program activities of MSFC. He coordinates civil service and support contractor effort in providing supply, transportation, photographic, and plant operation and maintenance services to all MSFC elements at Huntsville, Alabama. Mr. Herring has made important contributions to the Apollo Program by providing competent management direction to subordinate elements.

Mr. Herring has nearly 33 years of progressive civil service. He came to Huntsville in 1956 when he was employed by ABMA as Deputy Chief, Operating Services Office. He was transferred to MSFC in 1962 in the position which he currently holds.

Hildreth, Edward D.

Chief, Communications Division  
Management Services Office, A&TS

MSFC

Mr. Hildreth has directed the design and installation of an effective integrated tele-communications system essential to the Saturn Apollo development and subsequent mission operations. He has been instrumental in providing high speed data transmission facilities and video systems needed for the Launch Information Exchange Facility (LIEF) and Huntsville Operations Support Center (HOSC) and has assured effective communications support for critical launch operations and post-launch evaluation activities. In providing administrative communications service, Mr. Hildreth has obtained modern systems utilizing latest technology while at the same time effecting sizeable cost savings through constant evaluation of requirements.

Mr. Hildreth received his BS degree in Electrical Engineering from the University of Tennessee in 1950. His career in telecommunications spans a period of 16 years of which 7 years were spent as General Manager of a telephone cooperative providing invaluable experience to aid in the planning and operation of support to the Saturn Apollo effort. He assumed his present role in supporting the Center's development activity in 1960.

Hill, John W.

Chief, Engine Office  
Michoud Assembly Facility, PM

MSFC

Mr. Hill managed, coordinated, technically reviewed and accepted the work performance of the engine contractor for Saturn vehicle first stage engines. He served as technical advisor to the Manager, Michoud Assembly Facility, and as Resident Manager for the Manager, Engine Program Office, MSFC, in engine-associated or related activities, and served as Michoud point of contact for engineering and technical direction relative to engine programs. His work contributed materially to the successful record of firings established by Michoud-built boosters.

Mr. Hill received a Bachelor of Science in Engineering degree from Mississippi State College in 1950, and served in NASA's Engine Program Office at MSFC and in the test laboratory of the Army Ballistic Missile Agency in Huntsville prior to employment at Michoud. His research on liquid fuel rocket engine testing also contributed to the Apollo mission.

Hillenbrand, Joseph S.

Deputy Chief, Analytical Operations Division

MSFC

Quality and Reliability Assurance Laboratory, S&E

Mr. Hillenbrand is a recognized authority in the area of airframe structural evaluation. He developed structural acceptance criteria and techniques applied to all Saturn I and Saturn V in-house stages and significantly influenced the criteria and techniques used by MSFC prime contractors. In recognition of his expertise, he was appointed and served, both as a member and chairman, on several structural investigative committees and task groups, such as the IU - Shroud Assessment following the Apollo 7 flight.

Mr. Hillenbrand received a B. S. in Mechanical Engineering in 1948 and a B. S. in Business Administration in 1949 from the University of Tennessee. After three years with TVA, he came to Redstone Arsenal in 1952.

Hirsch, Oliver M.

Manager, Contracts Office

MSFC

As Manager of the Contracts Office, Mr. O. M. Hirsch has managed a complete and comprehensive Contract Management Program for the Marshall Space Flight Center since its inception in 1963, encompassing negotiations and administration of a variety of complex contracts of many years duration of which the present value exceeds \$7 billion. This includes planning, directing, and coordinating all phases of contractual acquisition of space vehicles, major combinations, major items and associated equipment, industrial property, facilities and services at MSFC, MAF, MTF, and Contractor Plants.

Mr. Hirsch is inimitably qualified for the position of Manager, Contracts Office, having held various positions involving contracted procurements of ordnance missile material while serving as an officer in the U. S. Army since March 1942, retiring in November 1963 as Colonel, Ordnance Corps. He has held many high level positions throughout his career, some of which were Chief of Staff and Executive Officer Redstone Arsenal, Director, Industrial Operations (Proc. & Prod.) Army Ballistic Missile Agency, Project Manager, Pershing Weapons Systems, and serving concurrently as Deputy to the C G, U. S. Army Missile Command for all Land Combat Missile Systems of the U. S. Army.

The contributions of Mr. Hirsch during his tenure at MSFC has been outstanding, having guided the contractual activities for the procurement of large complex space vehicles from their inception, with all the trials and tribulations of a newly assigned program for NASA and the U. S. Government. Born in Kansas City, Mo., Mr. Hirsch attended the University of Kansas City, Findley Engineering College, the Ordnance Advance School and Command & General Staff College, U. S. Army and received a degree in Business Administration from the University of Chicago.

Hoag, Phillip C.

Mission Definition & Development Div.,  
Central Systems Engineering, S&E (Formerly  
Assistant Saturn V Project Engineer, Aero-  
Astrodynamics Laboratory Projects Office, S&E)

MSFC

Mr. Hoag contributed to the Saturn V lunar landing program by directing study efforts which led to the design, development and flight of the Saturn V vehicle. As secretary of the Guidance and Performance subpanel, he performed many flight mechanics tasks which required interfacing with MSC and KSC. The tasks included development of Crew Emergency Detection System criteria for abort from the launch vehicle, range safety data, vehicle trajectories and performance, wind restrictions, and tracking and communication data. Through his effort, operational channels of communications were effected which allowed for smooth data flow among MSFC, MSC, KSC and NASA Headquarters. He also helped establish Center positions on many design and development problems.

Mr. Hoag received his B.S. in Physics in 1958 from North Georgia College, Dahlonega, Georgia. While serving as an officer in the U.S. Army he attended and graduated from the U.S. Army Artillery and Guided Missile Schools at Ft. Sill, Oklahoma, and Ft. Bliss, Texas. He joined the MSFC Aero-Astrodynamics Laboratory in 1963.



HOBBS, SAMUEL H.

Chief, Photographic Division  
Technical Services Office  
Adm. & Technical Services

MSFC

Mr. Hobbs directed photographic support programs which provided photo-optical instrumentation of Saturn launch vehicle test and evaluation. Under his guidance, a wide spectrum of camera systems was developed to record diverse research studies including materials flammability, propellant sloshing, electron beam welding, Saturn stage oscillation, and others.

Mr. Hobbs has been associated with launch vehicle data acquisition since 1951 when he joined the Rocket Development Division at Redstone Arsenal, assisting in the development and modification of optical-data systems. In 1960, he joined NASA, Marshall Space Flight Center, Huntsville, Alabama, where he became chief of the Photographic Division.

Hoberg, Otto

Deputy Director, Central Systems Engineering,  
S&E (Formerly Assistant Director, Astrionics  
Laboratory, S&E)

MSFC

Mr. Hoberg defined and directed the design and implementation of the Saturn launch vehicles instrumentation and communication system. Through his outstanding experience in this field and his strong guidance this system has an unexceptionable reliability despite its high accuracy requirements and the necessarily resulting complexity as demonstrated by all Saturn launch vehicle flights. As Assistant Director of Astrionics Laboratory, Mr. Hoberg contributed essentially in all areas of the Saturn/Apollo Astrionics system. In particular, he contributed very effectively in his assignments as Chairman of the Saturn Instrumentation and Communication Working Group and as MSFC Co-Chairman of the Apollo Instrumentation and Communication Panel.

Mr. Hoberg came to the United States as a member of the von Braun team. He transferred with most of them in 1960 from the Army Ballistic Missile Agency to the newly-formed George C. Marshall Space Flight Center. He was the Chief of the Instrumentation Division of Astrionics Laboratory until 1966 when he became Assistant Director of Astrionics Laboratory. In 1969 he accepted the position of Deputy Director, Central Systems Engineering.

Hochberger, Norman L.

Chief, Professional Staffing Office  
Manpower Office, A&TS

MSFC

Norman Hochberger, Chief of Professional Staffing at MSFC, was instrumental in assembling the scientific and technical work force that developed the saturn space vehicle that will place a man on the moon in this decade. Recruiting problems have been complex inasmuch as missions were often accomplished on a "crash" basis. He conducted an Executive Search Program throughout the nation to locate candidates for highly critical positions. In addition, Mr. Hochberger coordinates all aspects of the Federal Equal Employment Opportunity Program, and has worked actively in the Youth Opportunity Corps Program, the Neighborhood Youth Program, and Summer Employment Programs. His knowledge of the requirements for specialized skills and his efforts to find individuals to meet these requirements contributed directly to the Center's ability to accomplish its missions.

A native of Dubuque, Iowa, Mr. Hochberger graduated from Dubuque High School in 1951 and attended the University of Dubuque. In 1952 Mr. Hochberger entered the Federal service when he became employed by the Rock Island District Corps of Engineers. In 1956 he transferred to the Army Ballistic Missile Agency in Huntsville, Alabama. Mr. Hochberger transferred to MSFC in July 1960. During his Federal career he has received numerous letters of commendation for his dedication, outstanding ability, and resourcefulness.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Hoelzer, Helmut, Dr.	Director, Computation Laboratory	MSFC

Dr. Helmut Hoelzer is internationally known for his contributions to the development of analog computers both for use as flight equipment and ground computing and simulation. The principles of these computers have been adopted in the majority of present-day guided missiles as well as in analog computing equipment. At MSFC he is responsible for directing the application of this computer expertise to the development of digital and analog computers and mathematical techniques for all phases of the Saturn launch vehicle program.

A graduate of the Technical University, Darmstadt, Germany, he received his Master's Degree in Electronics and holds a Doctorate in Mathematics and Natural Sciences.

Before his transfer to NASA on July 1, 1960, he was Director of the Army's Computation Laboratory at Redstone Arsenal where he was instrumental in the development of both flight and ground computers for the Redstone and Jupiter missiles.

As a pioneer and authority in the field of flight and ground computing, he has significantly contributed to the state-of-the-art. In particular, he developed an electronic analog computer for the solution of differential equations and the "mixing computer", the heart of the control system of the V-2. He holds several patents for advanced analog computers. Dr. Hoelzer was awarded the Exceptional Civilian Service Decoration in 1959, the Army's highest civilian award.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Holderer, Oscar C.	Deputy Chief, Aerophysics Division	MSFC

Mr. Holderer serves as Deputy Chief, Aerophysics Division, after having served as chief of the former Experimental Aerodynamics Branch up to the formation of the Division. He was instrumental in the mechanical design of the 14 x 14 inch Trisonic Wind Tunnel, the center piece of MSFC's experimental aerophysics facilities. The flexibility and responsiveness of this facility have been an invaluable asset in the development of the Saturn and Apollo projects, have literally cut many months from the vehicle development time, and have continually paid off in the Center's projects. The 14 inch tunnel has an exceptional standing among tunnels of its type and size, owing to Mr. Holderer's thorough study of the necessary operational steps and his skill in devising mechanical solutions of utmost simplicity and reliability. Mr. Holderer's influence has extended far beyond the 14 x 14 inch Trisonic Wind Tunnel and has, for instance, found its latest reflection in design features of the Center's High Reynolds Number Test Equipment. In addition to his activities in the mechanical design of the Center's aerodynamic test facilities, Mr. Holderer was also responsible for the implementation of the Saturn wind tunnel test programs.

Mr. Holderer received his BS in mechanical engineering from the Technical University of Berlin, Germany, in 1941. He came to Fort Bliss, Texas, with the von Braun team in 1945, and was transferred to NASA in 1960.

Hoodless, Ralph M. Jr.

Project Engineer, Saturn/Apollo  
Systems, Astronautics Labor-  
atory, S&E

MSFC

Mr. Hoodless directed the technical design, development, and testing of the propulsion systems for the S-IVB stage for the Saturn IB and V vehicles. Among his many important contributions to the Saturn program is the AS-203 Liquid Hydrogen Experiment, which provided urgently needed design information in the field of cryogenic propellant fluid mechanics. During the AS-502 Flight Evaluation Review, his evaluations and recommendations played a major role in correcting the flight anomalies caused failure of the S-IVB J-2 engine. During current launch and flight operations, he serves as expert on stage systems to aid in effecting rapid resolution of problems as they develop.

Mr. Hoodless received his BSAE and BSME at Auburn University in 1959 and 1960, and has spent more than 9 years at MSFC in systems engineering.

Hopson, George D. Chief, Life Support and Environment Branch MSFC  
Propulsion and Thermodynamics Division  
Astronautics Laboratory, S&E

Mr. Hopson directed and contributed personally to the thermal design of the Saturn vehicle, especially in the areas of aerodynamic and engine exhaust heating, and the orbital control of the S-IVB propulsion systems electronics. His participation in design and development of the S-IC and S-II base heat shields has proved of utmost importance to the success of the Saturn V launches.

Mr. Hopson received his M. S. Degree from the University of Alabama in 1955 and has had 14 years experience in heat transfer and thermal design. Since joining MSFC in 1962, he has become a recognized authority in his field through work with industry, authorship of technical papers and presentations.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Helmut J. Horn	Deputy Director, Aero-Astroynamics Laboratory	MSFC

As Deputy Director of the Aero-Astroynamics Laboratory, Mr. Horn directs and stimulates a staff of engineers and scientists in the conceptualization and development of space vehicle and spacecraft systems of the Saturn class. In this role and as the former chief of the Dynamics and Flight Mechanics Division, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. Accordingly, he is directly responsible for the conception and development of the Saturn "Iterative Guidance Mode". Optimum steering commands are directly calculated during flight by quasi-explicit solution of the calculus of variations conditions made possible by using exact solutions for a simplified problem and assuming a uniform external force field. As the vehicle approaches the end condition, the initial simplification becomes an improving description of the actual flight conditions. Consequently a repetitive recalculation of the steering equations leads to a trajectory converging with any desired accuracy to the end state variables with negligible losses in propellant consumption. Several other significant Saturn V contributions are attributed to Mr. Horn's leadership and participation. One is the analysis of the response of large vehicles to the atmospheric disturbances and the other is the development of the slosh model representation of the dynamics of fluids in the propellant tanks. The model was applied to the dynamics and control interaction of the vehicle and led to the design of the slosh baffle which reduces structural weight and provides propellant damping.

Mr. Horn has been with NASA since the Saturn and Apollo program inception prior to 1960. Since 1939 he has been engaged in missile and vehicle control systems research and development as a scientist, division chief, and assistant laboratory director. He assumed his present position in May 1969. He received an M.S. degree in Engineering from the Technical University of Darmstadt, Germany in 1938, came to Fort Bliss, Texas with the original von Braun team in 1946, and received the NASA Exceptional Scientific Achievement Medal in 1966.



Hosenthien, Hans H., Chief, R&D Analysis Office, S&E-ASTR-A

As an original member of the nation's first missile and rocket research team, Mr. Hosenthien has participated meritoriously in a long line of successful space programs including the Apollo program. As former Chief of the Flight Dynamics Branch, Astrionics Laboratory, he was responsible for research and development in the field of flight dynamics of multistage space vehicles, including the investigation of integrated systems for the control and guidance of flight vehicles, specifications of control and guidance system characteristics to assure satisfactory response and stability, and system verification through simulations incorporating actual flight hardware. He has also been responsible for the conception, synthesis, and analysis of advanced control systems.

Mr. Hosenthien received his BS and MS degrees at Technical University, Berlin, Germany. His scientific achievements and contributions in aerospace research have spanned a period of nearly 25 years.

*Cowp*

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Houston, Charles E.	Chief, Data Reduction Branch Formerly, Chief, Measuring Section	MSFC

Mr. Houston has participated in the successful and expedient recovery of telemetry data from each SATURN I, IB, and V launched since December 1962. His contributions include MSFC and stage contractor procedures for analog and digital processing of telemetry data; the OMSF standard for SATURN instrument calibration; and the OMSF standard for post-flight processed telemetry data exchange. These standards are used by KSC and MSC as well as MSFC and are vital to the rapid post-flight evaluation of each launch. The efficient and accurate reduction and presentation of telemetry data which have resulted from Mr. Houston's efforts, have been essential to the continued successful Apollo launches. Mr. Houston has recently been advanced to Branch Chief, a position which requires supervision of meteorology, vibration, tracking and trajectory, and flight analysis, as well as his former speciality of telemetry measurement.

Huber, William G. Director, Advanced Systems Analysis Office

MSFC

Mr. Huber, with Messrs. Koelle, Williams, Barber, and Callaway, published two papers on the "Juno V Space Vehicle" in 1958. The concepts and analyses of the Juno V were some of the earliest steps leading to the Saturn vehicles. Mr. Huber continued his systems analysis of the mighty vehicles after the name was changed to Saturn, and presented his findings in several other publications and a movie. In addition to the work on the Saturn, he has also contributed to the solution of problems in the Manned Lunar Landing and to Lunar Transportation capabilities. His futuristic outlook is indicated by his ideas for Post-Saturn vehicles and a Lunar Base.

Mr. Huber earned his Bachelor of Science degree in general engineering at the University of Illinois in 1953. He began his aerospace engineering career while in the U.S. Air Force stationed at Wright-Patterson AFB, Ohio. During his tour of duty he attended the USAF Institute of Technology to gain his Master of Science degree in aeronautical engineering. He became a member of the research and development team in Huntsville in 1958 when he accepted a position with the Army Ballistic Missile Agency at Redstone Arsenal. When the Marshall Space Flight Center was established, Mr. Huber transferred to the new Center. Prior to appointment to the position he now holds he was the Acting Chief of the Systems Analysis and Program Planning Office, Advanced Systems Office, at the Center. Mr. Huber specializes in systems analysis and operations research, and is a member of the American Institute of Aeronautics and Astronautics.

Hueter, Hans H.

Deputy Director, Program Management

MSFC

As Deputy Director of Program Management (formerly Industrial Operations) since its inception in October 1963, Mr. Hueter is assigned responsibility for technical and administrative management of the Saturn Launch Vehicle, Engine Program, Apollo Applications Program, and the industrial efforts that support these programs.

This responsibility includes all actions to assure that the Saturn programs are successfully developed, manufactured, tested, delivered, launched, and their specified missions performed. During Mr. Hueter's years as Deputy Director, many significant achievements have been attained through his dynamic leadership. These accomplishments range from activation of field installations to the successful launching of flight vehicles. Mr. Hueter's 32 years of missile experience began in the development of liquid propellant rockets in Berlin, Germany, and as Chief of Test Engineering with the German War Department in Pennemuende, Germany. In 1945 Mr. Hueter was invited to join Dr. von Braun's team and was involved in the initial formation of what became the Army Redstone Missile Team.

Mr. Hueter has a B.S. degree in mechanical engineering from Technikum Mittweida, Germany. Among other awards, Mr. Hueter received the Army's highest civilian award, the Exceptional Civilian Service Decoration, in April 1959 at Redstone Arsenal, Alabama; he received an honorary Doctor of Science Degree from Adelphi College, Garden City, New York, in June 1959.

Huff, William A.

Deputy Chief, Program Engineering Office  
Saturn Program

MSFC

Mr. Huff served as Chief of the Systems Engineering Office, Saturn I/IB Program, from March 1967 until February 1969. His responsibilities included overall vehicle system design which required a thorough knowledge of aerospace programs and of advanced principles and concepts in systems engineering and program management.

Prior to this assignment, he served as the Deputy Chief of the Systems Engineering Office Saturn I/IB Program, from October 1963 to March 1967. In both of these assignments, Mr. Huff, through his outstanding leadership, supervisory capabilities, and professional competence, contributed greatly to the highly successful Saturn I/IB Program. Mr. Huff was awarded a Certificate of Merit from the Director, Marshall Space Flight Center, for his service and contributions to the outstanding achievement of the Saturn I/IB Program.

Mr. Huff began his missile/space career in February 1955 and has made significant contributions not only to the Saturn Program but to the NIKE, La Crosse, Pershing and the Sergeant Programs.

Mr. Huff, a native of Kentucky, received his Bachelor of Science Degree in Electrical Engineering from the Tennessee Polytechnic Institute. He is currently serving as the Deputy Chief, Program Engineering Office, Saturn Program.

Hughes, Pleasant M.      Acting Chief, Vehicle Systems Checkout Division      MSFC  
Quality and Reliability Assurance Laboratory, S&E

As a recognized expert in launch vehicle checkout, Mr. Hughes has made significant contributions to the Saturn program. His Division was responsible for developing the checkout plans and methods and for directing the checkout of all stages and GSE, both in MSFC and at contractor plants, to assure successful mission accomplishment. He made <sup>MANY</sup> ~~VERY~~ contributions to the development and application of automated checkout techniques, such as development of the digital event evaluator and the ATOLL computer program language.

After receiving his B. S. in Electrical Engineering from the University of Alabama in 1950, he was employed six years with the TVA. In 1956, Mr. Hughes joined ABMA and has performed outstandingly in vehicle checkout while progressing to his present position.

Huth, Chauncey W.

Director, Facilities Office

MSFC

As Director of Facilities, and just prior to this assignment, as Assistant to the Deputy Director, Administrative, Mr. Huth has been instrumental in the overall initial planning of the Saturn/Apollo Program. In these positions, Mr. Huth has had an across-the-board responsibility for policy formulation, management services, facilities, technical services, civil defense, agreements and working relationships with other Centers, NASA Headquarters, other Government Agencies, and major contractors; human resources, industrial operations, research and development, and AO budget reviews. As a member of top management of MSFC, Mr. Huth has had a definite influence in planning and charting the Center's course throughout the Saturn/Apollo Program.

Prior to coming to NASA, Mr. Huth held executive positions with Redstone Arsenal, during which time our initial test facilities were built leading to the Saturn/Apollo Program. Prior to WWII, he was Works Manager at Springfield Arsenal, Springfield, Mass., where he served and retired as a full Colonel. While there, he was awarded the Legion of Merit for reduction in costs and production of small arms weapons. Mr. Huth is a graduate of Georgia Institute of Technology with a BS Degree in Mechanical Engineering.

Isbell, Thomas P.

Chief, Vehicle Systems Division  
Astronautics Laboratory, S&E

MSFC

As a technical expert on propulsion and mechanical systems, Mr. Isbell has made significant contributions to the outstanding performance of the Saturn launch vehicle. As Deputy Chief of the Propulsion Division, Astronautics Laboratory, Science and Engineering (S&E), he was instrumental in simplifying S-IVB stage restart and also in solving the Saturn V POGO problem.

Mr. Isbell has been associated with launch vehicle propulsion and mechanical systems since 1951 when he became involved in the ballistic missile effort and later joined the Army Ballistic Missile Agency at Redstone Arsenal, Alabama. There, he made major contributions to the development of the Redstone and Jupiter missile propulsion systems, and participated in research programs advancing our knowledge in rocket and missile propulsion systems. Mr. Isbell joined the George C. Marshall Space Flight Center in 1960.



Ise, Rein

Project Manager, Apollo Telescope Mount

MSFC

Mr. Ise served as the Chief of Systems Engineering Office, Saturn IB/Centaur Program Office from June 1965 to July 1966. In this position, he provided technical and program management staff planning, coordination, and direction in Saturn IB/Centaur launch vehicle systems engineering. He directed design and engineering requirements planning in areas such as vehicle performance, design integration, flight test objectives, and configuration. He also performed initial program planning for the Apollo Applications Program, including contractor support requirements definition, mission planning, and conduct of payload integration studies.

Prior to this assignment, he served in key positions in the Saturn V Program as Staff Assistant to the Manager from November 1961 to September 1963 and Chief of Systems Engineering Office from October 1963 to January 1965. He is currently serving as Project Manager, Apollo Telescope Mount, Apollo Applications Program.

For his outstanding contributions to both the Saturn I/IB and Saturn V Programs, Mr. Ise has received a Certificate of Merit and also a Superior Achievement Award. Born in Tallinn, Estonia, he holds a BS in Mechanical Engineering from the Johns Hopkins University and an MS from Purdue University.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
ISE, REIN	PROJECT MANAGER APOLLO TELESCOPE MOUNT	APOLLO APPLICATIONS PROGRAM

Mr. Ise served as the Chief of Systems Engineering Office, Saturn IB/Centaur Program Office from June 1965 to July 1966. He is currently serving as Project Manager, Apollo Telescope Mount, Apollo Applications Program.

As the Chief of the Systems Engineering Office, Mr. Ise provided technical and program management staff planning, coordination, and direction in Saturn IB/Centaur launch vehicle systems engineering. He directed design and engineering requirements planning in areas such as vehicle performance, design integration, flight test objectives, and configuration. He also performed initial program planning for the Apollo Applications Program, including contractor support requirements definition, mission planning, and conduct of payload integration studies.

Prior to this assignment, he served in key positions in the Saturn V Program: Staff Assistant to the Manager from November 1961 to September 1963; Chief of Systems Engineering Office from October 1963 to January 1965; Acting Deputy Chief, Systems Engineering Office from January 1965 to June 1965. Mr. Ise was also Staff Assistant to the Saturn I Project Manager from May 1958 to November 1961.

(see reverse)

Mr. Ise has made many outstanding contributions to both the Saturn I/IB and Saturn V Programs. He has received a Certificate of Merit and also a Superior Achievement Award. Mr. Ise, born in Tallinn, Estonia, holds a BS in Mechanical Engineering from the Johns Hopkins University and an MS from Purdue University.

Jackson, Jim M.

Deputy Director, Program Planning Office

MSFC

Prior to October 1967, Mr. Jackson served as Project Manager of the Space Engine Project and Assistant Director, Engine Program Office, with program management responsibility to plan and direct large and complex research, development, and production engine projects for the various space vehicles in NASA's manned space flight program. He assisted the Program Manager in building one of MSFC's most skilled and well-integrated management teams, thus becoming a nationally known consultant in propulsion systems. Since that time he has served as Chief, Integration Support Branch, Apollo Application Program Office, responsible for planning, organizing, coordinating and directing the integration of scientific experiments for current proposed systems. Recently, he was named Deputy Director, Program Planning Office.

Mr. Jackson received his Bachelor of Science degree from Auburn University in 1950. He was first employed by the TVA in 1951 as an electrical engineer and maintained that position until he transferred to the Army Ballistic Missile Agency, Redstone Arsenal, Alabama, as a guided missile design engineer in 1956. In 1960 he received a Sustained Superior Performance Award for his work in connection with the research and development of the REDSTONE and JUPITER missiles.

Jacobi, Walter W.

Deputy Chief, Requirements  
Integration Division, Central  
Systems Engineering

MSFC

Mr. Jacobi directed, guided, and contributed personally to the development, procurement, and operational readiness of the mechanical ground support equipment and launch system of the Saturn V. As chief of the Systems Operations Branch he was responsible for system integration of launch site checkout requirements, systems launch availability analysis, and intercenter interface requirements integration. He was instrumental in redefining program requirements of configuration ground rules to assure an improved on time launch probability.

Mr. Jacobi received his engineering education at Engineering College, Ilmenau, Germany. He joined the Peenemuende Team in 1940 and came to the USA in 1945. He made major contributions in the system integration application to the Redstone, Jupiter, Explorer I, Mercury Redstone, and Saturn launch vehicles.

James, Lee B.

Manager, Saturn Program

Lee B. James is Manager of the Saturn Program at the Marshall Space Flight Center. Since coming to NASA he has occupied very key positions which include: Deputy Director of the Apollo Program in the Office of Manned Space Flight at NASA Headquarters in Washington; Manager of the highly successful Saturn I/IB Program at MSFC; and presently Manager of the Saturn Program at MSFC, a combination of the Saturn I/IB and Saturn V Programs.

He was among the first Army officers assigned in the field of guided missiles and space vehicles. Through his research and development assignments, he has made significant contributions not only to both Saturn Programs but to the Jupiter, Redstone and Pershing Programs.

Mr. James has twice received the NASA Exceptional Service Award for his outstanding contributions to the Saturn Launch Vehicle Program.

A native of Indiana, he holds a Bachelor of Science Degree in Military Engineering from the United States Military Academy at West Point, N. Y., and a Master of Science Degree in Guided Missiles and Aeronautics from the University of Southern California at Los Angeles.

Otha C. Jean

Technical Assistant to Director, Central  
Systems Engineering, S&E (Formerly  
Deputy Director, Aero-Astrodynamics  
Laboratory, S&E)

MSFC

During the development time of the Saturn launch vehicles, Mr. Jean headed first the Projects Office and then became Deputy Director of the Aero-Astrodynamics Laboratory. Mr. Jean contributed first substantially in the areas of trajectory analysis and mission planning. He was responsible for the Saturn launch vehicle sizing to accomplish the lunar mission using the lunar orbit mode. Later he has been coordinating and managing research and development assignments in the flight mechanics and guidance and control areas; he deserves special credit for resolving subsystem and system interfaces and finding optimum solutions. As chairman of the Flight Mechanics Panel and of the Dynamics and Control Working Group, he was very instrumental and successful in resolving and negotiating efficiently interface problems.

Mr. Jean received his B.S. in Mathematics and Physics from the Middle Tennessee University in 1951. He has been associated with the von Braun team since 1956, which in 1960 became the nucleus of the Marshall Space Flight Center.

Johnson, Everett W.

West Coast Resident Manager  
Engine Program Office  
Program Management

MSFC

Mr. Johnson has been associated with the Engine Program Office and MSFC since NASA's inception. He was the H-1 Resident Project Manager for 4 years prior to his assignment as the Rocketdyne, Canoga Park Resident Manager. Mr. Johnson has done an outstanding job in maintaining a firm control on the contractor's activities. His being at the contractor's site to personally witness and monitor the manufacture and testing of engines has been a real asset to MSFC and NASA. The image that he has maintained for MSFC and NASA is most commendable. He has been instrumental in effecting a highly technical management team to monitor engine manufacturing and testing activities. His assurance that engines are manufactured to a high quality level has been an important key to the successful Apollo Program.

Mr. Johnson's 15 years of experience in the propulsion field fit him well for his position.

He has received numerous letters of commendation and appreciation for his many contributions to the Apollo Program.

A native of Emporium, Pennsylvania, Mr. Johnson received his BS degree in Industrial Engineering from Pennsylvania State University in 1936.

Johnson, Melvin (NMN)

Deputy Manager, ATM Project  
Apollo Applications Program

MSFC

Mr. Johnson served as Chief of the Program Control Office, Saturn I/IB Program, from November 1963 until January 1969. He is currently Deputy Manager, ATM Project, Apollo Applications Program.

As Chief of the Saturn I/IB Program Control Office, he was directly responsible for assuring that all effort required to accomplish the total Saturn I/IB Program was planned and actually being accomplished in a coordinated, effective, and efficient manner. Mr. Johnson has independently performed all phases of his responsibilities in an outstanding manner. His complete understanding of the Saturn I/IB Program, his exceptional technical and managerial ability to plan the most efficient method of accomplishment, and his keen insight into the capability of personnel have assured that schedules are established and projects completed prior to assigned target dates. He was awarded a Certificate of Merit by the Director, MSFC, in January 1969, for his service and contribution to the outstanding achievements of the Saturn I/IB Program.

Prior to his employment with MSFC, Mr. Johnson occupied several key positions: Chief Programs Division, Army Ordnance Missile Command; Deputy Chief, Manufacturing Division, Ordnance Ammunition Command.

A native of North Dakota, he holds a Bachelor of Science Degree in Electrical Engineering from North Dakota State College.



Johnson, William G. Dr.

Director  
Research Planning Office, S&F

MSFC

Dr. Johnson's early research was in the fields of cosmic ray, acoustical and upper atmospheric physics. Since joining NASA, he directed the development of three meteoroid detection satellites, flown on three of the Saturn 1 vehicles to test the hazards to spacecrafts from meteoroids and micrometeoroids in outer space. Prior to that he had been project scientist of Project Highwater also flown on the early Saturn vehicles. He has been closely connected with the research involved in support of the Saturn Program.

Dr. Johnson received his Doctorate from the University of North Carolina in 1955 in physics and mathematics. He was employed by Redstone Arsenal in 1959 as Assistant Chief Scientist and served briefly as Chief Scientist, Acting. Transferring to MSFC in 1961 he worked in the Space Science Laboratory as Chief of the Physics and Astrophysics Division. He moved to his present position in 1965. Among his professional recognitions and awards is included the NASA Exceptional Service Award.

NAME	POSITION	ORGANIZATION
Harry M. Johnstone, Jr.	Chief, Systems Test Branch	Test Division Astronautics Laboratory

Mr. Johnstone served as senior project engineer for Operations and Facilities of the Systems Test Division, Test Laboratory. In this capacity he was responsible for the direction of the planned scheduling, Logistics, of facilities for all Division Test Programs.

Mr. Johnstone received his BS degree in Aerospace Engineering from Auburn University, Auburn, Alabama in 1949. He has made significant contributions to System Static Testing both at the Army Ballistic Missile Agency and in his present position with NASA. Throughout the critical phase of the Saturn Testing Program, Mr. Johnstone has demonstrated his ability to organize and to select the proper individuals to perform as a competent team; and to obtain the best results from professional and non-professional personnel under his supervision.

Jonakin, Lynn (NMN)

Chief, Operations Support Staff  
Technical Services Office

MSFC

Mr. Lynn Jonakin has made many contributions to the technical support of the Saturn and Apollo programs, which include such examples as: put into effect a system of production reporting in order to provide adequate statistics for advance planning, which established a basis for more accurate projections; participation in negotiations of lease vehicle and many other contracts which resulted in lower costs; developed techniques to preclude possible organizational and functional trouble areas; planned and installed an improved bus service system through the Center complex, etc.

Mr. Jonakin graduated from Hickman High School, Hickman, Kentucky, in May 1924, and attended the University of Kentucky during 1924 and 1925. He served with the Army Corps of Engineers, 1934-1956, where he became the Chief of Cost Accounting Section, Office of Comptroller, and then transferred to Army Ballistic Missile Agency, Redstone Arsenal, Alabama, July 1956, as Budget Administrator. He was Chief of Program Coordination Office, Research and Development Operations, when he transferred to Marshall Space Flight Center in March 1962, and has served as Chief, Operations Support Staff, Technical Services Office, MSFC, until the present time.

Jones, Joseph M.

Chief, Media Branch  
Public Affairs Office

MSFC

As chief of the Media Branch in the Marshall Center's Public Affairs Office, Mr. Jones has done an outstanding job planning, organizing, and executing a broad program to fully inform the public on all aspects of the Saturn/Apollo program. In addition, he has made significant contributions to the successful operation of NASA news centers operated at other manned flight centers--KSC and MSC--during Apollo manned missions.

Mr. Jones has been associated with the Saturn/Apollo program since coming to NASA in 1960. Prior to that time he was a special assistant to the Chief, Public Information Office, Army Ordnance Missile Command, Huntsville, from March 1958 to April 1960. From May 1956 to March 1958 he was an information specialist at Redstone Arsenal, Huntsville. Mr. Jones was born May 28, 1931, in Heflin, Alabama. He attended the Jacksonville, Alabama, State University and the University of Alabama, Montgomery Center. He earned his BA degree in 1960 at Athens College, Athens, Alabama.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
John H. Kastanakis	Chief, Data Acquisition Branch	Test Division Astronautics Laboratory

Mr. Kastanakis is the Chief of an organizational segment charged with the responsibility for the measuring and instrumentation required in the captive testing at MSFC of the F-1 and J-2 engines associated with the Apollo 11 launch vehicle. He planned, directed and coordinated assigned activities including the design, development, modification, systems integration, procurement, installation, checkout, operation and maintenance of the measurement and instrumentation systems to detect, measure, record and control performance characteristics and phenomena encountered in captive testing associated with the above mentioned related Apollo 11 activities. Mr. Kastanakis was the Government representative appointed by his Laboratory Director to monitor the design, procurement, fabrication, installation and checkout of the ground instrumentation system for the Beta Complex at Sacramento, California, used for captive testing all S-IVB flight stages. Mr. Kastanakis received his BS degree in Electrical Engineering from Georgia Institute of Technology, Atlanta, Georgia in 1948. He is a member of the following Professional Societies: NSPE, ASPE, IEEE, and is a registered professional engineer of the State of Alabama.

Katz, Harold K.

Deputy Director, Management Services Office      MSFC  
Administration & Technical Services

Mr. Katz plans and oversees many day to day operations supporting the Saturn Apollo effort with a variety of administrative management services. In the role of technical representative for contractual support in the field of occupational health, Mr. Katz has assured a healthful working environment for the Center's development activities and provided programs aimed at maintaining employee health. He was instrumental in the activation of the Mississippi Test Facility having temporarily filled a key administrative management position during the formulation of operating policies and procedures. Along with his everyday direction of support activity, Mr. Katz has provided the Center's liaison with the Army Missile Command in technical and administrative relationships necessary to the support of Saturn Apollo development.

Mr. Katz received his BS degree in Electrical Engineering from Union College, Schenectady, New York, in 1931. His career with the government began in 1935 and includes over 20 years in key administrative management positions. He entered the missile and space development field in 1956 as Executive Assistant to the Commanding General, Army Ballistic Missile Agency, and has been associated with Saturn Apollo and predecessor programs ever since.

King, Edgar

Assistant to Chief, Program Control Group

MSFC

Mr. King was a member of the Saturn V Program Office from its inception in November 1963. He was a Branch Chief in the Saturn V Program Control Office having the responsibility for planning the procurement of the various elements of the program. Mr. King received his formal education at the University of Alabama in the schools of Arts and Sciences and Law.

He was assigned to the Redstone and Jupiter Project Offices in the Army Ballistic Missile Agency where he had the responsibility to the Program Managers for the program control functions of planning, the budget, schedule, and procurement activities. He was recently assigned to the Program Planning Office of Program Development.

KINGSBURY, James E.

Deputy Director  
Astronautics Laboratory, S&E

MSFC

Mr. Kingsbury is professionally known for his expertise in the field of materials research and development. Under his guidance, programs such as Saturn I heat shield, and super-insulation for Saturn V have been developed. His vital contributions have resulted in the successful S-IC-T Assembly, S-IC-501 Roll-out, solutions to manufacturing problems of the S-II stage and solution to the S-IVB titanium bottle explosion.

Mr. Kingsbury received his BS degree in Electrical Engineering from Pennsylvania State University in 1951. He was employed by Redstone Arsenal in 1953. Since that time, he has progressed through various responsible positions with the Department of Army and NASA involving R&D in the areas of materials processing, non-destructive testing techniques, environmental simulation and material selection. He is presently serving as the Deputy Director, Astronautics Laboratory.



<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Kistler, Wallace G.	Chief, Launch Vehicle Systems Off.	R-SE

Mr. Kistler (1924-1966) was known for his pioneering efforts in failure effects and criticality analyses at MSFC, and was also a pioneer in systems integration. Early in 1959, he began work to identify and implement a systems integration methodology. That development paralleled "systems engineering/operations research" and "design integration/systems design" activities and techniques to provide logical analyses and supporting justifications for decisions.

Through Mr. Kistler's efforts, operations analysis became one of the most widely-used techniques in the Saturn-Apollo and Apollo Applications Programs; the analysis served as the baseline for establishing ground support equipments, maintenance studies, spare parts, and launch vehicle availabilities in terms of meeting launch windows. Under Mr. Kistler's leadership were such other activities as systems design test and checkout analysis, ground display requirements for mission operations, remote electromechanical systems verification and simulation models.

Through Mr. Kistler's persistence, the concept and many specific techniques of total systems integration reached acceptance and became important tools in the conduct of major MSFC/NASA programs.

Klauss, Ernst K.

Chief, Projects Office

MSFC

Quality and Reliability Assurance Laboratory, S&E

In successive positions as Laboratory Saturn Project Engineer and Chief of the Projects Office, Mr. Klauss has exerted great influence on the Saturn quality program. Of real merit is his ability to seize complex tasks and organize them into efficient operations. In particular, his overall direction and control of activities between the Laboratory and the contractor in performing the S-IC-1 and S-IC-2 checkouts and simultaneously training the contractor contributed to the efficient transfer of S-IC activity from MSFC to industry.

Mr. Klauss was born in Berlin, Germany, and his rocket experience extends back to Peenemuende. He came to the United States in 1945 at Fort Bliss, Texas, and has since continuously served with the rocket programs of the Army and NASA.

KRAMER, Fritz

Technical Assistant to Director  
Astronautics Laboratory, S&E

MSFC

As a top applied researcher, Mr. Kramer has made significant contributions to the development of new and novel test facilities for the testing of Saturn systems, sub-systems and components. Under his guidance, a means was devised of suppressing, to a safe level, sounds that are created by captive testing of boosters with thrusts up to and possibly above 7.5 million pounds.

Mr. Kramer was educated in Germany where he received his BS degree in Mechanical Engineering in 1924 and his MS degree in 1930. He has been associated with Rocketry since 1947 when he came to the United States from Germany. In 1952, he joined the Redstone Arsenal Guided Missile Development Division as an Aerodynamic Engineer. He has since served in responsible positions in ARGMA, ABMA, and finally in MSFC, during which time he has made major contributions in the development of test facilities for captive testing.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Kroeger, Hermann W.	Director, Products Office Science & Engineering	MSFC

Mr. Kroeger, nationally known in aerospace guidance, navigation, control, and electronics circles, served as Deputy Director of the Astrionics Laboratory of MSFC during 1960-1969, the years of Apollo development. He personally was assigned the responsibility for delivery to flight operations of the first Apollo -Saturn Instrument Unit, and resolved a number of difficult engineering, management, qualification test, and production problems which threatened the entire Apollo schedule. He was instrumental in recognizing the need for a systems engineering discipline in the Astrionics Laboratory and guided the formation of the Systems Engineering Organization which paved the way for the development of balanced vehicle systems of guidance, navigation, and control subsystems with automated checkout capabilities.

Mr. Kroeger received his BS Degree in mechanical engineering from the Institute of Applied Technology, Koethen, Germany, in 1932. Since his graduation he has been successfully an assistant professor for internal combustion engines, a test engineer and test pilot, and director of flight testing of rocket fighters and guided missiles at Peenemuende. He spent seven years as a test engineer at Wright Air Development Center, engaged in flight testing of bombing systems, optical amplifiers, and new bomb shapes. In November 1954, Mr. Kroeger joined the Technical Staff of the Army Ballistic Missile Agency.

Kroll, Gustav A.

Chief, Engineering Division,  
Astronautics Laboratory, S&E

MSFC

A technical expert on launch vehicle structural and mechanical design, Mr. Kroll has made many significant contributions to the outstanding performance of the recent Apollo 11 Moon Landing. As Chief of the Structures Division, he was responsible for the structural design, testing, and analyses to establish and maintain the structural integrity of the Saturn V launch vehicle.

Mr. Kroll received his B.S. degree in aeronautical engineering from College Lage, Lage, Germany in 1935. He was associated with the German V2 program at the German Rocket Research Center, Peenemuende, Germany, as Chief, Airframe Design Section. Mr. Kroll arrived in this country in 1945 as part of the original von Braun team and continued in airframe design by directing the designs of the Redstone and Jupiter family of vehicles under the responsibility of the U. S. Army. In 1960, he was transferred to MSFC as Chief, Structures Division and guided the design of the Saturn I, IB, and Saturn V. More recently, he has been assigned as Chief, Engineering Division encompassing all aspects of structural, mechanical, propulsion, vehicle assembly, and test facility design.

MSFC

Kromis, Andrew G.

Chief, Environmental Control and Life Support Systems Branch,  
Preliminary Design Office, Program Development

As a member of the S-IVB Workshop Study Group, Mr. Kromis contributed directly to the definition, design and management of this system during the conceptual and preliminary design phases. As technical assistant to the Chairman of the NASA/ Industry POGO Working Group, Mr. Kromis contributed significantly to the successful solution of the S-IC stage POGO oscillation problem first evidenced on AS-502. The incorporated solution successfully suppressed POGO oscillations on the S-IC stage and contributed to the successes of Apollo 8, 9, and 10.

Mr. Kromis received his B.S degree from Auburn University in 1956, M.S. from Southern Methodist University, Dallas, Texas in 1962, and has completed all course work for a PhD at the University of Alabama. He was employed by MSFC in 1962 and served as Chief, Powered Flight Section responsible for aerodynamics, vehicle dynamics and control, and flight trajectory optimization of advanced flight systems. Later he was assigned as staff technical specialist to the Chief, Advanced Studies Office, P&VE providing technical and management direction for studies of advanced vehicle concepts. He has been in his present position since March 1969, responsible for engineering analyses in the areas of nuclear analysis, environmental control subsystems, and human factors.

Kuers, Werner R.      Director (retired)  
                                 Manufacturing Engineering Laboratory, S&E      MSFC

Mr. Kuers was responsible for the manufacturing development of the first stage boosters for the Apollo lunar mission. In this position, he pulled together a team of engineers, technicians, and craftsmen who have worked together skillfully and efficiently in overcoming the many obstacles encountered in advancing the state-of-the-art of large and sophisticated booster manufacturing while at the same time maintaining critical schedules. His team has also served as consultants to all prime Apollo contractors in identifying and solving critical manufacturing development problems at the contractor plants.

Mr. Kuers received his M. S. degree in Mechanical Engineering in 1930 from the Technical University of Berlin, Berlin, Germany. He began his career in rocket research in 1942 at Peenemuende, Germany. He joined the Army rocket test team at Fort Bliss, Texas, in 1945. He moved with the team to Huntsville and worked with Army Ballistic Missile Agency. In 1960 he transferred to NASA and was appointed Deputy Director, Fabrication and Assembly Engineering Division. In 1962 he became Director, Manufacturing Engineering Laboratory and served in this capacity until his retirement in 1968.

KURTZ, H. FLETCHER, JR.      MANAGER, OPERATIONS OFFICE  
MISSION OPERATIONS

MSFC

Mr. Kurtz was instrumental in the planning and development of the Huntsville Operations Support Center, MSFC's operations supporting element to KSC for launch operations and MSC for flight operations. In addition, Mr. Kurtz planned and coordinated development of MSFC mission rule inputs to KSC and MSC and thereby stabilized and streamlined the management of this important Apollo effort. Throughout the Apollo program, Mr. Kurtz has made contributions relating to Range Safety which enhanced operational capability.

Mr. Kurtz received his MA degree in 1957 from the University of California. He has worked extensively in the fields of space vehicle analysis and tracking station networks since April 1958. Mr. Kurtz transferred to MSFC, Aero-Astroynamics Laboratory from ABMA in 1960. Since the establishment of the Mission Operations Office in 1965 Mr. Kurtz has been assigned as Manager, Operations Office, Mission Operations Office.



LaHatte, William F.

Manager, S-II Stage Project  
Saturn Program

MSFC.

Mr. LaHatte served as Deputy Manager, Saturn I/IB Program from June 1965 until February 1969, demonstrating his outstanding ability in planning and coordinating activities related to the highly successful Saturn I/IB Program. He is currently serving as the Manager, S-II Stage Project of the Saturn Program.

Prior to his assignment in the Saturn I/IB Program, Mr. LaHatte had 14 years of experience in the missile and space programs, including the NIKE HERCULES and the NIKE AJAX missiles. He also attended the Army's highest service school, the U. S. Army War College.

He was awarded the Legion of Merit in 1967, the Army Commendation Medal in 1965, the Air Force Commendation Medal in 1962, and the Headquarters 2nd Artillery Group Certificate of Achievement in 1957.

A native of Mississippi, he holds a Bachelor of Science Degree in Electrical Engineering from the Mississippi State College, Starkville, Mississippi, and a Master of Science Degree in Electrical Engineering from the John Hopkins University in Baltimore, Maryland.

Lamb, Carl D.

Deputy Chief, Systems Operations  
Branch, Astronautics Laboratory  
S&E

MSFC

Mr. Lamb provided technical direction of the design, development, and operation of MSFC ground support equipment (GSE) utilized for test, check-out, and launch of the Saturn vehicle.

Mr. Lamb received his B.S. degree from Auburn University in 1958. His career in development of GSE began as a support contractor to Army Ballistic Missile Agency on the Jupiter program in 1958. He was employed by Launch Operations Center (later Kennedy Space Center) in 1961 and transferred to MSFC in 1965.

Lamb, Vincent S.

Associate Chief Counsel  
Office of Chief Counsel

MSFC

Since 1962, during the major portion of the Apollo program, Mr. Lamb has been the attorney principally responsible for assistance in development and legal review of contracts and procurement procedures and regulations under which MSFC secured support for its in-house Saturn program efforts and secured Saturn stage and major component research and development from industry. He has been a principal liaison for the Center in the matters of GAO, Congressional and Headquarters involvement in Center procurement activities.

Mr. Lamb received a B.S. degree in engineering from the U.S.M.A. and LL.B. and LL.M. degrees from Harvard and Georgetown Law Schools, respectively-- and LL.M. with the Chetwood Medal for class salutatorian. His World War II service culminating in the rank of Colonel in the Army Air Forces, Mr. Lamb was afterward engaged in private practice of law, and acquired an expertise in procurement law in eight years service in the Navy Office of General Counsel.

LANDS, JOHN E.

CHIEF, ASSEMBLY ENGINEERING SUPPORT SECTION  
MANUFACTURING ENGINEERING LABORATORY, S&E

MSFC :

Mr. Lands was responsible for all phases of engineering planning and scheduling for the manufacture of the electrical/electronic networks, rocket engine modification, and flight propellant feed valves for Saturn launch vehicle. Under his direction the planning for the fabrication and assembly of the Saturn V Damper System was conducted from inception through assembly, field test, qualification testing and shipment to KSC. He supported various program offices as a Manufacturing Consultant on problems encountered during manufacturing and assembly of Saturn Hardware.

Mr. Lands received his Bachelor Science in Mechanical Engineering Degree from the University of South Carolina in 1954. In 1960 he joined NASA in Huntsville. Prior to his Civil Service employment, he worked for Chrysler Corporation Missile Division on the Redstone and Jupiter Missile Systems. He is a Registered Professional Engineer in the State of Alabama.

MSFC

Laue, Jay H.            Deputy Chief, Structures and Mechanics Division,  
Preliminary Design Office, Program Development

Mr. Laue contributed directly to the initial conceptual design layouts and preliminary systems analyses for the S-I, S-IC, S-II and S-IV stage systems, supplying vehicle systems comparison and analytical inputs to the Large Launch Vehicle Planning Group (Golovin Committee). He also performed and directed propulsion system/vehicle integration analyses contributing to the specifications and system definition of the F-1, J-2, and M-1 engine systems. Mr. Laue was appointed as the first chairman of the S-IVB Workshop Study Group, and in this capacity contributed significantly to the conceptual definition and analysis of the S-IVB Orbital Workshop.

Mr. Laue received his B.S. degree from the University of Notre Dame in 1955, and has completed all course work for an M.S. degree at the University of Alabama. He has been a member of MSFC and its organizational predecessor, the Army Ballistic Missile Agency, since 1956 when he was assigned here on active military duty. Since 1961 Mr. Laue has served as chief and/or deputy chief of various organization elements within the Advanced Studies Office, P&VE Laboratory, assuming his present position in March 1969. He was awarded a commendation for a U.S. Patent granted for invention of the Multi-Mission Module stage concept.

Ledford, Harold

Senior Systems Engineer, Analysis  
Group, Launch Vehicle Systems Office  
Central Systems Engineering, Science  
& Engineering

MSFC

Mr. Ledford began work at MSFC in 1959. In 1963, while in the Aero-Astrodynamic Laboratory, he was appointed Apollo Project Engineer. During this time, he was also Co-Secretary of the Apollo Flight Mechanics Panel, one of several key NASA Intercenter Panels. This panel was charged by the Apollo Program Manager to perform mission planning and resolve major mission oriented technical interface problems of integrating the Saturn Launch Vehicle with the Apollo mission objectives to carry out the Manned Lunar Landing. As Panel Co-Secretary and Apollo Project Engineer for the Aero-Astrodynamic Laboratory, Mr. Ledford was instrumental in resolving this complex mission planning and engineering for the Apollo Program.

Mr. Ledford received his BS degree in 1958, and his M.A. degree in 1959 in math and education from the Western Carolina College. In April of 1968, Mr. Ledford was appointed Senior Mission Engineer for the Saturn Launch Vehicles, a position he has since held in the Centers Systems Engineering Organization. His outstanding efforts and tireless resolution of complex integration and interface problems has contributed very significantly to the Apollo Program success.

Lee, Thomas J.

Manager, KSC Resident Office  
Saturn Program

MSFC

Mr. Lee is Manager of the Saturn Program Resident Office at Kennedy Space Center. He served as Chief of the Saturn I/IB Resident Office at KSC from September 1965 to December 1968. As a result of the merger of the Saturn I/IB and Saturn V Programs, he assumed additional responsibility for management of the total Saturn function as Manager of the Saturn KSC Resident Office. This position carries the full responsibility of acting for the Program Manager in making all decisions associated with or related to the Saturn Program launch vehicles at KSC. He has been remarkably effective in managing these activities thus contributing significantly to the successful programs.

He has 11 years experience in the missile and space industry including the positions of Resident Project Manager of the Pegasus Project, Saturn I/IB Program Office with duty station at Bladensburg, Maryland; and NASA Representative at General Dynamics in San Diego; California.

A native of Wedowee, Alabama, he holds a Bachelor of Science Degree in Aeronautical Engineering from the University of Alabama. He has received two Superior Achievement Awards. He was awarded a Certificate of Merit from the Director, Marshall Space Flight Center, in January 1969, for his service and contributions to the outstanding achievements of the Saturn I/IB Program.

NAME

Lindberg, James P.

POSITION

Chief, Mission Planning and Analysis Division

ORGANIZATION

MSFC

As Chief of the Mission Planning Division, Mr. Lindberg directs a staff in the performance of mission and systems studies for space vehicles and spacecraft. In this role, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. Accordingly, he enabled the Saturn postflight performance evaluation and malfunction analyses to be completed within sixty days and the essential design improvements to be accomplished before each succeeding manned flight. He is directly responsible for the establishment of a documented flight evaluation plan for the Saturns IB and V vehicles, the development of a computerized impact analyses program of the Saturn flights from the generation of raw data to the final flight analysis, and the development of an automatic telemetry program which provides a quick-look review of the flight telemetry. These analyses have resulted in over twenty-five unexpected design modifications. The major ones include the implementation of SIV-B guidance and propulsion system integration fixes which eliminated the guidance errors that resulted from the basic design of the propellant utilization system - one such fix is a tolerance setting which senses the guidance staging and prevents the early staging due to stage oscillations from the thrust, an SIV-B stage non-propulsive vent system which corrects excessive orbital attitude perturbations, the determination of the spacecraft propulsion system impingement on the separated SIV-B instrument unit, the establishment of the first manned flight automatic abort sensor limit settings, and the elimination of the failure of the differential pressure measurement of the angle-of-attack and attitude response of the Emergency Detection System - an automatic-manual on-board network of sensing devices to alert the astronauts of flight malfunctions and enable them to abort or use alternate flight plans.

Mr. Lindberg has been with NASA since the Saturn and Apollo program inception prior to 1960. Since 1954 he has been engaged in missile and vehicle flight test evaluations as a section, branch, and division chief. In 1951, he received a B.S. in Aeronautical Engineering from the University of Minnesota.



Ling, Edwin R.

Deputy Chief Counsel  
Office of Chief Counsel

MSFC

Mr. Ling joined the "von Braun team" in 1962, serving as the chief legal advisor in the negotiation of the major MSFC Apollo contracts. In 1963, he became Satellite Counsel for the Michoud Assembly Facility and the Mississippi Test Facility, manufacturing and static testing centers for Saturn vehicle stages. Returning to Huntsville, Alabama, in 1967 he became the MSFC Deputy Chief Counsel. His duties have consisted of advising the Center Director and his principal staff on all matters of law and legal policy and in providing professional guidance to the attorneys and administrative personnel in the Office of Chief Counsel to the end that the Center might be provided with complete legal and general counseling services.

A native of Wichita, Kansas, Mr. Ling graduated in 1954 with a Phi Beta Kappa key and cum laude from Grinnell College in Iowa. He received his Juris Doctor degree in 1957 from the New York University School of Law, where he was a Root-Tilden scholar. Prior to joining NASA, he worked in the Justice Department and with the Atomic Energy Commission. Mr. Ling is the author of publications appearing in professional journals, has received numerous honorary awards, and is cited in Who's Who in the West and Who's Who in Space.

Lochridge, Robert W.

Chief, Engineering and Design Group

MSFC

Programs and Resources Office

Quality and Reliability Assurance Laboratory, S&E

Mr. Lochridge brought to the Saturn program his significant electrical engineering talents acquired from his key roles extending back to the Redstone missile program. His vast knowledge of power and control networks encompassed missiles, GSE, and launch sites. He directed the design and installation of the Saturn I, IB, and IU MSFC checkout complexes. His conscientious effort was largely responsible for the successful transfer to and initial operation of the IU checkout station at the contractor's plant on an extremely tight schedule. He has developed several unique checkout station concepts, such as Terminal Distribution Racks which have enhanced the Saturn checkout process.

Mr. Lochridge received a B. S. in Electrical Engineering from Auburn University in 1949. After two years with the TVA, he came to Redstone Arsenal in 1951.

Lucas, Dr. William R.

Director, Program Development

MSFC

Dr. Lucas is known nationwide for his scientific achievements and contributions to rocketry in the field of materials technology. Under his capable direction, breakthroughs were made in the ablation concept of thermal protection for re-entering vehicles, and the development of a tool for evaluating the compatibility of engineering materials with liquid oxygen. Dr. Lucas has made other important contributions in the areas of cryogenics, lubricants, structural materials, handling techniques for toxic propellants, and adhesives. As Director, P&VE Laboratory, Dr. Lucas provided technical direction and expertise in structural, mechanical, propulsion, systems and materials design and development of the Saturn I, IB, and V,

Dr. Lucas received his Ph. D. from Vanderbilt University in 1952. Immediately thereafter he was employed by Redstone Arsenal as a chemist in the Guided Missile Development Division. Serving the Marshall Center since July 1960, he has progressed from a supervisory chemist of the Materials Division, P&VE Laboratory, to Director, P&VE Laboratory, and recently to his present position as Director, Program Development. He has authored many publications on Metallurgy and Materials Engineering. For his outstanding contribution, he has been honored with such distinguished awards as the Herman Oberth Award and the NASA Medal for Exceptional Scientific Achievement.

Lucero, William H.

Special Assistant to Chief  
Apollo Applications Systems Office  
Central Systems Engineering

MSFC

&

Special Assistant to Director  
Central Systems Engineering for  
Inter Center Panel Activities

As MSFC's Executive Secretariat to the Apollo Panel Review Board, Mr. Lucero helped establish and contribute directly to the difficult and complex task of defining and controlling the technical interfaces between major elements of the Apollo space vehicle and associated launch equipment under the varied responsibilities of the three prime NASA development Centers.

Mr. Lucero graduated from the Massachusetts Institute of Technology in 1947. Prior to joining NASA in 1961, his introduction to space technology was with the Navy in nuclear special weapons and the Army Ballistics Missile Agency as a project engineer on the Pershing Missile System. His early work with NASA included defining and establishing the ground test program for verification of highly sophisticated components in the Emergency Detection System in the Saturn Launch Vehicle. His recent former position as Chief, Support Systems Office, provided important and valuable contributions to the Saturn systems engineering activities.

NAME	POSITION	ORGANIZATION
Joseph T. Lundy	Chief, Structural Mechanics Test Branch	Test Division Aeronautics Laboratory

Mr. Lundy is a top technical expert on launch vehicle engines and has made significant contributions to the outstanding performance of the Saturn Launch Vehicle. As Chief of the Booster Engine Test Branch, Test Laboratory, he was responsible for the F-1 Engine system testing of the S-1C stage.

Mr. Lundy received his BS degree in Mechanical Engineering from the University of Kansas in 1955. In 1956, he joined the Army Ballistic Missile Agency at Huntsville, and later was transferred to MSFC in 1960.

Mack, Jerry L.

Assistant Director, Central Systems Engineering  
(formerly, Chief, Systems Engineering Office, ASTR. Lab )

Mr. Mack directed and contributed personally to the advanced research, design and development of the Saturn launch vehicle flight guidance & control systems and associated automated checkout and launch systems, which has repeatedly demonstrated extreme reliability. In particular, he was responsible for the analysis and design of guidance and control schemes involving complex flight mechanics theory and for the implementation of on-board digital computer programs requiring the development of computational and error correcting techniques that has been proven of utmost importance in the Saturn launch program.

Mr. Mack attended Springhill College at Mobile, Alabama and received his BS in Engineering Physics from Auburn University, Auburn, Ala., in 1951. Since 1952 he has been associated with launch vehicle research and development with the US Army and NASA at Huntsville, Alabama where he has made major contributions in various areas of Astrionics systems on the Saturn family of multi-stage launch vehicles.

Malone, Lee B.

Deputy Chief, Communications and  
Tracking Branch, Astrionics  
Laboratory, S&E

MSFC

Mr. Malone initiated and directed development of the Secure Range Safety System for the Saturn IB and Saturn V programs, providing a highly secure and reliable means of destroying any uncontrollable launch vehicle. Through Mr. Malone's direction and personal participation, a system which would assure reliable execution of an authorized destruct command while rejecting commands originating from clandestine or radio-noise sources was developed and environmentally qualified for manned flight. Mr. Malone also directed development of the Instrument Unit Command System for Saturn.

Mr. Malone has performed design and development work in command and communications equipment in support of numerous programs since 1951. During this period, he has directed and participated in the design, development and qualification of radio command systems and components for the Redstone, Mercury, Jupiter, and Juno II programs. He also contributed significantly to the development of transmitters and receivers for several scientific satellites of the Explorer series.

Mandel, Carl H.      Chief, Guidance & Control Division, Astrionics Laboratory      MSFC

Mr. C. H. Mandel directed and contributed personally by his detailed knowledge and experience the development of the inertial sensor system from inception to the final checkout of the hardware for the Saturn-class vehicles. The stabilized platforms which furnished the guidance and control information for the Saturn I, IB, and V vehicles demonstrated in all flights the excellent performance expected with respect to accuracy and reliability. Under the most severe environmental conditions the inertial sensors of the stabilized platform yielded accuracies three to ten times better than any other sensor system available today. Mr. Mandel's contributions and devoted efforts to improve the system and its components were essential in obtaining these excellent results.

Mr. Mandel received his Electrical Engineering degree in 1934, and as early as 1935, began to work in close cooperation with Dr. von Braun's group at Kummersdorf and Peenemunde. He has worked continuously in the inertial reference field since that time. He came to the United States in 1946 and rejoined Dr. von Braun's group which was working for the U.S. Army Ordnance Corps at Fort Bliss, Texas. He transferred to Redstone Arsenal with that group in 1950, and has had a major role in development of the guidance and control systems for the family of U.S. Army missiles and Saturn launch vehicles that have been developed at Redstone Arsenal and MSFC.



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Marmann, Richard A.

Was

Chief, Weight Engineering Section, MSFC  
Astronautics Laboratory, S&E

Now Deputy Chief, Mission Definition &  
Development Division,  
Central Systems Engineering, S&E

Mr. Marmann, as Chief of the Weight Engineering Section, Astronautics Laboratory, S&E, was responsible for all mass data generation for Apollo vehicles at MSFC. In particular, his efforts in the area of weight control has provided weight visibility for all levels of management; thus optimum design and maximum performance was made available for utilization in Jupiter, Saturn I, IB and V Programs.

Mr. Marmann received his B.S. degree from Florence State University, Florence, Alabama, in 1953. His career in weight/systems engineering for space vehicles, missiles and aircraft spans 16 years. He has made major contributions in all phases of weight/systems engineering from empirical studies, through hardware development, to post-flight analyses and evaluation.

Marshall, Larry E.

ESE Sub-System Manager  
Vehicle GSE Project Office  
Saturn Program

MSFC

Mr. Marshall managed and contributed significantly to the overall technical program of the LVESE equipment design, development, manufacturing and testing operations. He was remarkably effective in coordinating efforts of contributing elements to consolidate and interpret technical plans or obtain necessary technical data. Through these efforts, the Project Manager was able to make sound decisions based on authoritative recommendations from Mr. Marshall.

Mr. Marshall is a native of Jackson, Mississippi and holds a BS Electrical Engineering degree from Mississippi State University.

Marshall, William R. Chief, Systems Layout & Integration Division

MSFC

As Project Manager of the S-II Stage Mr. Marshall provided immediate overall technical and management direction of the S-II Stage to technical elements within the Center and supporting contractors. He was directly responsible for the accomplishment of program requirements and provided major policy guidelines. He clarified the relationship of the particular project to the overall space vehicle mission and planned, directed, and reviewed project efforts.

Mr. Marshall received his Bachelor of Science degree from the University of Oklahoma in 1955. As a specialist in trajectory analysis and flight controls, he worked as Chief of the Systems Analysis Office - Redstone at White Sands Missile Range for four years before coming to the ABMA in 1960. At Redstone Arsenal he served as Chief of the Test Section for the Pershing missile. In 1962 he transferred to MSFC to work in the S-II Stage Project Office. Since then he has completed the requirements for and received his Master of Science degree in addition to his work in the Saturn program.

MARTIN, WILLIAM "K"

Chief, Air Operations Branch  
Transportation Division  
Technical Services Office

MSFC

Mr. William "K" Martin is a NASA pilot and has personally contributed to the planning and coordination for air transportation of NASA key personnel as well as congressional and other VIP visitors to NASA. He is an expert in the field of administrative aircraft and through his organization has provided safe and efficient transportation of NASA critical cargo and NASA travelers, necessary to achieve the Apollo Lunar Landing. It is widely recognized that administrative aircraft operations have been immensely improved under Mr. Martin's cognizance.

Mr. Martin attended Southwest Missouri State College prior to entering the Navy where he was commissioned an Ensign in 1944. He served with distinction as a fighter pilot, instructor, and operations officer, and attained the rank of Commander. Among his assignments was the Antarctic Expedition in 1946-47 under Admiral Richard E. Byrd when he flew the fifth C-57 from the Carrier U.S.S. Philippine Sea to Little America. Later, he served as Aide and Flag Pilot to Commander in Chief, Atlantic Fleet. Commander Martin was detailed to NASA/MSFC in 1964 to supervise the Air Operations and serve as a pilot.

Maurer, Paul H.      Chief, Projects Office  
                                 Manufacturing Engineering Laboratory, S&E      MSFC

Mr. Maurer was instrumental in organizing an industry-government team effort which was beneficial in resolving most of the major manufacturing problems that arose on the Saturn/Apollo program. He established a communication network between government and contractor organizations, and between contractors themselves, which provided for an open exchange of knowledges and experiences in manufacturing areas. This effort has been recognized by both industry leaders and NASA Headquarters personnel as being one of the most unique and beneficial relationships to have existed between a government agency and their contractors.

Mr. Maurer joined the Manufacturing Engineering Laboratory in September 1962, to accomplish the foregoing. Industrial experience has been in General Management of activities dependent principally on scientific and engineering efforts. A Registered Professional Engineer in the State of Michigan with Electrical Engineering his educational major at the Newark (N. J.) College of Engineering.

Maus, Hans H.

Director, Executive Staff

MSFC

Mr. Maus has been a principal advisor to the Center Director and member of the MSFC top management team throughout the Apollo Program. Under his direction, the Executive Staff functions as an extension of the Director's Office, furnishing vital support to the top level decision process. Involved in the development and manufacture of the Saturn vehicles from the early conceptual stages, Mr. Maus was responsible for developing and implementing new and advanced techniques in manufacturing methods, process automation, welding, assembly and tooling concepts. He was highly instrumental in the initial planning and implementation phases of the Saturn management system, and was intimately involved in establishing the Marshall Center role in the Apollo/Lunar Landing Program.

Mr. Maus received the M.S. degree in Mechanical Engineering from the Technical University of Darmstadt, Germany. His career in rocketry and space exploration spans twenty-seven years, during which he has held many positions of responsibility. From 1950 to 1961, he served as Director of the Fabrication and Assembly Engineering Laboratory at Redstone Arsenal as it phased through the development of the Hermes, Redstone and Jupiter, into early Saturn fabrication. Under his guidance, the laboratory became a part of MSFC in 1960. In 1962, he became director of the Central Planning Office, which was retitled Executive Staff in 1963. For his outstanding service, Mr. Maus holds the Exceptional Civilian Service Award, presented by the Secretary of the Army.

May, Ellery B.

Deputy Chief, Launch Vehicle Systems  
Office, Central Systems Engineering  
Science & Engineering

MSFC

Since 1966, Mr. May has been in the Systems Engineering Organization, Saturn Launch Vehicles Systems Office, where he has made his most significant contributions to the Apollo Program. Under his guidance, this office has provided the leadership and program management interface for the final preparations of integrating the Saturn Ground and Flight Hardware into the complex missions of Apollo 8, 9, 10, and 11. His outstanding leadership and resolution of schedule and technical problems have resulted in complete success of Saturn's support of the Apollo Program.

Mr. May received his B.S. degree from Auburn University in 1947. He joined the Center in 1951. While a member of Aero-Astrodynamic Laboratory, he was responsible for the Centers Saturn-Apollo Wind Tunnel Programs, becoming Chief of the Aerodynamics Design Branch in 1963.



McCool, Alexander A., Jr.

Chief, Systems Engineering/Projects  
Office, Astronautics Laboratory

MSFC

Mr. McCool has served as Chief of the Systems Engineering/Projects Office throughout the critical research and development phases of the Saturn V. He contributed immensely to the solution of those critical design problems that were termed "program stoppers". These included problems not only pertaining to the Saturn V stages, but LVGSE as well. Previous to this current assignment, Mr. McCool was Deputy to the Chief of the Propulsion Division, which had cognizance of the development of the H-1, F-1, and J-2 engines as well as propulsion, environmental, thermal, and mechanical systems for the Saturn V.

Mr. McCool holds a MS degree in engineering from Louisiana State University in 1951. He joined the von Braun team in 1954, and has contributed to the development of the Redstone, Jupiter, Juno, Pershing, and Saturn family of rockets.

McCrickard, T. L., Jr.

Deputy Chief, Systems Checkout Office

MSFC

Vehicle Systems Checkout Division

Quality and Reliability Assurance Laboratory, S&E

As a key leader in the management of systems test and checkout of the Saturn stages, Mr. McCrickard made major contributions to the overall assurance of safety, functional reliability, and design compatibility of flight hardware. As a highly active leader of the Modification and Validation Evaluation Team, he developed a system for verifying stage flightworthiness prior to launch after all changes and modifications have been worked that greatly enhance confidence in the launch vehicle.

Mr. McCrickard received his B. S. in Electrical and Mechanical Engineering from Virginia Polytechnic Institute in 1954. Since his appointment with MSFC in 1964, he has made many significant contributions in the field of systems checkout and has excelled in the area of configuration management.

McCulloch, James C.

Manager, S-IVB Stage Project Office  
Saturn Program

MSFC

Mr. McCulloch is Manager of the S-IVB Stage Project Office, Saturn Program, responsible for defining, directing, reviewing, and evaluating the composite MSFC/industry performance through the phases of planning, coordination, and contractor direction in the design, development, integration, production, testing, delivery, and prelaunch checkout of the stage and associated equipment. His outstanding achievements as the S-IVB Stage Manager include directing the successful ground test program in which S-IVB flight systems were integrated for the first time into an active propulsion stage and checked out by automatic GSE; directing the extensive component qualification test program; developing and establishing the facility requirements for the stage program.

Mr. McCulloch received the NASA Exceptional Service Medal in January 1969. He was also awarded a Certificate of Merit by the Director, Marshall Space Flight Center, in January 1969 for his service and contribution to the outstanding achievement of the Saturn I/IB Program. Mr. McCulloch has been with the Apollo team since 1961.

A native of Huntsville, Alabama, he holds a BS in Mechanical Engineering from Auburn University and a Master of Business Administration Degree from Xavier University.

McDonough, Dr. George F.

Chief, Apollo Applications Systems  
Office, Central Systems Engineering  
Science & Engineering

MSFC

Dr. McDonough directed the development of the complex, theoretical fluid and structural dynamic analyses of the Saturn V vehicle; contributed to the design of the Saturn V Dynamic Test Vehicle, test stand and test equipment; and directed the analysis of test data required to verify and modify the equations for dynamic response analysis of large, complex launch vehicles. His work contributed directly to calculation of vehicle interaction response required for the design of the guidance schemes and control systems of the Saturn V vehicle.

Dr. McDonough received his B.S. degree in civil engineering from Marquette University in 1953, his M.S. in Applied Mechanics in 1956, and his Ph. D. in 1959, from the University of Illinois. Dr. McDonough worked as a university professor, a consultant to the RAND Corporation, and structural dynamicist before joining MSFC in 1963. As an engineer in the Aero-Astroynamics Laboratory, he worked on fluid and structural dynamics problems of launch vehicles until his present assignment in July 1968.

MCKINNEY, WILLIAM J.

Chief, Contract Management      Marshall Space Flight Center  
Branch  
Purchasing Office  
Administration & Technical Services

Mr. McKinney, a designated Contracting Officer and Branch Chief, plans and directs procurement activities relative to the complex, long-term research, design, and development of the most highly specialized equipment and material for flight vehicle hardware - ground support equipment - tooling and fixtures to support MSFC's development of advanced space vehicles.

Mr. McKinney studied Business Administration at Northwestern University. He started his career in procurement as a Buyer with Fairbanks, Morse and Company, Chicago, Illinois. After serving as a Procurement Specialist with the United States Navy, he was employed by the State of Illinois as the State Purchasing Agent with responsibility for reorganizing and supervising the State Purchasing Department. In April of 1961, he was employed by the Marshall Space Flight Center Procurement and Contracts Office as a Contract Negotiator. He was designated a Contracting Officer and Branch Chief in 1962 with responsibility for management, direction and administration of complex Research and Development Contracts.

McMinn, Travis J.

S-II Project Engineer

MSFC

Projects Office

Quality and Reliability Assurance Laboratory, S&E

Mr. McMinn has been a significant contributor to the successful performance of the S-II stage. As Laboratory Project Engineer, he has monitored and coordinated most aspects of the quality and reliability effort which is particularly noteworthy since he took the job over when the stage was recognized as being well behind schedule from a development and manufacturing standpoint and therefore requiring intensive attention. His methodic approach and untiring energy enabled him to isolate many weak areas in the contractor's effort in Seal Beach, MTF, and KSC and to initiate corrective steps, such as the introduction of special problem tracking systems, the streamlining of checkout methods and techniques in the different locations, the establishment of functional tests of components prior to installation into the next higher assembly, and the implementation of the Quality Maintenance Program.

Mr. McMinn joined the MSFC team in 1955 and received a B. S. in Physics from Athens College in 1961.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
McNair, Lewis L.	Chief, Systems Safety	Safety Office

Mr. McNair is Chief, System Safety in the Safety Office at MSFC. Serves as the principal authority and advisor to the Center Safety Director on all system safety efforts and provides for a comprehensive and integrated center wide system safety program. Acts as the focal point for continuous review and evaluation of system safety activities at all levels throughout the Center and at all MSFC off-site activities. Insures the system safety requirements are inherent in MSFC programs and activities from system conception to mission completion. Reviews and insures execution of a Center System Safety Program through membership on panels, committees and working groups, etc. He establishes and maintains a functional interface with MSF/NAASA Safety Groups and Contractor Safety personnel in the conduct of the MSF Safety Program. Prior to this position, Mr. McNair was Chief, Projects Office, for Aero-Astrodynamic Laboratory. Included within his responsibility and authority was overall technical systems integration and management for Apollo in the areas of flight mechanics, mission planning, dynamics, aerodynamics, control, guidance and flight environment. Served as Co-Chairman of Panel for Integration and Coordination of Interfaces of above areas for launch vehicle and spacecraft. Mr. McNair has received a number of achievement awards during his work on the Apollo Program.

Mr. McNair received his B.S. degree in Aeronautical Engineering from the University of Georgia in 1956. Mr. McNair was an instructor at the University of Georgia prior to joining the Apollo Team.

Meyers, Charles H.

Deputy Manager, S-IVB Stage  
Project, Saturn Program

MSFC

Mr. Meyers' outstanding performance as Chief of the S-IVB Stage Project Engineering Branch from October 1963 to April 1968 has contributed significantly to the success of the Saturn IB and V Launch Vehicles. He expertly guided the efforts of a project engineering groups in the determination, control and coordination of design engineering requirements pertaining to the S-IVB Stage and interface with other stages of the Saturn IB and V Launch Vehicles. His initiative and devotion to duty resulted in the success of the S-IVB Stage. Mr. Meyers has been associated with the Apollo program since November 1963.

Mr. Meyers, a native of Washburn, North Dakota holds a BS in Mechanical Engineering from the University of Michigan. He received a Superior Achievement Award in November 1966 for his efforts on the S-IVB Stage.



<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Milner, Robert W.	Chief, Flight Design Section, (Chief, Instrument Unit ESE Section, ES Branch)	S&E-ASTR-EB Electrical Division

Mr. Milner has participated in design concepts for Ground Support Equipment for launch vehicles since 1951. He has successfully carried out these designs in such programs as Redstone, Jupiter, Mercury and Pershing.

Mr. Milner was charged with the responsibility of establishing the checkout and launch control equipment design for the Instrument Unit of the Apollo Vehicles. Through continuous dedication to his responsibility, beginning with Saturn I, he established working relationships with all the Center's technical elements involved in I.U. design, fabrication, checkout and launch activities. These contacts, together with his concern for the overall system requirements assured the Center of an I.U. ESE system adequate to meet the demands of the more advanced Apollo Vehicles, the Saturn IB and V.

Mr. Milner's technical expertise was significant in the execution of the contract for layout, design, fabrication, installation and checkout of the I.U. ESE for Saturn IB and V.

~~The successful operation of the I.U. ESE on the Saturn Vehicles is evidence of his vital contributions to the Apollo Program.~~

NAME

POSITION

ORGANIZATION

Mink, Harold J.                    Deputy Chief, Vehicle Dynamics Branch                    S&E-ASTR-SD

Mr. Harold Mink has made important contributions to G&C system design of the Saturn and earlier vehicles. He directed the system design of the Saturn V powered flight control system, being instrumental in establishing the fact that load relief control was not required. His contributions date back to guidance system gain selection for the Jupiter weapons system.

Mr. Mink received his BS in chemistry and mathematics from Florence State College in 1949. He has done graduate work in physics, engineering, and mathematics at the University of Alabama. He was employed by the Ordnance Missile Lab in 1954, transferred to ABMA in 1956, and then transferred to MSFC in 1960. His position prior to becoming Deputy Chief of Vehicle Dynamics Branch was Chief, Control Dynamics Section I.

Mintz, Edward S.

Engine Project Engineer

MSFC

Quality and Reliability Assurance Laboratory, S&E

As Laboratory Engine Project Engineer, Mr. Mintz's engineering experience and knowledge have bolstered the quality and reliability efforts on all Saturn engine programs. His methodical and practical approach have repeatedly led to innovations in the program which provided for improved visibility and therefore for timely corrective action. The inauguration of a program to periodically bring engines into MSFC for tear down inspection is just one example where problems were revealed early enough to be corrected without serious program impact where otherwise crippling failures could have occurred.

Mr. Mintz, a 1952 B. S. Mechanical Engineering graduate of Auburn University, served seven years in the Army rocket program. Before assuming his present position in 1963, he performed for three years as RL-10 Engine Project Manager.

Mohlere, Edward D.

Director, University Affairs

MSFC

Joining NASA at the Marshall Space Flight Center in 1966 after a long and distinguished Army career, Colonel Mohlere became Assistant to the Deputy Director, Technical, with significant responsibilities in the top level decision making process. For six months in 1967 he served as Deputy Director of the S-II Special Task Team charged with major management and technical responsibilities in on-site resolution of serious, program-impacting and widely diversified problems at Seal Beach, California. Subsequently, in late 1967 he embarked on a similar venture for seven months at Downey, California, in connection with the Command and Service Module, functioning as Deputy to the Director, Apollo Special Task Team. These task team efforts were highly significant in promoting timely accomplishment of Apollo mission objectives, thus paving the way for the lunar landing.

Colonel Mohlere earned a Master of Science Degree from MIT in 1941 and a Master of Arts Degree in 1961 from George Washington University. He holds a number of decorations from the U.S. and foreign governments including the Legion of Merit with Oak Leaf Cluster.

Montgomery, Brian O.

Manager, MSFC Resident Office at KSC

MSFC

Brian O. Montgomery, Manager of the Marshall Space Flight Center Resident Office at Kennedy Space Center, Florida, has been involved in the Apollo/Saturn Program since his appointment to that position in 1964. He has made valuable contributions to the program by directing the efforts of MSFC resident and temporary duty personnel for coordinating and supporting the MSFC launch vehicle program and related activities at KSC. He represents MSFC on both technical and business functions of project management and other operational interfaces between MSFC and KSC.

Mr. Montgomery has been the focal point for formulating and implementing MSFC/KSC intercenter agreements, and sub-agreements to define center interfaces and promote smooth transition of activities between the design center and launch operations center. He has displayed outstanding leadership in guiding and managing the Resident Office, molding it into a decision-making group which has continuously assumed more responsibilities in making real time on-site decisions to facilitate accurate configuration management, provide visibility of design specification intent and conformance, to expedite resolution of problems and to assure timely and adequate cross center support.

He has demonstrated a perceptive overview of activities at KSC in which MSFC has an interest, such as long range planning for evolving new programs, technology utilization, public affairs, etc., so that incipient problems can be identified and resolved expeditiously.

His dedicated personal contribution in each of these areas has brought beneficial recognition to NASA by civic, legislative, and industrial leaders.

Moody, Jewel W.

Chief, Reliability, Quality  
and Safety Office, Saturn Program

MSFC

Mr. Moody is Chief of the Saturn Program Reliability, Quality and Safety Office at Marshall Space Flight Center. His assignment entails providing technical and program functional management, planning, directing, and coordination through a number of program and project offices for the overall vehicle quality, qualification, safety, and reliability requirements. His outstanding ability to plan and coordinate activities has proven invaluable to the Apollo Program.

Mr. Moody, a native of Bogalusa, Louisiana, began his career in rocketry 17 years ago. His first assignment was as physicist with ABMA. He joined the Dr. von Braun team in July 1952 in the reliability and quality area. Since that time, he has held various positions in this field and became Chief of the Saturn V Reliability and Quality Office in 1964. He was awarded a Certificate of Appreciation (ABMA) and a Sustained Superior Performance Award (MSFC). Among his accomplishments, a paper on "Transistors Airborne Power Supplies" was published in the Electrical Manufacturing Magazine. Also, he delivered a speech on "Reliability of Solder Joints" to the American Ordnance Association.

Mr. Moody received a Bachelor of Science Degree in Physics from Southeastern Louisiana College.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
MOODY, JEWEL W.	CHIEF, RELIABILITY, QUALITY AND SAFETY OFFICE, SATURN PROGRAM	SATURN PROGRAM

Mr. Moody is Chief of the Saturn Program Reliability, Quality and Safety Office at Marshall Space Flight Center, Huntsville, Alabama. His assignment entails providing technical and program functional management, planning, directing, and coordination through a number of program and project offices for the overall vehicle, quality, qualification, safety, and reliability requirements. He is required to maintain extensive personal contacts with MSFC Laboratory Directors, other program and project engineers, and high level program managers of the various Saturn industrial contractors subcontractors as well as NASA Headquarters program manager officials. His technical competence and his outstanding ability to plan and coordinate activities have proven invaluable to the Apollo Program.

Mr. Moody held a key position in the Army Ballistic Missile Agency where he established and supervised the Pershing Weapon System Reliability Program with outstanding success.

Mr. Moody, a native of Bogalusa, Louisiana, began his career in rocketry 17 years ago. His first assignment was as physicist with ABMA. He joined the Dr. von Braun team in July 1952 in the reliability and quality area. Since that time, he has held

various positions in this field and became Chief of the Saturn V Reliability and Quality Office in 1964. He was awarded a Certificate of Appreciation (ABMA) and a Sustained Superior Performance Award (MSFC). Among his accomplishments, a paper on "Transistors Airborne Power Supplies" was published in the Electrical Manufacturing Magazine. Also, he delivered a speech on "Reliability of Solder Joints" to the American Ordnance Association.

Mr. Moody received a BS Degree in Physics from Southeastern Louisiana College.

MOORE, Fletcher Brooks

Director, Astrionics Laboratory  
Science and Engineering

MSFC

As a top technical expert on guidance and control, Mr. Moore has made significant contributions to the outstanding performance of the Saturn launch vehicle. In his former assignment as Chief, Guidance and Control Division, Astrionics Laboratory, he had responsibility for performing research and development in the areas of guidance and control, digital and analog computers, inertial sensors, electrical networks, instrumentation, and communication systems for the Saturn vehicle. He co-authored several papers on the Saturn vehicle including, "Saturn Ascending Phase Guidance and Control Techniques" and "Application of Redundancy in the Saturn V Guidance and Control System."

Mr. Moore received his BS degree in Electronic Engineering from Alabama Polytechnic Institute (now Auburn University) in March 1948 and his MS in Electronic Engineering from Georgia Institute of Technology in March 1949. He has been associated with launch vehicle guidance and control systems since he joined the "von Braun team" in 1952 as an Electronic Engineer. His exceptional managerial and technical competence in launch vehicle guidance and control systems contributed greatly to the successful Saturn program.

Mr. Moore has held the position of Director, Astrionics Laboratory, since April 1969.



Morea, Saverio F.

Deputy Manager, Engine Program Office  
Program Management

MSFC

Mr. Morea has been associated with the manned space flight effort since its official inception in July 1960. Since July 1966, he has served as the Deputy Program Manager, Engine Program Office. For 1½ years during this period, he also managed the J-2 Engine Project. From March 1962 until his deputy assignment he was the F-1 Engine Project Manager. However, Mr. Morea's initial responsibility of the F-1 Engine began in 1960 and involved all aspects of development through qualification of the engine. Of major significance is his leading role in the J-2 simplified engine program which has become an important adjunct to the Apollo Program.

Mr. Morea has received several letters of commendation and appreciation for his contributions to the Apollo Program and for his part in assuring the successful launches. As a young engineer of 23, he assumed managerial responsibilities and his outstanding increased technical and management capabilities have played a major role in NASA's prime objective of exploring outer space. His continuous contact with the contractor has assured a timely, economical, and efficient development and production of Apollo-Saturn rocket engines.

A native of New York City, Mr. Morea received his BS degree in Mechanical Engineering at City College of New York and has completed some graduate work at the University of Alabama.



Mrazek, Dr. William A. Associate Director for Engineering

MSFC

Dr. Mrazek was the Director of the Structures and Mechanics Laboratory of the Army Ballistic Missile Agency. The entire laboratory was transferred in 1960 to the National Aeronautics and Space Administration and renamed the Propulsion and Vehicle Engineering Laboratory. As Director of the laboratory, he supervised conceptual and preliminary design, overall vehicle design integration, structural and material R&D, and had management responsibility for propulsion systems development of the Jupiter, Pershing, Jupiter C, Juno I and II, Mercury-Redstone, Saturn I and Saturn V vehicles.

As the Assistant Director (Engineering), Industrial Operations, he reviewed and assured technical adequacy of program systems and subsystems for Saturn IB and V space vehicles by bringing to the attention of Program Managers and the Director, Industrial Operations, the potential and current problems affecting vehicle development.

Dr. Mrazek received his professional education at the Deutsche Technisch Hochschule in Bruenn. One of the members of the "von Braun team," he has served in positions of responsibility with such distinction that he has received six awards from the Army and NASA, as well as an honorary Doctor of Science degree from Auburn University.

MULLOY, Lawrence B.

Technical Assistant to  
Chief, Analytical Mechanics  
Division, Astronautics  
Laboratory  
S&E

MSFC

Well qualified in the areas of structural design and test associated with launch vehicle stages, Mr. Mulloy has made significant contributions to the outstanding success of the Saturn/Apollo Program. As Chairman of the Apollo 8 and Apollo 9 S-II Joint Structural Assessment Team, he was responsible for the resolution of structural deficiencies in the S-II stage. He was also Chairman of the Apollo Space Vehicle Structural Assessment Team.

Mr. Mulloy received his B.S. from Louisiana State University, Baton Rouge, Louisiana in 1960. He joined MSFC in 1960 and has contributed significantly to the successful development of the Apollo launch vehicle. Mr. Mulloy has received several letters of commendation and a NASA Sustained Superior Performance Award.

Murphy, James T. Associate Director for Management, Program Development MSFC

Mr. Murphy has served as The Deputy Manager for Management, Saturn V Program Office. In this highly responsible position he participated fully in the program management effort and accomplished a major share of all phases of management with special emphasis on: (1) the development and direction of all Saturn V activities relating to program management policies, procedures, working relationships, and management interfaces with contractors, NASA Headquarters, and other NASA Centers; (2) all management aspects of contract negotiation and administration, evaluation of contract proposals, review, coordination, and direction of activities of Propulsion Stage, Launch Vehicle GSE, and Instrument Unit Project Managers and Systems Engineering, Test, Reliability and Quality, and Program Control Managers.

Mr. Murphy attended the University of Utah, Salt Lake City, to earn his Bachelor of Science degree in 1947 and George Washington University, Washington D. C., to earn his Master of Business Administration degree in 1961.

A twenty-year veteran of the U.S. Air Force, Murphy began his military career in May 1941. Four years later, in 1945, he was honorably discharged. After attending the University of Utah and working with W. H. Bintz Company for a while, Murphy returned to active duty with the Air Force and accepted a regular commission. Assignments in many of the States, North Africa and Europe brought Murphy experience not only in management of information systems for aircraft but also in management of information systems for missile development, design, implementation and operation.

Murphy, a Lieutenant colonel at the time, retired from the Air Force in July 1965 and became Deputy Manager for Management of the Saturn V Program, Industrial Operations, at Marshall Center.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
MURPHY, JAMES T.	MSFC SAFETY DIRECTOR	MSFC

Mr. Murphy is Director of Safety for the Marshall Space Flight Center serving as principal authority and advisor to the Center Director on all safety matters. This encompasses the assurance of systems safety in launch vehicles and industrial and public safety at all MSFC locations.

Previously, Mr. Murphy served as Deputy Director for Management, Saturn V Program, from July 1965 to July 1968. In this position, Mr. Murphy directed, or behalf of the Program Manager, the integration of the many complex activities of program management, of contractors, and of research and development agencies to produce the Saturn V launch vehicle system, the product of an immense national undertaking that involved the efforts of hundreds of thousands of skilled workers. Within his responsibility was over-all direction of the management aspects of contract negotiation and administration, contract proposal evaluation and review, coordination with, and direction to the MSFC laboratories and to the stage projects and the functional managers of the Saturn V Program. Mr. Murphy contributed most significantly and outstandingly to the Saturn V successes.

Mr. Murphy joined the Marshall Space Flight Center in 1965 after 20 years of active duty with the U.S. Air Force. From 1961 to 1965, he served as Chief, Data Systems

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Division, Ballistics Systems Division, Air Force Systems Command. In this capacity, he directed the development, design, implementation, and operation of management information systems used in the Atlas, Titan, and Minuteman missile programs. The Ballistics Systems Division managed a capital investment of more than \$25 billion encompassing more than 100 major contractors.

Mr. Murphy holds an M. B. A. Degree from George Washington University, a B.S. Degree from the University of Utah, and is the recipient of outstanding achievement individual and group awards.

Myers, Myron L.

Chief, S-IC Branch  
Test and Quality Evaluation Office,  
MTF, PM

MSFC/MTF

Mr. Myers, as Chief of the S-IC Stage Branch, has contributed materially in assuring that the test and checkout program for this stage was developed and implemented in a manner to satisfy the acceptance requirements. He has performed in a manner resulting in the attainment of maximum efficiency in utilization of the resources of the stage contractor and the MTF service contractor. He has been exceptionally successful in securing compatibility of program, resources and acceptance requirements.

Mr. Myers received his B. S. in Civil Engineering from Washington State University, Pullman, Washington, in 1952, and later attended Catholic University, Washington, D.C. Before coming to the MTF, Mr. Myers was employed at MSFC, Huntsville, Alabama. There he managed construction of facilities projects for S-IC manufacturing and test facilities center-wide. He has been particularly effective in managing the efforts of systems engineers in the field of instrumentation, controls, electrical and electronics, cryogenics, etc.

Napper, Frank E.

Director, Planning & Resources  
Office, S&E

MSFC

Mr. Napper has significantly contributed to the Saturn/Apollo Program through administration and control of fiscal, manpower and physical and logistics resources of the S&E Directorate. Under his direction a continuing analysis of the total S&E resources picture in terms of its significance, availability and use for the Saturn Program was accomplished. The coordination and integration required to assure that each S&E Laboratory's requirements were developed and allocations of resources made was a most complex task.

Mr. Napper retired from the U. S. Army Ordnance Corps in August 1962 as a Colonel after more than twenty years service. From 1953 to 1956 he was in charge of engineering firing tests for all Army missile systems at White Sands Missile Range, New Mexico. He joined MSFC in January 1964 as Chief of the R&DO Program Control Office and since March 1969 has been Director of the S&E Planning and Resources Office with responsibility for overall S&E resources management.



Naumann, Robert J. ~~Acting~~ Chief, Physics & Astrophysics Division  
Space Sciences Laboratory, S&E

MSFC

Mr. Naumann is a nationally recognized authority on the meteoroid environment and the hazard it presents to manned space vehicles. As Principle Investigator on the Pegasus Meteoroid Satellite, he obtained data which defined the meteoroid environment to which Apollo was designed. As Chief of the Meteoroid Physics Branch, he conducted research on hypervelocity impact phenomena, equation of state of metal at extreme pressures, and meteoroid astronomy that confirmed the adequacy of Apollo and future spacecraft design.

Mr. Naumann received his B.S. and M.S. in physics from the University of Alabama. He has recently completed his Ph.D. dissertation in Metallic Equations of State. He was employed by ABMA in 1957 and was transferred to MSFC with its creation in 1960. He served as Chief of the Meteoroid Physics Branch and later became Chief of the Physics and Astrophysics Division of Space Sciences Lab. He has authored many papers on satellite dynamics, the meteoroid environment, impact phenomena, and equations of state for metals.

Alice K. Neighbors - Technical Assistant, Guidance & Control Division - S&E-ASTR-GT

Mrs. Neighbors has applied extensive experience in astronics and flight mechanics to produce very substantial contributions to the Saturn programs. She was a member of a small group that produced the original design concept for the Saturn vehicle guidance and control system. She later played an active part in solving problems that were encountered in the spin axis bearings of the guidance system stabilization gyros. She also performed an important analysis of the ST124-M stabilized platform heating, which contributed to accurate prediction of inflight performance.

Mrs. Neighbors received her B. S. degree in Physics from Auburn University in 1954 and an M.S.E. from the University of Alabama in 1967. Her experience in the aerospace engineering area, in which she has become an expert, began in 1956 with work on the Redstone missile and has continued through development of the Jupiter and Pershing missiles, and the Saturn launch vehicle.

Neubert, Erich W.

Associate Deputy Director, Technical

MSFC

Mr. Neubert has been directly involved with the development and manufacture of the Saturn/Apollo vehicles from the early conceptual stages. He has been directly responsible for technical decisions impacting systems analysis and reliability. In 1960 he was advanced to the position of Associate Deputy Director for Research and Development of the Marshall Space Flight Center where he participates fully in top management technical decisions. In this position, Mr. Neubert assumed two additional roles which contributed heavily to the Saturn/Apollo Program. During one critical year (1964), he assumed complete project management of the S-II Stage of the Saturn V vehicle. This assignment included total technical and management direction of the vehicle stage development. From 1967 through 1968 he was in charge of the overall safety activities of the Center. In this capacity he organized and executed the total systems safety failure analysis of the first Saturn V vehicle and established the criteria and system for failure analysis of follow-on Saturn vehicles.

He received his Master of Science Degree in Electrical Engineering in 1936, and has been a pioneer in rocketry and space vehicles since 1939 as a prominent member of the von Braun team. He joined the Marshall Space Flight Center as a part of the mass transfer to NASA from DOD in 1960. In 1959, Mr. Neubert was awarded the Department of the Army Decoration for Exceptional Civilian Service.

*A.R.*

<u>Name</u>	<u>Position</u>	<u>Organization</u>
ERICH W. NEUBERT	ASSOCIATE DEPUTY DIRECTOR, TECHNICAL	MSFC

Mr. Neubert has been a major contributor to the Saturn/Apollo Program since the first Saturn vehicles were conceived as boosters for the Apollo Spaceship and Manned Lunar Landing. He received his Master of Science Degree in Electrical Engineering in 1936, and has been a pioneer in rocketry and space vehicles since 1939 as a prominent member of the von Braun team. He joined the Marshall Space Flight Center as a part of the mass transfer to NASA from the DOD in 1960, in the position of Director, Systems Analysis and Reliability.

Mr. Neubert has been directly involved with the development and manufacture of the Saturn/Apollo vehicles from the early conceptual stages. He has been directly responsible for technical decisions impacting systems analysis and reliability. In 1960 he was advanced to the position of Associate Deputy Director for Research and Development of the Marshall Space Flight Center where he participates fully in top management technical decisions.

In this position, Mr. Neubert assumed two additional roles which contributed heavily to the Saturn/Apollo Program. During one critical year (1964), he assumed complete

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project management of the S-II Stage of the Saturn V vehicle. This assignment included total technical and management of the vehicle stage development. From 1967 through 1968 he was in charge of the overall safety activities of the Center. In this capacity he organized and executed the total systems safety failure analysis of the first Saturn V vehicle and established the criteria and system for failure analysis of follow-on Saturn vehicles.

In 1959, Mr. Neubert was awarded the Department of the Army Decoration for Exceptional Civilian Service.

NEWBY, David H.

Director, Administration & Technical Services

MSFC

As Director, Administration and Technical Services, Mr. Newby is responsible for overall management and direction of the Center's institutional program, including budgeting and programming, financial management, facilities planning and design, plant engineering, supply and equipment management, transportation, communications, technical documentation, photography and graphics, purchasing, personnel, manpower, labor and community relations, training, management studies and research, ADP management, Congressional affairs, organization and policy, technology utilization, cost reduction, the patent program, and general housekeeping support. Prior to this position, Mr. Newby had comparable responsibility as Associate Deputy Director, Administration. He made a personal contribution to Apollo through his general management of the facilities program in support of Saturn V development, test, and checkout.

A veteran of 27 years with the government, Mr. Newby began his career in 1942 with the National Advisory Committee for Aeronautics at Langley Field, Virginia in the field of aeronautical instrumentation. He entered the field of rocketry as Chief of Test and Evaluation at Redstone Arsenal in 1951. In 1959 he joined the NASA staff and was instrumental in the transfer of the von Braun Team from the Army to NASA. In addition to his NASA position, Mr. Newby is an Associate Fellow in the American Institute of Aeronautics and Astronautics, a member of the American Association for Advancement of Science, a member of the American Society for Public Administration, past president of the Tennessee Valley Post of the American Ordnance Association, and the Rotary Club.

Noland, John P. Jr.

Associate Chief Counsel  
Office of Chief Counsel

MSFC

Mr. Noland has been primarily responsible for legal review of fiscal controls at the Marshall Space Flight Center. He has written numerous guidelines for program and staff offices on questions of obligational authority, availability of appropriations, and property acquisition and utilization. He has been a principal contributor to the Center's responses to GAO and Congressional inquiries in the area of fiscal administration. Other duties have included service as Government counsel before the NASA Board of Contract Appeals.

Mr. Noland received a Master's degree in Business Administration (University of Alabama, 1947) and a Master's degree in Law (New York University, 1952) before spending five years in the private practice of law. He entered Government service in 1959 and accepted his present position as Associate Chief Counsel at Marshall Space Flight Center in 1966. He is the author of publications appearing in professional journals and has received honorary awards for scholastic achievements, including a Fellowship at New York University.

Nowak, Max E.            Technical Assistant to Director  
                                 Manufacturing Engineering Laboratory, S&E            MSFC

Mr. Nowak directed the manufacturing assembly of all systems and sub-systems for the Saturn I, S-I, stages built at MSFC. He has served as project engineer and laboratory focal point for Apollo programs such as special nose cones for S-IB and S-IC, LH<sub>2</sub> flight experiments, and Saturn V retract and reconnect system. He participated in ad-hoc committees and served as consultant to contractors and other laboratories in areas of manufacturing and assembly technology.

Mr. Nowak received his B. S. degree from the Technical Institute of Leipzig, Germany in 1935. He began his work in rocketry in 1940 at the German Rocket Research Center in Puenemuende, Germany. He began working for the Army at Fort Bliss, Texas in 1945 in various areas of test stand installation, operation, and maintenance. He transferred to NASA in July 1960, and worked in many areas of manufacturing engineering.

Nuber, Robert J.

Chief, Stage Operations Office  
Michoud Assembly Facility, PM

MSFC

Mr. Nuber's performance in accomplishing his responsibilities for management of contractors engaged in design, fabrication, manufacture and testing of first stages of the Saturn vehicle has been a major contribution to the Apollo program. He served as Contracting Officer's Representative for all phases of the contractor's S-IC efforts with the exception of Quality Assurance responsibilities, directed the activities of a staff of project engineers engaged in managing and monitoring S-IC contractor performance and convened and chaired formal design review forums. He was recently assigned responsibility for both S-IB and S-IC stage operations.

Mr. Nuber has long been associated with aeronautical research and vehicle development. Before being assigned to Michoud in 1962, he was chief of experimental projects, vehicle development, NASA, at the Marshall Center. Previously, he was chief of experimental projects, missile development, Department of Army, at the Redstone Arsenal, Huntsville, and project engineer, aircraft research, National Advisory Committee for Aeronautics, Langley Field, Virginia.

Mr. Nuber received a Bachelor of Science degree in mechanical engineering from Louisiana State University in 1941, and has done graduate work at the University of Virginia and the University of Alabama. He is a member of the American Society of Mechanical Engineers.



Nunnelley, John R.

Chief, Chemistry Branch  
Astronautics Laboratory

MSFC

Mr. Nunnelley is one of the long time contributors to the science of rocketry having been engaged in this field for almost two decades. His disciplined investigations into chemical and physical properties, processes and analytical techniques appropriate to materials and propellants are well recognized by the vast majority of those responsible for the development of Saturn V. Particularly his studies and technical input in Lox impact sensitivity and in flammability have borne fruit at a critical moment in the Saturn V development cycle. \*In numerous instances, his theoretical acumen has been applied beneficially to the real world problems of Saturn V.

Mr. Nunnelley received his BA in Chemistry at Athens College in Athens, Alabama in 1943. In his quiet unassuming way, he has since made outstanding contributions to all the rocketry programs at Huntsville in the field of Chemistry.

O'Connor, Edmund F., Major General      Director, Program Management      MSFC

In his position as Director, Program Management (formerly Industrial Operations), General O'Connor has had management responsibility for the total design, development, manufacture, checkout, test, and delivery of Apollo's launch vehicles, Saturn IB and Saturn V. As primary focal point for Marshall's participation in the Apollo Program, he has coordinated the industrial effort and utilized the in-house technical effort required to ensure the quality and reliability of the hardware, and its successful performance of mission objectives. At the peak, this combination of effort encompassed the activities of approximately 120,000 individuals in government installations and contractor plants across the country. The excellent launch record of the Saturn vehicles attests to General O'Connor's outstanding contribution in directing this complex management structure.

Prior to his assignment with NASA in 1964 through a special arrangement with the Department of Defense, General O'Connor has held various top positions in research and development and weapons systems management during his Air Force career. He is a graduate of the United States Military Academy at West Point and the Air Force Institute of Technology, where he received the B.S. degree in aeronautical engineering. For his outstanding service to the nation, he has received numerous decorations and awards. He holds the Air Medal with seven Oak Leaf Clusters, the Distinguished Flying Cross, the NASA Medal for Outstanding Leadership, and NASA's Exceptional Service Medal.

Odom, James B.

Chief, Engineering and Test  
Operations Branch, Saturn Program

MSFC

As Chief of the Engineering and Test Operations Branch of the S-II Stage Project Office, Mr. Odom has demonstrated the highest degree of managerial ability in supervising his employees in the direction of the stage contractor to meet assigned flight mission objectives. His superior capabilities contributed significantly to the highly successful S-II Stage of the Saturn V Launch Vehicle.

Mr. Odom received his BSME from Auburn University in 1955. He began his government career in 1956 at Redstone Arsenal, Alabama. He came to the Saturn Program in December 1963.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Orr, James P.	Ch, Manufacturing Research & Technology Division Manufacturing Engineering Laboratory	MSFC

Mr. James P. Orr planned, directed, and coordinated activities of the Manufacturing Engineering Laboratory which was engaged in manufacturing research and technology development for the Saturn-Apollo launch vehicle system. Management and technical judgments were rendered on the basic sciences of material joining, forming, electronics, and manufacturing process control systems. He was primarily responsible for the centralization of all manufacturing research activities in a new manufacturing technology building (4711) at the Marshall Space Flight Center.

Mr. James P. Orr joined MSFC in January 1963 and in October 1963 became Chief of Manufacturing Research and Technology Division for the Manufacturing Engineering Laboratory. He studied mechanical engineering at the University of Utah. Before joining NASA Mr. Orr was associated with Ryan Aircraft, San Diego, California as Chief of Manufacturing Research and Development. He is a nationally recognized expert in the field of explosive forming and has extensive experience in quality control techniques.

Pace, Robert E., Jr.

Deputy Manager, Program Engineering  
& Integration Project, Apollo Appli-  
cations Project Office, PM

MSFC

In his position as Deputy Manager for the Program Engineering and Integration Project for Apollo Applications, Mr. Pace has responsibility for the management of the overall program engineering activities assigned to the Apollo Applications projects including the development, test, and integration efforts required to assure compatibility as an integrated system of flight elements and GSE for the Apollo Application Program. Prior to his appointment to this position, he served as Assistant Executive Secretary to the Administrator, NASA in Washington, D.C. from May 1968 to October 1968; also as Executive Assistant to the Director, Program Management (formerly Industrial Operations). He exercised the highest degree of executive and managerial ability in his relationships with all organizational levels throughout MSFC and NASA.

Mr. Pace has been associated with launch vehicles since 1956 when he joined the ABMA as an electrical engineer in the Launching and Handling Laboratory. A native of McEwen, Tennessee, he received his Bachelor of Science degree in electrical engineering at Tennessee Polytechnic Institute, Cookeville, Tennessee in 1949. In 1963, his Master of Science degree was awarded at the Massachusetts Institute of Technology on a Sloan Fellowship in industrial management. He has specialized in the field of organization management.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Pack, Pamela B.	Aerospace Engineer, Trajectory Section	MSFC

Mrs. Pack, as an aerospace engineer in the Trajectory Section of the Aero-Astrodynamic Laboratory, assimilates and configures data representing the vehicle characteristics for use in generating the Saturn operational trajectory and guidance presettings.

Generation of operational trajectories representing the Saturn V vehicle requires identification, definition, and coordination of considerable and necessary input data. These trajectories are used as baselines for all types of analyses from vehicle lift-off and spacecraft abort to tracking and communication. Mrs. Pack has given the utmost attention to the intricacies of input data management which has enabled the meaningful baselines to be provided. Additionally, output data management has also received her minute attention enabling the trajectory data to fulfill the requirements of three other NASA Centers and the major systems contractors. Her significant contributions are evidenced by the accuracy history of the operational trajectory.

Mrs. Pack has been associated with the Saturn and Apollo program since 1964, her first effort being applied to the Saturn V operational trajectory. She received an A. B. degree from Athens College in 1964 with a major in mathematics.

Palaoro, Hans R.

Technical Assistant to Director,  
Central Systems Engineering,  
formerly Assistant Dir., P&VE Lab.

MSFC

Mr. Palaoro supervised the preliminary design efforts of Saturn I and Saturn V launch vehicles. He made major contributions in systems development, supervised the development of in-flight systems, directed R&D programs advancing our knowledge in rocket and missile technology. He directed and contributed personally to the design, continuous improvement and finalization of Saturn mechanical systems, ground support and automatic checkout systems and operations.

He was MSFC chairman of the Saturn Mechanical Design Working Group, Chief of the Vehicle Systems Div., of P&VE Lab and has been responsible for systems integration of the overall launch vehicle and the resolution of mechanical systems development problems in-house with MSFC contractors and other NASA centers.

Mr. Palaoro received his BS degree in Mechanical Engineering in 1940 from the Engineering College, Ilmenau, Germany. He joined Dr. von Braun's team in 1940 and arrived with it in the United States in 1945. As Chief of the Preliminary Design Section in the Army Ballistic Missile Agency he was responsible for the early design of the Jupiter missile.

Palmer, Jack R.

Chief, Resources Control & Analysis Branch  
Financial Management Office, A&TS

MSFC

As Chief of the Manned Space Flight Section and subsequently the Research, Development and Facilities Section of Budget and Operations Branch, Mr. Palmer was directly involved in budgeting, programming, distributing, and controlling MSFC's Manned Space Flight Resources. Through his personal efforts Mr. Palmer has contributed significantly to effective accomplishment of the Apollo mission by assuring that financial resources were made available when and where needed and that economical utilization of resources was effected. He was previously cited for similar contributions to the Saturn I project, and was recognized for submission of a cost reduction resulting in savings of \$216,000.

Mr. Palmer graduated from Columbus Grove High School, Ohio, and attended Athens College in Alabama. His government career, which began in 1942 and was interrupted on two occasions by military service, included various assignments at Wright Field, Dayton, Ohio, and Lima Ordnance Depot, Lima, Ohio, leading to his appointment in 1955 as Deputy Chief, Planning and Production Control Division of the Depot. He came to Huntsville in 1957 as a Production Specialist for the Army Ballistic Missile Agency and was transferred to MSFC in January 1961.



<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Parks, P. Gordon	Ch, Welding Development Branch Manufacturing Engineering Laboratory	MSFC

Mr. P. Gordon Parks joined MSFC in 1962 with vast experience in welding. He is responsible for development in metals joining and directs a modern welding laboratory and numerous study contracts. In 1963, he directed a survey of the aerospace community, identifying pertinent problems in welding. He subsequently managed a comprehensive, scientific weld development program, and the data was distributed to NASA Centers and contractors. Significant contributions were made in the reduction of weld porosity, weld repairs, and equipment malfunctions. These contributions have measurably added to the success of the Apollo Program.

Mr. Parks received an engineering education degree from the University of Pittsburg. Prior to joining MSFC, he was a welding engineer with Westinghouse Electric Corp., Solar Aircraft, and General Electric. Altogether he has 25 years experience in welding engineering.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Paschal, L. E.	Chief, Electrochemical Power Section (Technical Assistant, Electrical Systems Integration Division)	S&E-ASTR-EPE Electrical Division

Mr. Paschal has initiated design concepts for flight electrical systems since 1958 and has successfully carried out these concepts in such programs as Jupiter, Juno II, Pershing and Saturn.

He supervised a group of engineers in designing the Instrument Unit electrical system for the Saturn I, IB and V vehicles. His dedication and skill assured the Center of an Instrument Unit that would meet the stringent requirements of the Apollo Program.

Mr. Paschal was later assigned as Technical Assistant to the Division Chief where he coordinated division efforts on the Saturn Program and served as secretary to the Apollo Electrical Panel.

His knowledge and design experience enabled him to perform effectively in working out intercenter agreements and establishing interface documents for the Apollo Electrical Panel.

His contribution to the design of the Instrument Unit and his efforts in establishing intercenter working relationships were vital to the success of the Apollo Program.

Paul, Hans G.

Chief,  
Propulsion and Thermodynamics Division  
Astronautics Laboratory, S&E

MSFC

Mr. Paul, responsible for developing the propulsion systems and thermal engineering of the Saturn stages, is widely known for his many contributions in these areas. Under his direction and personal initiative, hidden problems were early recognized and successfully solved. He established, for example, the need for additional development testing of the Saturn V upper stage rocket engines under improved altitude simulation; a number of operational problems were uncovered and solutions found on time which greatly contributed to the successful Saturn flight.

Mr. Paul received his M. S. Degree from the Hannover Institute of Technology in West Germany; he has been active in rocket development for over 25 years. While employed by the U. S. Army he was instrumental in developing the first ablation cooled re-entry heat protection for the Jupiter IRBM. He has authored several papers and is serving on technical committees of national and international organizations.

Peck, James B.      Chief, Management Scheduling & Reporting Section  
                         Manufacturing Engineering Laboratory, S&E      MSFC

Since 1962 Mr. Peck has been actively involved in developing and implementing in-house detail schedules for all areas of manufacturing development. He was responsible for coordinating all program schedules with other laboratories and program offices and all management reporting against these schedules. He has consistently searched for and found better ways to accomplish scheduling and management reporting through out the laboratory. He is presently engaged in the development and implementation of a management information system designed to provide management data for all levels of management.

Mr. Peck received his B. S. degree from the University of Alabama in 1953. After two years experience in ground electronics in the U. S. Air Force, he worked for seven years in various industrial engineering fields for private industry. In 1962 he joined NASA and has worked in areas of scheduling and management systems since that time. He is a Registered Professional Engineer in the State of Alabama.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Guy D. Perry	Chief, Environmental Test Branch	Test Division Astronautics Laboratory

Mr. Perry, as Chief of the Environmental Test Branch, has directed such inhouse test programs as the Saturn V Launch Umbilical Tower (LUT) Service Arms Tests in support of KSC, the F-1 Turbopump and Propellant Feed System Tests to identify and test the solution to the S-1C POGO Problem, the S-1VB Auxiliary Propulsion System Tests under altitude firing conditions and the Lox and LH<sub>2</sub> Flow and Pressurization Tests under propellant slosh conditions.

Mr. Perry received his BS degree in Mechanical Engineering from Auburn University, Auburn, Alabama, in 1955. After serving three years in the Air Force he was employed by ABMA in 1958 and assigned as a test engineer in Test Laboratory. Mr. Perry is a registered professional engineer in the State of Alabama and is a co-inventor of a Zero Gravity Apparatus (U.S. Patent No. 3,408,870.)

Phelps, B. E., Jr.

Chief, Accounting Branch  
Financial Management Office, A&TS

MSFC

Mr. Phelps has directed the MSFC accounting operations since July 1960. As a member of the initial cadre for organization of MSFC he played a significant part in the establishment and implementation of accounting systems for the Center and has influenced the development of systems which have since been adopted NASA-wide. Under his direction the Accounting Branch has provided necessary fund controls and accounted for resources totaling over \$10 billion. By providing timely reports and efficient accounting services to program management officials, Mr. Phelps has made a significant contribution to efficient and economical management of the Center's financial resources and has thus contributed to the successful accomplishment of the Apollo mission.

Mr. Phelps received his B. S. degree from the University of Tennessee in 1949. He was an auditor with the Atomic Energy Commission from 1949 to 1951, was employed by private industry from 1951 to 1955 and came to Huntsville in 1955 as a price analyst and subsequently Deputy Chief of Accounting Systems with the Army Ordnance Missile Command. He transferred to MSFC as a system accountant in May 1960 and was subsequently appointed to his present position.

Potter, William R.      Chief, Plant Engineering Branch  
                                 Manufacturing Engineering Laboratory, S&E      MSFC

Mr. Potter has served as Chief of Plant Engineering for the Manufacturing Engineering Laboratory for the past 17 years. In this capacity he has been responsible for the development, design and acquisition of the major facilities and equipment used by this Laboratory in the development and prototype manufacture of major systems for the Apollo program. He has also served as consultant on facility problems to the major contractors associated with the Apollo Program. Member of the National Committee for the relocation of manufacturing site. Michoud and Mississippi Test sites were among the selections of this committee.

Mr. Potter graduated from the Dunwoody Industrial Institute in 1931. He was employed by Rock Island Arsenal in 1940, and came to Redstone Arsenal in 1952. He was with the Army Ballistic Missile Agency and was transferred to NASA when the MSFC was organized in 1960.

Powell, James T., Jr.

Chief, Instrumentation and  
Communication Division,  
Astrionics Laboratory, S&E

MSFC

Mr. Powell directed and personally contributed to the design and development of the Saturn instrumentation and communication system and was instrumental in assuring compatibility of the system with the Apollo spacecraft and world wide communications network. The successful operation of the highly complex Saturn IB and Saturn V instrumentation and communication system attests to Mr. Powell's vital contribution to the Apollo Program.

Mr. Powell received his B. E. E. degree from Georgia Institute of Technology, Atlanta, Georgia, in 1950. In 1952, he joined the Army Ballistic Missile Agency at Huntsville. There, he made major contributions in the field of measuring instrumentation on such programs as Redstone, Jupiter, Mercury and Juno II. He served as Chief of the Measuring Section and later as Chief of the Measuring Instrumentation Branch with MSFC. He became Deputy Chief of the Instrumentation and Communication Division in 1965 and accepted his present position in 1967.



Powell, Luther E.

Manager, Resident Management Office - IBM  
Saturn Program

MSFC

Mr. Powell is Manager of the Instrument Unit Resident Office at the International Business Machine Corporation, Huntsville, Alabama. Prior to this assignment, he served from February 1963 until October 1963 as the Manager of the Saturn V Instrument Unit and then from October 1963 until November 1964, as the Deputy Manager, Saturn V Instrument Unit. Mr. Powell has demonstrated remarkable technical and managerial competence in initiating engineering and resources planning efforts to define requirements for design, development, production, test, and delivery of components and systems of the Instrument Unit which contributed to the highly successful Saturn I/IB Program and also the success of the first four Saturn V flights.

In December 1966, Mr. Powell received a Superior Achievement Award for his significant contributions to the highly successful launch of the first Saturn IB (AS-201). Mr. Powell was also awarded a Certificate of Merit by the Director, Marshall Space Flight Center, in January 1969, for his service and contribution to the outstanding achievement of the Saturn I/IB Program.

Mr. Powell, a native of Bessemer, Alabama, obtained a BS in Electrical Engineering from the University of Alabama.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Prince, Carl	Deputy Director, Computation Laboratory	MSFC

Mr. Prince directed and contributed personally to the development of an MSFC capability for managerial computing, scientific computation, data reduction, and simulation required for the Saturn launch vehicle program. In particular, his knowledge and keen understanding of computing has been responsible for notable improvements in computer systems methodology used in the manned lunar landing program.

Mr. Prince received his BS degree in mathematics, magna cum laude, from Florence State University in 1950, and was awarded his Masters degree in mathematics from Peabody College in Nashville, Tennessee in 1951. He was employed by the Army Ballistic Missile Agency as a mathematician in 1952. Transferring to MSFC in 1960, he worked in Data Systems, as Assistant to the Director, Assistant Director, and accepted his present position in 1968. In his present position he plans and directs scientific and managerial type computing and data processing programs for MSFC and functions as a technical advisor and consultant to top management of the Center in the area of computation. An authority in the field of computing and data reduction, he has significantly contributed to the state-of-the-art.

Ramsey, Robert D., Jr. Chief, Engineering Div., Facilities Office MSFC

Mr. Ramsey is presently directing two segments of the Facilities Office, namely the Engineering Division and the Construction Branch. In this capacity, he has had the responsibility since 1963 for directing and managing the design of all facilities at MSFC and MAF, as well as various other locations; and directing engineering reviews of all criteria and design for all MSFC facilities. In all of the above, Mr. Ramsey has contributed directly to the Saturn/Apollo Program. He has many times manifested his high degree of knowledge in the engineering field by recognizing problem areas and consequently contributing greatly to a timely solution. Mr. Ramsey has been with MSFC since 1960.

Mr. Ramsey received his BS in Civil Engineering at Tennessee Polytechnical Institute in 1949. He was co-author with Dr. J. C. McCall of an article entitled "Liquid Hydrogen Study." He wrote and presented a paper entitled "Space Vehicle Test Stands" to the Alabama State meeting of the American Society of Civil Engineers. Mr. Ramsey is a Registered Engineer in the State of Tennessee; has membership in the National Society of Professional Engineers; American Society of Civil Engineers and the Society of American Military Engineers. He was listed in Who's Who Among Students in American Universities and Colleges (1948-49); and Who's Who in the South and Southwest (1967-68).

Read, Preston C.

Facilities & Plant Engineer  
Planning & Resources Office  
S&E

MSFC

Mr. Read has contributed greatly to the success of the Apollo/Saturn Program in his capacity of facilities and equipment management staff advisor for the S&E Directorate and its eight major Laboratories. He has been the top technical advisor in S&E for facilities and equipment all of which were absolutely essential for the Saturn Program. In fact he has been the "Plant Engineer" for S&E. Mr. Read has had the responsibility to perform advanced planning for facilities and equipment management activities. In addition he has provided staff direction throughout S&E for construction, acquisition, maintenance, repair, alteration and disposition of facilities and equipment.

Mr. Read received his B.S. in Mechanical Engineering from Purdue University, Lafayette, Indiana, in 1932. He entered Civil Service in 1960 with ABMA and joined MSFC in April 1962 as a facilities engineer in the Program Planning Office. He has served in his present position as S&E staff advisor for facilities and equipment since August 1967.

Reed, Kenneth W.

Chief, Propulsion Engineering  
Branch, Engineering Division,  
Astroautics Laboratory, S&E

MSFC

Mr. Reed is well known for his numerous contributions to the development of Saturn V propulsion systems. He technically directed contractor activities for the booster and upper stage engines. Mr. Reed made important contributions in development of the RL-10 engine which is a fore runner of the present liquid hydrogen/ liquid oxygen engine employed by the Saturn V upper stages. He also personally assisted in the resolutions of the Augmented Spark Ignition line anomalies which occurred on early Saturn V flights.

Mr. Reed received his B.S. degree in mechanical engineering from Rhodes Polytechnic Institute in 1950. He joined ABMA in 1951 transferring to MSFC in 1960 and continued his participation in development of vehicle propulsion systems. His most recent assignment is Chief of the Propulsion Engineering Branch.

Rees, Eberhard F. M

Deputy Director, Technical

MSFC

As Deputy Director, Technical, at the Marshall Center, Dr. Rees has played many important roles in the development of Apollo hardware. A key figure in the early technical planning, scheduling and management of Saturn launch vehicle systems, he has made vital contributions throughout the program by spearheading attacks on specific problems. Often functioning as Apollo's chief troubleshooter, he has made contributions to the development of the vehicles and the spacecraft, as well. On many occasions his direct efforts have resolved critical technical and management problems, resulting in the timely accomplishment of program milestones and mission objectives. These activities have frequently carried him afield from his Huntsville base for extended periods of time. His work with NASA Headquarters, other Centers, and numerous NASA contractors has gained Dr. Rees the respect of engineers and managers in the Apollo effort across the country.

Dr. Rees holds the Master of Science degree in mechanical engineering from the Dresden Institute of Technology, and the honorary Doctor of Science degree from Rollins College, Florida. He is a Fellow Member of the American Rocket Society (AIAA). For his contributions to rocketry and space flight over the past twenty-eight years, Dr. Rees has received a number of awards, including the Department of Defense Distinguished Civilian Service Award, the NASA Outstanding Leadership Medal, and the NASA Distinguished Service Medal.

Reinartz, Stanley R.

Deputy Manager, Apollo Applications Program

MSFC

Mr. Reinartz was Deputy Manager of the highly successful Saturn I/IB Program at Marshall Space Flight Center from December 1963 to February 1965. He is currently Deputy Manager of the Apollo Applications Program at MSFC.

As Deputy Manager of the Saturn I/IB Program, he demonstrated exceptional managerial ability in managing and coordinating all phases of program planning which was a most significant contribution to the success of the Program. This entailed development of overall plans, concepts and schedules; review and approval of major design parameters; formulation of cost estimates; determination of requirements for Saturn I/IB support efforts; and review, coordination, and direction of project managers and supporting staff.

Other key assignments include Manager, Saturn IB/Command Program at Marshall Space Flight Center and Technical Advisor to the Project Director, Saturn Applications Office from 1961 to 1963. He has 14 years experience in the Missile and Space industry.

A native of Ashland, Kentucky, he holds a Bachelor of Science Degree in Mechanical Engineering from the University of Cincinnati. He received a Sustained Superior Performance Award in 1961.

EARL J. REINBOLT

DEPUTY CHIEF, TECHNOLOGY DIVISION

S&E-ASTR-R

Mr. Earl J. Reinbolt as deputy chief of Astrionics Laboratory's Technology Division has extensively contributed to the success of Saturn V through his demonstration of exemplary management of applied technology programs in the laser/optical and micro-electronics fields. He was instrumental in initiating, planning, organizing, and equipping a modern environmental test laboratory that has reflected long-range foresight as environmental requirements have increased. Much of the success of Saturn electronic systems can be traced to improvements implemented as a result of evaluation under simulated environmental stress.

Mr. Reinbolt was born on April 22, 1923, in Pittsburg, Kansas. During World War II, he served in the U. S. Army in the European Theatre of Operations. He received a B.S. degree in Physics from Southwestern College in 1948 and after a period of teaching electronics at Keesler AFB, he joined the rocket team being formed by the U.S. Army at Redstone Arsenal in 1951. In 1960 he transferred to NASA in his present position.



Richard, Ludie G.

Deputy Director, Technical  
Science & Engineering

MSFC

As Deputy Director, Technical, Mr. Richard is responsible for managing the technical activities of Marshall's major laboratories and technical offices. His contributions to the Apollo program span many years, beginning with some of the earliest launchings from Cape Kennedy. He was instrumental in the formulation and development of the Saturn guidance and control system hardware and for the Saturn software. His contributions lead directly to effective automation of Saturn checkout and countdown. He was responsible for overall systems engineering of all MSFC's current vehicle development programs.

The measure of the success of the Saturn flight programs, to date, demonstrates the full effectivity of Mr. Richard's technical leadership and direction. He holds a degree in Electrical Engineering from the University of Colorado. Before coming to Huntsville, he was associated with various Air Force guided missile and electronic programs. At MSFC, he was Director, Systems Engineering Office, prior to accepting his present position. He holds a NASA Exceptional Service Medal.

Richardson, Jerry W.     *acting* Deputy Chief, Programs and Resources Office     MSFC  
Quality and Reliability Assurance Laboratory, S&E

Mr. Richardson brought to the Laboratory's Saturn effort a unique capability to apply keen technical judgement and action to a multitude of areas. Often serving as a personal representative of the Director and Deputy Director, he consistently displayed an uncommon analytical approach. His personal efforts in establishing the Saturn IB checkout station were largely responsible for meeting the schedule. His technical and managerial versatility qualify him for his expert performance as a program troubleshooter and source of innovation.

Mr. Richardson joined MSFC in 1961. He holds a B. S. in Industrial Management and has done graduate engineering work at the University of Alabama.

Riddick, Edwin L.

Chief, Protocol Branch  
Public Affairs Office

MSFC

As chief of the Protocol Branch in the Marshall Center's Public Affairs Office, Mr. Riddick has contributed significantly to the public's knowledge and understanding of NASA and MSFC aims and objectives. Through his superior efforts in developing and administering the Center's official visitor program, the public at large, special groups, and visiting dignitaries--congressmen, top government officials, and scientific and industrial leaders--have been able to observe first hand the Marshall Center's involvement in the Saturn/Apollo program.

Prior to joining the Marshall Space Flight Center in 1960, Mr. Riddick was Chief of Protocol of the U.S. Army ABMA from 1959 to 1960; from 1958 to 1959 he was Technical Training Officer, Technical Skill & Equipment, at the U.S. Army ABMA at Redstone Arsenal; and from 1956 to 1958 he was Technical Training Officer, Safety Office, at the U.S. Army ABMA at Redstone Arsenal, Alabama. Mr. Riddick holds BS and MS degrees from Auburn University, Auburn, Alabama. He was born February 10, 1923, Hurricane Valley, Alabama.

RIDGEWAY, GERALD D.

Chief, Fabrication Section      Marshall Space Flight Center  
Program R&D Branch  
Purchasing Office  
Administration & Technical Services

Mr. Ridgeway, a designated Contracting Officer, plans and directs procurement activities pertaining to off-site fabrication requirements relative to major Apollo and Apollo Applications Program, and occasional off-site work associated with supporting research and technology, advanced studies and supporting development.

Mr. Ridgeway received his B.S. Degree from Howard College, Birmingham, Alabama in 1953. He was employed as a Contract Specialist at Redstone Arsenal, Huntsville, Alabama in 1958. Transferring to Marshall Space Flight Center in 1962 as a Contract Negotiator, he worked in Flight Hardware and Ground Support Equipment Branch. In 1964 he assumed the duties of Section Chief with responsibility for planning and directing the procurement activity relative to the RIFT Program and accepted his present position in March of 1968.

ROBERTS, LYMON L.  
DOB: 11-15-18

CHIEF, INDUSTRIAL SAFETY  
SAFETY OFFICE

MSFC

Mr. Roberts is Chief, Industrial Safety for the MSFC Safety Office. He is responsible for planning, preparing and overseeing the implementation of a comprehensive industrial safety and fire protection program for the center. Under his direction, this essential program has been most effective in preventing the costly damages that can result from fire and accidents, thus providing for the safe and timely accomplishment of the Center's Apollo objectives. To accomplish this task, he has established and maintained liaison with professional safety engineering and fire protection organizations in industry and government agencies.

Mr. Roberts, a native of Henderson, Tennessee, received a B.S. Degree in Agricultural Engineering from the University of Tennessee in 1940. He served as an Aerologist in the U. S. Navy during World War II. Prior to assuming his present position, Mr. Roberts was Safety Director of Redstone Arsenal.

James Rorex

Space Vehicle and GSE Division, Central Systems  
Engineering, S&E (Formerly Chief, Telemetry Systems  
Branch, Instrumentation & Communication Division,  
Astrionics Laboratory, S&E)

MSFC

Mr. Rorex made exceptional contributions in the flight telemetry field of the Saturn Program. He laid out the telemetry system for all Saturn Programs, SA-I, SA-IB and SA-V. He instigated the design and manufacturing of the telemetry systems through our prime contractors and vendors. The present flight record of our Saturn vehicles and the performance knowledge MSFC has obtained during all flights cannot be separated from the outstanding performance of the Saturn Telemetry Systems. All flights showed perfect functioning of the telemetry systems and with only minor exemptions, all planned flight data could be obtained. This perfect record in this area was only possible due to Mr. Rorex's initiative, devotion and contribution in this field.

Mr. Rorex received his BS degree in Electrical Engineering from the University of Alabama in 1949. His career in the development of telemetry systems spans more than 20 years. As an expert in the fields of instrumentation and telemetry, he has significantly contributed to the state-of-the-art.

Rudolph, Arthur L. H.

Former Manager, Saturn V Program Office

MSFC

From August 1963, to May 1968, Dr. Rudolph served as Manager of the Saturn V Program at MSFC where he outstandingly directed that operation through the first two Saturn V launches, including the "all-up" flight of the first Saturn V on November 9, 1967, which capped one of the largest development tasks in history. A great task master, his management techniques and skills are highly recognized by top leaders throughout the nation's space industry. Since his retirement in January 1969, he has worked as a consultant to the Center Director.

An American citizen since 1954, he came to this country with the von Braun group at the end of World War II in the Army's "Operation Paperclip". He worked on various assignments for the Army including Technical Director in charge of the Redstone Missile System, Project Director of the Pershing Missile System, and Director of the Research and Development Directorate for the Army Ballistic Missile Agency in Huntsville. Joining NASA in December 1961, he served as Assistant Director for Systems Engineering, Office of Manned Spaceflight/Huntsville Office.

A native of Stepfershausen, Germany, Dr. Rudolph holds a Bachelor's Degree in Mechanical Engineering from the College of Berlin. His Honorary Doctorate of Science was awarded at Rollins College in Florida. Among his many honors are the Department of Army Exceptional Civilian Service Award and NASA's Distinguished Service Medal.

<u>NAMES</u>	<u>Position</u>	<u>Organization</u>
Ryan, Robert S.	Acting Deputy Chief, Dynamics & Control Div., and Chief, Flight Analysis Branch	MSFC

As Acting Deputy Chief of the Dynamics & Control Division, Mr. Ryan assists in the direction of a staff in the performance of dynamics and control systems studies for space vehicles and spacecraft. In this role and as Chief of the Flight Analysis Branch, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. Accordingly, he is directly responsible for the concept and development of an engineering and mathematical model which explains the Saturn V flight results, shows which of the subsystems dominates in the behavior pattern, isolates the dynamic coupling phenomenon which occurred on the AS-502, between the vehicle's longitudinal and lateral oscillation modes and caused large local loads in the spacecraft region, and led to the installation of a propulsion system accumulator as a point of pressure relief for changes in propellant pressure or flow. The longitudinal acceleration on the LEM of 0.72 g's which was superimposed on the steady state vehicle acceleration load of 3.7 g's. Loads of this magnitude are reaching the danger limit and were not predicted before flight. All prior analysis considered only one oscillation plane at a time. The POGO analysis simulation model is an original contribution the understanding and advancement of science and technology in propulsion and structural systems stability. It handles two types of couplings predominant in launch vehicles - a symmetrically arranged mass whose supporting structure (LEM) is unsymmetrical to the shell structure of the vehicle or spring offset and a mass (Saturn V) located off the vehicle's centerline.

Mr. Ryan has been with NASA since the Saturn and Apollo program inception prior to 1960. Since 1956 he has been engaged in missile and vehicle propulsion and structural investigations and analysis as a section and branch chief. He has served in his current position as Deputy Division Chief since May 1969. In 1964, he received an M.S. degree in Mathematics from the University of Alabama.



Sanders, Myrl E.

Deputy Project Manager, Mission Support  
Hardware Project, Apollo Applications  
Program Office, P.M.

MSFC

In his present position as Deputy Project Manager, Mission Support Hardware Project for Apollo Applications, Mr. Sanders has responsibility for the management of the overall mission support hardware assigned to the Apollo Applications projects.

Prior to this assignment, Mr. Sanders was Chief of Systems Test Operations Branch, MTF, and was responsible for the testing and checkout of S-IC and S-II stages at MTF. He discharged this function admirably from the initial activation testing thru testing of S-II-4 and S-IC-6. He directed the accomplishment of R&D testing of the S-II-T and first acceptance testing for production of S-II stages. During this time the procedures and policies regarding captive firings and acceptance testing were developed with Mr. Sanders being the key figure in leadership of this effort.

Mr. Sanders received a M.E. degree from Mississippi State University.

Sanderson, Arthur E.

Chief, Personnel Office  
Manpower Office, A&TS

MSFC

As Chief of Personnel during the formative years of the MSFC, Arthur Sanderson was responsible for recruiting and assembling on a nation-wide basis a highly motivated scientific and professional staff. Under his direction, the complexities of personnel administration were efficiently handled. He has been particularly active in understanding and interpreting the variety of needs of the Center and its work force. For example, in the past three years, Mr. Sanderson has negotiated two union contracts with a government workers Federal union and this Center. Mr. Sanderson has also been instrumental in establishing an excellent working relationship with the Civil Service Commission which has enabled the Center to better accomplish its goals. His overall effort and that of his staff have contributed significantly to the effective operation of the Center whose responsibility has been the designing the developing of a space vehicle used in the lunar landing.

A native of Kansas, Mr. Sanderson graduated from Chase High School in 1938. He attended Sterling College from 1938-42 before entering Washington University in St. Louis, Missouri, to earn a Bachelor of Science degree in social science in 1951. A Master of Arts degree in political science was awarded to Mr. Sanderson by the University of Oklahoma in Norman in 1968. He has also completed additional graduate work in political science. Mr. Sanderson served in the Air Force during World War II, spending 18 months in the European Theater. Later he served as instructor in the Air Force Radio School, Sedalia, Missouri. He was employed seven years by the U. S. Army Finance Center at St. Louis before becoming Civilian Personnel Officer at the St. Louis Ordnance District in 1952. In January 1956 he joined the Army Ballistic Missile Agency, Huntsville, Alabama, as deputy director and later director of the Civilian Personnel Office, Mr. Sanderson transferred to the MSFC when it was established in July 1960.

SCHWINGHAMER, Robert J.

Chief, Materials Division  
Astronautics Laboratory, S&E

MSFC

Mr. Schwinghamer has demonstrated outstanding ability in coordinating the design and development of a unique new family of space vehicle fabrication tools employing high intensity transient magnetic fields. These tools constituted a first in the Aerospace Industry and were used in the fabrication of the first stage of the Saturn Vehicle.

Mr. Schwinghamer received his BS degree from Purdue University in 1950 and his MS degree in Management from MIT in 1968. He was employed by the Army Ballistic Missile Agency in 1957 where he became heavily involved in the development of the Army's Jupiter "C" missiles. During the next eight years, he progressed from a Section Chief to a Deputy Division Chief. His responsibilities included research, development and application of instrumentation for Saturn launch vehicles and vehicle facilities; advanced electrical and electronic development of intense transient magnetic field generating systems and apparatus, electron beam devices and high powered lasers. His present position is Chief, Materials Division. He had authored many papers on in-flight experiments and has been honored with numerous professional recognitions and awards, including the Alfred P. Sloan Fellowship in Executive Development.

Sells, Harold Ray

Chief, Systems Operations Branch  
Astronautics Laboratory, S&E

MSFC

Mr. Sells has made numerous and significant contributions in the systems engineering area. He directed the development and integration of the mechanical systems flight sequence requirements which were preprogrammed in the Saturn vehicle computer to control its operation in flight. He was also responsible for the analysis of prelaunch and flight systems operations to develop systems safety interlocks and mission rules for the purpose of insuring a safe countdown and flight with the greatest probability of success.

Mr. Sells received his B. S. degree in Mechanical Engineering from Tennessee Technological University in 1957. After graduation he was employed in industry and by the Army Engineer Research and Development Laboratory, Fort Belvoir, Virginia. Since joining MSFC in 1963, he has served in Unit, Section, and Branch Chief positions in the Astronautics Laboratory. He has completed numerous graduate courses in management and is a member of Tau Beta Pi Engineering Honor Society.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Settle, Gray L. DOB: Dec. 22, 1941	AST, Theoretical Simulation	MSFC Computation Laboratory Simulation Branch

Joined NASA in 1962 following graduation from the University of Tennessee with a BS in Electrical Engineering. Has continued education at the University of Alabama Huntsville and with various university and industry sponsored short courses.

Participated in the development of one of the first large scale hybrid computer systems for simulation. Has been responsible for programming and development of digital and hybrid simulations involving the Saturn V and related systems. Valuable contribution was made by providing digital simulations describing the "POGO" effect on the Saturn V. Provided software and program support for the design and checkout of the digital interface for an Apollo Telescope Mount cockpit simulator used for human factors studies.

Now engaged in the application and development of software and techniques for computer display of three-dimensional images with rotational and translational capability for use in simulation of lunar and other space-related vehicles.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Sharpe, Max H.	Chief, Project Engr. Office Manufacturing Dev. Division Manufacturing Engr. Lab., S&E	MSFC

Mr. Sharpe has been responsible for manufacturing research and development in chemical, mechanical, and manufacturing engineering areas of space vehicles and support equipment. He provided technical guidance in electroplating, anodizing, chemical metal processing receiving two patents which cover the process of chemical milling the 70" dia. and 105" dia. bulkheads for the Saturn I and Saturn IB launch vehicles and the process of chemical milling 2219-T37 aluminum for the Saturn V vehicle.

Mr. Sharpe received his BS in Chemical Engineering from Tennessee Polytechnic Institute in 1957 and accepted employment at Redstone Arsenal as a Chemical Engineer. He transferred to MSFC in 1960 and became Chief of the Project Engineering Office in 1966. In this capacity he served as a special consultant to the Apollo Special Task Team, headed by Dr. Rees, in the resolution of manufacturing problems encountered in manufacturing processes on the Lunar Module and the corrosion problems during the manufacturing and testing of the Life Support Systems of the Apollo Spacecraft.

Shepherd, James T.

The Assistant to the Director

MSFC

Mr. Shepherd's contribution to the Apollo Program cover a span of almost ten years as a key member of the von Braun team. He obtained a degree in Electrical Engineering from the Georgia Institute of Technology, and began his career as an Electronics Engineer. In 1960 he moved from the position of Associate Director for Instrument Development at ARGMA, and joined NASA at the Marshall Space Flight Center. He progressed to the position of Associate Director for Facilities Engineering, and in 1965 became the Assistant to Dr. von Braun.

As the Assistant to Dr. von Braun, Mr. Shepherd has participated fully in every facet of the Center mission and objectives, including development of the Saturn boosters for the Apollo Program. His principal contribution however, has been in the area of facilities. He was responsible for the development and implementation of the overall facilities plan in support of the MSFC boosters and engines for the Apollo Program. This plan was nationwide in scope and encompassed development shops, structural test facilities, hazardous test facilities, static test stands, production and transportation facilities. All of these facilities were developed on a highest priority basis, keeping pace with the commitment for the Apollo Program. This facilities operation represented one of the most complex facilities programs in the country, with unprecedented engineering and management problems and achievements.

Mr. Shepherd's entire career since 1950 has been dedicated to the improvement of engineering and management techniques associated with the furtherance of space vehicle technology.

Shields, William G.

Space Vehicle & GSE Division,  
Central Systems Engineering, S&E  
(Formerly, Deputy Chief, Airborne Electrical  
Systems Branch, Electrical Systems Integration  
Division, Astrionics Laboratory, S&E)

MSFC

Mr. Shields made exceptional contributions in electrical system engineering to the Saturn program. He laid out the electrical basic systems approach for the launch vehicles SA-I, SA-IB and SA-V and combined the various stages into one system. As MSFC's authority on emergency detection, he worked with MSC and the astronauts to arrive at a system which ties together the launch vehicle and the spacecraft. His authoritative contributions to the EDS system are highly respected within the NASA organizations.

Mr. Shields received his BS degree in Electrical Engineering from Auburn University in 1951. His career in the development of electrical systems for space vehicles spans more than 13 years as an expert in this field. He has significantly contributed to the state of the art.



Siebel, Mathias P. L.            Director  
   Manufacturing Engineering Laboratory, S&E            MSFC

Dr. Siebel has been responsible for the manufacturing development of flight and ground support hardware for the Apollo program, first as Deputy Director and then as Director of the Manufacturing Engineering Laboratory. He has provided authorship and direction of unique and sophisticated management systems to further the efficiency and capabilities of the manufacturing development team which had been pulled together to accomplish assign mission objectives. As resources were constantly shrinking he has been able to organize this team to still achieve the critical mission requirements.

Dr. Siebel received his BSME (1949) and his Ph. d (1952) in mechanical engineering from the University of Bristol. After working in heavy industry in Great Britain. He emigrated to the United States in 1957. Initially he carried on research and taught at Columbia University. At the same time acting as consultant to industrial and government clients. He then joined Pall Corporation as manager of Pressure Equipment Operations. Later he accepted the position of Vice President, and Manager of Operations with Radiation Dynamics, Inc. In 1965 he joined NASA at MSFC in the position of Deputy Director, Manufacturing Engineering Laboratory. He was promoted to his present position in 1968. He has written a number of papers and has several patents.

Sieber, Werner H., Dr.      Chief, Scientific Engineering Division      MSFC  
Space Sciences Laboratory, S&E

As chief of the Test Instrumentation and Control Division, Dr. Werner Sieber directed the firing control, measuring and instrumentation activities for the developmental and acceptance test programs of the Saturn I and Saturn launch vehicle at Huntsville, Alabama.

Dr. Sieber's outstanding qualifications are reflected in his relatively long and progressively responsible experience in rocketry and aerospace instrumentation. He has been associated with instrument development and measuring instrumentation for captive test programs for 30 years and has significantly contributed to the state-of-the-art in this field.

Simmons, William K., Jr.

Manager, Saturn I Workshop Project  
Apollo Applications Program

MSFC

Mr. Simmons served as the Manager of the Instrument Unit Project for the Saturn I/IB Program from March 1964 to November 1964. In November 1964, he was given the added responsibility as Deputy Manager, Saturn V Instrument Unit Project. As the Saturn IB Manager and the Saturn V Deputy Manager of the Instrument Unit Project, he defined, directed, reviewed, and evaluated the composite MSFC/Industry performance through the phases of planning, coordination, and prelaunch checkout of the Instrument Unit and associated equipment.

Mr. Simmons received a Sustained Superior Performance Award in May 1966 which cited his superior technical ability and excellent judgment in accomplishing his dual responsibility. His outstanding ability to plan and coordinate activities related to the Instrument Unit from design through delivery has proven invaluable to the Apollo Program. He was also awarded a Certificate of Merit by the Director, Marshall Space Flight Center, in January 1969, for his service and contributions to the outstanding achievement of the Saturn I/IB Program.

Mr. Simmons, a native of Canal Zone, Panama, obtained a Bachelor of Science Degree in Civil Engineering from Clemson University. He is currently serving as Manager, Saturn I Workshop Project, Apollo Applications Program.

Sims, Clifton R. - Chief, Systems Flight Qualification Section - S&E-ASTR-GS

Mr. Sims' work in the areas of reliability and automation was an important factor in the successful development of the ST124-M stabilized platform for the Saturn guidance system. He planned, specified, developed, instrumented, and evaluated simulated environmental tests to prove the reliability of the ST124-M system. He developed requirements for the computer controlled automated testing of that system.

Mr. Sims received his Electrical Engineering degree in 1952, served two years with the U. S. Air Force, then held a responsible position with the Tennessee Valley Authority until he accepted a position in this organization (at that time ABMA Guidance and Control Lab) in 1957. He has worked continuously in inertial reference system design and development since then, and has become an expert in his specialized area. He played a progressively responsible role in the design and development of stabilized platform systems for the Redstone, Jupiter, and Pershing missile systems, and for the Saturn launch vehicles.

Sittason, Frederick M.

Chief, Programs and Resources Office

MSFC

Quality and Reliability Assurance Laboratory, S&E

Managing an office with diverse responsibilities, Mr. Sittason's contributions to the Saturn program have been varied and significant. Particularly noteworthy was his overall direction and control of the planning, engineering, and operational support of the Saturn IB and IU checkout complexes. When the transfer of NASA quality philosophy to the contractors was especially difficult, his direction of the Quality Technique Training effort provided real enhancement. His engineering management skills and innovations have been instrumental in the Laboratory's successful accomplishment of many tasks when technical resources of both the physical plant and the work force were committed to the ultimate.

Mr. Sittason graduated from the University of Alabama with a B. S. in Industrial Engineering in 1951. He joined Redstone Arsenal in 1952.

Slattery, Bart J.

Director of Public Affairs

MSFC

As Director of Public Affairs for the Marshall Space Flight Center, Mr. Slattery has developed an outstanding program of public affairs to establish, enhance and maintain the public's awareness of the Marshall Center, NASA, and the programs and projects in which NASA and MSFC are involved. His superior efforts have contributed significantly to the best possible image of NASA through maintaining the highest public opinion and acceptance of the Saturn/Apollo program.

Mr. Slattery has been associated with the Saturn/Apollo program since his assignment to MSFC in June 1960 while still on active duty in the Navy. Retiring from the Navy in 1963, with the rank of Captain, he remained at the Marshall Center as Director of Public Affairs. He was Assistant Director of Plans and Evaluation in the Navy's Office of Information at the Pentagon before coming to the Marshall Center. Prior to this assignment, he served as Public Information Officer for Naval Air Station, St. Louis; Naval Air Reserve Training Command, Glenview, Illinois; and Naval Air Reserve Facility, Miami, Fla. During World War II, he commanded Carrier Aircraft Service Unit 36 at Santa Rosa, California, and during sea duty aboard the aircraft carrier USS Franklin won the Bronze Star for "heroic achievement in combat" off the coast of Honshu, Japan. Mr. Slattery was born on May 6, 1911, in St. Louis, Missouri, and attended St. Joseph College at Windsor Springs, Missouri.

Smith, Earl W.

Chief, Stage & Engine Engineering Office

MSFC

Analytical Operations Division

Quality and Reliability Assurance Laboratory, S&E

Early in the Saturn program, Mr. Smith organized and directed the MSFC Central Receiving facility. The operation was instrumental in the early detection of unsatisfactory hardware and in providing the confidence required in items used in fabrication. Under his guidance, several unique and complicated test and inspection devices were developed which shortened the process time and improved the testing accuracy. For the last several years, he has served as the Senior Division Project Engineer, and, as such, he is in charge of all activities of the Division in support of the MSFC out-of-house project. By applying his previous experience across the board, he has provided for excellent cross fertilization between the different projects and contributed tremendously to timely elimination of potential failure areas.

Mr. Smith received a B. S. in Mechanical Engineering from the University of Alabama in 1949. After several years in industry, he came to Redstone Arsenal in 1957.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Smith, Earnest C.	Aeronautical Research Engineer, <del>CC-12</del>	S&E-ASTR-SGI

Mr. Smith performed overall control system integration work on the Saturn attitude control system for early Saturn IB and Saturn V vehicles. He also gathered and analyzed pertinent information on the overall Saturn V control system and wrote the first control system information document for the Saturn V vehicle.

In connection with the above tasks, Mr. Smith performed laboratory simulation studies of the Saturn IB and V vehicle control systems with the actual flight control computer included in the tests. These tests verified flight worthiness of the Saturn control computer when integrated with the overall control system and vehicle dynamics environment. Mr. Smith's experience in these tests enabled him to have a significant roll in establishing the I.U. contractor's control computer test facility and the test procedures later used in verifying the adequacy of the Apollo 11 control computer.

Mr. Smith received his B.S. degree in mathematics from AM&N College in Pine Bluff, Ark., and his M.A. degree in mathematics from the University of Arkansas. He has worked at MSFC since 1964. ~~He is married to the former Bessie M. Matlock of Pine Bluff, Ark. They have four children and reside at 3010 Turf Drive, N.W. in Huntsville.~~



<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Smith, James R.	Deputy Chief, Manufacturing Control Office, Manufacturing Development Division, Manufacturing Engineering Laboratory, S&E	MSFC

Mr. Smith has been responsible for directing and coordinating the scheduling of work which includes parts, mechanical components, sub-assemblies, main assemblies and advanced experimental prototype models in support of the Division's mission in the Apollo program. By analysis and evaluation of current and anticipated fabrication and assembly workloads and their effect on facilities, tooling, and schedules, Mr. Smith proposed new or improved methods of scheduling and controlling the flow of work through the shops thereby assuring the coordination and cooperation of all segments of the Division to meet the Apollo schedules.

Mr. Smith entered the government service in 1941 at Brookly Air Force Base and transferred to Redstone Arsenal and joined the Manufacturing Engineering Laboratory in 1956. Mr. Smith became Deputy Chief of the Manufacturing Control Office in 1962.

NAME

POSITION

ORGANIZATION

Smith, Orvel E.

Chief, Terrestrial Environment Branch

MSFC

As Chief of the Terrestrial Environment Branch, Mr. Smith plans and directs research programs to integrate terrestrial environmental conditions into the design, static firings, mission analysis, operation, and performance of the integrated Apollo and Saturn manned programs. As the Apollo program developed it became evident that the Saturn V pad stay time would be extended from several days to several months. This created a vehicle structural design problem. Classical statistical methods or theories did not exist to describe the risk as a function of time. Mr. Smith resolved the problem by developing a new and novel concept of "exposure period probabilities" based on combinational analysis. In the Saturn development program, some vehicles were wind limited due to inflight winds. Mr. Smith conducted a statistical analysis of winds aloft and determined that by biasing the vehicle tilt program, wind load relief could be gained and thus the probability of launching the vehicle on schedule could be increased significantly. This method enabled successful flight tests to be conducted and invaluable load data to be collected. Mr. Smith contributed to the analysis and study of techniques to predict vertical wind profiles in terms of detailed structures never before envisioned. These predictions were used routinely to compute vehicle loads during critical phases of the Saturn V launch operation to assure that structure limits of the vehicle would not be exceeded.

Mr. Smith has been with NASA since the Saturn and Apollo programs inception prior to 1960. Since 1960, he has served in his present position engaged in theoretical and empirical applied statistics and mathematics research for these programs. He received a B. S. degree in mathematics from Athens College, Athens, Alabama, in 1955.

Smith, Richard G.

Chief, Launch Vehicle Systems Office  
Central Systems Engineering, Science  
and Engineering

MSFC

In 1965, Mr. Smith was assigned to the Systems Engineering Office as Chief of the Flight Systems Division. He was responsible for Flight System analysis and integration efforts. The past three years were directed toward resolution of major system problems, resulting in success of the maiden flight of Saturn V, and to its continued success. His technical and managerial ability resulted in his being appointed to the position of Chief, Systems Engineering for Saturn Launch Vehicles at the MSFC.

Mr. Smith received his B.S. degree from Auburn University in 1951. He started work at MSFC's Astrionics Laboratory. When work was begun on the Saturn Launch Vehicles, he was responsible for network design. He was named Co-Chairman of the NASA's Intercenter Panel for Crew Safety, responsible for System Design, with its purpose to save the Apollo Crew in case of hardware malfunctions. New concepts and logic were developed under his leadership, requiring examination of equipment and subsystem in the Saturn vehicle.

Smith, Robert L., Jr.

Deputy Chief, Verification Engineering Div.,  
Central Systems Engineering, S&E (Formerly  
Chief, Future Programs and Technology Office,  
Quality & Reliability Assurance Lab, S&E)

MSFC

Mr. Smith directed and contributed personally to the high reliability electrical/electronic parts program for the Saturn V launch vehicle through the activity of his office. He deserves special credit for the excellent reliability results on all launch vehicles in his area of responsibility. Mr. Smith also contributed heavily to the initial work of automating the checkout of the Saturn stages, which has resulted in the present highly successful application to automated launch system.

Mr. Smith received his BSEE degree from Speed Scientific School of the University of Louisville, Louisville, Kentucky, in 1946, and his MSEE degree from the University of Florida, Gainesville, Florida, in 1951. He joined Dr. von Braun's team which later became the nucleus for the Marshall Space Flight Center. He was responsible for launch vehicle acceptance testing in the Redstone, Jupiter and Saturn class programs. His career in the missile and space vehicle field spans more than 18 years.

Smith, Spencer E.

Manager, Saturn Launch Vehicle  
Ground Support Equipment

MSFC

Mr. Smith, as Manager, Vehicle Ground Support Equipment Project (LVGSE), is responsible for LVGSE from the design phases through support of launches of Saturn vehicles. Mr. Smith has held this position since March 1964 since which time the project has been accomplished on schedule and within predicted costs, even though the LVGSE represents a major advance in the state-of-the-art in the areas of automation and reliability. This was an especially difficult task because it required the coordination of interfaces of all the individual stages and launch complexes, and many times required the solving of a total systems engineering problem.

Mr. Smith is a native of McComb, Mississippi, and holds a Bachelor of Science Degree in Electrical Engineering from Mississippi State University, and a Master of Science Degree in Industrial Engineering from Massachusetts Institute of Technology. The latter degree was earned as a result of being appointed a Sloan Fellow in 1962 after recommendation by NASA. He joined the Army Ballistic Missile Agency in February 1956, where he served as Control Systems Engineer for Redstone and Jupiter projects and was Laboratory Project Engineer for the Pershing Project. After joining NASA in 1960, Mr. Smith served as Division Chief of the Quality Engineering Division where he initiated, and contributed strongly to the implementation of the present NASA Quality Assurance Program, including the development of basic requirements documents and manuals.

Smith, Thelmer P.

Acting Manager, J-2 Engine Project  
Engine Program Office  
Program Management

MSFC

Mr. Smith has been associated with MSFC since 1961. His management of the J-2 Engine Project began in January 1969. He served as the H-1 Engine Project Manager for approximately 7 years prior to his present assignment. He was the NASA/MSFC Plant Representative and M-1 Resident Project Manager at Aerojet Corporation, Sacramento, California for a six months period. He served as the RL-10 Engine Project Engineer for about a year which helped compile a broad knowledge of several engine systems. His most significant contribution is the outstanding management of the H-1 engines which resulted in the Saturn I and Saturn IB perfect record of launches. He solved many problems and paved the way for a successful Saturn V Program. His assurance that the contractor produced acceptable engines in a timely and economical manner has been most valuable to MSFC and NASA. He managed two field offices in a most efficient manner. He was instrumental in deactivating engine facilities at our Neosho, Missouri plant and realigning the H-1 facility at Canoga Park to be commensurate with on-going and planned effort.

Mr. Smith has received letters of appreciation and commendation for his contributions to the Apollo Program.

Mr. Smith's 19 years of propulsion experience and his managerial capability have been very ably applied to the Apollo Program.

A native of Foreman, Arkansas, Mr. Smith received his BS degree in Mechanical Engineering from the University of Arkansas in 1950.

Sneed, Bill H.,

Director, Program Planning Office

MSFC

Mr. Sneed has served as an Aero-space Engineer with OMSF, NASA Headquarters (Huntsville Office). In this capacity he was responsible for vehicle system technical coordination involving the Saturn I, IB, and V, Apollo Future Projects, all Launch Vehicles and Spacecraft in the manned space exploration program. From this position he became Chief, Program Control Office, Saturn V Program. In this capacity, he directed, supervised, and managed the Saturn V Program Control function. He was directly responsible to the Program Manager, in total program sense, for assuring that all effort required to accomplish the program was planned and actually accomplished in a coordinated, effective, and efficient manner.

Mr. Sneed received a BS Degree in Industrial Engineering from the University of Tennessee in December 1954. He has worked as both an Industrial and a Methods Engineer in private industry and as such had to make engineering analysis of new manufacturing techniques, newly developed machines and machine tools, and determine the feasibility of incorporating same into operations. He served as Procurement and Production Officer with the United States Army Ordnance Corps at Redstone Arsenal, Alabama. His assignment included the responsibility for planning, directing, coordinating, and controlling the acceptance of all procurement and production of guided missiles.

G.R.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
SNEED, BILL H.	DIRECTOR, PROGRAM PLANNING	PROGRAM DEVELOPMENT

Mr Sneed served as Chief of the Program Control Office, Saturn V Program, at Marshall Space Flight Center, Huntsville, Alabama from August 1963 to February 1969. He is currently Director of Program Planning, Program Development.

As Chief of the Saturn V Program Control Office, he was directly responsible for assuring that all effort required to accomplish the total Saturn V Program was planned and actually being accomplished in a coordinated, effective, and efficient manner. He was singularly effective in managing and directing these activities. His contributions to the Saturn V Program are, to a most significant degree, responsible for the Program's success.

Mr. Sneed has held such key positions as Chief, Program Coordination and Information, Systems Engineering, Office of Manned Space Flight, NASA Headquarters, with duty station in Huntsville, Alabama; and Special Assistant to the Chief, Test Branch, Pershing Project, Army Ballistic Missile Agency in Huntsville, Alabama.

He is a native of Chattanooga, Tennessee, and holds a BS Degree in Industrial Engineering from the University of Tennessee. His many honors include three Sustained Superior Performance Awards, a Superior Achievement Award, and

(see reverse)



an Outstanding Performance Award. He also won honorable mention for outstanding public service from the William A. Jump Memorial Foundation for developing the Program Control System concept, which has been recognized as one of the most complete, realistic and responsive systems to provide a basis for management decisions.

OK  
C.R.

SNODDY, William C.

Chief, Space Thermophysics Division  
Space Sciences Laboratory, S&E-SSL-T

MSFC.

Mr. William Snoddy worked on the development of spacecraft thermal control techniques utilized throughout the Apollo/Saturn System. This work dates back to the thermal control of the earliest Explorers and includes: the development of computer programs for thermal design, the development of thermal/vacuum testing criteria, the build-up of a thermophysical laboratory, experimental and theoretical studies of space environmental effects on thermal and optical surfaces, the flying of experiments to measure such environmental effects, the development of space stable thermal control coatings, the development of thermal control utilizing fusible material, the definition of space electromagnetic environmental criteria, and the definition of the lunar thermophysical environment.

Mr. Snoddy received his B.S. and M.S. degrees from the University of Alabama. He became a member of the Huntsville team in 1958 as a physicist working on the thermal control of the early Explorers. He later served as project engineer for the thermal control of the Pegasus spacecraft and as Chief of the Thermal Environment Physics Branch of the Space Sciences Laboratory. He has authored many papers on thermal control and has been honored with professional recognitions and awards, including the AIAA Hermann Oberth Award.

Snyder, Louis E.

Chief, Budget Operations  
Center Plans and Resources Office, A&TS

MSFC.

As Chief of Budget and Operations Branch, Financial Management Office Mr. Snyder directed the preparation of annual budgets, financial and program operating plans, and the allocation of funds and resources authority. In this capacity and as a financial advisor to top management on all budgeting and financial operations activities he has made a significant contribution to timely and efficient utilization of MSFC resources and has thus been a major participant in the successful accomplishment of MSFC's role in the Apollo mission.

Mr. Snyder received his AB & BS degrees from the University of Missouri in 1941. He was employed by private industry from 1941 to 1947 and entered Government Service with the Atomic Energy Commission serving as Chief Accountant and Budget Officer from 1947 to 1960. Upon transfer to MSFC in 1960 he became Chief of the Budget Branch (subsequently known as Budget and Operations Branch), Financial Management Office and remained in this position until May 1969, at which time he was assigned to his present position.

Sommers, Louis H.

Digital GSE Sub-System Manager  
Vehicle GSE Project Office  
Saturn Program

MSFC

As the Sub-System Manager for Saturn Digital Ground Support Equipment, Mr. Sommers has exercised the highest degree of technical ability in the management and overall technical support of equipment design, development, manufacturing, and testing operations. He was remarkably effective in coordinating efforts of contributing elements to consolidate and interpret technical plans to obtain necessary technical data. Through these efforts, the Project Manager was able to make sound decisions based on authoritative recommendations from Mr. Sommers.

Mr. Sommers received his BS Electrical Engineering from the University of Tennessee in 1949. He began his government career in 1960 with the Army Ordnance Missile Command. He has been in his present position since October 1963.

Sorensen, Victor C.     Director, Management Services Office  
Administration & Technical Services

MSFC

As functional manager for a wide range of administrative and management support activities, Mr. Sorensen has effectively aided the Saturn Apollo effort throughout the development period. Under his direction, the research and development work of the Center has been afforded vital support in such areas as telecommunications, occupational health, technical documentation, security administration, graphic aids, printing and similar general administrative services. Mr. Sorensen was instrumental in the activation of MSFC planning for a smooth transfer of activities from the Army and negotiating support agreements. In addition to his current support role, he has guided the Center's personnel administration, safety and traffic management programs with a high degree of success. In all assigned functions he has consistently pursued the latest technology to assure that the Saturn Apollo team has the best available support to do its job.

Mr. Sorensen attended the University of Minnesota, majoring in Business Administration and Industrial Relations. His government service began 32 years ago. The broad range of experience gained as a career administrator with the Army beginning in 1941 has proven invaluable to his role as advisor to Center management. Mr. Sorensen has been closely associated with the development programs of the Saturn Apollo team for 13 years, having joined the Center Director in 1956 as Chief Administrator under the Army's Development Operations Division, ABMA.

SPEER, F. A., Dr.

Manager, Mission Operations Office  
PM

MSFC

Dr. Speer skillfully brought together all the major operations functions at MSFC under one operational element and organized an effective Mission Operations function for MSFC. In accomplishing this, Dr. Speer directed an engineering project which developed the Huntsville Operations Support Facility, (an arm of the Center's operations capability which provides real time engineering support to KSC and MSC during mission periods) from a one room, limited input data facility to a multiple purpose facility which has served the Apollo Program in the critical real time analysis required to provide the launch and flight operations centers the kind of design engineering support necessary to increase mission success. Perhaps more significantly, Dr. Speer has nurtured the development of the MSFC Flight Control Office at MSC. This office, a part of MSFC's Mission Operations Office in Huntsville, has the responsibility for the actual flight control of the Saturn Launch Vehicles designed and developed by the MSFC team of civil servants and associated contractor personnel. Dr. Speer accurately evaluated the requirements that would be placed upon MSFC for flight control and sought out key personnel that could spearhead the accomplishment of the nerve racking task of providing the vital link between space vehicle and earth and which could mean success or failure of a mission. No single factor by itself adequately describes the contribution of this man to MSFC's roll in the success story of Saturn. One thing is certain, Mission Operations which just four years ago was, for Marshall, a fragmented, not too well functioning, fuzzy concept, is today an integrated, significant element of a successful team of scientists and engineers that spells success for Apollo.

Dr. Speer received his PHD degree in 1954 from the Technical University, Berlin, Germany.

Stamy, James L.

Deputy Manager  
Michoud Assembly Facility, PM

MSFC

In a work environment composed of two stage contractors and one engine contractor dependent upon two other contractors for support, Mr. Stamy's ability to achieve integrate the efforts of these diverse elements has been a major contribution to the Apollo program. As Deputy to the Manager, Michoud Assembly Facility, he has assisted in all phases of management of the facility, and has effectively accomplished his principal role of technical management of engineering research, development, and production activities. He has provided effective and competent technical and managerial leadership in the overall management and direction of assigned programs, assuring that highly reliable vehicles and hardware are obtained on specified, high-priority schedules within allocated resources.

Mr. Stamy received a Bachelor of Science degree in mechanical engineering from Iowa State College, Ames, Iowa, in 1946. He previously served as project engineer for NASA at MSFC, and as mechanical engineer for the Army Ballistic Missile Agency and at White Sands Proving Ground, Las Cruces, New Mexico. He has specialized in the following research fields: ground support equipment, project engineering, systems engineering, and project management. He is a member of the American Rocket Society, the Soaring Society of America, Experimental Aircraft Association, and Pi Kappa Alpha Fraternity.

STERETT, James B., Jr.

Chief, Analytical Mechanics Division  
Astronautics Laboratory  
S&E

MSFC

Mr. Sterett is well known for his efforts in the field of analysis and test of vehicle structural components and systems. Under his direction, analyses of such problems as POGO have been successfully solved and major test programs such as the S-II "A", S-II "B", and S-II "C" and the Saturn IB and Saturn V Vehicles Dynamic Test Program have been successfully completed. These programs have been the basis for structural modifications which have been proven by the successful flights of Apollo 8, Apollo 9, and Apollo 10.

Mr. Sterett received his B.S. from the University of Evansville, Indiana in 1952. He was employed by MSFC in 1960, as Chief, Tail Section Stress Unit. In 1963, he became Deputy Chief, Structures Division and accepted his present position in 1969. Mr. Sterett has participated on and chaired many committees, working groups, and boards. He has been honored with many letters of commendation and has received the NASA Superior Achievement Award.



Stevenson, Harold H.

\*Chief, S-I/IB Operations Office  
Michoud Assembly Facility, PM

MSFC

Mr. Stevenson planned, directed, coordinated and supervised a staff of project engineers engaged in the reviewing, monitoring, and coordinating of the design, fabrication, manufacture, and testing of the S-I and S-IB vehicles at the Michoud Assembly Facility, with results evidenced in the successful performance of these vehicles. He effectively accomplished the engineering and scientific management, coordination, direction, review and acceptance of the S-I/IB contractor's engineering and scientific work performed at Michoud.

Mr. Stevenson received a Bachelor of Science in Mechanical Engineering degree from the University of Florida in 1940. He began his federal career in 1942 as an Associate Mechanical Engineer at the U. S. Naval Air Station in Pensacola Florida, and served with NASA before coming to Michoud at Langley Field. He also worked for the Army Ballistic Missile Agency. He has designed mechanical and aeronautical structures, machines and equipment used in research relating to aeronautics, and was instrumental in the development of ground support equipment for the REDSTONE and PERSHING missile systems. Mr. Stevenson received a Sustained Superior Performance Award from ABMA in 1960.

\*Mr. Stevenson transferred from Michoud January 20, 1969, and is currently serving as NASA Resident Manager, McDonald Aircraft Corp., St. Louis, Missouri.

Stewart, Francis M. III

Manager, F-1/H-1 Engine Project  
Engine Program Office  
Program Management

MSFC

Mr. Stewart has served in his present position since July 1966. He was the F-1 Engine Deputy Manager for approximately 3 years prior to his present assignment. Mr. Stewart was instrumental in developing the F-1 engine state-of-the-art technology. He has demonstrated an outstanding technical knowledge and management capability of the F-1 engine from inception to its present flight qualification. He has continuously surveilled the contractor's efforts to assure acceptable engines in a timely and economical manner. His complex spectrum of interfaces to insure engine reliability and stage compatibility has been handled in a commendable manner. His unique ability to detect the reasons for continued success of the Apollo Program.

He received a letter of appreciation for his contributions to the Apollo 8 mission from Dr. von Braun.

Mr. Stewart's 11 years of liquid propulsion background and managerial capabilities fit him well for his role.

A native of Gray, Georgia, Mr. Stewart received his BS degree in Mechanical Engineering from Georgia Institute of Technology in 1942.

Stewart, Rodney D.

Manager Lunar Module-A (LM-A) Project  
Apollo Applications Program, Program Management

MSFC

Rodney D. Stewart, Manager of the Lunar Module-A (LM-A) Project for the Apollo Applications Program and has the responsibility to plan and direct the execution of all LM-A Project activities.

Prior to assuming his present position in July 1966, he was Manager of the RL-10 Engine Project, Engine Program Office, where he was responsible for the research, development and production of the RL-10 Engine which was used on the Saturn I vehicle. The RL-10 engine was the country's first Liquid Hydrogen/Liquid Oxygen performance system developed and flown. He also served previously as Project Manager of the M-1 engine project and as a Project Engineer on the F-1 Engine Project.

Prior to joining NASA, Stewart held positions in engineering, administration and advanced rocket propulsion planning at Thiokol Chemical Corporation for seven years. He also spent three years as an officer in the U.S. Army Ordnance Corps in the field of Guided Missile and Nuclear Weapons training.

A native of Washington, D. C., he received his Bachelor of Science Degree in Civil Engineering from Virginia Polytechnic Institute in 1951. He is an Associate Fellow Member of the American Institute of Aeronautics and Astronautics (AIAA) and past president of the Alabama Section. He was a recipient of the AIAA Martin Schilling Award in 1962 and received a NASA Superior Achievement Award in 1965 for his work on the RL-10 engine as a part of the Saturn I program. He is a registered professional engineer in the State of Alabama.

Stone, John F.

Business Manager  
S-II Stage Project  
Saturn Program

MSFC

In this key position as S-II Stage Business Manager, Mr. Stone has demonstrated his dexterous managerial ability and made invaluable personal contributions to the successful Saturn V Launch Vehicle. These are evidenced in the management and direction of funding, engineering, changes, scheduling, contracting, and interfacing of business management activities for the highly complex S-II Stage.

Mr. Stone is a native of Wilsonville, Alabama and obtained his BS in Mechanical Engineering from the University of Alabama.

STRANDEMO, HERBERT C.

CHIEF, SYSTEMS INTEGRATION SECTION,  
MANUFACTURING ENGINEERING LABORATORY,  
S&E

MSFC

Mr. Strandemo was responsible for planning, directing, coordinating, and supervising a staff of engineers and production controllers engaged in engineering planning, liaison engineering and processing for the Propulsion Systems, Systems Integration and Vehicle Assembly required for the manufacture of Apollo Hardware. He also served as Laboratory representative on the Vehicle Storage Committee of Apollo Hardware for MSFC and as a consultant on manufacturing development problems to prime stage contractors.

Mr. Strandemo received his B.S. In Aeronautical Engineering from the University of Florida in 1956. He then was employed as an Aeronautical and Mechanical Engineer with the Navy in Penscola, Florida. In 1960 he transferred to NASA at Marshall and has worked in the Planning and Engineering Branch of Manufacturing Engineering Laboratory.

Stuhlinger, Ernst

Associate Director for Science

MSFC

Dr. Stuhlinger served as Director of the Space Sciences Laboratory at Marshall from its inception in 1960 until he became the Center's Associate Director for Science in December, 1968. As Director of the Laboratory, he directed and conducted research which strongly supported the development of the Saturn launch vehicles, while devoting a large effort to the planning and study of scientific missions on the lunar surface. He has made a personal contribution to the lunar landing through his participation as a member of the Apollo Site Selection Board.

As a scientist, Dr. Stuhlinger has achieved international fame for his pioneering work on electric propulsion systems for space flight, which he began in the early 1950's. His early papers on the subject, presented at national and international meetings, served as a base for later work by others. He is the author of the book Ion Propulsion for Space Flight, published in 1964.

He received his Ph.D. in physics from the University of Tuebingen, Germany, in 1936. In the spring of 1943, he joined the Rocket Development Center at Peenemuende, under the technical direction of Dr. Wernher von Braun. For his many contributions to space flight, Dr. Stuhlinger has received numerous honors and awards including the American Rocket Society's Propulsion Award in 1960, the International Galabert Prize for Astronautics in Paris in 1962, the Hermann Oberth Award in 1962, the NASA Medal for Exceptional Scientific Achievement in 1964, and the Hermann Oberth Medal in 1964. He is the author of over 150 papers and articles, and co-editor of two books dealing with scientific and technical aspects of space science and launch vehicles.

Styles, Paul L.

Director, Manpower Office

MSFC

During the formative years of MSFC, Paul L. Styles worked in direct support of NASA Headquarters as well as Marshall Center top management to resolve critical labor management problems. Resolution of these problems has been essential to the progress of the Apollo mission which will have its climax with the lunar landing in July of this year. In his present capacity as Director of the Manpower Office, he is responsible for the overall manpower utilization within the Center. It should be noted that his extensive background in labor relations has been invaluable in the management of the Center's human resources.

Mr. Styles was born in Knoxville, Tennessee, attended Huntsville High School, and holds an honorary Doctor of Law degree from the John Marshall Law School in Atlanta, Georgia. He began his labor relations career in 1936 as co-chairman of the Industrial Relations Committee of the Huntsville Chamber of Commerce. He was employed by the 10th Region of the National Relations Board in Atlanta from 1937 until 1950, beginning as a field examiner and becoming regional director in 1945. From 1943 until 1945 he was loaned to the National War Labor Board where he served as vice-chairman of the Atlanta, Georgia, Regional War Labor Board. In 1950 he was appointed to the National Labor Relations Board by President Harry S. Truman. He served with the Board until 1953, when he resigned and became a private labor relations consultant for management at Toledo, Ohio. Prior to becoming a member of the Marshall Center management staff, Mr. Styles was director of industrial relations with a company at Morgantown, West Virginia, and also served as a management consultant for labor relations for numerous firms in the same area. Mr. Styles is a member of the Industrial Relations Research Association, and has had numerous articles published in the labor relations field.

Frank Swalley

Chief, Systems Application Office, Central  
Systems Engineering, S&E (Formerly Deputy  
Branch Chief, Propulsion Performance Branch,  
Astronautics Laboratory, S&E)

MSFC

Mr. Swalley, as Deputy Branch Chief of the Propulsion Performance Branch, made a significant contribution to the Saturn V Launch Vehicle development. Particular areas of contribution include planning, directing and coordinating design, development, and verification related to propulsion system performance criteria, propulsion system predictions and propulsion system performance evaluation.

Mr. Swalley received his B.S. from Georgia Tech in 1959. After graduation he went to work at the Langley Research Center as a research engineer in the fields of hypersonic aerodynamics and reentry heating. In 1961 he transferred to the Thermodynamics and Fluid Mechanics Branch, Astronautics Laboratory, MSFC, and worked in the areas of thermal heating of satellites, high performance insulation systems, the design of propellant feed systems for the Saturn vehicles and low gravity fluid mechanics. In 1962 Mr. Swalley received his M.S. in Aerospace Engineering from the Virginia Polytechnic Institute. Since 1966 he has been associated with propulsion systems and evaluation.



Swanson, Charles A.      Chief, Industrial Support Branch  
                                 Manufacturing Engineering Laboratory, S&E      MSFC

As a Branch Chief Mr. Swanson supervises the activity of Aerospace Engineers and Industrial Specialists responsible for phasing work from the Manufacturing Engineering Laboratory to industry. Provided technical liaison and technical assistance to aerospace contractors in the development and manufacture of complex space vehicle tooling, structures, and propulsion and mechanical systems. Coordinated the various technical problems during the manufacturing development and qualification program and assured a timely delivery of structures and systems essential to the build up of the space vehicle. These actions contributed to the successful flight performance of the S-IC Stage of the Saturn V Vehicle.

Mr. Swanson received his B. S. degree from Auburn University in 1948 and entered Government Service in 1952 with the Guided Missile Development Division of the Army which later became the Army Ballistic Missile Agency. He was associated with the manufacturing development of the Redstone and Jupiter missile as well as the Mercury vehicle prior to transferring to NASA-MSFC at its formation in 1960.

Swearingen, Charles N.

Chief, Computers Division  
Astrionics Laboratory  
Science and Engineering

MSFC

As a top technical expert on guidance computers, Mr. Swearingen has made significant contributions to the outstanding performance of the Saturn launch vehicle. In his former assignment as Chief, Digital Computer Systems Branch, Mr. Swearingen had responsibility for directing the design and development of highly complex state-of-the-art and advanced aerospace digital computers for flight applications. He also had responsibility for design and development of flight and prelaunch software(programs), ground digital computers(RCA-110A), and prelaunch checkout programs. He has made significant contributions to the Launch Vehicle Digital Computer, Launch Vehicle Data Adapter, Flight Programs, Ground Computer, and Prelaunch and Checkout Programs.

Mr. Swearingen received his BS degree in Electrical Engineering from the University of Tennessee in 1949. He came to work at Redstone Arsenal in November 1950 as an Electrical Engineer and transferred to Marshall with the mass transfer in 1960. He has worked in the research and development area of guidance computer equipment through the Redstone, Jupiter, Pershing, and Saturn Programs. His exceptional managerial and technical competence in the area of computers contributed greatly to the successful Saturn program.

Mr. Swearingen has held his present position of Chief, Computers Division since April 1969.

Swearingen, Jack C.

Chief, Program Control Office  
Apollo Applications Program

MSFC

From January 1962 until July 1966, Mr. Swearingen held several positions in the Saturn I/IB Program Office which included Technical Assistant to the Saturn C-1 Project Director, Chief, Plans Branch, Technical Advisor to the Saturn I/IB Program Manager and Chief, Program Control Office, Saturn IB/Centaur Program. In these positions, Mr. Swearingen made many outstanding contributions in the initial establishment of the program control activities of the Saturn I/IB Program.

Mr. Swearingen has received three Outstanding Performance Ratings and Sustained Superior Performance Awards, and he also received an Achievement Award in 1965.

A native of Tennessee, he received a BSEE from the University of Tennessee in 1949.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
TAYLOR, HUGH M., JR.	Supv Aerospace Engineer	S&E-ASTR-N

Mr. Taylor joined the Army development group in 1951 where he became intimately involved in the development of missile guidance systems. He continued in this work after transfer to NASA and spearheaded the development efforts on the guidance computer for the Saturn space vehicle. He served as a technical consultant and lead design engineer for the <sup>flight</sup> guidance hardware making major contributions with advanced technology and application of redundancy to <sup>digital</sup> ~~(guidance)~~ hardware. The fact that the guidance system and hardware for the Saturn launch vehicle has met the criteria and requirements of the manned space flights on the Apollo program can be attributed to a large extent to Mr. Taylor's advanced planning and influence on the development. Mr. Taylor was killed in an air crash on July 9, 1964 while returning from Washington, D. C. where he <sup>had</sup> participated in a design review of the Saturn-Apollo guidance system.

Taylor, James C.

CHIEF, TECHNOLOGY DIVISION

S&E-ASTR-R

Mr. Taylor is responsible for directing research and technology in the fields of Physics, Chemistry, Electronics and other related fields in support of current and future NASA/MSFC missions. Mr. Taylor and his organization have made specific contributions to the Apollo flights in development of microelectronic devices and circuits, failure analysis, development of digital and analog techniques and devices for incorporation in the launch vehicles, static power supplies and 3-phase static inverters, optical research, optical devices, and optical and laser systems.

James C. Taylor is Chief of the Technology Division of the Astrionics Laboratory at NASA's Geo. C. Marshall Space Flight Center. He joined the research and development team in Huntsville in October 1951, and became part of MSFC when it was established in July 1960. Mr. Taylor was born in Winchester, Tennessee, attended Georgia Institute of Technology and the University of Texas to study engineering and physics.

TEAGUE, Elijah W., Sr.      Tool Stock and Parts Keeper      MSFC  
S&E-Manufacturing Engr Lab

An expert tool stock and parts keeper, Mr. Teague has made significant contributions to manufacturing and development of the Saturn Launch Vehicle. Supporting the fabrication and assembly shops, his knowledge of specialized tools and their application promoted the efficiency of shop operation.

Mr. Teague has been associated with research and development of launch vehicles since 1954, serving the Army Ballistic Missile Agency and NASA. His proficient service and contribution to effective ideas has contributed greatly to tool, parts, and stock keeping operations and to research and development programs.

Teir, William

Manager, Saturn IB Program

MSFC

Mr. Teir was assigned to MSFC as Deputy Manager, Technical, Saturn I/IB Program in June 1965 while a Colonel in the U. S. Army and continued in this capacity after his retirement. He became Manager of the Saturn IB Program in January 1967 and has been responsible for the management of the Saturn IB development and production through the history-making manned Apollo 7 mission and the phasedown of the program to the forthcoming AAP Program. Because of Mr. Teir's thoroughness of action and his detailed knowledge of and working relationships with the Saturn prime contractor structure, he has been assigned the task of managing a group of personnel to study the various aspects of a standard Saturn V launch vehicle which can be produced for half of the current price, and which vehicle will be used for the follow-on production in the future.

Mr. Teir has received many commendations and awards for his extensive experience and knowledge, both technical and managerial, in various guided missile and rocket programs for the past 25 years. He began his career in rockets and missiles in 1946 as a design engineer for Boeing; in 1947 he was recalled into Army service and spent the next 19 years primarily in the fields of guided missile R&D management and operations.

Mr. Teir received his Bachelor of Science Degree in Mechanical Engineering from Oregon State College in 1946 and received a double Master of Science Degree in Aeronautics and Guided Missiles from the University of Southern California in June 1950.. He also attended the Army War College at Carlisle Barracks, Pa., and was evaluated as potential for promotion to General Officer rank.

TESSMANN, Bernhard R.

Assistant Director  
Astronautics Laboratory, S&E

MSFC

Mr. Tessmann has made vital contributions in solution of unprecedented problems involving the design of test facilities for the experimental and developmental testing of Saturn launch systems, sub-systems and components.

Mr. Tessmann was educated in Germany where he received his BS degree in Mechanical Engineering in 1935. He came to the United States under the Department of Army's "paper clip" program in September 1945. He transferred from Fort Bliss to Redstone Arsenal in April 1952 as Chief, Test Stand Design Section. Since that time, he has served as Assistant Director, Test Laboratory, ABMA, and as Deputy Director, Test Laboratory, MSFC. He accepted his present position as Assistant Director, Astronautics Laboratory, in February 1969.



Thomason, Dr. Herman E. Deputy Director, Preliminary Design Office MSFC

Dr. Thomason has published, along with other writings, a Marshall Technical Paper entitled "Scheme Error in Azimuth Alignment of Saturn V Platform" and a NASA Technical Note titled "Saturn Vehicle Attitude Resolver Computer Error Analysis." His contributions in the field of control and inertial platform systems have contributed significantly to the Marshall effort. His specialized research has resulted in patents on an Azimuth Laying System and a Trigonometric Vehicle Guidance Assembly.

Dr. Thomason received his B. S. in 1951 from VPI. He worked as a project officer in the Air Force, later as a test engineer in private industry and at the same time continued his education. He received his M. S. from UCLA in 1955 and his Ph.D. in 1968. He is a member of the Institute of Electrical and Electronics Engineers (IEEE) and The American Institute of Aeronautics and Astronautics (AIAA).

Thompson, Ara W.

Deputy Chief, Test Support Shop Branch

S&E-ME-V

As Deputy Chief of the Test Support Shop Branch, participated in the planning of test facilities required in the static, dynamic, and component testing of flight stages from the Redstone through Saturn V programs. Supervised the fabrication and erection of many of these facilities and later was responsible for the transportation and erection of the various test and flight stages involved in these programs.

Mr. Thompson received his B. S. degree from Auburn University in 1948, and after four years with the university, joined the Guided Missile Development Division, Redstone Arsenal, in 1953. He transferred to NASA with the mass transfer in July 1960.

Thompson, Arthur W.

Special Assistant to Director  
Program Management

MSFC

Mr. Thompson served as the Manager of the S-I/B Stage, Saturn I/IB Program from November 1963 until January 1969. He made many superior contributions to the S-I Stage and also the redesign of the S-I booster into the S-IB Stage which reduced the stage weight by more than 20,000 pounds to increase payload capability. He was awarded a Certificate of Merit by the Director, MSFC in January 1969 for his services and contributions to the outstanding achievement of the Saturn I/IB Program. Prior to this assignment, Mr. Thompson served as the Chief of the Systems and Instrument Branch where he had a significant part in the early satellite program. He was instrumental in developing the solar cell power systems, the vidicon system currently used in the Tiros Program, energetic particle detection systems, tape recorders, and tracking systems. From December 1961 to December 1963 he also served as Chief, Technology Utilization Office, and was nominated for the National Civil Service League Career Service Award. He received a Sustained Superior Performance Award for his contribution to the research program, particularly in the coordination of the scientific tests whose instrumentation was carried by the Army-fired EXPLORER satellites.

Mr. Thompson, a native of Louisville, Kentucky, holds a Bachelor of Science Degree in Physics and Math from Western Kentucky College.

Thomson, Jerry

Deputy Chief, Engineering Division,  
Astronautics Laboratory, S&E

MSFC

Mr. Thomson is a propulsion system expert nationally known for his direction and chairmanship of agency wide Ad Hoc committees which resolved combustion instability and augmented spark ignition line problems. The resolution of these problems made possible the development of our present Saturn V propulsion systems. He has made numerous important contributions through technical direction of Saturn engine contractor activities. \*

Mr. Thomson received his B. S. degree in 1952 in mechanical engineering from Auburn University. Following graduation, he worked at North American Aviation for four years in rocket engine development. After joining ABMA in 1958 and transferring to MSFC in 1960, he served as chief of the Advanced Propulsion Section; later as chief of the Engine and Power Branch. His most recent assignment is Deputy Chief of the Engineering Division.

Tiede, Jack E.

Special Assistant Test & Quality  
Evaluation Office, Mississippi Test Facility  
Program Management

MSFC

Jack Tiede joined the NASA team in September, 1961 as a Project Engineer on the H-1 Engine and has held various key positions since that time. Shortly thereafter he was reassigned to the H-1 Engine Resident Project Office at Neosho, Missouri where the prime contractor, Rocketdyne, tested components of the H-1 engine. Later, manufacturing of several major components of the J-2 and F-1 engines was transferred to the Neosho plant. As Resident Project Manager, H-1 Engine Resident Project Office, Tiede provided the daily on-site coordination to the contractor for manufacturing and acceptance of these various components. He was awarded the Superior Achievement Award in November 1965 for the qualification of the 200K H-1 Engine in a timely manner with subsequent early delivery of ground test engines.

He is currently serving as Special Assistant, Test and Quality Evaluation Office of MSFC's Mississippi Test Facility.

Mr. Tiede, a native of Billings, Missouri, served in the U.S. Navy from 1941 to 1946. He received his BS degree in Chemical Engineering from the University of Missouri, Missouri School of Mines, Rolla, Missouri in 1940.

Trader, John E.

S-IV-B Sr. Laboratory Representative

MSFC

Quality and Reliability Assurance Laboratory, S&E

As the Senior Laboratory Representative for the S-IV-B stage, Mr. Trader has been highly effective in assuring a complete quality and reliability program, both at Huntington Beach and at SACTO. The Quality Maintenance Program was successfully completed under his guidance. His versatility and diverse knowledge are well known, and he was selected to serve on the MSFC team at Downey to improve the Command Module quality; he was also selected to perform special quality surveys at MSC.

Mr. Trader joined MSFC in 1963. He received his B. S. in Physics from Ohio State University in 1949.

Trott, Jack

Deputy Director

MSFC

Quality and Reliability Assurance Laboratory, S&E

After compiling an outstanding record in the Manufacturing Engineering Laboratory, which saw him progress from a Unit Chief position to Deputy Director, Mr. Trott transferred to the Q&RA Laboratory as Deputy Director in 1965. His energetic approach has promoted outstanding contributions in the Saturn Apollo quality and reliability effort. His personal investigation for the Program Manager into the S-II Q&R activity at Seal Beach, during the period of severe program difficulty, resulted in many changes in the contractor's approach and significantly improved their program. Dr. Rees specifically requested him to spearhead the MSFC Q&R team sent to Downey to assist in improving the CM contractor validation and checkout techniques. Again, he personally influenced significant program improvements. After an overall Saturn quality evaluation, he directed the development of a Quality Maintenance Program designed to elicit extra initiative from the prime contractors.

Mr. Trott's rocket experience began at Redstone Arsenal in 1954. He holds a B. S. in Mechanical Engineering from Auburn University and a M. S. in Industrial Engineering from the Georgia Institute of Technology.

Turner, Gerald L.

Chief, Advanced Computer Office  
Computer Division, Astrionics  
Laboratory, Science & Engineering

MSFC

Mr. Turner directed many of the efforts which led to the design, development, and incorporation of the Saturn Ground Checkout System. As Deputy Chief of the Digital Computer Branch of Astrionics Laboratory, he had primary responsibility for the ground checkout computers and their related software system. This responsibility was held during conceptual design, hardware and software development, integration into the system, and subsequent usage at KSC. He was responsible for the major contracts during this period. As Chief of Ground Systems Office in the Systems Engineering Office, he later was responsible for integration of the entire ground checkout system and contributed significantly to the many operational refinements and system improvements made during the early utilization of the checkout system.

Mr. Turner received his B.S. degree in electrical engineering from Tennessee Polytechnic Institute in 1950. After serving in the Air Force, he joined Missile Firing Laboratory of Ordnance Missile Laboratory in January 1955, and worked in the area of missile tracking at Cape Canaveral. In 1956, he joined ABMA in Huntsville and worked in the Guidance and Control Laboratory in the area of ground checkout equipment for the Redstone, Jupiter, and Pershing missiles. He transferred to MSFC in 1960 and has, since then, been instrumental in the development of the Saturn I, Saturn IB, and Saturn V systems.



Tyson, Overton Steed

Manager, S-IVB Resident Office

MSFC

Mr. Tyson is Manager of the S-IVB Resident Office at McDonnell Douglas Astronautics Corporation, Huntington Beach, California. Mr. Tyson has applied new management techniques and methods to his assignments and, on numerous occasions, has been selected by his superiors for special assignments as the Marshall Space Flight Center representative. He has developed and maintained a unified consistent and cohesive MSFC approach to the contractor, blending the capabilities of the management team into an efficient, rapidly responding source of local direction. He has established and maintained proper relationship and communication between contractor, other Government agencies, other project participation and NASA. As a result of this, he has been able to make on-the-spot resolutions of the S-IVB Stage problems which otherwise could have had adverse impact on the project.

Mr. Tyson, a native of Rome, Georgia, obtained a BS in Mechanical Engineering from Georgia Institute of Technology in 1957. He has had approximately twelve years in the missile industry. Prior to his assignment as S-IVB Stage Resident Manager in January 1968, Mr. Tyson served as the S-IV Stage Resident Manager and then as the S-IVB Stage Resident Manager at Sacramento. He has also served as a Project Engineer at Santa Monica, California and MSFC, and as a Research Engineer at Rocketdyne.

Urlaub, Matthew W.

Manager, S-IB/IC Stage Project  
Saturn Program

MSFC

Mr. Urlaub has served as the S-IC Stage Project Manager since the inception of the Saturn V Program in October 1963. Prior to this, he held the same position in the Saturn Systems Office. He has been responsible for the first stage since October 1961. Prior to 1961, he was Project Manager for the R&DO Labs of ABMA on the Jupiter and Redstone Programs. Due to his wealth of knowledge and ability to analyze problems and recommend sound solutions, he has been of invaluable assistance in the Program. He has performed his assignment in such a manner that he has been commended by top management many times and has received outstanding performance awards. Mr. Urlaub is presently Manager of the S-IB/IC Stage Project. The combination of these two projects resulted from the overall consolidation of these two major programs - the Saturn V and Saturn I/IB in January 1969. He was one of 19 MSFC employees awarded the NASA Exceptional Service Medal for the successful Apollo 8 lunar mission.

Mr. Urlaub became a member of the Army Ballistic Missile Agency's Industrial Division staff at Redstone Arsenal in 1957. He was the ABMA senior resident engineer for the Jupiter Program at Chrysler Corporation in Detroit from 1955 to 1957.

Born in Brooklyn, New York, Mr. Urlaub attended Duke University, Durham, North Carolina, to earn his Bachelor of Science Degree in Mechanical Engineering in 1948.

Vandersee , Fritz A.

Chief, Test Support Shop Branch

S&E-ME-V

As Chief of the Test Support Shop Branch, participated in the planning of test facilities required in the static, dynamic, and component testing of flight stages from the Redstone through Saturn V programs. Supervised the fabrication and erection of many of these facilities and later was responsible for the transportation and erection of the various test and flight stages involved in these programs.

Mr. Vandersee has been associated with space flight since starting to work with the V-2 program in the early 1940's. He came to the United States with project Paperclip in 1945 and continued work with the U. S. Army Missile program at Fort Bliss, Texas, and Huntsville, Alabama. He joined NASA in 1960 with the mass transfer to Marshall Space Flight Center.

Vaniman, Jerold L. Chief, Thermal Engineering Branch  
Propulsion and Thermodynamics Division  
Astronautics Laboratory, S&E

MSFC

As a technical expert in the field of thermodynamics and heat transfer, Mr. Vaniman has supervised and personally made significant contributions in the design and development of the Saturn V launch vehicle environmental control and propellant conditioning systems. In particular, he developed the residual propellant engine dump technique which is used after S-IVB second burn termination to provide additional impulse required to prevent the S-IVB stage from impacting the moon and to expedite passivation.

Mr. Vaniman has been associated with the design and development of launch vehicles thermal and propellant systems since his employment with ABMA in 1958. Shortly after the mass transfer to MSFC in 1960, he became Chief of the Thermophysics Section within Propulsion and Vehicle Engineering Laboratory. He has made major contributions to the Saturn V launch vehicle which have contributed to the current outstanding performance.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Vaughan, William W.	Chief, Aerospace Environment Division	MSFC

As Chief of the Aerospace Environment Division, Mr. Vaughan directs a staff of scientists and engineers in natural aerospace environment studies for space vehicles and spacecraft. In this role, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs. He is responsible for establishing the natural environment system design and operational criteria for the Saturn V vehicle. In the early development phases of the Saturn no wind monitoring system in existence was capable of measuring the vertical wind gradients and shears with the resolution required to identify the frequency content of the wind profile near the bending-mode frequencies of the vehicle. To alleviate the problem he directed the development and operational deployment of the FPS-16 Radar/Jimsphere Wind Monitoring System which minimizes vehicle failure risks when integrated into a flight simulation program. The resolution of data obtained permits calculation of structural loads associated with dangerous bending modes of the vehicle during the critical dynamic pressure phase of the flight and improves the accuracy better than an order-of-magnitude over the conventional rawinsonde wind-profile measuring system. The system is used in the prelaunch monitoring of Apollo and Saturn manned programs. In addition, Mr. Vaughan is responsible for ground wind probabilities which led to the design of a vehicle damper which minimizes the risk to the Saturn V due to ground winds. He pioneered in the establishment of sophisticated winds aloft statistics which permit accurate calculations of structural loads associated with in-flight winds during the critical Apollo-Saturn V launch phases.

Mr. Vaughan has been associated with the Saturn and Apollo programs of NASA since 1960.

In 1952, he became engaged in applied meteorology studies, particularly atmospheric problems associated with the research, design, and development of missiles and space vehicles. He received a B.S. degree in mathematics and physical science from the University of Florida in 1951 and subsequently completed a year's graduate study in atmospheric physics at Florida State University. He is a Certified Consulting Meteorologist.

Vedane, Charles R.

Senior Systems Engineer, Systems  
Verification Division, Central Systems  
Engineering, Science & Engineering

MSFC

Mr. Vedane directed and contributed to conceptual design, manufacture, installation, and operation of stage systems checkout equipment used for verification of operational readiness of stages of the Saturn-Apollo launch vehicles. He directed contractor effort for design and installation of prototype automatic checkout equipment at MSFC. He has directed development of integrated test plans and procedures being applied to the checkout of the Saturn vehicles.

Mr. Vedane received his B.S. degree in aeronautical engineering from St. Louis University in 1952. He joined ABMA as an engineer in 1958, and transferred to MSFC in 1960, where he has been employed in development work on Saturn I, Saturn IB, and Saturn V test and checkout plans and operations.

VERBLE, Adas J., Jr.

Deputy Chief, Vehicle Systems Division  
Astronautics Laboratory, S&E

MSFC

As technical expert in structural design of launch vehicles, Mr. Verble has made significant contributions to the outstanding performance of the Saturn launch vehicle. As Chief of the Structural Design Branch, Structures Division, Propulsion and Vehicle Engineering Laboratory, he was responsible for the major load carrying structures for this launch vehicle.

Mr. Verble has been associated with structural design work at MSFC and earlier with Army missile development since 1951. During this time he worked on Redstone, Jupiter, Saturn I, Saturn IB, and Saturn V programs. He joined MSFC in 1960.

von Braun, Wernher

Director, Marshall Space Flight Center

MSFC

A pioneer in the field of rocketry and space travel, Dr. von Braun has been in the forefront of the development and management of launch vehicle technology for over thirty-five years. When he received his Ph.D. in physics from the University of Berlin at the age of 22, he had already sketched the plans and made the calculations for a launch vehicle to carry men to the moon and back. The fulfillment of this dream, the development of the giant Saturn V rocket under his leadership at the Marshall Center, is the latest of his contributions to the nation's space accomplishments. Vehicles developed under his technical direction placed the first U.S. satellite into orbit, and launched the first American into space and the first men to the moon.

Dr. von Braun has been Director of NASA's George C. Marshall Space Flight Center in Huntsville, Alabama, since its inception in 1960. In this position, he has guided the Center throughout the Apollo Program and has been a principal member of the Saturn/Apollo management team. For his outstanding contributions, he has been honored with numerous honorary degrees and distinguished awards, including the Dr. Robert H. Goddard Memorial Trophy, the Hermann Oberth Award, the Distinguished Federal Civilian Service Award, and NASA's Distinguished Service Medal. He has written many articles on rocketry and space exploration, and has authored and co-authored several books, including History of Rocketry and Space Travel (1966) and Space Frontier (1967).

For Dr. von Braun, the accomplishment of the Apollo objectives represents an important milestone in a life dedicated to the exploration of space.



von Pragenau, George L., Aerospace Engineer, S&E-ASTR-A

Mr. von Pragenau has been instrumental in the design and development of Saturn launch vehicles. His investigations of performance and stability with regard to the thrust vector control system and flexible body dynamics have been fundamental to the success of the booster program. In addition he was responsible for the design and development of a hydraulic support for a fully loaded Saturn V by which free flight conditions can be simulated. Mr. von Pragenau continues to be closely associated with booster problems.

Mr. von Pragenau received his BS in Mechanical Engineering and MS in Electrical Engineering from the Institute of Technology, Vienna, Austria. He has had 12 years experience in the aerospace field covering a wide range of technical disciplines.

Vreuls, Frederick E.

Deputy Chief, Products Office  
Science & Engineering Directorate

MSFC

Mr. Vreuls has contributed a number of significant first in the aerospace industry as a member of the von Braun team for the past 18 years. During the early days of his career he was instrumental in providing practical reentry body designs, orbital payload launchers, and has on many occasions provided first use of new materials and fabrication processes in the aerospace industry. In the later years of his career, Mr. Vreuls held positions in management and systems engineering, being responsible for the booster stage of the Saturn I launch vehicle, Saturn IB launch vehicle systems engineering, and has held the position of Deputy Director of the Systems Engineering Office of the Science & Engineering Directorate of the Center. Some of the activities Mr. Vreuls directed for the Launch Vehicle Program Manager included the Design Certification Review preceding Manned Flight of the Saturn IB Launch Vehicle. Mr. Vreuls also served on the Crew Safety Review committees for first manned launches in the Apollo Program.

Mr. Vreuls received his B.S. degree in Aeronautical Engineering from Auburn University in 1949. He was first employed by the von Braun team in February as an airframe designer and has recently assumed responsibility as Deputy Director of the Products Office. He has many awards to his credit including Sustained Superior Performance.

Wade, George H.

Deputy Director, Facilities Office

MSFC

Mr. Wade as Deputy Director, Facilities Office, and Acting Chief of the Master Planning Office, has the responsibility of planning, directing and supervising the analysis of facility requirements, development of facility concepts, determination of optimum facility plans and criteria; and the establishment of facility master plans for sites administered by MSFC at Huntsville throughout the United States as they relate to the Saturn/Apollo Program. This is one of the most complex facility programs in the country, nation-wide in scope, with unprecedented engineering and management problems. Mr. Wade's astute direction and application of many hours of his own time contributed greatly to the development of these facilities on the highest priority basis in keeping pace with the commitments for the Saturn/Apollo Program.

Prior to coming to MSFC, Mr. Wade was employed with the Air Force at Arnold Engineering Developing Center, Tullahoma, Tennessee, where, as Chief of the Engineering Division, he was engaged in the planning and design of some of the most advanced aerospace test facilities in the world. Mr. Wade is a graduate of Dartmouth College, Hanover, N. H., where he received his BS and MS Degrees in Engineering. He is a member of the Institute of Environmental Sciences.

Walker, Russell D.

Manager, Project Logistics Office  
Program Management

MSFC

Mr. Russell D. Walker was one of the original employees at MSFC with responsibility to insure an adequate supply of propellants, pressurants, gases, and oxidizers for MSFC space vehicle use.

He has served as Deputy Chief, Project Logistics Office, for 3 years and is currently Acting Chief. He has successfully monitored all logistic changes to assure that changes are within Apollo specifications or that required changes are requested.

Mr. Walker is recognized as a national expert in the propellants and pressurants field. Through his efforts in managing a program of unprecedented scope, magnitude, and complexity, the required support to the Apollo Program in the logistics field was provided as minimum cost.

Mr. Walker received a B.S. from Tennessee Polytechnic Institute in 1949. He received a Sustained Superior Performance Award in 1959 and again in 1964.

Wallace, George D. Chief, Program Plans & Requirements Group

MSFC

Mr. Wallace served for three years as Deputy to the Project Manager of the S-II Stage. In that capacity he provided immediate overall technical and managerial direction to technical elements within the Center and to supporting contractors. His duties included planning, organizing, implementing, and coordinating the effort required for timely and reasonable production of a quality product.

Mr. Wallace received his B. S. in Mechanical Engineering in 1948 and worked for eight years in private industry. He entered the aerospace field as a project engineer on the Nike missile system at Redstone Arsenal. He also contributed to the Redstone and Pershing programs before transferring to MSFC in 1961. His initial duties with NASA were in the nuclear propulsion and power studies area. He moved into the Saturn program as Deputy Project Manager of the Pegasus Project in 1963.



Weber, Fritz

Chief, Future Systems Engineering, Central  
Systems Engineering, S&E (Formerly, Chief  
Projects Office, Astrionics Laboratory, S&E)

MSFC

As Chief of the Astrionics Projects Office, Mr. Weber has been responsible for controlling the incorporation of the astrionics system and components in the Saturn launch vehicles; in particular, his Projects Office was in charge of the Instrument Unit, the electronic stage of the launch vehicle. Mr. Weber directed very successfully and resolved, in many cases personally, interface problems. His thorough knowledge and experience in systems engineering, as well as in component design, helped him to exercise best judgment for optimum solutions. At several opportunities he headed ad hoc investigation teams to evaluate critical development phases; his strong personal participation in these teams and the generated recommendations resulted always in optimum improvements.

Mr. Weber received his BSEE from the GAUSS Schule in Berlin, Germany, in 1936. In 1948 he joined the von Braun team again in the United States at the Ord. Res. & Dev. Sub. O., Fort Bliss, Texas. After transferring to the Marshall Space Flight Center, he became first the Assistant to the Director of Astrionics Laboratory until Astrionics Projects Office became established in 1963, which he built up and directed.

Weckwarth, Fred

Deputy Chief, Manufacturing Development Division  
Manufacturing Engineering Laboratory, S&E

MSFC

Mr. Weckwarth has made contributions to the space vehicle development in several different fields. He was responsible for the development of in-house manufacturing plans, schedules, assembly sequences and resource requirements for the assembly of the S-IC stage. He directed the development and assembly of parts and components for the S-IC stage. He exerted outstanding management skills in obtaining maximum team work throughout his division and laboratory to achieve difficult schedule goals and manufacturing requirements.

Mr. Weckwarth received his B. S. degree in Industrial Engineering from Syracuse University in 1951. He worked for the Corps of Engineering until he transferred to the Army Ballistics Missile Agency in 1956. Since 1963 he has held progressively more responsible managerial positions with the Manufacturing Development Division of the Manufacturing Engineering Laboratory.



Weidner, Herman K.

Director, Science and Engineering

MSFC

As Director of Science and Engineering (formerly R&D Operations), Dr. Weidner has management responsibility for the systems engineering of all Saturn vehicles and technical responsibility for excuting hardware phases of the Saturn program. Through his leadership, Dr. Weidner coordinated and guided the scientific and engineering efforts of 8 major technical laboratories and 4 offices to achieve high technical excellence of Saturn flight hardware and performance planning, and successful accomplishment of a long series of unique vehicle launches. The success of the Saturn flight program amply illustrates the scope of Dr. Weidner's contribution in the management and direction of highly complex and interacting technical programs.

Dr. Weidner has had a long and varied experience in the field of rockets. A member of the V-2 Development Team at Peenemunde, Germany, he came to the US in 1945, working with the Army first at Ft. Bliss, and later at Redstone Arsenal, Huntsville, Alabama. He became a US citizen in 1955. In 1960, he was transferred to the Marshall Space Flight Center; where he served as Deputy Director, Propulsion & Vehicle Engineering Laboratory; Director of Propulsion, MSFC; and Director, R&D Operations. He received his Master's degree in Mechanical Engineering from Technische Hochschule, Darmstadt, Germany, and an Honorary Doctorate from Rollins College, Florida, in 1969. He holds the NASA Medal for Outstanding Leadership and the NASA Exceptional Service medal.

Weir, Robert H.

Deputy Manager, Instrument  
Unit Project Office, Saturn Program

MSFC

As Deputy Manager of the Instrument Unit Project Office, Saturn Program, Mr. Weir made significant contributions to the outstanding performance of the Saturn IB and V Launch Vehicles. In addition, as Chief of the Instrument Unit Engineering Branch from August 1964 to December 1969, he successfully provided direction to the stage prime contractor (IBM) and the guidance system contractors necessary for the Instrument Unit Project to meet assigned flight mission objectives within funding limitations and schedule commitments. Mr. Weir has been a part of the Apollo Program team since March 1963.

A native of Jackson, Mississippi, Mr. Weir holds a BS in Aeronautical Engineering from Mississippi State University. He was nominated for the Hugh Dryden Fellowship Award in 1967.

Whitaker, Ann F.

Biophysics and Radiation Section  
Astronautics Laboratory

MSFC

Mrs. Whitaker was one of the key individuals involved in solving the serious bearing problem on the huge Saturn crawler at the launch site. Her highly specialized knowledge, formal education, and experience in the field of bearing technology was a deciding factor in the successful solution of the crucial bearing difficulty which, at one time, threatened to render it virtually impossible for the crawler to carry the massive Saturn V from the VAB to the pad. She personally contributed heavily to the successful solution to this problem, and did so at no little personal sacrifice, since the task team assigned to this problem worked on a 24-hour basis for a period of three to four weeks.

Mrs. Whitaker received her BS in Physics degree from Mt. Berry College at Rome, Georgia in 1961. She has diligently pursued further education, and received her Masters Degree in Physics from the University of Alabama (Huntsville) in 1968.

Williams, Francis L.

Associate Director, Program Development

MSFC

Mr. Williams is a recognized leader in the area of advanced planning and preliminary design of space transportation systems. He had a leading role in the early design studies which defined the present configuration of the Saturn launch vehicle. From 1963 to 1965, during the Center's buildup for the Apollo Program, he served as the Assistant to the Director, MSFC. Under his capable leadership as Director, Advanced Systems Office, much of the work of defining an Earth Orbital Space Station and a Reusable Logistics Vehicle has been accomplished.

Mr. Williams received his B. S.<sup>°</sup> degree in Aeronautical Engineering from Alabama Polytechnic Institute (Auburn University) in 1951 and his M. S. in 1955 from Massachusetts Institute of Technology. He has authored many publications in the area of advanced systems and is an Associate Fellow of the American Institute of Aeronautics and Astronautics.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Wittenstein, Gerald	Chief, Trajectory Section	MSFC

As Chief of the Trajectory Section in the Aero-Astroynamics Laboratory, Mr. Wittenstein performs and supervises the generation of the preflight performance predictions for space vehicles and spacecraft. In this role, he has made significant and lasting contributions to the integrated Apollo and Saturn manned programs.

Accordingly, he is directly responsible for the development of the first mathematical model of the total performance behavior of the Saturns IB and V. The model incorporates the system performance interactions of propulsion, guidance, and control to include the guidance and steering logic as it is implemented on-board, the precise thrust history and the aerodynamic and control configuration and stability characteristics. The model is used for each Saturn launch to predict the real-time flight performance of the manned vehicle from the launch location, through earth orbit injection, to attainment of the translunar flight path. The accuracy of the model has continually been verified from insignificant differences between the model and the actual flight evaluation results. This model is also used for verification of systems design criteria such as structural load determinations and margin predictions of aerodynamic heating, range, and crew safety.

Mr. Wittenstein has been associated with Saturn and Apollo programs of the National Aeronautics and Space Administration since 1961, after he received his B.S. degree in mathematics and physics from Birmingham Southern College. He performed and coordinated Saturn guidance and control design studies as an Assistant Project Engineer for the Aero-Astroynamics Laboratory until 1963 when he became engaged in the prediction and evaluation of the Saturn flights. He has served in his current position since 1966.

Wittmann, Albin E.

Technical Assistant to the Director

MSFC

Quality and Reliability Assurance Laboratory, S&E

Mr. Wittmann's vast experience, knowledge, and accomplishments constitute tangible values which he has brought to the Saturn program. He is recognized as an authority on electronic quality techniques, such as automated centrifugal tinning for dip spin soldering of PC boards and the WAS-12 Wavesoldering Line. His early influence is still reflected in many aerospace electronic industry practices and NASA specifications and requirements.

Mr. Wittmann began his rocket career in Peenemuende, Germany. He came to Fort Bliss in 1946 and worked in the Army rocket programs there and at Redstone Arsenal until ABMA was converted to NASA.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Wojtalik, Fred S.	Chief, Systems Division	S&E-ASTR-S

Mr. Wojtalik has been a key individual in the development and implementation of the Saturn ground computer complex installed at KSC and its application to automatic checkout of the Saturn launch vehicles. Some of his specific contributions are: He was instrumental in translating the checkout requirements imposed by KSC and the on-board checkout requirements into an efficient and accurate automatic checkout scheme which could be implemented by a digital computer; He was a key individual in the selection and procurement of the digital computer used for this purpose, serving as COR on contracts which approached 75 million dollars; He has served on several working groups, panels, and committees chartered to transact business in his specialty including the NASA headquarters Information Display Working Group. He was given a Commendation for Meritorious Service in 1964, a Commendation Award for Service and a Cost Savings Commendation in 1966, and a Sustained Superior Performance Award in 1967. He has just completed the Sloan Fellowship program in industrial management at MIT.

Mr. Wojtalik has held the position of Chief, Systems Division, Astrionics Laboratory, since April 1969. After receiving a B. S. Degree in Electrical Engineering from Michigan State University in 1952, he served as Electronics Officer in the U. S. Air Force and as Group Supervisor in the Guidance and Control Department, Chrysler Corporation, working on the Redstone and Jupiter missile systems. He came to Huntsville in January 1960 and joined the von Braun group as Deputy Chief, Ground Support Equipment Section, ABMA. He transferred to NASA in July 1960 and served as Chief of the Ground Support Equipment Section, as Technical Assistant to the Chief, Guidance and Control Division, and as Chief, Engineering Office, Guidance and Control Division until appointment to his present position.

WOOD, ANDREW J.

Deputy Director, Purchasing Office    Marshall Space Flight Center  
Administration & Technical Services

Mr. Wood, as Deputy Director, Purchasing Office has been one of the principal advisors to Marshall Space Flight Center's top management for those procurement and contracting activities within the purview of the Purchasing Office during the Apollo Program.

Mr. Wood graduated from the University of North Texas with B.S. and M.S. Degrees in Government and Public Administration. His experience in Government contracting work covers a period of 27 years, 24 of which has been <sup>as</sup> a Contracting Officer. He began his career with the Government in 1942 at Rock Island Arsenal, Rock Island, Illinois. He has been employed at Marshall Space Flight Center since February of 1962. Prior to coming to Marshall Space Flight Center, Mr. Wood was Chief of the Procurement and Contracts Office of the Red River Arsenal at Texarkana, Texas. He assumed his present position in September of 1963.



Wood, Charles C.     Deputy Chief,  
                         Propulsion and Thermodynamics Division  
                         Astronautics Laboratory, S&E

MSFC

Mr. Wood directed and contributed personally to the design, continuous improvement and finalization of the Saturn stages, propellant storage, propellant feeding, pressurization and conditioning systems. For example, finding solutions for the successful restart of cryogenic rocket engines under low g conditions in orbit, a problem of great importance to the success of the Saturn Launch Vehicle Program.

Mr. Wood received his B. S. degree from Auburn University in 1944, and did graduate work at the University of Virginia. His career with the Langley Research Center, the Army Ballistic Missile Agency and the Marshall Space Flight Center covers more than 20 years of research and development in high speed aircraft, missile re-entry and base heating protection and launch vehicle propulsion systems. He has authored a number of papers on problems important to the successful operation of the Saturn stages.

Wood, James E.            Supervisor, Equip. & Instr. Unit  
                                 Manufacturing Engineering Laboratory, S&E            MSFC

Mr. Wood has served as supervisor of Equipment and Instrumentation Unit for the Manufacturing Engineering Laboratory for the past seven years. In this capacity he has been responsible for the development, design, manufacture and maintenance of electronic control systems for welding and milling equipment used by this Laboratory in the development and prototype manufacture of major components for the Apollo Program. He has served as consultant on facility problems to the major contractors associated with the Apollo Program. A guide for electronic technicians for automatic welding system was developed under his supervision. This is widely used by industry.

Mr. Wood attended Texarkana College graduating in 1937. He served in the U. S. Navy from 1944 to 1947. Mr. Wood was employed at the Army Ordnance Depot, Texarkana, Arkansas, in 1949 and came to the Army Ballistic Missile Agency in 1956. He was transferred to NASA when the MSFC was organized in 1960.

Woolf, Herbert L., Jr.

Chief, Maintenance Division  
Technical Services Office, A&TS

MSFC

Mr. Woolf has managed the construction of a number of facility projects critical to the success of the Saturn V Program. Among the projects were installation of Neutral Buoyancy Experimental equipment and modifications for S-II Structural Test Program. He has also directed handling and transportation of stage components and instrument units on the installation and between local manufacturing facilities and local shipping points. Mr. Woolf concurrently directed the plant maintenance activities at MSFC necessary to keep the installation operational.

Mr. Woolf received his education at Snead College and Jacksonville State University. With the exception of five years in private business, he has been active in construction, utilities, and plant maintenance fields for approximately 30 years. His career has included positions with the Bureau of Public Roads, Departments of the Air Force and Army, as well as over seven years with NASA at MSFC.

<u>NAME</u>	<u>POSITION</u>	<u>ORGANIZATION</u>
Woosley, Alvan P.	Chief, AAP-2 Section	S&E-ASTR-SEC

Mr. Woosley directed and made many personal contributions to the design and development of the Saturn booster stages electrical systems which has obtained an excellent performance record. As Chief of the Stage Integration Section, Airborne Electrical Systems Branch, Astrionics Laboratory, R&D Operations he lead a group of circuit specialists who established the design concepts and their implementation.

Mr. Woosley has been associated with the design of vehicle electrical systems since 1957 when he joined the Army Ballistic Missile Agency to design circuitry for biological experiments flown in Jupiter nose cones. In 1960 he was assigned to the Mercury program where he made significant contributions in the development of the Emergency Detection System for monitoring crew safety.

Mr. Woosley received his B.S. degree from Murray State University in 1936.

Worlund, Armis L. Chief, Fluid Mechanics and Dynamics Branch MSFC  
Propulsion and Thermodynamics Division  
Astronautics Laboratory, S&E

Mr. Worlund directed and made significant contributions to the design and development of the pressurization and propellant delivery systems of the Saturn launch vehicle. His planning, initiation and evaluation of analytical and experimental programs that established the dynamic characteristics of the propulsion systems were essential to defining and assuring vehicle stability during ascent.

Mr. Worlund received his B.S.M.E. degree from Auburn University, Auburn, Alabama in 1957 and his M.S.M.E. degree in 1959. In 1961, he joined the Marshall Space Flight Center at Huntsville. He has conducted and directed thermodynamic, fluid mechanic, and fluid dynamic studies of propulsion systems for launch and orbital operation that advanced our knowledge in propulsion technology.

Wuenschel, Hans F.      Assistant Director for Advanced Projects  
                                 Manufacturing Engineering Laboratory, S&E      MSFC

Mr. Wuenschel is responsible for advanced configuration and technology development of booster stages and space application projects. He introduced full scale engineering mock-up support and headed the Mock-up Working Group for MSFC. He was also instrumental in Saturn I, Block 2 redesign to the use of advanced aircraft type large preforged and automatically machined components. He established an advanced Tank Configuration and Technology Development Program and proposed structural modifications of the Saturn V Booster tank stiffener arrangement, which saved more than 10% weight of the first stage tank structure.

Mr. Wuenschel joined the Army Ballistic Missile Agency in 1958 as a Scientific Assistant to the Laboratory Director and Senior Project Engineer and transferred to NASA in 1960 in the same position. He became Deputy Chief, Manufacturing Research and Development Branch and Chief of the Experimental Projects Office in 1961. Since 1965 he has been Assistant Director for Advanced Projects, Manufacturing Engineering Laboratory.

Yarchin, Samuel (Ret., Col.)

Private Industry

Colonel Yarchin, as an Air Force detailee, served as Manager of the S-II Stage Project from July 1964 until November 1967. Colonel Yarchin arrived at the Center during the difficult days when the S-II Stage was a matter of critical concern. His response to this imposing challenge was inspirational. The task was large, and it was beset by difficulties and problems where solution required the exercise of hard judgment and great managerial competence. Prior to his military detail with NASA, Colonel Yarchin had 17 years with the U. S. Air Force in various assignments.

A native of Baltimore, Maryland, he holds a BS in Aerospace Engineering from the University of Alabama and a Master of Science Degree in Industrial Engineering from Georgia Institute of Technology. Included in his many honors are the Legion of Merit, Air Force Commendation Medal, Air Force Commendation Ribbon, Oak Leaf Cluster, and Bronze Star. He was also recommended for the NASA Exceptional Service Medal by Dr. von Braun.

<u>Name</u>	<u>Position</u>	<u>Organization</u>
SAMUEL YARCHIN		Private industry

Colonel Yarchin, an Air Force detailee, served as Deputy to the Saturn V Program Manager and was soon assigned to also manage the S-II Stage Project. He served in that capacity from January 1964 to October 1967. Colonel Yarchin arrived at the Center during the difficult days when the S-II Stage was a matter of critical concern. His response to this imposing challenge was inspirational. The task was large and it was beset by difficulties and problems where solution required the exercise of hard judgment and great managerial competence. Prior to his military detail with NASA, Colonel Yarchin had 17 years of various assignments for the U.S. Air Force including, Deputy Commander, Headquarters Southern Air Procurement District, Ft. Worth, Texas; Assistant Director, Procurement and Production; Chief, Quality Control Division; and Chief, Contract Administration Division at Kelly AFB, Texas; Chief, Casablanca Air Logistics Office; Chief, France Air Logistics Office; Chief, Ogden Air Procurement District; and Chief, Headquarters Ogden Control Management District, Hill AFB, Utah.

A native of Baltimore, Maryland, he holds a BS Degree in Aerospace Engineering from the University of Alabama and an MS in Industrial Engineering from Georgia Institute of Technology. Included in his many honors are the Legion of Merit, Air Force Commendation Medal, Air Force Commendation Ribbon, Oak Leaf Cluster, and Bronze Star. He was also recommended for the NASA Exceptional Service Medal by Dr. von Braun.



~~HOYSE~~ YEARWOOD, Hoy le

FLIGHT COMPUTERS BRANCH

Mr. Yearwood has participated in the design and development of the Flight Control Computer for the Redstone, Juno I, Juno II, Mercury-Redstone, and Pershing Missiles. He has led a group of engineers and technicians in the successful design and development of the Saturn Flight Control Computer. Much of the above work included last minute changes which were implemented on a crash basis, and Mr. Yearwood performed in a truly superior manner to meet these schedules with no degradation of quality.

Mr. Yearwood received his B.S. degree in Electrical Engineering from the University of Tennessee in Knoxville, Tennessee in 1959. From 1955 until this time, he worked under the co-op program in the Control Computer Unit under the Army.