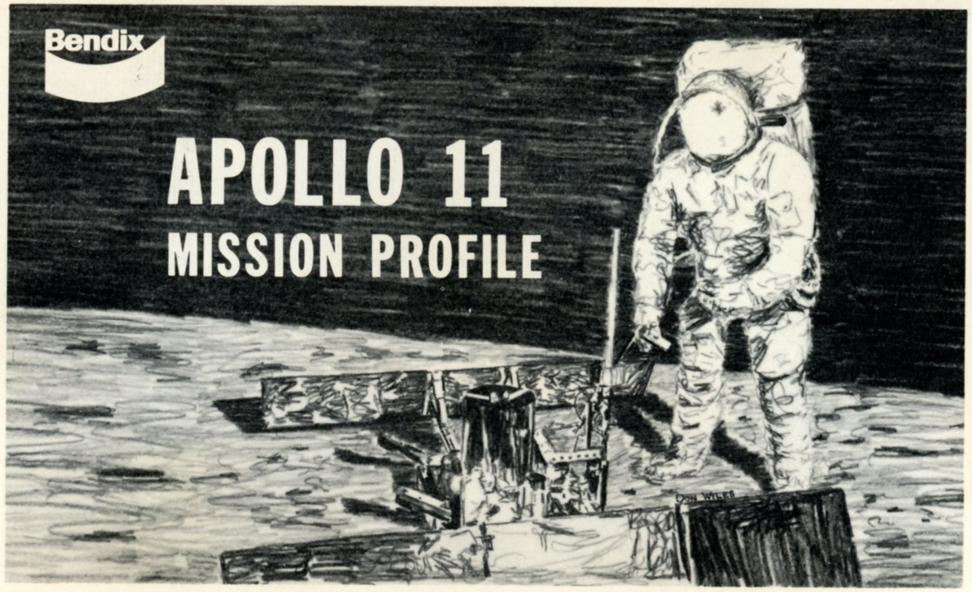
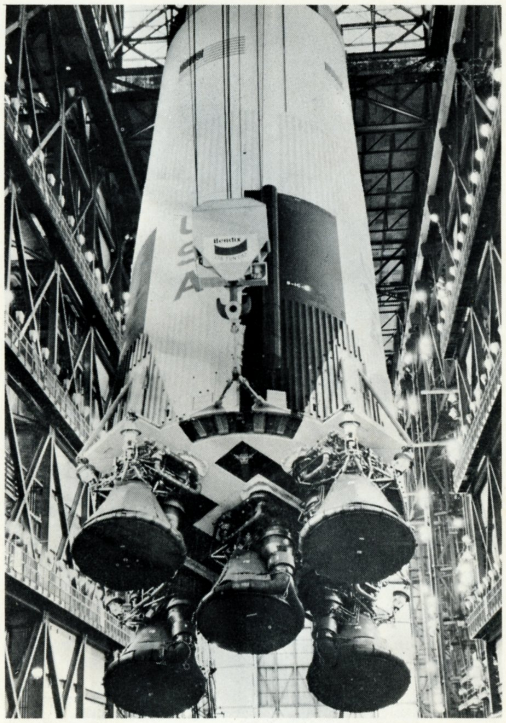

Bendix
APOLLO 11
MISSION PROFILE


29322
US 5c
CAPE CANAVERAL FL
JUL
20
P M
1969
32920
Box 1
Rockledge, Fl



STACKING - Bendix cranes lift the 294,900-pound first stage of the Saturn 5 with ease, preparing to place it atop the mobile launcher in the high bay of the VAB. Launch Support Division is responsible for the stacking operations of all stages and the spacecraft, in preparing it for "roll out" to the launch pad.

INTRODUCTION

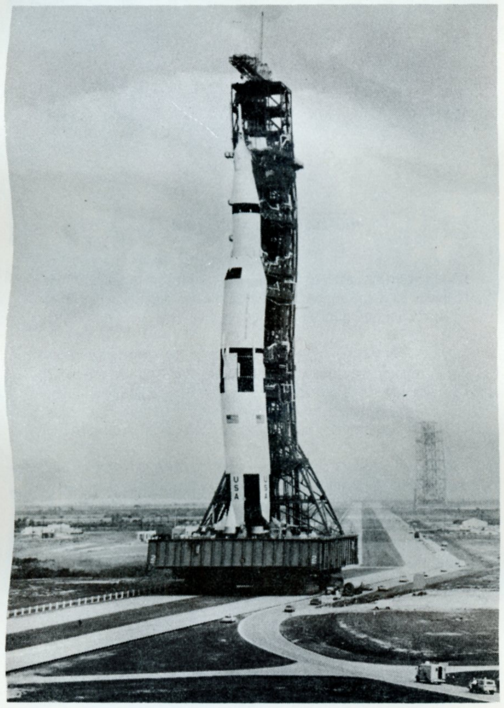
If you have been fortunate in this historic hour to watch the events surrounding the pre-launch and launch of Apollo 11 unfold, either from a vantage point at the Kennedy Space Center, or along the banks of the Indian and Banana Rivers, or from motel rooms along the Florida East Coast, then you have been privileged to see first hand the greatest human achievement in the annals of mankind.

NASA and its team of aerospace contractors are now reaching for just one of their goals -- landing a man on the surface of the moon and returning him safely to earth. There are yet other space conquests in America's exploration of outer space which will call for even more determined spirit which has been the backbone of NASA's space program.

The pages of this booklet are designed to acquaint you with facts of the Saturn 5, the Apollo spacecraft and the Lunar Module moonship, and to keep you informed of the day-to-day scheduled missions as they are now planned, for the duration of this 8-day mission.

This booklet may also be a souvenir to remind you for many years to come that you were here during the flight of Apollo 11, the greatest adventure story since Christopher Columbus began his perilous voyage into the unknown.

THE BENDIX CORPORATION



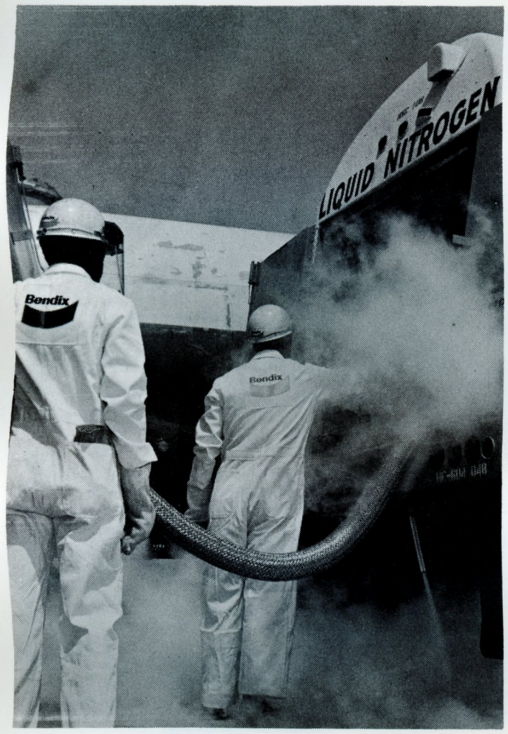
ROLL OUT - The Bendix-operated 6 million pound Crawler/Transporter lumbers lowly to the pad carrying its precious cargo, Apollo/Saturn 5. Known as one of the strongest, slowest, noisiest, strangest land vehicles in the world, the giant tractor moves at less than one mile per hour during missions.

SATURN V - APOLLO 11

AS-506/CSM - 107/LM-5

MAJOR OBJECTIVES

1. Perform a manned lunar landing and return to earth.
2. Perform selenological inspection and sampling, including contingency/lunar bulk sample collection.
3. Obtain data to assess the capability and limitations of the astronaut and his equipment in the lunar environment, including: Inertial Measurement Unit (IMU) lunar surface operations and lunar surface EVA operations.
4. Obtain data on characteristics and mechanical behavior of lunar surface.
5. Obtain data on landing effects on LM.
6. Determine position of LM on the lunar surface.
7. Obtain data on effects of illumination and contrast conditions on crew visual perception.
8. Demonstrate procedures and hardware used to prevent contamination of the earth's biosphere.
9. Obtain photographic coverage during lunar landing and lunar stay period.



APOLLO 'GAS STATION' - The Bendix Corporation's Launch Support Division High Pressure Gas Department and the Propellant Section combine to provide the world's largest "gas station", offering high and low pressure gasses and propellant delivery for NASA's Apollo Program.

MISSION OBJECTIVES

10. Obtain television coverage during lunar stay period.

11. Deploy the Early Apollo Scientific Experiments Package (EASEP).

12. Demonstrate operational launch vehicle (LV) capability by injecting a fully loaded Apollo Spacecraft (SC) onto a specific circumlunar conic.

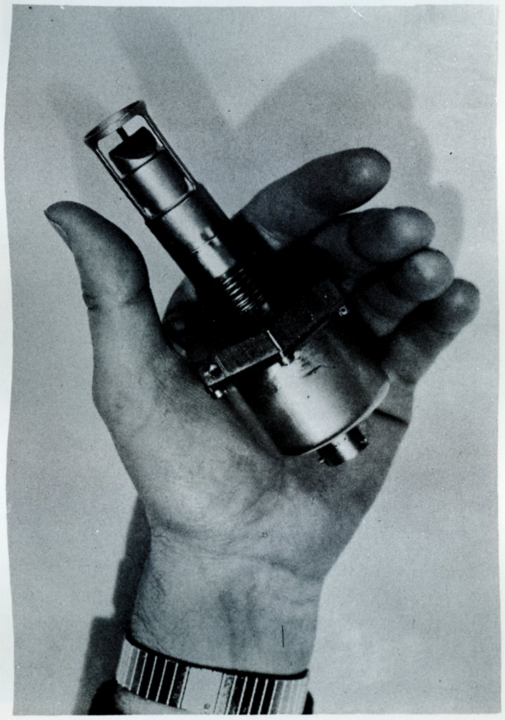
13. Demonstrate the adequacy of all SC systems and operational procedures for translunar and transearth flight.

14. Demonstrate the adequacy of deep space navigation techniques and of guidance accuracy during translunar and transearth midcourse corrections.

15. Demonstrate acceptable service propulsion system (SPS) performance and SC guidance during the lunar orbit insertion boost and the transearth injection boost.

16. Demonstrate acceptable Lunar Module (LM) systems performance during the descent-to-hover boost.

17. Demonstrate acceptable LM systems performance during the ascent and rendezvous mode.



A BIG JOB - Although it weighs less than a pound, this sensor is capable of initiating shut-down of the 1.5 million-pound-thrust engines of the S-IC, the initial booster stage of NASA's Saturn 5. The sensors is built by The Bendix Corporation Instruments and Life Support Division, Davenport, Iowa.

PERTINENT DATA

Saturn V Launch Vehicle

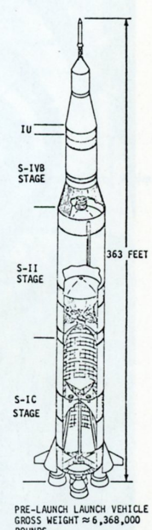
SOLID ULLAGE ROCKET AND RETROROCKET SUMMARY				
STAGE	TYPE	QUANTITY	NOMINAL THRUST AND DURATION	PROPELLANT GRAIN WEIGHT
S-IC	RETROROCKET	8	75,800 POUNDS • 0.541 SECONDS	278.0 POUNDS
S-II	ULLAGE	4	23,000 POUNDS † 3.75 SECONDS	336.0 POUNDS
	RETROROCKET	4	34,810 POUNDS ‡ 1.52 SECONDS	268.2 POUNDS
S-IVB	ULLAGE	2	3,390 POUNDS † 3.87 SECONDS	58.8 POUNDS

ENGINE DATA					
STAGE	QTY	ENGINE MODEL	NOMINAL THRUST EACH	NOMINAL THRUST TOTAL	BURN TIME
S-IC	5	F-1	1,526,500	7,632,500	150 SEC
S-II	5	J-2	230,000	1,150,000	360 SEC
S-IVB	1	J-2	230,000	230,000	493 TO 505 SEC

	STAGE DIMENSIONS		STAGE WEIGHTS	
	DIAMETER	LENGTH	DRY	AT LAUNCH
S-IC Base (including fins)	63.0 FEET	138 FEET	294,900 POUNDS	5,029,900 POUNDS
S-IC Mid-stage	33.0 FEET			
S-II Stage	33.0 FEET	81.5 FEET	84,600 POUNDS	1,071,500 POUNDS
S-IVB Stage	21.7 FEET	59.3 FEET	25,100 POUNDS	262,000 POUNDS
Instrument Unit	21.7 FEET	3.0 FEET	4,203 POUNDS	4,203 POUNDS

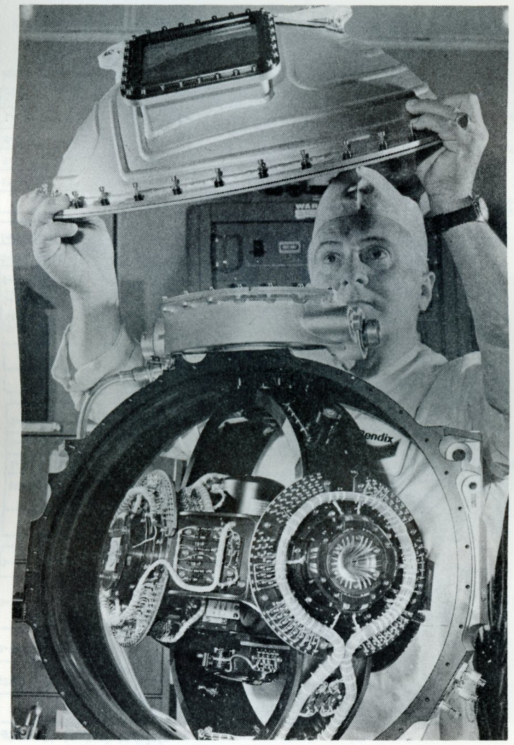
SATURN V STAGE MANUFACTURERS	
STAGE	MANUFACTURER
S-IC	THE BOEING COMPANY
S-II	NORTH AMERICAN-ROCKWELL
S-IVB	McDONNELL - DOUGLAS CORP.
S-IU	INTERNATIONAL BUSINESS MACHINE CORP.

NOTE: THRUST VALUES, WEIGHTS, AND BURN TIMES ARE ALL APPROXIMATIONS.



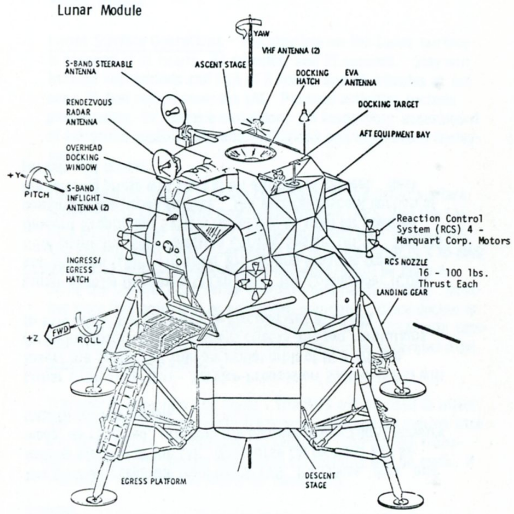
PRE-LAUNCH LAUNCH VEHICLE GROSS WEIGHT ≈ 6,368,000 POUNDS

• MINIMUM VACUUM THRUST AT 120°F
† AT 170,000 FT. AND 70°F
‡ NOMINAL VACUUM THRUST AT 60°F



COVER UP - An inertial guidance system of the type assigned to keeping the Saturn V rocket on course during Apollo 11 moon shot. The unit is built by Navigation and Control Division, Teterboro, N. J.

Lunar Module



Descent Propulsion System (DPS)

TRW Corporation motor provides
10,500 lbs. Thrust

Total Weight - 30,531 lbs.

OUTLINE OF FLIGHT PROFILE

Launch and Earth Parking Orbit Insertion - The Saturn V Vehicle will insert the S-IVB/IU/LM/CSM into a 100 NM circular orbit at 11 minutes, 24 seconds after liftoff. The S-IVB/IU and Spacecraft checkout will be accomplished during the orbital coast phase.

Translunar Injection and Coast - The Launch Vehicle S-IVB stage will be reignited during the second parking orbit, to inject the S-IVB, LM and CSM into a translunar trajectory. This nominal injection will provide a "free return" to Earth if the insertion into lunar parking orbit cannot be accomplished.

The CSM will separate from the S-IVB, transpose, dock, and initiate ejection of the LM. Midcourse corrections will be made, as required, utilizing the Manned Space Flight Network (MSFN) for navigation.

Lunar Orbit Insertion - Service Propulsion System (SPS) will insert the Spacecraft into an initial orbit of 60 X 170 NM. Following insertion and systems checks and two revolutions in this orbit, the orbit will be circularized at 60 NM.

Lunar Module Descent and Landing - The Commander (CDR) and LM Pilot (LMP) will enter the LM and separate from the CSM using the SM - Reaction Control System (RCS). The LM Descent Propulsion System (DPS) will be used for powered descent to the lunar surface. The vertical descent portion of the landing phase will start at an altitude of 150 feet. Rest periods will follow.

Flight Profile

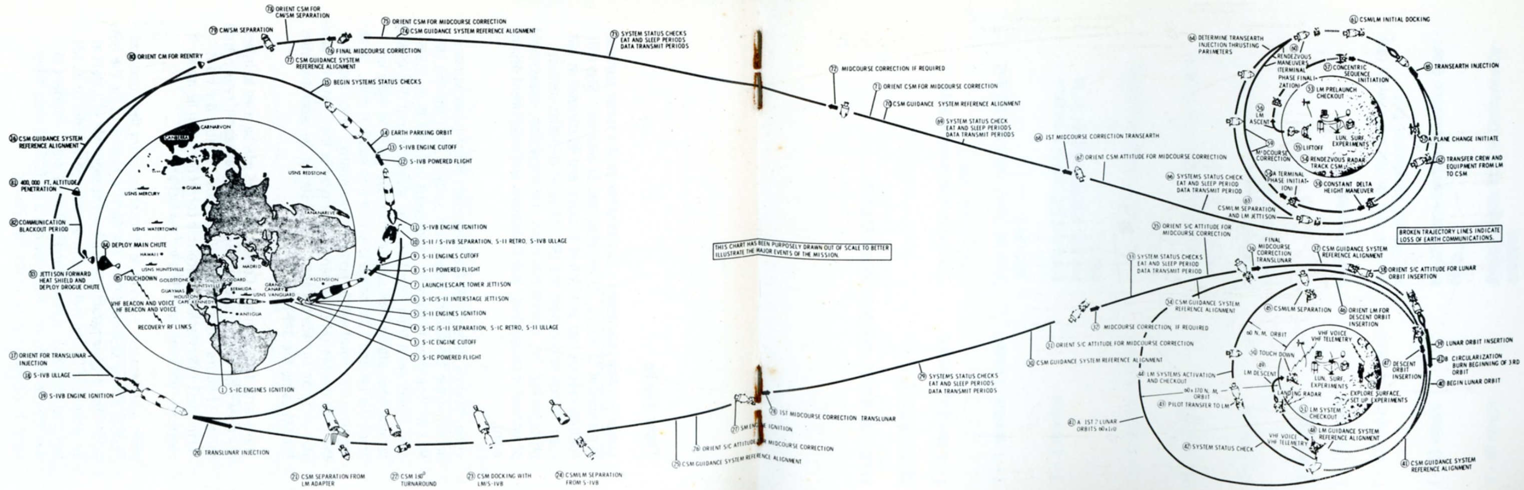
Lunar Surface Operations - The staytime on the lunar surface is planned at 21 hours, 33 minutes, and 21 seconds. Stay will include rest periods and EVA of 2 hours and 40 minutes at not over 70 feet radius from the LM. Planned activities include photography, TV, sample collection, LM inspection, assessment of astronaut capabilities, and limitations and experiment deployment.

Lunar Module Ascent - At the completion of the lunar surface activities the LM-Ascent Propulsion System (APS) and the LM-RCS will be used to launch, rendezvous and dock to the CSM. The LM will coast from insertion to an elliptical orbit (9 X 45 NM) for one hour after which several maneuvers will be made to bring the LM and CSM range to within one nautical mile. Braking from this point will be performed manually. Once docked to the CSM the two LM Crewmen will transfer to the CSM with samples of lunar surface material. The CSM will be separated from the LM using the SM-RCS.

Transearth Injection and Coast - The SPS will be used to inject the CSM into the transearth trajectory. Transearth return time will be 63 hours, 51 minutes, 50 seconds. During the transearth coast intermediate midcourse corrections will be made, if required, utilizing the MSFN for navigation.

Entry and Recovery - Prior to atmosphere entry the Command Module will be separated from the Service Module using the SM-RCS. The drogue parachute deployment sequence will start at an altitude of 23,300 feet, the three main parachutes at 10,500 feet altitude. The nominal range from the entry interface at 400,000 feet altitude to touchdown will be 1285 nautical miles. Earth touchdown will be in the Mid-Pacific.

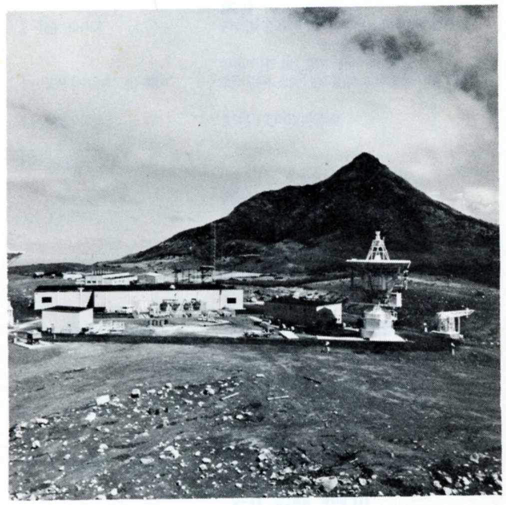
LUNAR LANDING MISSION PROFILE



MAJOR SCHEDULE AND COUNTDOWN EVENTS

Approximate Time	
T - 4 months, 2 weeks	Erected Launch Vehicle S-IC, S-11, S1VB, and IU
T - 3 months, 1 week	Erected Spacecraft CSM-107 and and LM-5
T - 2 months	Installed S/C and LV Ordnance and LES and Transferred SV to Pad A
T - 1 month, 2 weeks	Conducted SV - Flight Readiness Test - FRT
T - 1 month	Hypergolic Loading and RP-1 Fuel Loading of SV
T - 3 weeks	Begin Countdown Demonstration Test - Wet and Dry

Countdown	
T - 114 hours	Begin Countdown
T - 106 hours, 30 min.	Monitor GH_2 Facility and Provide GN_2 and GHe for Duration of Test
T - 93 hours	Begin Space Vehicle Ordnance Operations
T - 89 hours	Begin Launch Vehicle Ordnance Operations
T - 85 hours	Provide SCAPE Support



APOLLO TRACKING - Bendix men operate the Devil's Ashpit station on tiny volcanic-extinct Ascension Island, 5,000 miles downrange from Cape Kennedy. This is one of the 12 stations maintained and operated for NASA's Goddard Space Flight Center by the Bendix Field Engineering Corporation.

Countdown

T - 25 hours	Validate Astronaut Vans
T - 24 hours	Inspect MSS for Travel Configuration
T - 22 hours	Activate First Industrial Water Engine and Bring Up to Speed
T - 20 hours	Install and Soap Plywood Surface at Pad
T - 15 hours, 45 min.	Start and Stabilize Crawler Transporter Secure Hammerhead Crane for Launch
T - 15 hours, 30 min.	Pressurize and Leak Check GH_2 Cross Country Lines
T - 13 hours, 45 min.	Propel C/T to Top of Ramp
T - 13 hours, 15 min.	Propel C/T to Mate MSS
T - 12 hours, 45 min.	Jack C/T to Mate MSS
T - 11 hours	Install and Soap Plywood Surface at MSS Parksite Release Weather Balloon
T - 10 hours, 45 min.	Jack MSS up to Clearance Height
T - 10 hours, 15 min.	Propel MSS to Parksite
T - 9 hours, 45 min.	Provide Generator Support at CCF Until End of Mission
T - 9 hours, 30 min.	Verify 11 Scott Air Packs in the ECS Room and 23 in the Blast Room

Countdown

T - 9 hours	Begin Built-in Hold of 6 hours Slide Wire Preps Complete and Ready to Support
T - 8 hours, 15 min.	Begin LV Propellant Loading
T - 8 hours	Begin LV Cryogenic Loading
T - 7 hours	Clear Route for Astro Van Activate 2nd and 3rd Industrial Water Engines
T - 6 hours, 45 min.	MSS Mated at Parksite
T - 6 hours, 15 min.	MSS is Hard Down on Mounts
T - 6 hours	Release Weather Balloon
T - 3 hours, 45 min.	MSS Parksite Clear of Personnel
T - 3 hours, 15 min.	Prime Crew Enter Astro Van at MSO Bldg.
T - 2 hours, 45 min.	Crew Ingress at C-39 Pad A
T - 1 hour	Support RP-1 Fuel Level Adjustment on LV
T - 7 min.	Verify GO for Launch
*T - 3 min.	Terminate LV Liquid Oxygen and Hydrogen Replenishment
*T - 2 min., 47 sec.	Pressurize S-IVB LOX Tank
*T - 1 min., 37 sec.	Pressurize S-IC, S-II and S-IVB Fuel Tanks

Countdown

*T - 1 min., 22 sec.	Pressurize S-II Liquid Hydrogen Tank
*T - 1 min., 12 sec.	Pressurize S-IC LOX Tank
T - 1 min.	Pad Industrial Water On
*T - 40 sec.	Flame Deflection Cooling Water On
T - 9 sec.	Ignition Sequence Start
T - 2 sec.	All 5 Engines Running

*May not be exact time - actual countdown not available at this time.

FIRST DAY
Wednesday

T - 9 sec.	Ignition Command
T - 0	Liftoff
T + 2 min., 14 sec.	S-IC Inboard Engine Cutoff (1)
T + 2 min., 40 sec.	S-IC Outboard Engine Cutoff (4)
T + 2 min., 41 sec.	S-IC/S-II Separation
T + 2 min., 42 sec.	S-II (2nd Stage) Ignition Jettison Launch Escape Tower (LET)
T + 8 min., 50 sec.	S-II Engine Cutoff (5) S-II/S-IVB Separation
T + 8 min., 51 sec.	S-IVB (3rd Stage) Ist Ignition
T + 11 min., 21 sec.	S-IVB Velocity Cutoff - Orbit Insertion - 100 NM
T + 2 hrs., 44 min., 18 sec.	S-IVB 2nd Ignition on 2nd Revolution
T + 2 hrs., 49 min., 39 sec.	S-IVB Cutoff - Translunar Injection (TLI)
T + 3 hrs., 12 min.	CSM Separation from S-IVB/IU/LM-5 and Transposition
T + 3 hrs., 22 min.	Dock CSM with LM
T + 4 hrs., 10 min.	Eject LM from S-IVB
T + 4 hrs., 39 min., 37 sec.	Evasive Maneuver - SPS Ignition of CSM/LM

FIRST DAY

T + 4 hrs., 49 min.	S-IVB 3rd Ignition - Slingshot Maneuver - Orbit S-IVB/IU Around Sun
T + 7 hrs.	30,000 NM from Earth
T + 11 hrs , 16 min.	Midcourse Correction Maneuver No. 1 (MCC #1) of CSM/LM-5
T + 19 hrs.	90,000 NM from Earth

SECOND DAY
Thursday

T + 26 hrs., 20 min.	MCC #2 (if required)
T + 43 hrs.	150,000 NM from Earth

THIRD DAY
Friday

T + 53 hrs., 55 min.	MCC #3 (if required)
T + 56 hrs., 17 min.	Lunar Module Pilot (LMP) - Intra-Vehicular Transfer (IVT) to LM Commander (CDR) - Transfer Equipment to LMP in LM
T + 57 hrs., 5 min.	CDR - IVT to LM
T + 58 hrs.	LMP and CDR return to CSM 180,000 NM from Earth
T + 70 hrs., 55 min.	MCC #4 (if required)

FOURTH DAY
Saturday

T + 73 hrs.	GO-NO-GO for Lunar Orbit Insertion #1 (LOI_1)
T + 75 hrs., 55 min., 03 sec.	LOI_1 60NM X 170NM Orbit Burn Time - 6 min., 5 sec.
T + 80 hrs., 10 min	Lunar Revolution # 3
T + 80 hrs., 12 min, 01 sec.	LOI_2 60NM X 60NM Orbit Burn Time - 14 sec
T + 81 hrs., 48 min.	LMP - IVT to LM
T + 83 hrs., 48 min.	LMP - Returns to CSM
T + 84 hrs., 07 min.	Lunar Revolution #5
T + 94 hrs., 26 min.	LMP - IVT to LM
T + 94 hrs., 50 min.	CDR - ICT to LM

FIFTH DAY
Sunday

T + 97 hrs., 30 min.	GO-NO-GO for Undocking
T + 97 hrs., 58 min.	Lunar Revolution #12
T + 98 hrs, 18 min.	Undock LM from CSM
T + 98 hrs., 43 min.	LM Separation from CSM
T + 99 hrs., 42 min., 27 sec.	Descent Orbit Insertion (DOI) Burn Time - 35 sec.
T + 100 hrs., 38 min., 57 sec.	PDI
T + 100 hrs., 50 min., 50 sec.	Touchdown on Moon

FIFTH DAY

T + 100 hrs., 54 min.	GO-NO-GO for 7 min. Stay
T + 101 hrs., 01 min.	GO-NO-GO for 1 Lunar Revolution of CSM
T + 101 hrs., 52 min.	Lunar Revolution #14 for CSM
T + 102 hrs., 10 min.	GO-NO-GO for Lunar Stay - LM
T + 108 hrs., 32 min.	Begin preparations for Egress
T + 109 hrs., 50 min.	Lunar Revolution #18 for CSM
T + 110 hrs., 30 min.	CDR - Start Extravehicular Activity (EVA)
T + 110 hrs., 40 min.	CDR - Initial EVA with LMP Assistance and Monitoring Sequence C Camera - TV
T + 110 hrs., 55 min.	Contingency Sample Collection
T + 111 hrs., 08 min.	CDR - Rest and Photograph LMP - EVA
T + 111 hrs., 30 min.	TV Deployment Solar Wind Component (SWC) Deployment Bulk Sample Collection EVA and Environment Evaluation
T + 111 hrs., 42 min.	Perform LM Inspection
T + 111 hrs., 45 min.	Lunar Revolution #19
T + 112 hrs.	Early Apollo Scientific Equipment Package (EASEP) Deployment
T + 112 hrs., 08 min.	Documented Sample Collection

FIFTH DAY

T + 112 hrs., 40 min.	LMP - EVA Termination
T + 112 hrs., 45 min.	CDR - Rock and Transfer Sample Return Container (SRC)
T + 113 hrs.	CDR - EVA Termination (Total EVA - 2 hrs., 40 min.)
T + 113 hrs., 43 min.	Lunar Revolution #20 - CSM
T + 114 hrs., 21 min.	Jettison Surplus Equipment Eat and Rest

SIXTH DAY
Monday

T + 122 hrs., 28 min., 11 sec.	LM-AS-Liftoff-Ascent Propulsion (APS) System - Burn Time - 400 sec.
T + 122 hrs., 35 min., 25 sec.	Orbit Insertion of LM-AS
T + 123 hrs., 26 min., 27 sec.	LM-RCS-Coelliptic Sequence Initiation Maneuver - (CSI) Burn Time - 46 sec.
T + 123 hrs., 29 min., 27 sec.	CSM Backup CSI Burn
T + 124 hrs., 24 min., 25 sec.	LM-RCS Constant Delta Altitude Maneuver (CDH) Burn Time - 2.8 sec.
T + 124 hrs., 27 min., 25 sec.	CSM Backup - CDH Burn
T + 124 hrs., 02 min., 46 sec.	LM-RCS Terminal Phase Initiation Maneuver (TPI) Burn Time - 23.3 sec.
T + 125 hrs., 17 min., 46 sec.	LM-RCS-MCC #1

SIXTH DAY

T + 125 hrs., 32 min., 46 sec.	LM-RCS-MCC #2
T + 125 hrs., 42 min., 22 sec.	LM-RCS Braking Maneuvers Burn Time - 1.5 sec., Range - 1.0 NM
T + 125 hrs., 44 min., 05 sec.	LM-RCS Braking Maneuvers Burn Time - 9.6 sec., Range - .5 NM
T + 125 hrs., 45 min., 14 sec.	LM-RCS Braking Maneuvers Burn Time - 9.0 sec., Range - .2 NM
T + 125 hrs., 47 min., 02 sec.	LM-RCS Braking Maneuvers Burn Time - 4.3 sec., Range - .08 NM
T + 125 hrs., 48 min., 03 sec.	LM-RCS Braking Maneuvers Burn Time - 4.2 sec., Range - 0.3 NM
T + 126 hrs.	LM Active Docking with CSM
T + 126 hrs., 48 min.	CDR - IVT to CSM
T + 127 hrs.	LMP - IVT to CSM
T + 128 hrs.	Jettison LM-AS
T + 129 hrs., 32 min.	Lunar Revolution #28
T + 131 hrs., 28 min., 43 sec.	Transearth Insertion (TEI) Burn Time - SPS - 2 min., 29 sec., Lunar Revolution #29

SEVENTH DAY
Tuesday

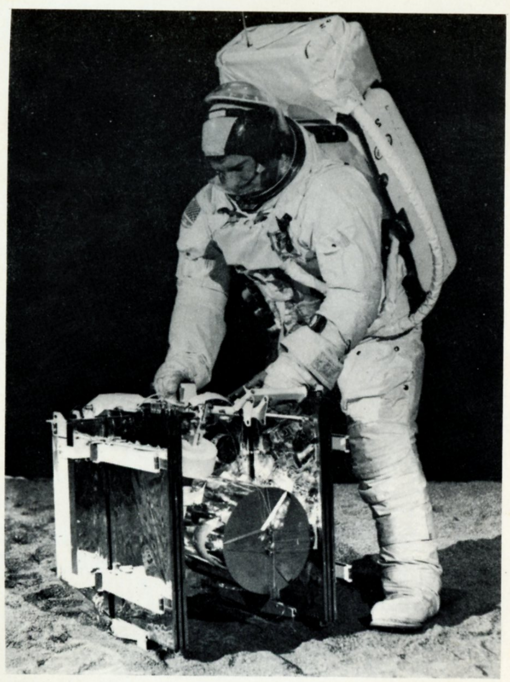
T + 148 hrs., 32 min.	MCC #5 (if required)

EIGHTH DAY
Wednesday

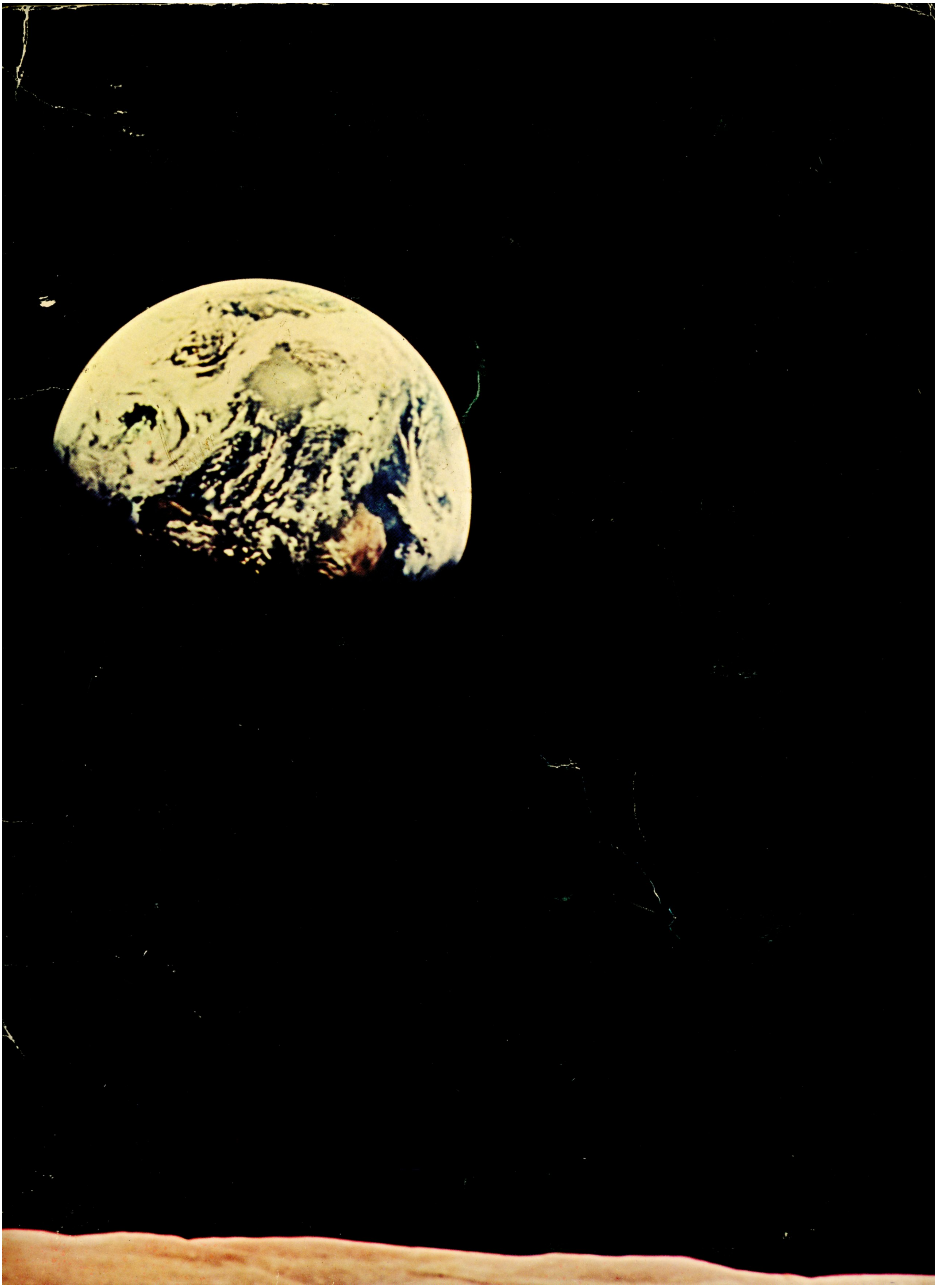
T + 172 hrs., 58 min.	MCC #6 (if required) Earth insertion (EI) - 22 hrs.

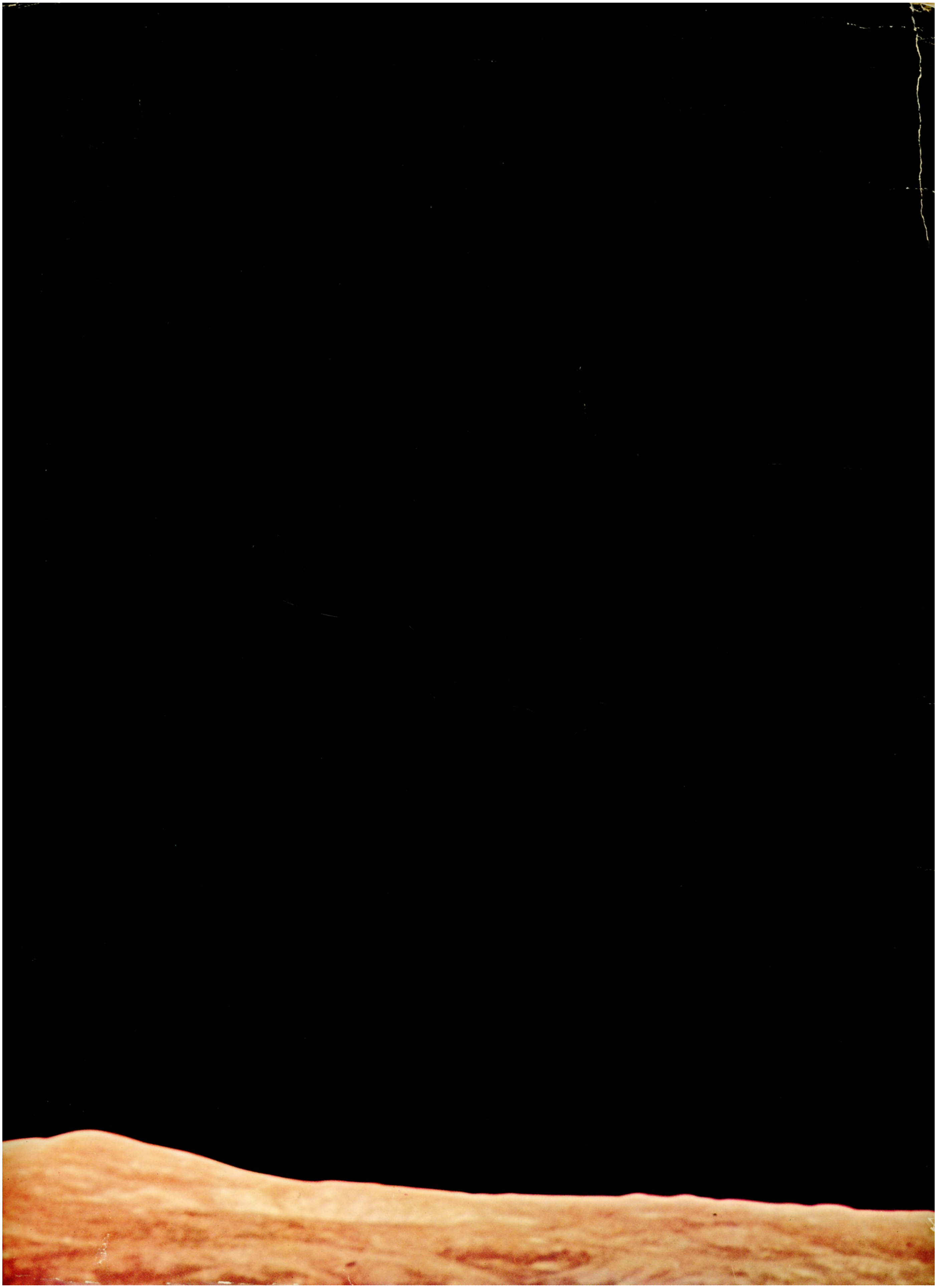
NINTH DAY
Thursday

T + 192 hrs., 06 min.	MCC #7 (if required) EI - 3 hrs.
T + 194 hrs., 57 min.	CM/SM Separation
T + 195 hrs., 06 min., 27 sec.	Earth Insertion - Altitude - 400,000 ft.
T + 195 hrs., 06 min., 53 sec.	Enter, S-Band Blackout
T + 195 hrs., 07 min., 51 sec.	Astronauts Experience Peak G Force
T + 195 hrs., 07 min., 53 sec.	Exit, S-Band Blackout
T + 195 hrs., 15 min.	Drogue Chutes Deployment 23,300 feet altitude
T + 195 hrs., 15 min., 49 sec.	Drogue Chutes Disconnect and 3 Main Parachutes Deploy at 10,500 feet altitude
T + 195 hrs., 20 min., 42 sec.	Splashdown - Pacific Ocean



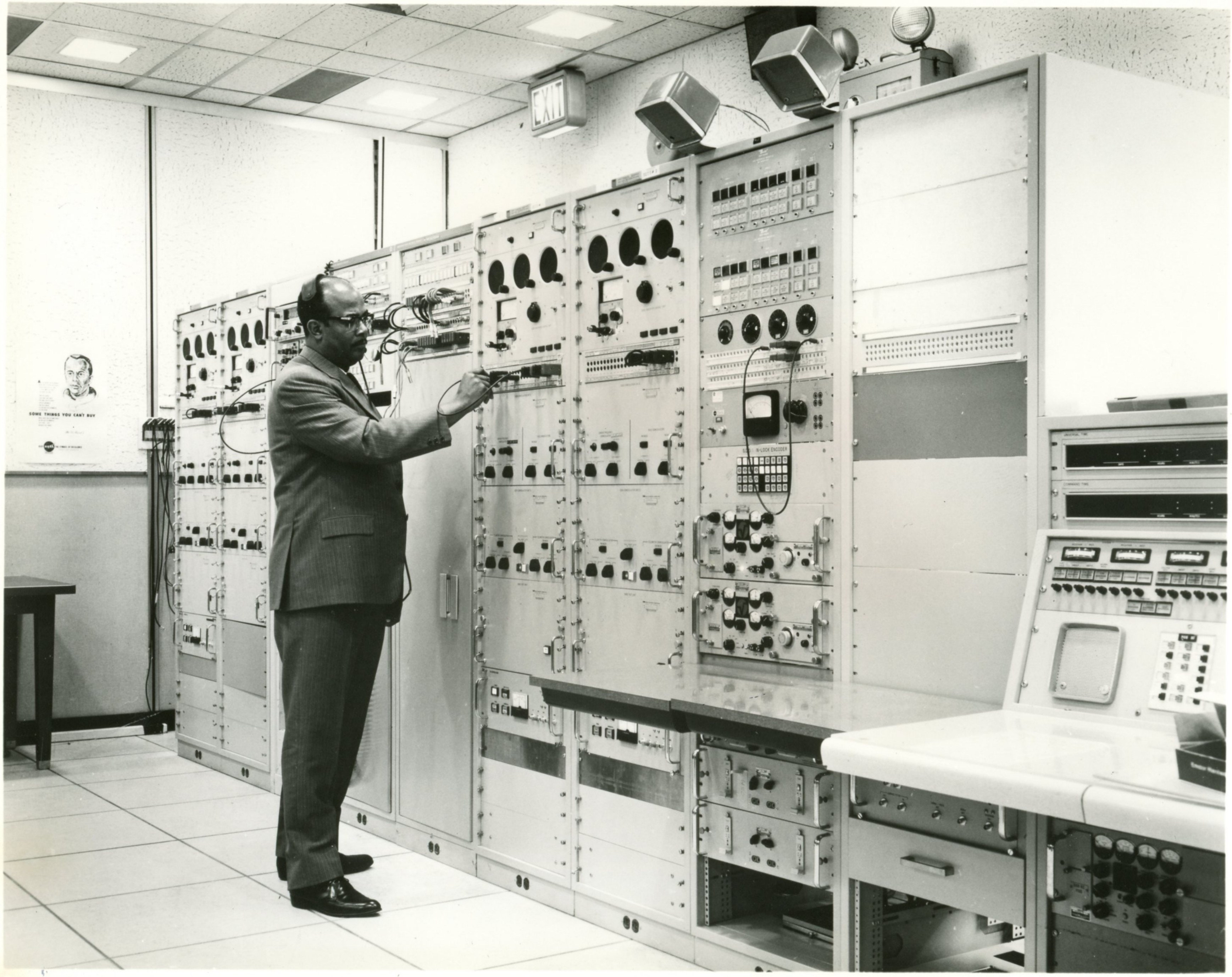
FOOT STEPS ON THE MOON - Apollo 11 astronauts will carry this self-contained seismic station as part of the Early Apollo Scientific Experimental Package (EASEP), to be placed on the moon. When operating, the seismometer may transmit to earth listeners the sound of the astronaut's footsteps. Ron Redick, of the Bendix Corporation's Aerospace Systems Division, Ann Arbor, Michigan, simulates the moon deployment.





OFFICIAL BUT PRETTY -- Monica Koerner, Test Official Recorder for Bendix in the Altitude Chambers, smiles prettily at the astronauts as they pass her console post on their way to manned tests on the Apollo. Monica's job is to monitor and record information during the tests, and she gets to listen in on the conversations of the astronauts. She describes her job as "darned exciting," compared to secretarial type positions held in the past.

NEWSBUREAU, THE BENDIX CORPORATION
Launch Support Division
Kennedy Space Center, Florida
Bill Lyerly - 784-0042


EXIT
SOME THINGS YOU CAN'T BUY

DATA DEMODULATOR, vital in Apollo communications, is part of the S-band system and handles -- among other chores -- all voice communications to and from Apollo 11 astronauts Armstrong, Aldrin and Collins. Bendix field engineer Leonard A. Parker insures uninterrupted flow of messages between lunar spacecraft and mission control in Houston.

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NEWSBUREAU, THE BENDIX CORPORATION
Bendix Field Engineering Corporation
Local Contact: P. R. Leatherwood
Cape Kennedy: 305 784-0042

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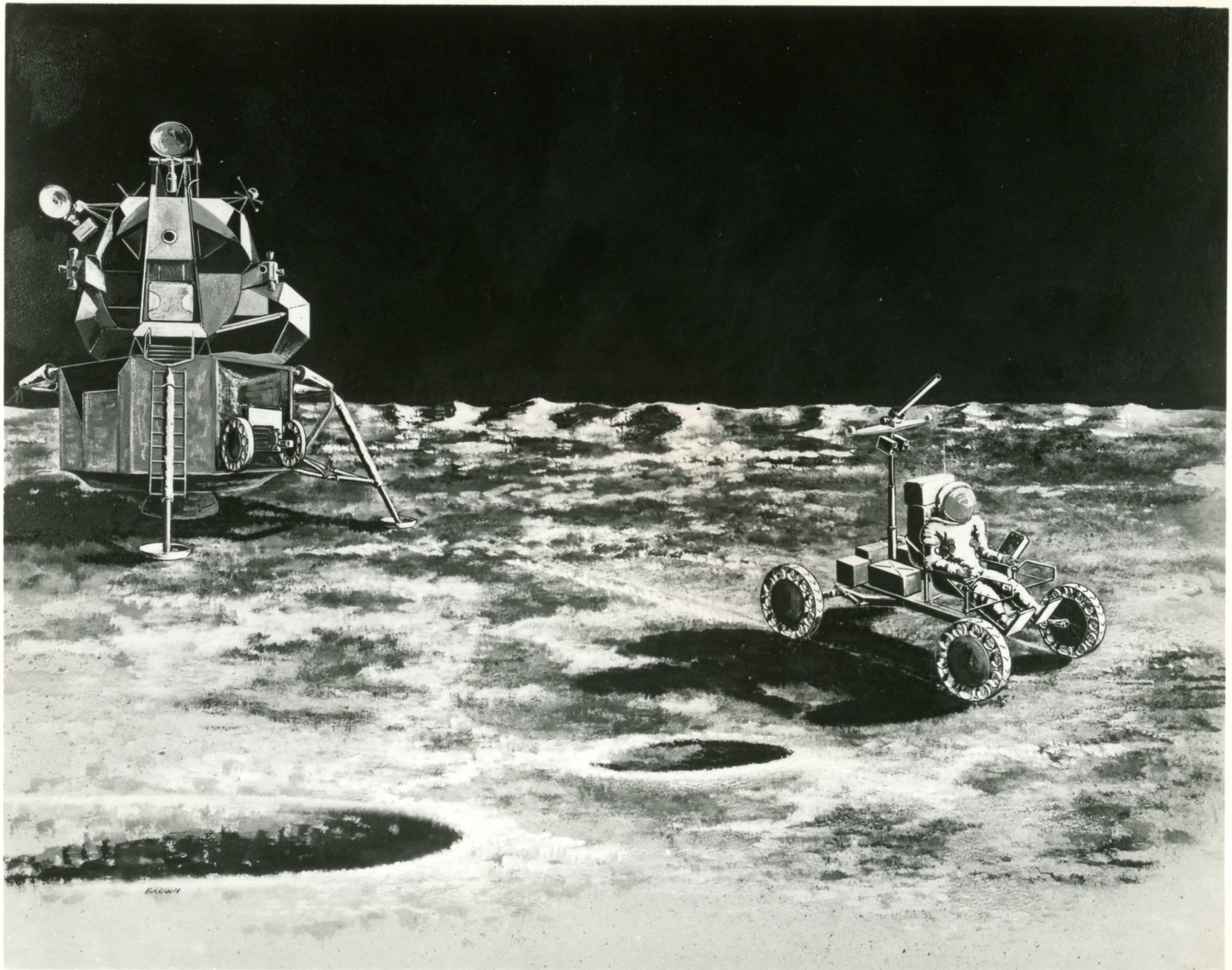

BROWN

MOON-MOBILE -- This is an artist's concept of the lunar roving vehicle (LRV) designed by The Bendix Corporation. It may be operated in either manned or unmanned mode. Astronauts can drive it as they explore the moon's surface. Portable life-support systems on the vehicle will permit them to roam farther. Unmanned, the LRV would have a two-wheel powered trailer and be watched and controlled from earth via television. An electric motor is primary power for each of the LRV's wheels.

- 0 -

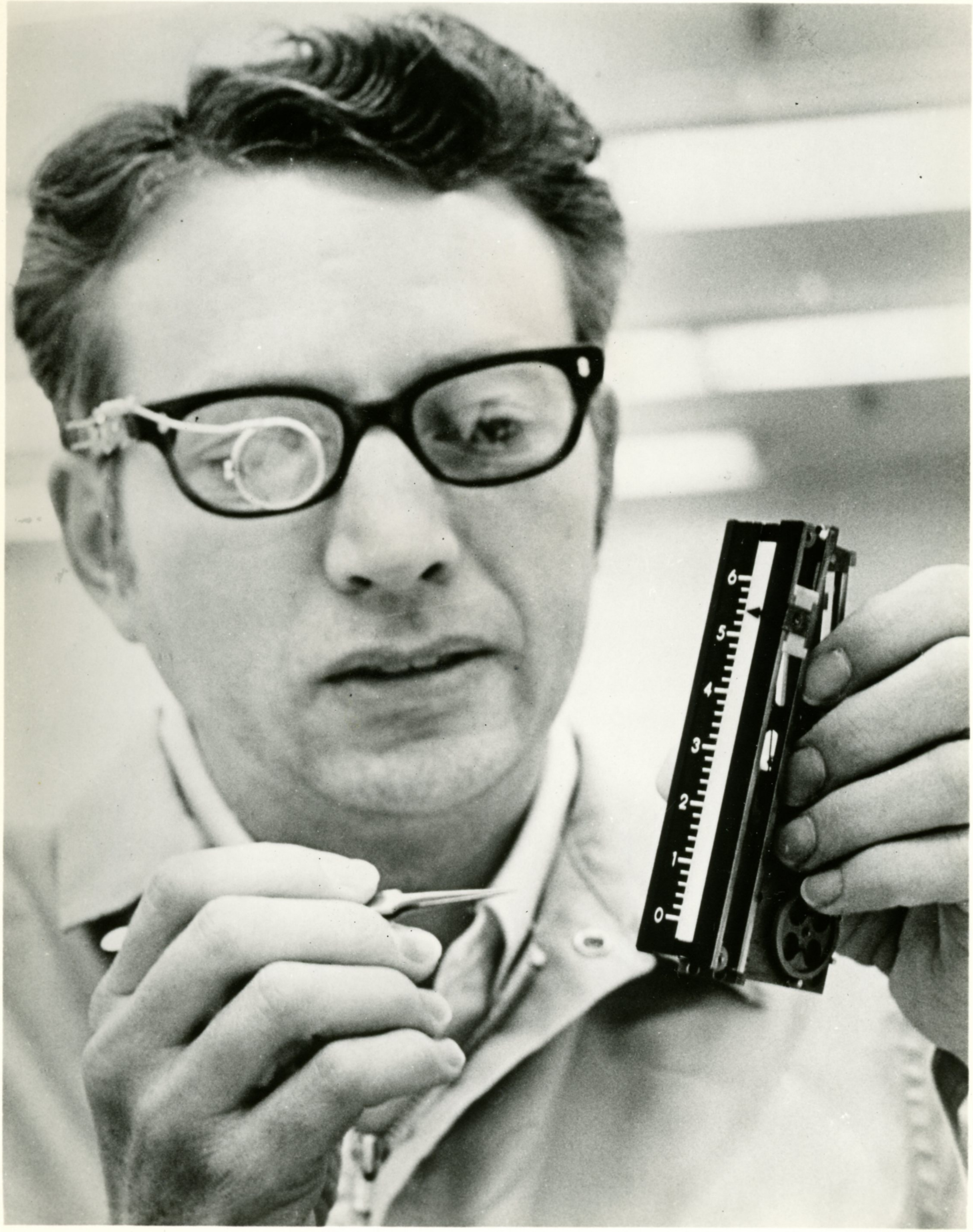
For Immediate Release

NEWSBUREAU, THE BENDIX CORPORATION
Aerospace Systems Division
Daniel H. Schurz
Cape Kennedy: 305 784-0042
Houston: 713 488-1090


Bendix
STOKES

LISTING POST -- Monica Koerner, in foreground, listens intently to conversations of the astronauts and to reports from the Altitude Chamber systems reporting in, and records that information. In the control room Bendix personnel operate the pumps which extract air from the chambers, simulating altitudes up to 50 miles above sea level. Monica's exciting job puts her in close contact with the astronauts and among her prized posessions is an autographed photograph of Neil Armstrong, who is to be the first human to set foot on the surface of the moon.

NEWSBUREAU, THE BENDIX CORPORATION
Launch Support Division
Kennedy Space Center, Florida
Bill Lyerly - 784-0042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GO-GO METER, precisely a thrust-to-weight-ratio indicator, will be used by an Apollo 11 astronaut to monitor the thrust of ascent and descent engines during lunar landing phase of the flight. The pointer moves along a fixed vertical scale that is calibrated from zero to 6.5 lunar-gravity-units. The Bendix-built device is mounted on lunar module's instrument panel.

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NEWSBUREAU, THE BENDIX CORPORATION
Launch Support Division
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BENDIX FACT SHEET

FOR

APOLLO 11

Bendix Launch Support Division, Kennedy Space Center, Fla.:

-- Personnel operate and maintain major systems associated with the two launch pads, three mobile launcher towers on which the Saturn V's are assembled and launched, the two giant transporters that move the equipment from the parking area to the pad, the Complex control center, the industrial water facility, the fire extinguisher pumping station, and the major launch support systems.

-- Technical Shops Department assembles and services the wide variety of electronic systems.

-- Systems Components Laboratory cleans and tests ground support equipment, flight systems and components.

-- High Pressure Gas Department maintains and operates the high pressure gas converter compressor facilities, pneumatic distribution subsystems, mobile converters and tube banks at the launch site.

-- Industrial Operations Branch provides maintenance and operations personnel for NASA manned spacecraft test and checkout facilities within the space center industrial area.

-- Systems Safety Support Department monitors high-hazard operations to insure the safety of all personnel and property during the handling and testing of space vehicles, including the Self Contained Atmospheric Protective Ensemble Suits.

Bendix Microwave Devices Division, Franklin, Ind.:

-- Wavemeters, used in transmitting systems in tracking stations, monitor global and direct communications hookups.

-- Coaxial reed switches serve in much of the equipment including the "Man Pack" communications to be carried by the astronauts on their first moon walk.

Bendix Instruments and Life Support Division, Davenport, Iowa:

-- S-1C engine cut-off sensors detect liquid level and initiate shutdown when the fuel is nearly expended by the first stage booster.

- more -

-- S-1C propellant loading level systems fill and maintain the fuel in the first stage booster to the proper level.

-- Thrust-to-weight-ratio-indicator measures the acceleration forces in terms of the moon's gravitational force and thus aids in the lunar landing.

-- Longitudinal accelerometer tells the fore and aft acceleration during all phases of the flight.

-- Barometric altimeter indicates the proper altitude for manual parachute deployment.

Bendix Aerospace Systems Division, Ann Arbor, Mich.:

-- Early Apollo Scientific Experiment Package includes one experiment that reflects a laser beam that will measure the exact distance between the earth and the moon, and another that records moonquakes much as a seismograph does earthquakes.

Bendix Field Engineering Corporation, Owings Mills, Md.:

-- Engineering support encompasses the areas of researching and designing new electronic components, installing and testing the tracking stations.

-- Apollo 11 Mission Coordinator serves as the right hand of the Apollo 11 NASA planner.

-- Network Support Group develops, writes and publishes operational procedures, equipment tests, computer programs and checkout procedures for the mission support.

-- NSG engineers simulate the actual mission and test reactions to real problems as they develop.

-- NSG operating communications center transmits mission traffic to the network. Technical personnel will advise in the event of any station equipment failure and provide new information should requirements change during the course of the mission.

-- operates and maintains 11 NASA Manned Space Flight Network stations, one Network Test and Training Facility, five NASA Space Tracking and Data Acquisition Network stations, and four NASA Deep Space Network stations.

Bendix Electronic Components Division, Sidney, N.Y.:

-- manufactures teflon braided cables and gold-plated electrical connectors which constitute the electronic nerve system of the life support system that controls the space capsule's environmental atmosphere.

- more -

-- supplies electrical connectors for the Rocketdyne engines powering the first and second stages of the Saturn.

Bendix Navigation and Control Division, Teterboro, N.J.

-- ST-124 inertial guidance system presents altitude and acceleration data to keep Saturn on course.

-- Range rate indicator shows the pilots of the LM the distance from and rate of approach to their destination.

-- Descent engine servo system throttle actuator controls the descent engine's fuel and oxidizer flow valves to provide the proper rate of descent for a soft landing on the moon's surface.

Bendix Scientific Instruments and Equipment Division, Rochester, N.Y.

-- High-vacuum themocouple gauges monitor the vacuum on liquid gas storage tanks and low-temperature fuel transfer lines.

-- High-vacuum thin-film evaporators put controlled emissivity gold coating on instruments for uniform temperature control.

-- Space and environmental simulation chambers simulate the space environment's effects on components, vehicles and capsules.

-- High-vacuum systems are used for many experiments including the selection of fireproof spacesuit materials and friction and lubrication studies.

-- Dosimeter monitors the level of X-rays and gamma rays and is carried by astronauts.

-- Vacuum-jacketing fuel transfer lines and flow valves maintains gases in the liquid state and at very low temperatures.

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For Immediate Release

HEY, WHO'S STOMPING AROUND ON THE MOON?

KENNEDY SPACE CENTER -- When Astronaut Neil Armstrong stomps his size 11 boots on the lunar surface next week, earthlings may hear the crunch.

The sound will come from a 112-pound self-contained seismic station so sensitive it can detect the slightest motions on the lunar crust, even Armstrong's footsteps.

The seismometer is one part of experimental package EASEP, built by The Bendix Corporation, that the astronauts will carry on the Apollo 11 voyage.

The seismometer has its own radio transmitter, powered by solar cells, and can respond to as many as 37 commands from earth.

It has been designed to reveal information about the moon's composition and the relationship of the earth to the moon.

The other part of the EASEP package is a laser ranging retro-reflector, an array of precision optical reflectors that will serve as a target for earth-based laser systems.

The reflector will contribute to precise measurement of the earth-moon distance and help determine more precisely the distance on earth between a pair of laser pointing beams. The Bendix engineers say this should tell us more about how continents slide and the earth wobbles.

The lunar astronauts are scheduled to spend up to 2 hours and 40 minutes on the moon's surface. In addition to deploying the EASEP package they will collect enough lunar soil and rocks to fill a wheelbarrow, take pictures, and plant a 3-by-5 nylon American flag.

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NEWSBUREAU, THE BENDIX CORPORATION
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For Immediate Release

BACKGROUND MEMO

ON

BENDIX AND THE SPACE PROGRAM

The Bendix Corporation is deeply involved in the nation's space effort and will play an important role in the Apollo 11 mission set for Wednesday, July 16.

From Kennedy Space Center to the Apollo tracking stations around the world, the company will have more than 4,000 men directly involved in the lunar landing mission.

Bendix is ranked sixth on NASA's list of 100 major contractors. Its sales in 1967 of products, systems and services to space contractors amounted to $166,751,000, or 13 per cent of the company's total sales in the non-commercial classification.

Steering the Saturn

Starting on the production line, the company's divisions turn out several key components for the Saturn, such as the inertial guidance platform that helps steer the booster rocket and its payload into orbit. The platform is spherical in shape, weighs about 115 pounds and measures 21 inches in diameter. It is made by Bendix' Navigation & Control Division, Teterboro, N.J., which has participated in the Saturn program since 1961 and has supplied inertial guidance platforms for Saturn 1 and 1B as well as Saturn V, the vehicle used for Apollo 11 and subsequent manned missions to the moon.

Other Bendix components include:

-- A range rate indicator for the four-legged lunar module designed to keep Astronauts fully informed of their landing and ascent operations during their trip the moon.

- more -

-- A throttle actuator for the lunar module that controls the engine's descent to ensure a soft landing on the moon's surface.

-- A longitudinal accelerometer to monitor fore and aft acceleration forces during all phases of orbital and sub-orbital flight.

-- The frequency standard, used in the static power supply package, that energizes the guidance platform.

-- Gold-plated connectors and EMR (electro-magnetic radiation) hardware to overcome radio frequency interference, a major obstacle in manned space flight.

-- Cable assemblies that electrically connect the various circuits of the unit that controls the astronauts' oxygen, humidity, temperature and waste removal systems.

-- An air pump used to inflate three air bags that right the capsule if it capsizes (as in the case of Apollo 7) on ocean landing.

Launch Support

At the Cape, Bendix Launch Support Division personnel under contract to NASA provide all direct support required for launch vehicle and spacecraft operations. This includes operation, maintenance and site management of launch complexes, test facilities and ground support equipment. Bendix is also responsible for the requisitioning and dispersal of propellants and gases, storage and dispersal of ordnance, the operation of life-support facilities and specialized laboratories, and engineering functions.

At Complex 39, the area from which the astronauts will be launched, on their lunar landing mission, Bendix specialists maintain and operate major systems on the launch pads, three mobile launcher towers upon which the Saturn V vehicles are assembled and launched, the mobile service structure that stands adjacent to the launch vehicle on the pad during pre-flight checkout, and two giant transporters that carry the Saturn V and its launcher to the pad.

The same division has developed the Apollo Lunar Surface Experiments Package (ALSEP), a group of scientific experiment subsystems and related supporting subsystems for studying the moon, and the Early Apollo Scientific Experiment Package (EASEP) that will be deployed and left on the moon by Apollo 11 astronauts.

The ALSEP system is intended to provide advanced scientific study of the lunar environment, particularly in the fields of geology, geophysics and geochemistry.

EASEP is less complex, containing two experiments designed to reveal information about the moon's composition and the relationship of the earth to the moon.

In summary, Bendix has been -- and is now -- significantly involved at all levels of the space program. The corporation has provided a continuous input of products, services and technology since the days of Project Mercury.

Many of the company's divisions have contributed to the space effort, but particularly the Navigation & Control Division at Teterboro, N.J., the Launch Support Division at Cape Kennedy, Fla., the Aerospace Systems Division at Ann Arbor, Mich., Instruments & Life Support Division at Davenport, Iowa, and Bendix Field Engineering Corp. at Owings Mills, Md.

The success of Apollo 11 and subsequent missions will be in no small measure due to Bendix personnel and equipment.

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For Immediate Release

ELECTRONIC LIGHTHOUSES GUIDE VOYAGERS ON OCEANS OF SPACE

KENNEDY SPACE CENTER -- Like gigantic lighthouses guiding America's voyagers on the oceans of space, three 85-foot antenna tracking stations will keep the Apollo 11 spacecraft floating straight into history and to its port of call -- the moon.

They're at Honeysuckle Creek near Canberra, Australia; at Goldstone, north of Barstow, Calif.; in a Spanish village 60 kilometers west of Madrid, the three tracking stations, located about 120 degrees apart in longitude. They will watch, listen and direct the three-man Apollo crew past the obstacles of the journey.

The Bendix Field Engineering Corporation operates the Madrid and Goldstone stations. Australians operate the Honeysuckle Creek station.

Forming a continuous electronic blanket around the earth, the stations are the world's space vanguard. Always in contact with the astronauts as they orbit the moon or walk upon its surface, the stations are the first on earth to see, the first to hear, the first to inform the world of Apollo's progress.

Cocked moonward, the massive antennas are the only source of contact between the sojourning explorers and the earth. Bendix engineers and technicians hear every word spoken, watch every maneuver of the spacecraft and monitor the activities of the astronauts, even to their heartbeats.

The tracking stations are the relay point between the orbiting spacecraft and mission control at Houston. They transmit and receive voice communications, television and engineering and scientific data.

As the lunar module separates from its mother ship and heads for the moon's surface, Bendix technicians at the Goldstone station will monitor the descent and confirm the touchdown.

It will be, at long last, Man on the Moon.

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For Immediate Release

SPACE FLIGHT NETWORK

READY FOR APOLLO 11

KENNEDY SPACE CENTER -- Eight years after the birth of the Manned Space Flight Network the intricate tracking complex will fulfill its prime objective -- supporting the spacecraft carrying the first men to the moon.

Since June 1961, when the MSFN became operational in support of Project Mercury, it has been the "eyes and ears" of manned space flight successively through Projects Gemini and Apollo. As manned spacecraft complexities increased while America moved closer to a lunar landing, the ability of the MSFN to support astronauts in flight has had a corresponding increase in complexity.

Seventeen stations made up the Mercury network, and, since speed and efficiency of operations was necessary, U. S. national ranges under the Department of Defense and the Australian Department of Supply were used to the maximum extent possible. When America moved into Project Gemini the network requirements became more demanding. The MSFN would have to track a two-man spacecraft and a target vehicle; monitor rendezvous and docking maneuvers and extra vehicular (space walk) activities. The Gemini network exchanged about 40 times the amount of information as that of the Mercury network.

Unified S-Band

As America began the third and final step toward a lunar landing, Project Apollo, the unified S-band tracking network was designed with the specific purpose of providing reliable support to astronauts on lunar missions. To and from deep space, almost 250,000 miles from earth, the network was required to collect data, transmit commands and track the spacecraft and its crew.

- more -

The Apollo network, under the direct management of NASA's Goddard Space Flight Center, Greenbelt, Md., is made up of Apollo aircraft (instrumented versions of the Boeing 707), ship stations, and land stations that are located along the ground path of the orbiting spacecraft. They are constructed in low habitability regions so that manmade electromagnetic interference does not distort the faint signals received from space. Many of the stations have been maintained and operated by Bendix Field Engineering Corporation, Owings Mills, Md., which has been a principal space-tracking organization since the beginning of the space age.

85-Foot Antenna Stations

For the climactic moon landing mission, the Apollo network will consist of eight Apollo aircraft, four ship stations and 17 land stations. Included in the land stations are the three 85-foot antenna stations at Madrid, Spain; Canberra Australia; and Goldstone, California; the backup stations of Deep Space Network at the same three locations; the Deep Space Network's 210-foot Mars antenna at Goldstone, and the National Radar Astronomy Observatory's 210-foot antenna at Parkes, Australia. Fourteen of the land stations will be operated by Bendix Field Engineering Corporation.

Mission success requires a lot more than people and equipment, however. Network personnel must meet special qualifications and are formally trained in Apollo equipment and procedures at Goddard's Network Test and Training Facility. These engineers and technicians must continually modify equipment and update associated technical reference documents. At the same time, project personnel must develop and provide several hundred tests and operating procedures that will ensure readiness of station personnel and equipment to function in unity with the network and operations control. They also operate a logistics system that will continue to provide needed materials as diverse as "Q-tips" and 73-ton antennas in a routine or emergency manner.

-- more --

The Manned Space Flight Network represents a big part of NASA's global tracking and data acquisition networks, a huge national resource, located in the U. S. and 16 foreign territories. MSFN facilities alone represent a capital investment of over $600 million. In addition to the Apollo missions, the NASA tracking networks, are used to support about 60 unmanned scientific missions each year. Bendix Field Engineering Corporation has about 3,000 personnel maintaining and operating various stations and providing network support services.

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Monica literally lives in the future: when Apollo 11 is launched, she and her Bendix team mates will be working on Apollo 13.

"Apollo 10 was out of the chamber before I came to work here," she explained. "We were already at work on Apollo 11 and were soon to begin tests of Apollo 12."

Before joining Bendix she had a secretarial job that she described as a "drag compared to this."

Monica is a native of landlocked Lexington, Ky., but fell in love with the sea on a visit to her grandmother here and decided to stay. She now lives in Cape Canaveral, only two blocks from the beach. She loves to swim, and that shows in her golden tan, set off by her white blouse with its blue Bendix signature.

She especially appreciates the informality of her job. She can wear slacks on second and third shift, and she wears them very well.

"I never grumble about having to go to work," she said, "I love it." So do the astronauts, reports an informed source.

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For Immediate Release

FACT SHEET

ON

CRAWLER/TRANSPORTER

CAPE KENNEDY -- The two mammoth Crawler/Transporters at the Kennedy Space Center have driven a total of 473 miles in 66 operational moves since the roll-out of Apollo/Saturn 501 in late summer of 1967, including the roll-out of the moonship, Apollo/Saturn 506.

Transporter No. 1 has driven 244 miles while its sister, Crawler No. 2, has rolled up a total of 229 miles.

The two 6-million-pound tractor-like crawlers have carried a total of 367,000 tons, or three-quarters of a billion pounds in those 66 moves, and have carried heights totaling 23,650 feet, or just under 4½ miles high, an average of 425 feet high per mission.

The Mobile Launcher, carried from the VAB to the pad, a distance of 3½ miles, is 447 feet high and the Mobile Service Structure, transported from its park site to the pad and back by the Transporter, is 402 feet high.

The Mobile Launcher with the empty Saturn 5 weighs approximately 12.6 million pounds at roll-out, and the Mobile Service Structure weighs approximately 11.6 million pounds.

Gas, Oil and Water, Etc.!

Normal maintenance of the family car calls for changing oil and lubrication every 2,000 miles or thereabouts. The Crawler must change a 400-pound grease drum approximately every 11½ miles (based on usage of 125 pounds each 3½ mile trip from the VAB to the pad.)

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Where the fmily car uses less than five gallons of water in its radiator (unless it's air-cooled), the Crawler needs 500 gallons of water in its six radiators. On the large radiator, a 75-horsepower motor is used to pump water through cooling systems.

The family bus has one engine, with an average horsepower of 150 to 200 horsepower. The Crawler has six diesel engines turning generators that power 16 electric motors, putting out 6,000 horsepower to move the monster.

The Transporter weighs 6 million pounds. The family car averages 3,000 pounds. So the ratio is a mere 2,000-to-1.

One or two mufflers are sufficient on most cars, but the Transporter has six mufflers, the largest weighing 3,000 pounds and over nine feet long.

The Transporter cannot have a flat tire, but when one of the shoes on the giant caterpillar-like tracks becomes worn it is replaced with a 2,000-pound new shoe, secured with a 100-pound pin.

The Transporter's six diesel engines burn approximately 150 gallons of fuel each hour, and the monster moves at approximately one half to three quarters of a mile per hour. It takes approximately 825 to 1,000 gallons for a 3½-mile trip from the VAB to the Pad.

Autos speed along the highway at rates of 50 to 75 miles per hour, depending on local speed laws, but the Transporter will never go faster than one mile per hour no matter what the local speed laws allow.

Most trucks have a load limit of approximately 36,000 pounds. The Transporter, with the Mobile Launcher and the Saturn on its back, carries a weight of over 12 million pounds, reaching a height of as much as 40 stories.

The Transporter travels on a "Crawlerway" that's as wide as the New Jersey Turnpike.

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For Immediate Release

APOLLO MOON LANDING
HAS STRINGS ATTACHED

KENNEDY SPACE CENTER -- Charles Lindbergh used a "plumb bob" -- a weight on the end of a string -- to help maintain balanced flight during his Atlantic crossing. The two Apollo 11 astronauts who plan to set foot on the moon's surface on July 20 will also be assisted by a weight on the end of a string to make their lunar descent.

The string, of special silk suture thread, and its weight constitute an integral part of the thrust-to-weight-ratio indicator, a flight instrument designed and built by The Bendix Corporation especially for use in the vicinity of and on the moon.

The instrument measures lunar acceleration or deceleration in terms of moon "g's." (A moon "g" -- gravitational force unit -- is about one-sixth that of an earth "g".) The measurement reveals the rate at which the Lunar Module descent engine is slowing down the spacecraft as it approaches the moon's surface.

This is the only purely mechanical instrument aboard the Lunar Module spacecraft; all others are at least partially electrical. The tension of a spring balances the weight when the instrument is at rest or moving at a constant velocity. An increase or decrease in speed is sensed by the weight, which moves in the opposite direction. The string's role, along with a series of pulleys, is to scale the weight translation into readable units of lunar "g's."

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For Immediate Release

DESCENT THROTTLE ACTUATOR
ENSURES SOFT MOON LANDING

KENNEDY SPACE CENTER -- When Astronauts Neil Armstrong and Edwin Aldrin set their four-legged spider module on the moon next week, it will be with a jolt no greater than that of a three-foot jump on earth.

To ensure this "soft landing," they will be relying heavily upon a descent throttle actuator -- one of three flight instruments produced by the Bendix Corporation Navigation & Control Division for the Apollo 11 mission.

The throttle actuator has been designed with a passive "fail-soft" redundant circuitry so that it will continue to operate even if a component fails or shorts.

The descent engine's servo system controls the position of the descent engine's fuel and oxidizer flow valves. Varying the actuator output shaft position controls the descent engine's thrust, providing the proper rate of descent.

The other two Bendix-built instruments are a range rate indicator and an ST-124 inertial guidance platform.

The indicator will keep the lunar module astronauts fully informed of their landing and ascent operations on the moon, and later help them rendezvous with the command module that will return them safely to earth.

The inertial guidance platform is the key component that steers the Saturn V rocket into orbit.

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For Immediate Release

WORLD'S SLOWEST DRIVER

BEGINS TRIP TO THE MOON

KENNEDY SPACE CENTER -- Ed Walsh is probably the world's slowest driver, yet he's the lead-off man on the trip to the moon.

Ed is not an astronaut, but an employee of Bendix Launch Support Division, which has the job of transporting the moon rocket and its mobile launcher -- an unwieldy 12.6 million pounds rising 451 feet above the ground -- from the Vehicle Assembly Building (VAB) at this sprawling space complex to the launch pad, three and a half miles away.

The rocket and launcher are mounted atop a transporter or "crawler," one of the biggest, slowest, strongest, strangest and noisiest land vehicles ever devised by man. It weighs another 3.5 million pounds, adding up to a kingsized balancing and juggling act calling for, in the words of Fred Renaud, one of the control engineers, "some pretty hairy maneuvers."

The trip normally takes 6 to 8 hours, because the "crawler" lives up to its name traveling at a cautious maximum of .75 miles per hour.

"You can't imagine the difference between .7 and .9 miles an hour with this much weight," says Frank Reaves, one of the hydraulic engineers. At .7 the ride is very smooth, at .8 the fibrations may be noticeable, but tolerable, and at .9 it's pretty sure to be difficult, to say the least."

Two transporters, which took three years to make, are maintained and operated by Bendix.

- more -

Each has two cabs containing the usual controls found in an automobile -- an accelerator, foot and parking brakes, speedometer, air conditioner, radio (for two-way communications), adjustable seat and windshield wiper.

Some Warm-Up!

While the accelerator on the family car controls a single engine rated at around 250 horsepower, the crawler's counterpart controls 16 motors with a capacity of more than 6,000 horsepower, equal to more than 32 automobiles!

Preparing a transporter for duty goes far beyond the simple turn of an ignition key. The supervisory engineer first advises the control room, the actual operating "heart" of the vehicle, that all is ready.

It takes approximately 90 minutes for the crew of 14 Bendix engineers and technicians to start and warm-up the six diesel engines, energize several dozen electrical circuits, start up three hydraulic systems, one pneumatic system, a fuel system and two lubricating systems, and make a series of checks called for by a 39-page startup procedure manual.

Each of the eight tank-like tracks on the transporter is made up of 57 plates called "shoes," and an individual shoe weighs literally a ton. The largest of the six mufflers on the vehicle weighs 3,000 pounds, and is about nine feet long.

Handling such a monster machine requires a cool head, extreme patience, and much teamwork, especially the loading and unloading at either end of the trip.

"The first time out is an awesome experience," says Ed. "You think about that terrific weight up there and what would happen if you had some catastrophic malfunction. You know, on paper, it will do the job, but you wonder if it really works. You don't quite know what to listen and look for."

-- more --

Don't Lean On The Brake

Inside the VAB, the transporter must be steered with the aid of gauges, guidelines, and a personal judgment by Bendix personnel stationed at strategic checkpoints, to within two inches of a set of pedestals ranging across the 150-foot width of the mobile launcher to allow the load to be firmly bolted down.

"When a man stands next to the 'crawler,' it looks big," says Bill Clemens, supervisor of the transporter team, "but when you see it under the mobile launcher, it looks incapable of lifting such a big load."

But it does, and then begins the slow, painstaking methodical trip to the pad.

"This part of the move is not particularly hard," says Ed, who, by now is perched in his cab, steering the massive vehicle.

"The main concern is just staying on the road, and if you have to stop quickly, don't lean on the brake. The small jolts and jerks down here are sledgehammers on top."

"One of the hazards is you tend to overcontrol the machine because it takes things so long to happen. You come up to a curve, put in a steering signal, and about 25 minutes later you come out of the curve. The tendency is to put all the steering in at once."

Up The Hill

At the pad, the transporter now with its crew of as many as 30 men, most of them on radios to monitor the trip, must negotiate a 1200-foot-long incline, at about a 5 per cent grade, before depositing its precious cargo on another set of pedestals.

Ed and one of his counterparts, possibly Ken Kelley, in the cab on the other end of the transporter, steer the front and rear ends into position, while the foreman on the pedestals give verbal directions to move right or left.

-- more --

"The effort to negotiate the grade is not noticeable on the way up because of so much excess power," says Ed, "but coming down you don't dare allow yourself to go too fast. She wants to free-wheel and coast, and if you overspeed too far the diesel engines will shut off -- which spells trouble! You must keep the speed under control."

In Supervisor Clemen's view, connecting the Mobile Service Structure (MSS) to the Saturn V at the pad is the trickiest and most delicate maneuver of all.

Tight Squeeze

The MSS, which towers 402 feet above the ground, provides five access platforms for final checking out and testing the Apollo spacecraft and the rocket booster stages. It is hauled to and from its parking site on the crawler.

"You have only a few inches of clearance when you're mating the structure to the pad," said Bennie Smith, who has now relieved Frank as the JEL operator. "There are clamshell doors that hinge and close around the bird, and if you run into them there will be no shot. It's as simple as that."

Seven of the 21 men who maintain and operate the crawler are qualified drivers. Their formal title is "operating engineer" and each is a graduate engineer. They perform a dual role as an expert in hydraulics, diesel engines, electronics, electrical power systems or structural maintenance.

To Clemens, supervising the operation of the "crawler" is exciting, even though the incredibly slow vehicle is a tremendous contrast to the speeds which he was accustomed to traveling while in the Air Force.

Now he's a landlubber, and revels in the accomplishment of traveling 3 1/2 miles in 6-8 hours.

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For Immediate Release

PRETTY TECHNICIAN PUTS ASTRONAUTS TO THE TEST

KENNEDY SPACE CENTER -- The girl seated at the console of NASA's altitude chamber control room is enough to make any astronaut do a double take.

Headset nestled in her brown hair, she is sandwiched between male technicians at a console that monitors manned test runs of the Apollo spacecraft.

Tanned and brown-eyed Monica Koerner, 21, records information from an array of test stations as the Apollo astronauts put their spacecraft through a series of systems checks.

A fringe benefit of her job with Bendix' launch support division is the opportunity to meet the astronauts and smile brightly at them as they prepare to enter the test chamber.

The flow of information over her earphones comes in sometimes fast and furious, she says.

She records, "what time we start pump down (air evacuation in the vacuum chambers), when we hit maximum altitude -- of almost 50 miles -- and when we're back down to sea level."

She listens to the astronauts checking systems on the lunar, command and service modules, hears their light-hearted conversations and even listened to Astronaut Pete Conrad singing as he checked out Apollo 12.

She collects autographed photos of the astronauts including Neil Armstrong, commander of Apollo 11, who will be the first man to set foot on the moon.

-- more --

Monica literally lives in the future: when Apollo 11 is launched, she and her Bendix team mates will be working on Apollo 13.

"Apollo 10 was out of the chamber before I came to work here," she explained. "We were already at work on Apollo 11 and were soon to begin tests of Apollo 12."

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She especially appreciates the informality of her job. She can wear slacks on second and third shift, and she wears them very well.

"I never grumble about having to go to work," she said, "I love it." So do the astronauts, reports an informed source.

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