

General Disclaimer

One or more of the Following Statements may affect this Document

- This document has been reproduced from the best copy furnished by the organizational source. It is being released in the interest of making available as much information as possible.
- This document may contain data, which exceeds the sheet parameters. It was furnished in this condition by the organizational source and is the best copy available.
- This document may contain tone-on-tone or color graphs, charts and/or pictures, which have been reproduced in black and white.
- This document is paginated as submitted by the original source.
- Portions of this document are not fully legible due to the historical nature of some of the material. However, it is the best reproduction available from the original submission.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

**Cumulative
Bibliographic Index No. 41-1**

**Bibliographies
of the
Jet Propulsion Laboratory
Nos. 39-1 through 39-5**

FACILITY FORM NO. 8

N 65-33147

(ACCESSION NUMBER) 179

(PAGES) 64613

(NASA CR OR TRS CR AD NUMBER)

(THRU) 1

(CODE)

(CATEGORY) 34

GPO PRICE \$ _____

CSFTI PRICE(S) \$ _____

Hard copy (HC) 3.00

Microfiche (MF) .75

ff 653 July 65



**JET PROPULSION LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA, CALIFORNIA**

July 15, 1965

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Cumulative
Bibliographic Index No. 41-1

**Bibliographies
of the
Jet Propulsion Laboratory
Nos. 39-1 through 39-5**



Irl E. Newlan, Manager
Technical Information Section

JET PROPULSION LABORATORY
CALIFORNIA INSTITUTE OF TECHNOLOGY
PASADENA, CALIFORNIA

July 15, 1965

PREFACE

JPL Cumulative Bibliographic Index No. 41-1 is derived from JPL Bibliography Nos. 39-1, 39-2, 39-3, 39-4, and 39-5. The Bibliographies indexed catalog the official reports of the Jet Propulsion Laboratory for the period January 1938 through June 1964. Beginning with No. 39-2, each Bibliography covers a one-year period; informative abstracts are given for most of the reports.

Source material for the Index was derived from the indexes of each Bibliography; the subject descriptors and terminology of the separate indexes were retained wherever possible, and minimum changes were made to the "prevailing vernacular." Certain changes in major descriptors were made for simplicity where the correlation is clear and little opportunity exists for ambiguity; e.g., *aircraft* for *airplanes*.

To locate the material referenced by the Index, the following recall code system is used: The first numeral (1-, 2-, 3-, 4-, or 5-) is the number of the Bibliography in which the indexed material appears; e.g., "3-" cites Bibliography No. 39-3. The combination letter symbol and numeral following the hyphen (-W089) is the entry number as it appears in the volume indicated: "3-W089" means Entry W089 as found in JPL Bibliography No. 39-3.

Procedures for obtaining actual reports indexed herein are contained in each Bibliography.

CONTENTS

Subject Index	1
Numerical Index	57
Publications	57
Memorandums	58
General Reports	59
Progress Reports	60
Technical Releases	64
External Publications	65
Miscellaneous Documents	67
Technical Reports	68
Technical Memorandums	71
Summaries	72
Astronautics Information Documents	73

BLANK PAGE

SUBJECT INDEX

Ablation

and associated subjects, bibliography 2-AC26

Acceleration

level maintenance by vibration exciter servo 1-L040
of turbojet engine, theoretical investigation 1-S050

Accelerometers

miniature, with fused-quartz suspension 1-J121
testing methods 1-W004
instrumentation requirements of nonperiodic
sawtooth pulse 1-W187
pulse-torque system, research 2-AB15
development with a fused-quartz suspension 2-J19
operation and testing 2-M17
pulse-torquing principle for measurement,
investigation 3-J17

Acetylene

inhibition of acetylene-oxygen flame by chlorine atoms 3-F02

Administration

JPL employee development, 1953-1960 2-C02

Aerodynamics

(see also **Atmospheric Entry, Boundary Layer, Fluid Flow, Wind Tunnels**)

calculations of supersonic flow over an ogive
by method of characteristics 1-B065
surface temperature and shock stresses of
parachute during descent, estimate 1-C035
wave drag of projectile nose, by Karman-Moore method 1-C051
approximate method of integration of ballistic
equations 1-C055
Canard-type aircraft, dynamic longitudinal
stability analysis 1-C073
aircraft using auxiliary jets, performance and
flight characteristics 1-D001
Agard calibration Model B; lift, drag,
and pitching-moment data 1-D071
drag of streamlined bodies, influence of shape 1-D080
aircraft using auxiliary jets, analysis of rate of climb
and maximum level speed 1-F038
tests of two rocket-propelled projectile models 1-F050
dynamic effects of spin on manufacturing inaccuracies 1-F092
unguided antiaircraft rocket, design problems 1-F101
reduction and simulation of nonperiodic vibration 1-G004
effect of roughness on turbulent skin-friction drag 1-C045
linearized supersonic theory of conical wings 1-L001
force characteristics of delta wings 1-L002
normal force characteristics of delta wings 1-L003
drag due to lift of delta wings 1-L004
supersonic lift and moment characteristics of shell 1-L095
flutter calculations for *Corporal E* tail surfaces 1-L115
supersonic flutter-stability predictions, two-
and three-dimensional theories 1-L122
flutter characteristics of *Sergeant* tail surfaces 1-L130
heating of reentry vehicle, preliminary study 1-L157

tests of fin-stabilized projectile, comparison 1-L159
cone-temperature recovery-factor data 1-M007
aircraft using auxiliary jets, flight test results 1-M027
aircraft using auxiliary liquid jets, takeoff and
flight performance 1-M028
aircraft using auxiliary jets, analysis of takeoff
and initial climb 1-M179
winged-body problem for linearized flow 1-M207
coefficients for circular-arc airfoils in supersonic flight 1-M210
preliminary calculations for *Bumper Wac* 1-N001
downwash distribution behind delta wing at
supersonic speeds 1-P001
drag function of *Loki Dart* 1-P128
compressible flow tables for air in increments
of M 0.001 1-R064
equations of motion for elastic nonpinning missile 1-S190
stability and control aspects 1-S207
lift and drag of cones at supersonic speeds,
theoretical calculations 1-S217
body-wing interference in supersonic flow 1-S232
problems in ramjet design 1-T007
sphere drag at supersonic speeds and low
Reynolds number 2-W02
supporting research and advanced development;
progress summary, 6/62-6/63 5-AB28
4-AB08
4-AB14
4-AB16
4-AB26
4-AB32
4-AB38
stability of planetary-entry vehicles 4-B33
stability, Allen's solution for envelope of oscillation 4-B33
testing and photography in wind tunnels 4-D02
spark schlieren photos of wakes 4-D03
low-density sphere drag with equilibrium and non-
equilibrium wall temperatures 5-A08
supporting research and advanced development; progress
summary, 8/63-4/64 5-AB07
5-AB13
5-AB19
5-AB25
5-AB31
investigation of solid and jet spoilers 5-AC08
pitch damping at high amplitudes of oscillation;
wind-tunnel measurements 5-D04
carbon dioxide effects on re-entry bodies 5-J04
free-flight dynamic damping of axially symmetric body 5-J05
launch vehicle vibration data correlated with
wind tunnel data 5-S07

Aeroelasticity

JPL 6-in. booster test rocket 1-M206
static stability of booster test rocket 1-N003

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-f
SUBJECT INDEX

Aeroelasticity (Cont'd)

- instability of swept strut in supersonic flow 1-P163
- dynamic effects of spin on thrust misalignment
 - due to elastic deformation 1-S189
- equations of motion for elastic nonspinning missile 1-S190
- forced flexural motion of spacecraft 4-A03
- model construction for testing, bibliography 4-AC14

Aircraft

- rocket-powered, feasibility and anticipated performance .. 1-B098
- Canard type, dynamic longitudinal stability analysis 1-C073
- using auxiliary jets, performance and flight
 - characteristics 1-D001
- using auxiliary jets, analysis of rate of climb and
 - maximum level speed 1-F038
- subsonic and transonic, preliminary design 1-K026
- stability 1-L133
- using auxiliary solid jets, flight test results 1-M027
- using auxiliary liquid jets, takeoff and flight
 - performance 1-M028
- using auxiliary jets, analysis of takeoff and initial climb .. 1-M179
- ramjet-powered, optimum altitude 1-S215
- ramjet-propelled, effect of wind and power loading 1-T007

Airglow

- UV oxygen, laboratory spectra 4-B08

Alcohol

- reactions with isocyanates 3-S10

Aluminum

- crystal structure of tial 1-D117
- solubility of aluminum nitrate in red fuming
 - nitrate acid 1-M233
- zener and magnetic relaxation effects 3-F04

Ammonia

- and hydrogen, phase behavior 1-R013
- and nitrogen, phase behavior 1-R014
- gas-phase oxidation by nitrogen dioxide, kinetics 1-R117
- and hydrazine as propellant, investigation 1-T041
- application 1-T052
- rate of oxidation 1-W152
- and oxygen in quartz vessel, kinetics of
 - reaction between 1-W166
- kinetics of oxidation by nitric oxide 1-W169
- forced-convection and nucleate-boiling heat-transfer
 - characteristics 3-N08

Ammonium Nitrate

- oxidizer for smokeless solid propellant 1-A007
- water determination, Karl Fischer method evaluated 1-B187
- assay procedures 1-B188
- thermal decomposition 1-D062
- burning characteristics 1-H009
- as oxidizer for solid propellants 1-H010
- propellants, unique short duration grain design 1-H011
- development, for solid propellants 1-J132
- as oxidizer for solid propellants 1-J133
- moisture determination 1-M225
- analysis, determination of zinc oxide and ash 1-M228

- rate of moisture absorption at room temperatures 1-M235
- ether alcohol acrylates as resin binders 1-N033
- epoxide resin binders 1-N035
- kinetics of thermal decomposition 1-W180
- 1-W183

Ammonium Perchlorate

- chlorate impurities, spectrometric determination 1-B190
- magnesium-coated, preparation and detonation 1-F030
- propellant properties 1-M049
- rate of moisture absorption at room temperatures 1-M235
- physical properties, improvement 1-R043
- development of manufacturing facilities 1-S078
- and polyurethane propellants, storage stability 1-S160
- volumetric analysis 2-B014
- polyurethane, moisture effects on mechanical properties ... 4-L01

Amplifiers

- transistorized relay, development and performance tests .. 1-B163
- transistor emitter-coupled differential, applicability 1-S141
- stabilizing multichannel DC, for zero without
 - interaction 1-S143
- transistor emitter-coupled 1-S144
- feedback-stabilized transistor 1-S145
- transmission line parameters with negative-resistance
 - load 1-S194
- chopper type 1-W021
- chopper-stabilized, for general instrumentation 1-Z018
- degenerate parametric, with circulator 2-S25
- transmission-line parameters with negative-conductance
 - load, mathematical analysis 2-S26
- low-noise, calibration 2-S27

Antenna Radiation Patterns

- Corporal E model tests 1-C133
- effect of tilt on polarization of three-phase
 - Sergeant antenna 1-L062
- computation by varying apex angle, length, and
 - method of excitation 2-P06
- distribution from paraboloid 3-R13

Antennas

- circularly polarized, bibliography 1-AC20
- symmetrical three-phase impedances 1-L061
- ground, for space communications 1-L101
- alignment, checkout, and evaluation; 85-ft-D dish 1-M173
- large aperture, effect of propagation anomalies 2-AB05
- angular displacement, 85-ft at Goldstone 2-P03
- large, noise-temperature determination 2-S09
- Goldstone, progress report 3-AB21
- 3-AB22
- design and development; progress summary 3-AB27
- parabolic aperture efficiency 3-P06
- Cassegrain, simple beam shaping modification 3-P07
- ground, application of Cassegrainian principle
 - for space communications 3-F08
- large ground, DSIF systems; parameters, design 3-R01
- noise temperature determination in large antennas 3-S11
- DSIF, hailstorm damage 3-S46

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Antennas (Cont'd)

design and development; progress summary,
5/62-5/64 4-AB07
4-AB13
4-AB19
4-AB25
4-AB31
4-AB37
distortion due to imperfections, computation 4-B05
rotational parabolic, computation of weighted
rms path length 4-B05
for orbit determination 4-M27
horn, with suppressed sidelobes and equal beam widths 4-P13
DSIF, gear equipment 4-R07
scattering from a hyperbolic reflector 4-R18
spherical wave scattering by an arbitrary truncated
surface of revolution 4-R19
structural deflections caused by deadload and
thermal inputs 4-S30
design and development; progress summary,
5/62-5/64 5-AB06
5-AB12
5-AB18
5-AB24
5-AB30
5-AB36
5-H23

Astronauts

feasibility and function 1-P107

Astronomical Constants

AU determination by Venus radar reflections 3-M31
data from Venus radar experiment 3-V03
relationship between; radar determination of AU 5-M21

Astronomy

(see also **Radar—, Radio—**)
slow-scan vidicon, usability for space 5-M01

Atmospheric Entry

supporting research and development;
progress summary 2-AB15
aerodynamic stability of entry vehicle 4-B33
Mars, parametric study 5-B22
effects of carbon dioxide on reentry vehicles;
aerodynamic characteristics 5-J04
communication blackout problem for Mars-entry capsule 5-S19

Atomization

helical atomizers, design analysis 1-M141
bibliography 1-R106
application of photoelectric photometer 1-S60
of liquids injected into air stream 1-S63

Attitude Control

of spacecraft 1-G018
optical orientation system 1-M044
of satellites 1-N050

gyro instruments, effects of vibration and rotation

on drift 1-S250
design criteria for adaptive control systems 3-B16
gyro-free nonlinear satellite control system, analysis 3-N06
position control system with incremental motor 3-N07
for *Ranger* and *Surveyor*; design, development,
operations; progress summary, 8/63-5/64 5-AB04
5-AB10
5-AB16
5-AB22
5-AB28
5-AB34
optimum final value control technique of powered flight 5-P05

Automatic Pilots

Corporal Mark II, amplifier 1-S243

Batteries

remotely activated, mechanical study 1-S133
for *Sergeant*, description and development 1-T072
silver oxide—lin discharge behavior for AgO—Ag
electrode 5-B26

Bearings

(see also **Gas Bearings**)
DU sleeve, tests 3-N10
hydrostatic; of multi-wells, pressure distribution 4-B06

Beryllium Oxide

recrystallization at 2000°C, study 1-D100
1-D145

Bibliographies

radio astronomy 1-AC18
ablative heat transfer 1-AC19
circularly polarized antennas 1-AC20
sloshing of liquid propellants 1-A-C21
micrometeorites and impact studies 1-AC22
superconductivity 1-AC23
duplexing systems 1-AC24
photographic and TV equipment adaptable to
spaceflight 1-AC25
plasma physics and MHD 1-AC26
magnetic properties of materials and use in
instrumentation 1-AC27
cosmic rays and measuring devices 1-AC28
masers 1-AC29
magnetic fields, methods of measurement 1-AC30
lunar and planetary atmospheres 1-AC31
advanced propulsion 1-AC32
two-phase flow and acoustic phenomena in gases
and liquids 1-AC33
JPL ordnance research, Jan. 1, 1955—Dec. 31, 1956 1-I044
JPL ordnance research, Jan. 1, 1957—Dec. 31, 1958 1-J052
masers 1-K002
heat transfer at high heat-densities 1-K046
JPL ordnance research, June 1, 1953—Dec. 31, 1954 1-P091
atomization 1-R106

Boundary Layer (Cont'd)

- growth and heat-transfer calculation in axisymmetric nozzles4-E07
- integral momentum and energy equations4-E07
- turbulent supersonic, fluctuating pressure field.....4-K04
- laminar; in a rotating flow, use of momentum-integral method for study4-M01
- investigation of solid and jet spoilers.....5-AC08
- convective heat transfer5-B02
- calculated and measured thickness, on curved walls of JPL 20-in. wind tunnel, comparison5-D03

Bronze

- test of sleeve bearings3-N10

Bumper Wac

- lateral dispersion1-B067
- propellant tank, water tests of spinning scale model.....1-B075
- preliminary design considerations1-D034
- skin temperature in high-speed flight1-L116
- deviation from vertical trajectory1-M216
- preliminary aerodynamic calculations1-N001
- spin rocket development tests1-S119
- aerodynamic loads and launching1-S228

Burning Law

- development of new erosive-burning law1-R089

Cameras

- Strobe control system1-L037
- transistorized time-base generator1-L041
- image converter tube1-M043
- iris requirements for lunar approach camera.....5-M18

Carbon Compounds

- of liquid propellants, performance calculations1-M090
- C₂B₂H₂ structure5-B06
- pyrolytic, kinetics of high-temperature structural transformation5-F01
- kinetics of graphitization of petroleum coke.....5-F02
- reaction of O(1D) with CO5-R04
- electronically excited O₂ with CO, reaction5-R05

Carbon Monoxide

- IR-intensity and line-width measurements1-P034
- absolute values for integrated absorption of diatomic gases1-P057
- pressurized, quantitative line-width measurement in IR.....1-P065
- unpressurized, quantitative line-width measurements
 - in IR1-P066
 - quantitative IR intensity measurements1-P067
 -1-P068
- integrated absorption of fundamental CO1-P069
- CO₂ vibration-rotation bands, integrated absorption.....1-P075
- IR spectra of liquid and solid forms4-E10

Cavea-B

- in rocket motors, experimental evaluation3-E10
- hypergolic-ignition experiments3-E11
- density and viscosity of nitric acid solutions4-V02

Celestial Mechanics

(see Orbits)

Centaur Project

- structure, propulsion, and guidance systems.....2-J04
- study report2-J06
- design, development, operations; progress summary, 6/61-8/613-AB15
-3-AB16
- Surveyor bus as third stage, for Advent3-C12

Chemistry

- chemical processes to achieve high temperatures.....1-A075
- ionization of hydrozoic acid in aqueous solution.....1-B192
- ethylene glycol mononitrate1-I010
- unsymmetrical oxide, addition of nitrate ion.....1-I011
- inductive effect in ethylene oxide ring openings.....1-N043
- high-resolution nuclear magnetic resonance spectroscopy2-AB18
- supporting research and advanced development, progress summary, 7/61-4/64.....3-AB05
-3-AB06
-3-AB09
-3-AB28
-4-AB08
-4-AB14
-4-AB20
-4-AB26
-4-AB32
-4-AR38
-5-AB07
-5-AB13
-5-AB19
-5-AB25
-5-AB31
- IR absorption of ν₃ by liquid and solid CH₄ and CD₄.....5-E05
- spin properties of pair-correlated atomic and molecular singlet wavefunctions5-L11
- reaction rate between nitric oxide and ozone in supersonic nozzle5-M07
- reaction of O(1D) with CO5-R04
- geminal proton-proton coupling constants in CH₂=N-systems5-S11

Chemosphere

- nitrogen and oxygen atomic reactions2-B05

Chloride

- determination of small amounts by Volhard titration.....1-E193

Chlorine

- heat capacities, statistical and quantum mechanical calculations1-F012
- solubility of carbon dioxide and oxygen in.....1-K055
- solubility in titanium tetrachloride1-K055
- as inhibition of acetylene-oxygen flame3-F02

Chlorobenzene

- microwave spectrum, quadrupolar coupling constants, and dipole moment5-P24

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1

SUBJECT INDEX

Chlorobutadiene

NMR spectrum, double resonance study.....3-M05

Chromium Alloys

sigma phase, kinetics of formation.....1-D130

chromium-nickel, rate of corrosion by nitric acid.....1-L088

aging at 475°C, effect on formation of sigma phase.....1-M076

Circuits

for pulse-torquing principle in accelerometer.....3-J17

digital countdown, table of logics.....5-B05

Coatings

improving physical properties of chrome plating.....1-A080

gold plating Type 302 stainless steel.....1-B061

flame-sprayed and flame-plated ceramic, adhesive-

strength tests.....1-B147

vacuum techniques for coating solid propellant

ingredients.....1-M239

birefringent technique to determine stress about a crack..3-G03

thermal efficiency of coated fins.....3-L04

low-modulus photoelastic, formulation and casting.....4-S01

Coaxial Components

temperature distribution.....2-S27

Coding

systems; shift-register coders, principles of design.....1-G057

systems; cycles from nonlinear shift registers.....1-G058

theory and application to communication systems.....2-B06

systems; binary cyclic codes for error detection

and correction.....4-P04

systems; continuous ranging scheme using Boolean

functions.....4-T07

error-correcting codes at low signal-to-noise ratios,

properties.....5-P23

systems; correlation properties of cyclic sequences.....5-T13

continuous coded ranging scheme, analysis.....5-T14

Codexac

annotated history.....1-J085

Combustion

(see Rocket Motors)

Combustion Instability

dynamic factors affecting combustion of liquid spheres..1-A015

occurrence and mechanism of high-frequency

combustion.....1-B022

experimental investigation of solid propellants, Part I...1-B151

in solid-propellant rocket motors.....1-B157

problems in liquid-propellant rocket motors.....1-C021

an experimental investigation.....1-E019

homogeneous hydrocarbon-air mixtures in channeled

flow.....1-H002

two-stage combustion experimental study.....1-F.004

in internal-burning tubular solid-propellant rocket

motors.....1-L014

experimental investigation of solid-propellants, Part II..1-L020

in solid-propellant rocket motors.....1-L021

research at JPL.....1-O013

rocket motor as a servomechanism, general theory.....1-O016

melting and evaporation as rate processes.....1-P030

melting and evaporation as rate processes, addition.....1-P048

interpretation of photographic studies.....1-S264

ten-band spectrum analyzer for study.....1-S273

optical method of study.....1-T079

of homogeneous propane-air mixtures.....1-W035

oscillatory flow in liquid propellant systems, analysis..1-W118

of liquid propellant rockets, effect of vehicle structure..1-W119

of liquid propellant rockets, effect of vehicle structure..1-W122

temperature and flame structure analysis.....1-Z005

tubular case-bonded solid-propellant rocket motors.....3-L03

solid propellants, star grain experiments.....3-L04

low frequency, in solid rocket motors.....4-S8

low-pressure combustion limits of some solid propellants,

experimental investigation.....5-A03

Comets

as cause of tektite formation.....4-L21

Communication Satellites

feasibility of long-range communications.....2-S30

JPL role in Project Echo.....2-V03

ground equipment, system design.....3-V04

Communications

duplexing systems, bibliography.....1-AC24

cross-field magnetic demodulator.....1-B095

extraterrestrial radio tracking.....1-B137

using phase modulation and phase detection, analysis..1-C062

theory of magnetic cross values.....1-H060

JPL space science seminar, 1960.....1-J104

IGY satellite, application of microlink.....1-L100

ground antenna, for deep space.....1-L101

pseudorandom pulse, development.....1-L149

flow graph transformation.....1-L150

random sampling.....1-L151

properties of root loci.....1-L152

properties of root-locus asymptotes.....1-L153

problems in S-plane.....1-L155

stable UHF multiplier for phase coherent missile system..1-M039

for deep-space, development.....1-M174

system space development.....1-R027

1-R208

correlation properties of randomlike periodic sequences..1-T065

phase-stable oscillators, evaluation.....1-V036

precision frequency control.....1-V040

optimum filtering.....1-V042

game-theoretic model of jamming.....1-W073

supporting research and development; progress

summary.....2-AB09

2-AB12

2-AB15

supporting research and development; progress

summary.....2-AB18

digital, theory of binary sequences applied to design....2-B06

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Communications (Cont'd)

digital control of phase-locked loops	2-E07
derivation of entropy expression for continuous probability distributions	2-G06
with extraterrestrial beings	2-G08
worldwide commercial survey	2-H19
capacity of a channel	2-L05
system design for <i>Mariner I</i>	2-M05
coded phase-coherent	2-V05
supporting research and development; progress summary, 7/61-11/61	3-AB05
	3-AB06
	3-AB07
	3-AB08
	3-AB09
for <i>Ranger</i> , <i>Mariner R</i> and <i>Surveyor</i>	3-AB24
supporting research and advanced development; progress summary	3-AB28
test-bed configuration for flight testing of SNAP-8 powered electric-propulsion systems	3-B06
measurements on time-variant communication channels	3-K01
coding and security, research	3-L20
for space, application of Cassegrainian principle to ground antennas	3-P08
ruby maser performance	3-S41
960-Mc ruby maser and other components	3-S41
spectral distribution of signals	3-T03
ground support equipment	3-V04
supporting research and advanced development; progress summary, 8/62-6/63	4-AB08
	4-AB14
	4-AB20
	4-AB26
	4-AB32
	4-AB38
telecommunications design and operation for <i>Mariner Venus</i> flight	4-B34
multireceiver asymptotic performance characteristics through Rician multichannel	4-L17
application of lasers	4-P14
Earth-to-Moon and trans lunar	4-R02
for <i>Surveyor</i> ; design, development, operations; progress summary, 8/63-5/64	5-AB04
	5-AB10
	5-AB16
	5-AB22
	5-AB28
	5-AE34
for <i>Ranger</i> Block III TV subsystem; design, development, operations; progress summary, 8/63-5/64	5-AB04
	5-AB10
	5-AB16
	5-AB22
	5-AB28
	5-AB34

supporting research and advanced development; progress summary, 8/65-4/64	5-AB06
	5-AB07
	5-AB12
	5-A313
	5-AB18
	5-AB19
	5-AB24
	5-AB25
	5-AB30
	5-AB31
	5-AB36
Rician fading multichannel reception of binary and N-ary signals, error	5-L14
blackout problem for blunt Mars-entry capsule	5-S19
post-amplifier noise temperature contribution in low-noise system	5-S26
<i>Mariner B</i> , reliability study	5-T01
description for manned Mars mission	5-V03
excitation of higher order modes by step discontinuity of circular waveguide	5-Y01

Computer Programs

calculation of supersonic flow over an ogive by method of characteristics	1-B065
dynamic programming processes of high dimension; analytical and computational aspects	1-B072
digital calculation of transducer frequency response	1-B116
Monte Carlo methods applied to neutron-diffusion problem	1-L082
patched-conic to determine Earth-planet orbits	1-L111
two-dimensional analysis of interplanetary flight schedules	1-L112
<i>Sergeant Standard-8</i> trajectory program	1-S067
calculation of propulsion systems performance	1-S082
differential equations pseudocode interpreter	2-C09
powered flight trajectory	2-G03
<i>Sergeant</i> trajectories	2-S08
of stiffness matrix for structural frameworks	3-B04
studies of adaptive control system design criteria	3-B16
space trajectories, detailed analysis	3-H15
for thermal radiation configuration factors	3-P04
reduction of gas-liquid chromatography retention data	4-L10
precision lattice constants	4-L15
IBM 7090, for determination of precision lattice constants	4-L15
segmented rational minmax approximation	5-L04
magnetic tape ephemerides of Moon, application	5-P02
JPL χ^2 -determination program	5-W01

Computers

(see also Differential Analyzers)	
JPL facilities	1-B164
evaluating components, integral-error-squared method	1-B166
feedback, analog and digital components	1-B167
transistor analog, future	1-B168
for rocket motor test computations	1-B171
JPL facilities	1-C025

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 SUBJECT INDEX

Computers (Cont'd)

- simulation of missile flights 1-C026
- approximation of noise filter weighing functions 1-C102
- for linear control systems 1-C103
- for propellant performance calculations 1-D069
- applications 1-G054
- feedback system, dual-Nyquist stability analysis 1-H036
- digital encoder 1-H107
- evolution and performance at JPL 1-H116
- Naval Air Missile Test Center facility 1-P097
- distributed parameter vibration with structural damping
and noise excitation 1-P131
- assembly of logic packages utilizing circuitry
of TRADIC 1-S042
- preparation unit for punched paper tape 1-S109
- word-at-a-time printer system, development 1-S110
- digital recording, for static-test data 1-S268
- JPL facilities 1-W025
- digitization of transducers using programmed
attenuator 1-Z020
- simulation of intelligence 2-AC27
2-AC31
- supporting research and advanced development;
progress summary, 6/62-6/63 3-AB28
4-AB08
4-AB14
4-AB20
4-AB26
4-AB32
4-AB38
- digital, elastomeric pneumatic logic elements 4-B12
- design of diagnosable arithmetic unit 5-A09
- supporting research and advanced development;
progress summary, 8/63-5/64 5-AB07
5-AB13
5-AB19
5-AB25
5-AB31
- analog, diode function generator 5-B161
- IBM 7094, double-precision arithmetic operations,
accuracy study 5-L05

Conferences

- on boiling heat transfer and bubble dynamics 1-B019
- on transient heating 1-B174
- by Department of Defense 1-C124
- on guided missiles and upper atmosphere 1-J021
- by Department of Defense 1-J040
- Space Science Seminar, PART I 1-J060
- PART II 1-J062
- on research and development; JPL 1-J092
- on *Loki*; JPL 1-J102
- on radio science 1-J109
- propulsion seminar, JPL contributions 1-R092
- ARPA seminar on propulsion, JPL contributions 1-S159
- high energy liquid propellants 1-S210
- 1962 National Telemetry Conference, JPL contributions 3-S35

- on mechanical design of spacecraft 4-AC16
- on utilization of extraterrestrial resources 4-AC17
- on utilization of lunar resources 4-AC18
- Venus 1962 conjunction, radar and radiometric
observations 5-J11

Control Systems

(see Guidance and Control)

Converters

- power generation by electric wind 1-G074
- analog to digital; with improved linear sweep generator 1-S142
- free-gyro coordinated 1-S235
- nuclear; bibliography 2-AC28
- solar; bibliography 2-AC28
- thermionic; bibliography 2-AC28
- thermoelectric; bibliography 2-AC28
- two-fluid MHD, advantages 2-E06
- thermoelectric; SNAP 3, evaluation for spacecraft
secondary power 2-M23
- plasma generator, spectroscopic temperature measure-
ments to define flame 2-N01
- nuclear; transient times in fission-electric power elements 3-K02
- thermionic; 500-w solar energy system for spacecraft 3-S23
- thermionic; nuclear-electric spacecraft for unmanned
planetary missions 3-S35
- static; characteristics and problems 4-K06
- analog to digital converters and sync generators
for TV systems 5-A01
- thermionic; metallurgical examination 5-B08

Copper

- densification of pre-reduced power compacts in vacuum 1-J143

Corporal

- surface temperature, in high-speed flight 1-C034
- ORDCIT, estimated performance 1-C046
- trajectories of XF30L20,000 1-C046
- doppler system 1-C134
- preliminary investigation 1-C136
- type II propulsion system, low-temperature environment
tests 1-D046
- environments in XSSM-A-17 1-G010
- instrumentation to support integrated weapon-
system development 1-J013
- results of radar command system in Round 5 1-J015
- surface-to-surface missile XSSM-G-17 1-J076
- description 1-J083
- development 1-J094
- applicability as anti-aircraft missile 1-J100
- ruggedization of electronic components and tubes 1-J101
- propulsion system 1-J110
- arming philosophy 1-K015
- stability with time-lag in control system 1-L099
- telemetry equipment 1-N011
- aerodynamic guidance and control-stability equations 1-P011
- azimuth guidance system 1-P013
- guidance and control 1-P106
- required accuracy of fire 1-S083

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Corporal (Cont'd)

- boresight errors of the radar 1-S153
- static and dynamic stability estimates 1-S225
- Mark II* autopilot amplifier 1-S243
- range correction system, theory and analysis 1-S243
- evaluation of Type IIA guidance components 1-S292
- tactical phases of operation 1-W102

Corporal E

- trajectories, differential corrections 1-B068
- estimated values of aerodynamic coefficients 1-C058
- flight-load analysis 1-C074
- telemetry results of Round 3 1-C129
- telemetry antenna pattern based on model tests 1-C133
- design and development 1-D033
- axial-cooled rocket motors, fabrication 1-D035
- axial-cooled rocket motor, design 1-D036
- development status 1-D085
- resume of program 1-D086
- autopilot, summary report 1-G019
- control system 1-H026
- instructions for handling and servicing 1-H106
- model tests of launching characteristics 1-K027
- telemetry results of Round 1 1-L069
- modifications of telemetry system 1-L071
- subsonic flutter calculations for tail surfaces 1-L115
- trajectories 1-M213
- lift, pitching and pitching hinge moment 1-M214
- trajectories, with 40-sec propellant supply 1-M215
- control performance of Rounds 1 and 3 1-P008
- control and telemetry 1-P092
- telemetry ground equipment 1-S134
- first three firing tests, aerodynamic data analysis 1-T008

Cosmic Rays

- bibliography 1-AC28
- experiment for *Jupiter-C*, modification proposal 1-V029
- effects on meteorite age and composition 3-M09
- neutrons in 1- to 14-Mev range, depth variation
 - measurements 5-H20
- neutrons in 1- to 14-Mev range, time variation
 - measurements 5-H21
- correlation with solar-wind velocity 5-S15

Coaxial Components

- temperature distribution 2-S27

Cryogenics

- bibliography 1-AC23
- flux conservations using a removable ferromagnetic core 4-H17

Data Processing

- transformation of Earth-referenced data to inertial
 - coordinate systems 1-A016
- graphical plotter 1-B003
- precision digital to analog converter methods for
 - graphical plotters 1-B006
- on-line reduction-system for wind tunnel tests 1-B009
- data-relay problem, theoretical investigation 1-B084
- JPL digital-computer facility 1-C025

- Pioneers 3* and 5 firings, tracking and data handling 1-E013
- encoder and transcriber, description 1-F077
- transcriber, data handling system for instrumentation 1-F079
- semiautomatic plotter 1-G002
- on-site, for world tracking network 1-G008
- reduction of photographic position data, method 1-H048
- data reduction equipment, amplitude distribution
 - analyzer 1-H078
- accumulator for supersonic wind tunnels 1-H110
- central recording system 1-H119
- central data recording system at JPL 1-H120
- procedure for semiautomatic reduction 1-J018
- acquisition and reduction of minimum power,
 - lunar probes 1-M085
- reduction, external instrumentation for NAMIC 1-P097
- real-time presentation of reduced data 1-S083
- preparation unit for punched paper tape 1-S109
- filters for restoration of sampled data 1-S239
- digital recording, for static-test data 1-S268
- central recording system 1-S270
- central recording system: status, advantages and
 - disadvantages 1-S271
- mobile recording system for tests 1-S291
- systems for supersonic wind tunnels 1-W028
- automatic data-accumulation system for wind tunnels 1-W030
- paper-tape storage media for wind-tunnel data
 - reduction 1-W031
- playback servo 1-Y010
- encoder for data reduction 1-Z019
- encoder, data handling system for instrumentation 1-Z022
- spectrum analyzer for data reduction of signals 2-H17
- Mariner* Mars vehicle, storage 4-G01
- for *Surveyor*; design, development, operations; progress
 - summary, 8/63-5/64 5-AB04
 - 5-AB10
 - 5-AB13
 - 5-AB22
 - 5-AB28
 - 5-AB34
- compression, use of systematic statistics 5-E03
- FORTTRAN source program for retention of
 - measurements 5-L06
- data translator, operation and maintenance manual 5-M19
- high-speed low-cost printer system, design and operation 5-N09

Devil Project

- notes 1-H054

Deep Space Instrumentation Facility

- description, as of 1959 1-H007
- proposed operational and facility requirements
 - at Woomera 1-J063
- system capabilities and development schedule 2-H01
- specification of tracking and communications capability 2-J05
- tracking techniques and performance 2-R02
- participation in *Ranger* Project 3-AB17
- 3-AB18

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Deep Space Instrumentation Facility (Cont'd)

- Ranger 3, equipment and facilities* 3-AB23
- 3-AB24
- supporting research and advanced development;
 progress summary 5/62-6/62 3-AB27
- 3-AB30
- participation in *Ranger Project* 3-J06
- instrumentation and capabilities 3-J15
- telemetry support equipment for *Rangers 1 and 2* 3-M30
- large ground antennas; systems, parameters, design 3-R01
- participation in *Ranger Project* 3-R03
- noise temperature determination in large antennas 3-S11
- Goldstone Polar mount antenna data errors, evaluation 3-U01
- supporting research and advanced development;
 progress summary, 7/62-6/63 4-AB07
- 4-AB10
- 4-AB13
- 4-AB16
- 4-AB19
- 4-AB22
- 4-AB25
- 4-AB28
- 4-AB31
- 4-AB34
- 4-AB37
- 4-AB40
- antennas, gear equipment 4-R07
- 85-ft antenna; structural deflections caused by
 deadload and thermal inputs 4-S30
- operational status as of July 1, 1962 4-T02
- supporting research and advanced development;
 progress summary, 7/63-5/64 5-AB06
- 5-AB09
- 5-AB12
- 5-AB15
- 5-AB18
- 5-AB21
- 5-AB24
- 5-AB27
- 5-AB30
- 5-AB33
- 5-AB36
- 5-AB38
- system capabilities and development schedule,
 1964-1968 5-J12
- Madrid station site selection 5-T02

Delta Wings

(see *Aerodynamics*)

Differential Analyzers

- electronic, for simulation of missile flights 1-C131
- 1-G003
- circuits 1-G003
- automatic operation by time-sequence controller 1-H018
- 1-H020
- simulation by interpretative digital-computer routine 1-L081

- methods of simulation 1-L084
- automatic operation by time-sequence controller 1-P154
- JPL 1-W025
- comparison of digital analog and digital computers 2-C09

Diffusers

- exhaust, experimental investigation 1-M138
- inlet, design parameters and effects of other variables 1-P024
- exhaust, supersonic, experimental investigation 3-R11
- exhaust, for testing rocket engines 4-M13

Diodes

(see *Electronic Components*)

Dipropylene Glycol

- analyses for chain and stereo isomers, by gas-liquid
 partition chromatography 5-H19

Doppler Effect

- feasibility of measurement using satellite 1-W078
- equations for accelerating transmitter, reflector,
 and receiver 2-L07

Doppler Systems

- for *Corporal XSSM-G-17* 1-C134
- XMI, development status 1-G053
- theoretical development and some experimental results 1-L148
- anticountermeasures, characteristics 1-M139
- several coordinated receiving stations 1-M147
- experiments for amateurs 2-L18
- navigation, fundamental limitations to optical
 measurements 2-N05

Earth

- dispersion of long-period Love waves 4-K11
- toroidal ring current, theory and experiments 4-S15
- mass of planets, method of determination 5-M06
- measurements of electric currents originating in core 5-R26

Echo Project

- development 2-AB19
- 2-AB20
- analysis of tracking data 2-AB21
- I*, observed solar-pressure perturbations 2-M27
- Goldstone station communications and tracking system 2-S30
- preparatory-, system-test-, and operational phases;
 experimental results 2-V03
- orbic determination utilizing large antennas 4-M27

Ecological Systems

- performance analysis of biological gas exchangers 1-H073

Elastomers

- polyurethane, in rubber-to-glass transition zone 1-L011
- filled, viscoelastic properties 1-L013
- creep and other time-dependent mechanical properties 1-S156
- binders, properties and selection requirements for
 solid propellants 1-S163
- polyurethane; composition, mechanical and swelling
 properties 1-S166

Elastomers (Cont'd)

- glassbead-polyvinyl chloride elastomeric composites, volume changes and dewetting1-S168
- polyurethane, composition and mechanical properties . . .1-S173
- diisocyanate-linked, with substituted urea groups3-H05
- effects of space environment3-J03
- measurement of change in width, device3-L15
- elastomeric pneumatic logic elements for computers4-B12
- diisocyanate-linked; homogeneity, preparation, and properties4-H11
- effect of statistical variability and cross link density on rupture behavior5-L01

Electrets

- bibliography2-AC29

Electrical Propulsion Systems

- thrust-unit requirements for interplanetary spacecraft . . .2-E05
- for planetary and interplanetary missions2-J01
- for final phases of propulsion2-K06
- feasibility2-S10
- payload capabilities2-S17
- applications for planetary missions2-S20
- for spacecraft, bibliography3-AC29
- test-bed configuration3-B06
- control and guidance3-H12
- nuclear-electric spacecraft for unmanned planetary missions3-S35
- general survey, evaluation for interplanetary uses3-S38
- for high-energy missions4-B14
- 10-Mw reactor concept with nonsolid fuel element4-D01
- bibliography5-AC04
- investigations of nuclear reactor concept5-G11
- requirements for planetary and interplanetary vehicles . .5-S25

Electromagnetic Waves

- effects of jet flame on propagation1-S199
- spin and exchange corrections to plasma dispersion relations3-B17
- excitation of higher order modes by step discontinuity in circular waveguide5-Y01

Electron Paramagnetic Resonance

- atom concentration measurements1-H067
-2-H14
- effect on velocity of sound in metals5-V05

Electronic Components

- models of failures1-B079
- useful properties of junction transistor tetrodes1-B094
- sensors in temperature compensating networks1-B125
- economics and logistics of throwaway modules1-C095
- environmental design1-C097
- packaging parts for high-intensity vibration environments1-C099
- utilization of vibration testing1-C100
- behavior in high-intensity environments1-G012
- effects of nonperiodic vibration1-G013
- in orbiting missile, temperature control1-H050
- for *Pioneers 3 and 4* radiation instruments1-J147

- temperature coefficients of 1% resistors1-P025
- commercial, ruggedized, and premium tubes1-P026
- design considerations for enclosures1-S056
- diodes; quality assurance, evaluation3-C16

Electrons

- atom concentration measurements using electron paramagnetic resonance2-H14
- distribution function and mean energy in slightly ionized gas2-W21

Encoders

- digital, for analog-computer voltages1-H109
- magnetic tape transcriber1-L039
- for data reduction systems1-Z019

Environment

(see also **Magnetic Fields, Meteorites, Radiation, Simulation**)

- conditions; behavior of components in high-intensity . . .1-G012
 - conditions; satellite, via 1-mw oscillators1-R062
 - space, radiation particles2-N02
 - space, behavior of materials3-J01
 - space, evaporation effects on materials3-I02
 - space, bibliography3-N03
 - detection of plasma component of MHD waves3-N04
 - Ranger* TV subsystem testing4-AB05
 -4-AB17
 -4-AB23
 - planetary; *Mariner R* test program4-AB06
 - test program; *Mariners B and R*4-AB12
 - requirements; *Mariner R*4-AB12
 - magnetic field; spacecraft study, acoustic testing facility .4-AB14
 - nuclear radiation; effects on component part4-AB32
 - spaceflight; erectable, rigid microwave reflectors4-AB32
 - charged particles and cosmic dust flux; *Mariner R* experiments4-W15
 - Ranger* Block III TV subsystem; design, development, operations; progress summary, 8/63-5/645-AB04
 -5-AB10
 -5-AB16
 -5-AB22
 -5-AB28
 -5-AB34
- Environmental Simulators**
- solar, design and development; progress summary3-AB21
 -3-AB22
 - carbon-arc lamps as solar simulation for environmental testing3-M03
 - solar, JPL, performance of advanced design4-B03
 - solar, JPL, performance compared to flight date4-H20
 - design and development; progress summary, 8/63-5/64 . .5-AB09
 -5-AB15
 -5-AB21
 -5-AB27
 -5-AB33
 -5-AB38
 - JPL 25-ft, development and performance of glass-metal mirrors5-R12

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Ephemerides

- constants used in trajectory calculations.....3-C10
- lunar, Earth rad/km conversion factor.....5-C09
- planetary-velocity, obtained by special perturbations.....5-P01
- magnetic tape, lunar.....5-P02
- JPL tapes E9510, E9511, and E9512;
planets and the Moon.....5-P03

Ethylene Oxide

- rate of addition of nitrate ion.....1-P081
- humidity determination when used in decontamination...3-V01

Exhaust Diffusers

(see Diffusers)

Explosive Wires

- theory and experiments.....4-P019

Explorer Project

- temperature measurements.....1-B200
- 1 and 3, engineering and scientific measurements.....1-B201
- temperature control in *Explorer* and *Pioneer*.....1-B202
- 3, calibration records for reducing and interpreting data...1-C061
- 4, fourth-stage motor.....1-D073
- 1 and 3, trajectories used in launching.....1-F097
- contributions to technology and scientific
measurements data.....1-F102
- contributions to space techniques.....1-F103
- scientific results.....1-H055
1-H057
- 1, description.....1-J111
- 1, technical aspects.....1-K043
- 1, calibration records for reducing data.....1-R001
- 1, electronic systems.....1-R053
- instrumentation and operation.....1-R054
- rocket system.....1-R091
- booster research program.....1-R093
- radiative properties of surface materials considered
for use.....1-S123
- rocket system.....1-S211
- 1, *Jupiter C* configuration; cosmic-ray experiment,
proposal for modification.....1-V029
- electronics.....1-V034
- description.....1-V037
- statistical analysis of recorded impacts of
micrometeorites.....2-H10

Fission Particles

- energy spectrum of particles leaving a fuel sheet.....2-K02

Flame

- conductivity of acid-aniline jet flame, measurement.....1-A011
- conductivity of jet flame, measurement.....1-A012
- photographic technique for combustion study.....1-A014
- dynamic factors affecting combustion of liquid spheres...1-A015
- chemical processes of achieving high temperatures.....1-A034
- hydrogen-fluorine flame temperatures.....1-A070
- material transfer in turbulent flame.....1-E087

- stabilization in deflected jet.....1-B138
- effect of turbulence on flame propagation.....1-C033
- turbulent intensity and pressure drop across
flame holder.....1-D022
- NH₂-HNO₂ and NH₂-NO₂ diffusion flames.....1-F029
- equipment, facilities and techniques used in research...1-G025
- low pressure flame, resistance-thermometer
measurements.....1-G026
- chemical steady state of HBr flames.....1-G028
1-G029
- mechanism and flame speed for hydrazine
decomposition.....1-G030
- influence of pressure on flame speed.....1-G031
- hydrazine flame speed, pressure effects.....1-G032
- chemical steady-state in HBr flames.....1-G036
- effect of isotopic substitution in hydrogen
bromine flames.....1-G037
- hydrazine flame.....1-G038
- flame-blowoff studies of cylindrical flame holders
in channeled flow.....1-H003
- sampling of gases in flame.....1-H102
- diffusion, in turbulent flow.....1-H103
- contribution to theory of laminar flames with
radial symmetry.....1-M165
- propagation of cylindrical flames, thermal theory.....1-M167
- flame with cylindrical symmetry, analytical solution...1-M172
- spectroscopic studies of low-pressure combustion flame...1-P043
- flame temperatures, optical methods for determination...1-P061
1-P062
- low-pressure combustion flames, spectroscopic studies...1-P064
- temperature and concentrations in low-pressure
combustion chambers.....1-P071
- low-pressure combustion, spectroscopic studies.....1-P073
- apparatus for study of turbulent diffusion flames.....1-S017
- studies of flame-front oscillations.....1-S128
- stabilization in heated turbulent boundary layer.....1-T073
- measurements of speed and turbulence in small burner...1-W189
- composition distribution, flame holding mechanism.....1-W192
- influence of blockage on stabilization.....1-W193
- flame spreading from bluff-body holders.....1-W194
- flame stabilization on bluff bodies.....1-Z015
1-Z016
- low-pressure flame, inhibition by halogen atoms.....3-F02

Flowmeters

- metering of LOX.....1-F039
- for testing liquid propellant motors.....1-L038
- rolling-ball, recording equipment.....1-W023
- rolling-ball, for hazardous liquids.....1-W029
- rolling-ball, for hazardous and corrosive liquids.....1-W185
- electromagnetic, for low-conductivity fluids.....4 B01

Fluid Flow

(see also **Magneto-hydrodynamics**)

- supersonic-flow experiments using spheres, disks,
and blunt bodies.....1-K019
- adiabatic flow process, analysis.....1-P038
- problems of, in ramjet design.....1-T067

Fluid Flow (Cont'd)

- supporting research and development;
 - progress summary2-AB16
 -2-AB18
- sphere-drag measurements2-W02
- drag and wake measurements in magneto-dynamic
 - flow about a sphere3-M19
- ignition and combustion in laminar mixing zone1-A001
- detached shock waves, study1-A024
- chemical reaction during adiabatic flow through nozzle1-A063
- bibliography1-AC33
- transonic and hypersonic, mach number range of
 - applicability of similarity laws1-B064
- calculation of supersonic flow over an ogive by
 - method of characteristics1-B065
- base pressure at supersonic velocity1-C040
- boundary layer measurements on smooth flatplate
 - in supersonic flow1-C091
 -1-C092
 -1-C093
- round jet in moving air stream, investigation1-D041
- combustion in laminar mixing regions and
 - boundary layers1-D070
- quasilinear differential equations, methods of
 - characteristics for integration1-F046
- axially symmetric body with slight yaw, method of
 - characteristics1-F049
- velocity lag of particles in linearly accelerated
 - combustion gases1-G027
- power addition and extraction, feasibility study1-G075
- resistance of porous stainless steel1-G094
- permeability of porous copper specimens1-G095
- through porous metals1-G096
- nonsteady gas flow through porous wall1-G097
- transfer of mass in turbulent stream at high
 - temperatures1-H103
- supersonic-flow experiments using spheres, disks,
 - and blunt-bodies1-K019
- transition-Reynolds-number measurement on insulated
 - cones and flat plates1-L045
- equilibrium temperature and heat-transfer
 - characteristics of hot wires1-L051
- plane, laminar, vortex flow of viscous heat-conducting
 - gas1-M006
- laminar mixing process of two combustible streams1-M042
- flow separation in two-dimensional transparent nozzle1-M149
- stability of a shear layer1-M166
- stability of heterogeneous shear layer subject to
 - a body force1-M168
- stability of one-dimensional flow of real gas1-M169
- stability of constant-pressure deflagration wave1-M170
- stability of free-shear layer subject to body force1-M171
- linearized, winged-body problem1-M207
- notes on plasma physics1-O025
- fully developed turbulence1-P151
- stability of pipe flow, experimental study1-R044
- compressible flow tables for air in increments
 - of 0.001 M1-R064
- dynamic-head probe for evaluating properties of
 - free liquid jets1-R128
- turbulent, macroscopic diffusion of gas1-S058
- behavior of liquid streams injected into low-pressure
 - chamber1-S062
- lift and drag of cones at supersonic speeds, theoretical
 - calculations1-S217
 - supersonic, linearized theory1-S220
 - supersonic, body-wing interference1-S232
 - effects of compressibility in two-phase flow1-T009
 - Liouville's equation for weakly interacting gas1-V067
 - dc and ac glow anemometer for turbulence study1-V068
- propagation of weak disturbances in stationary
 - flow of gas mixtures1-W038
- supersonic flows with chemical reactions,
 - Study I1-W039
 - Study II1-W040
 - Study III1-W041
- departure from chemical equilibrium in supersonic
 - flow1-W041
 - nozzle flow for study of dissociation effects1-W043
 - rate constants of fast reactions in nozzle, measurement1-W045
 - supersonic nozzle flow with reacting gas mixture1-W046
 - stationary supersonic nozzle flow of reacting gas
 - mixture1-W048
 - pattern of gas flow leaving porous metal surfaces1-W092
 - gases through sweat-cooled tubes1-W093
 - temperature profiles in sweat-cooled tubes1-W096
 - oscillation, nonlinear aspects of measurement1-W116
 - oscillatory hydraulic flow including nonlinear effects1-W125
 - hypersonic conical flow1-W133
 - heated hypersonic stagnation-temperature probe1-W186
 - particle-tracking method of tracing fluid streamlines1-W190
 - combustion in mixing zone between two parallel
 - streams1-W191
 - MHD flow over a disk2-G10
 -2-H12
 - MHD flow past a current-carrying flatplate2-M01
 - stability of a heterogeneous shear layer subject
 - to body force2-M21
 - mathematical analysis3-C05
 - laminar, diffusion in liquids with variable diffusivity3-H02
 - stability of pipe flow with respect to disturbances3-K03
 - compressible viscous vortex, experimental study3-K05
 - hot-wire voltage fluctuations in unsteady compressible
 - field3-V10
 - free-surface boundary conditions with surface tension3-W13
 - conducting, magnetic field effect on two-dimensional
 - flows4-C12
 - conducting, two-dimensional and axially symmetric
 - flows in the inviscid limit4-C13
 - bluff body flame stabilization at low velocities4-M15

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 SUBJECT INDEX

Guidance and Control

(see also Attitude Control)

asymptotic behavior1-A013

transformation of Earth-referenced data to inertial
 coordinate systems1-A016

feedback, analog and digital components.....1-B167

linear, digital computers.....1-C103

radio-inertial, for *Jupiter*1-G005

radio elements and applications.....1-G015

terminal, of lunar probe1-G017

for *Corporal E.*1-H026

proposed radio-inertial, for ballistic missile.....1-J034

radio-inertial, for *Jupiter*1-J041

a study of requirements.....1-J057

radio-inertial, for *Jupiter*1-J084

feedback, stability using dual-Nyquist diagram.....1-J137

test station for *Sergeant*1-K038

of extraterrestrial vehicles, monopropellant-hydrazine
 unit1-L058

properties of root-locus asymptotes.....1-L153

statistical analysis1-N049

interplanetary post-injection1-N051

Corporal azimuth, philosophy1-P013

for guided missiles, analysis.....1-P014

application of noise and filter theories to problems....1-P017

rudimentary launch guidance methods.....1-P082

for space missions.....1-P083

jet control vanes, experimental investigations.....1-P143

design of optimum linear systems.....1-R029

bridged- and parallel-tie notch networks, method for
 rapid design1-S051

multiple-input filtering, solutions.....1-S238

Corporal range correction system, theory and analysis...1-S243

families of Nyquist diagrams, method for constructing...1-S246

multiple input linear filtering problem, degenerate
 solutions1-S247

multi-instrumented, design and analysis.....1-S249

evaluation of Type II-A *Corporal* components1-S292

linear servo theory applied to design of AGC loops....1-V039

linear, asymptotic theory.....2-A01

2-A02

supporting research and development; progress
 summary, 8/60-12/602-AB06

2-AB09

2-AB12

bibliography2-AC25

inertial, accuracy as applied to future lunar and
 interplanetary missions2-G09

inertial, rotor force and torque of a cryogenic gyro in
 magnetic field2-H05

supporting research and development; progress
 summary, 7/61-11/613-AB05

3-AB06

3-AB07

3-AB08

2-AB09

supporting research and advanced development;
 progress summary3-AB28

adaptive, integral squared and absolute error design
 criteria3-B16

adaptive, computer studies of design criteria.....3-B16

survey and discussion.....3-G02

inertial, acceleration measurement by pulse-torqued
 system3-J17

post-injection, requirements for lunar vehicles.....3-L09

injection, with post-injection midcourse correction
 for booster3-P01

supporting research and advanced development;
 progress summary, 8/62-6/63.....4-AB08

4-AB14

4-AB20

4-AB26

4-AB32

4-AB38

adaptive and remote, for lunar and planetary testing,
 bibliography4-AC15

injection and midcourse, for *Mariner 2* Venus flight....4-B02

digital control of second-order AFC system with large
 time delay; construction and nonlinear aspects.....4-B28

remote, command systems for interplanetary vehicles...4-S25

phase-locked loop dynamics in the presence of noise...4-V04

look-angle problem design solution.....4-W09

for *Ranger* and *Surveyor*; design, development,
 operations; progress summary, 8/63-5/645-AB04

5-AB10

5-AB16

5-AB22

5-AB28

5-AB34

supporting research and advanced development;
 progress summary, 8/63-4/64.....5-AB07

5-AB13

5-AB19

5-AB25

5-AB31

simplified model of midcourse maneuver execution
 errors5-G02

multiple guidance corrections of trajectory, dynamic
 programming analysis5-P06

Guns

thermodynamic hypervelocity, application to hydrazine-
 hydrogen peroxide system.....1-F018

liquid-propellant, thermodynamic properties.....1-F020

liquid-propellant, experimental firings.....1-F053

regeneratively pumped liquid-monopropellant,
 experimental firings1-F057

high-velocity firings with liquid propellant.....1-F070

liquid-monopropellant, spontaneous liquid ignition....1-F072

liquid-monopropellant, cylindrical and spherical
 combustion chambers1-F073

liquid-monopropellant, experimental firings.....1-G069

hydrazine monopropellant, test firing.....1-G100

Guns (Cont'd)

hypervelocity, application of hydrazine monopropellant...1-G195
high-velocity, liquid propellants...1-L104
liquid-propellant, application of Kent's solution...1-L125
limits of performance...1-L126
liquid-propellant, interior-ballistic system...1-L128
hydrazine, interior ballistics...1-L132
liquid-monopropellant, ballistic design process...1-L135
hydrazine, interior ballistics...1-L141
performance limits...1-V005

Gyroscopes

analysis of cross-coupling effects of gimbals...1-G108
free-gyro coordinated converters...1-S235
effects of vibration and rotation on drift...1-S250
cryogenic, development...2-AB18
cryogenic, theoretical and experimental studies...2-H04
cryogenic, rotor force and torque in magnetic field...2-H05
cryogenic, eddy-current damping of superconductive sphere by resistive shield...2-H06
gas-floated spinning spheres as stable references...2-L12

Heat Transfer

effects of chemical reactions in boundary layer...1-A033
measurement of thermal diffusivities in cylinder...1-A071
bibliography...1-AC19
and bubble dynamics, conference...1-B019
mechanism in forced-convection subcooled-nucleate boiling...1-B020
and cooling of motors using storable and liquid propellants...1-B046
in convergent-divergent nozzles...1-B053
red fuming nitric acid-ammonia propellant system...1-B054
convective coefficients in rocket nozzles, equation for estimation...1-B057
studies relating to power-plant development...1-D087
measurements in nitrogen sweat-cooled porous tube...1-D103
boiling, study of mechanism...1-E016
surface-boiling, to water with forced convection, photographic studies...1-G111
1-G114
in a tube, effects of oscillating flow...1-H028
and coke deposition of JP-3 fuel mixture...1-H029
at high heat densities, bibliography...1-K046
at high heat-flux densities...1-K047
at high heat-flux, characteristics of n-butyl alcohol...1-K049
coefficient, influence of heating surface curvature...1-K050
N₂O, gas under turbulent pipe-flow conditions...1-K054
from fine wires in supersonic flows, measurements...1-L046
characteristics and equilibrium temperature of hot wires...1-L051
coefficients, apparatus for measurement of transpiration effects...1-L078
boundary layer, methods of calculation...1-M001
exposure of nitrogen sweat-cooled cylinder to radiation...1-M248
calculations related to solid-propellant curing...1-N030

infinite cylindrical medium, heat generated by chemical reaction...1-N040
accommodation coefficients of gases, experimental values...1-O020
to receivers moving along axis of cylindrical chamber...1-P052
to hydrogen flowing through tubes with constant wall temperature...1-P144
to fluids in region of critical temperature...1-P147
problems, computational methods of solution...1-P154
problem solution, with electronic differential analyzer...1-P157
in rocket motors, effect of labile chemical intermediates...1-P159
theory of porous wall cooling...1-R005
in solid medium heated by chemical reaction...1-S055
to an incompressible turbulent boundary layer...1-S130
reduction to motors by wall-coating techniques...1-T057
in laminar boundary layers, method of calculation...1-V059
in solids, random-walk process...1-W051
problems, application of random-walk process...1-W052
in sweat-cooled metals...1-W053
1-W055
diffusion in solids as random-walk process...1-W057
in sweat-cooled porous metals...1-W058
in tube sweat-cooled, empirical equation...1-W089
sweat-cooled airfoil in high-temperature gas stream...1-W090
temperature drop across sweat-cooled wall...1-W091
influence of wall material on sweat-cooling process...1-W095
temperature profiles in sweat-cooled tubes...1-W096
in nitrogen and hydrogen sweat-cooled tubes...1-W097
and unsteady boundary layer, bibliography...1-W123
between gas and solid, sorption process...1-W145
characteristics of liquid nitrogen tetroxide...2-B11
test apparatus for liquid propellant engines...2-M07
and friction in smooth and rough tubes...3-D04
transient response and temperature distribution in plates...3-H09
thermal efficiency of coated fins...3-L04
calculation in axisymmetric nozzles...4-E07
steady-state heat meter for determining transfer rate to a cooled surface...4-L08
determination by calorimetric models...4-L09
local transient heat flux in uncooled rocket, method for determination...4-P15
local rates in thrust chambers incorporating convergent-divergent nozzles...4-W10
convective, in a convergent-divergent nozzle...5-B02

Helium

destruction of metastable atoms in binary collisions...1-V065

Hydrazine

evaluation as monopropellant and gas generant...1-A050
and water in vapor phase, equilibrium measurements...1-A054
as regenerative coolant, evaluation...1-B045
as regenerative coolant for rocket motors...1-B133
and fluorine system, performance characteristics...1-D061
as fuel for storable propellants...1-E020
physical-chemical studies of system hydrazine-hydrazine nitrate water...1-E021

Hydrazine (Cont'd)

- as rocket-motor coolant.....1-F064
- mechanism and flame speed for decomposition.....1-G030
- hydrazine flame speed, pressure effects.....1-G032
- decomposition in laminar nonisothermal flow.....1-C033
- flame studies.....1-G038
- decomposition in laminar nonisothermal flow.....1-G039
- as propellant or gas generant, catalysts for thermal decomposition.....1-C076
- as monopropellant and gas generant.....1-C080
- catalytic monohydrazine reaction chamber, design and operation.....1-G081
- as monopropellant for 40-mm gun.....1-G100
- as propellant for both .60-caliber and 20-mm machine guns.....1-G101
- application to hypervelocity guns.....1-G105
- and water mixtures, specific heats.....1-H100
- for turboalternator auxiliary power unit.....1-L055
- compatibility of various materials with, survey.....1-L057
- thrust unit, for velocity control of extraterrestrial vehicles.....1-L058
- monopropellant gun, interior ballistics.....1-L132
1-L141
- as regenerative coolant, practical aspects of thermal decomposition.....1-M097
- method for determining amount in liquid propellant.....1-M119
- and water in furfuryl alcohol-aniline mixtures, methods of determination.....1-M223
- freezing-point depressants.....1-P078
- decomposition burning of monopropellant drops.....1-R120
- and ammonia mixtures as propellant, investigation.....1-T041
- application.....1-T052
- thermal decomposition.....1-T054
- heat-transfer characteristics, experiments.....2-N03
- mixture with unsymmetrical dimethylhydrazine, heat-flux determination.....2-W18
- nitrogen-tetroxide system performance.....3-C06
- hypergolic ignition experiments.....3-E11
- pentaborane hydrazine performance testing.....3-N02
- in *Mariner* approach-correction propulsion system.....3-S25
- water content, determination by gas chromatography.....4-K15
- and hydrazine-hydrazine nitrate mixtures, performance calculations.....4-L12
- chlorine trifluoride-hydrazine, evaluation.....4-P16
- mononitrate density, vapor pressure, and viscosity of solutions in.....4-V01
- mononitrate density, vapor pressure, viscosity and freezing point in.....4-V03
- reaction chamber, effects of fuel inlet temperature on performance.....5-W09

Hydrides

- lithium; lowest-lying triplet-sigma state, potential energy curve.....5-T03

Hydrobombs

- preliminary theoretical calculation of propulsion system.....1-C043
- solid-propellant motor, development.....1-C045

- design of towing carriage for towing channel.....1-D029
- towing-channel tests and static tests of hydroduct.....1-D052
- towing-channel tests.....1-D053
- nozzles, design and testing.....1-E004
- propulsive unit for towing carriage of hydrodynamic tank.....1-P139
- modification of design.....1-V049

Hydrogen

- algebraic solution for species present in system containing.....1-A030
- thermodynamic properties and calculated rocket performance.....1-A040
- coolant for LOX propulsion systems, advantages.....1-A046
- as working fluid.....1-A052
- and fluorine flame temperatures.....1-A070
- and oxygen system, Mollier diagrams.....1-B014
- as coolant.....1-D102
- heat capacities, statistical and quantum mechanical calculations.....1-F012
- addition to fluorine-hydrazine system, performance increase.....1-F014
- tungsten filaments, dissociation of H₂ and N₂.....1-F027
- effect of isotopic substitution in hydrogen bromine flames.....1-G037
- gaseous atomic, paramagnetic line widths.....1-H070
- liquid propellants containing, performance calculations.....1-M090
- adiabatic flow of gas through nozzles, analysis.....1-P038
- flow with and without vibrational equilibrium.....1-P039
- halides, emissivities as function of temperature.....1-P042
- chloride and bromide, IR intensity measurements.....1-P044
- adiabatic flow through nozzle with and without composition change.....1-P046
- and ammonia, phase behavior.....1-R013
- NO₂ sensitization of H₂-O₂ mixtures, thermal reactions.....1-R116
- and nitrogen dioxide, kinetics of reaction between.....1-R118
- atoms, collision-induced spin-flip.....1-V066
- as sweat coolant in 50-lb thrust motor.....1-Z006
- molecular orbital study of 3 Σ_u^- and $3\Sigma_g^-$ states.....5-T04

Hypersonic Wind Tunnels

- 21-in., tests.....2-AB14
- development tests.....2-AB17
- 20- and 21-in., development.....3-AB07
3-AB08
- continuous-flow multigas facilities with CO₂ as contaminant.....4-K07

Igniters

- glassless, characteristics.....1-A029
1-A061
- for underwater rocket application.....1-J119
- for ammonium-nitrate propellants, investigation.....1-J128
- percussion-type system.....1-M047
- liquid-propellant, rocket-motor starting characteristics.....1-P138
- boron-potassium-nitrate, pressure-time curves.....1-S052
- starting fuels for red fuming nitric acid.....1-T058

Igniters (Cont'd)

- for *Jupiter C* and *Juno 2*.....2-J14
- boron-potassium-nitrate, pressure transients in inert,
vented chambers2-S06
- hypergolic, *Cavea-B* monopropellant system.....3-E11
- squib development for *Syncom 1*.....4-C20

IGY

- Translation from *Pravda*.....1-AC36
- results of satellite program.....1-P109

Impact

- sensitivity of explosive compounds, instrument for
determination1-A903
- micrometeorite and particle, bibliography.....1-AC22
- of materials1-C065
- propagation of plastic deformation under longitudinal
impact1-D144
- behavior of long beams under impact loading.....1-D149
- critical velocities of water droplets, injector-spray
sampling1-R124
- effect of Earth's oblateness on calculations.....1-W201
- dynamic penetration in crushed rock, atmospheric and
vacuum conditions3-R10

Indene

- NMR study of indene using proton-proton decoupling
technique3-E09

Inertia Wheel

- to measure rocket-motor impulse.....1-C104
- application in measuring performance of small
propellant grains2-C05

Inertial Guidance Systems

- transformation of Earth-referenced data to inertial
coordinate systems1-A016
- accuracy as applied to future lunar and interplanetary
missions2-G09
- rotor force and torque of a cryogenic gyro in magnetic
field2-H05
- acceleration measurement by pulse-torqued system.....3-J17

Injectors

- underwater propulsion by direct gas injection.....1-B021
- using NH_4-O_2 propellant, partial survey.....1-C020
- mixture-ratio distributions produced by various
configurations1-R026
- effect of rapid liquid-phase reactions on design.....1-E036
- spray type, for acid-aniline combination.....1-M157
- cavitation characteristics of two orifice inserts.....1-R107
- bridging gap between injector hydraulics and
combustion phenomena1-R123
- critical impact velocities of water droplets,
injector-spray sampling1-R124
- semiautomatic, size differentiating droplet counter.....1-R125
- liquid phase mixing of pair of impinging streams.....1-R126
- spray characteristics and injector design parameters,
correlation1-R127
- liquid-propellant, hydrodynamics1-R129

- measurement of droplet sizes in full sprays, diffraction
ring method1-S061
- behavior of liquid streams injected into low-pressure
chamber1-S062
- using nitromethane and 2-percent chrome acetyl
acetate as fuel.....1-S066
- path of liquid streams under rotating conditions.....1-S094
- flow distribution of liquids.....1-T039
- solid-propellant *Nota* injection vehicle system feasibility.....3-Z10

Inlet Diffusers

(see *Diffusers*)

Instrumentation

(see also *Accelerometers*, *Photometers*, *Radiometers*,
Spectrometers)

- magnetic properties of materials, applicability.....1-AC27
- multipressure measuring system.....1-B004
- baseline systems, position error studies1-B081
- baseline systems, NAMIC configurations.....1-B083
- high-speed recording potentiometer.....1-B110
- high-speed potentiometer recorder.....1-B117
- for rocket-motor testing.....1-B118
- frequency response calculated by Fourier transform.....1-B119
- packaging component parts for high-intensity vibration
environments1-C099
- semiautomatic plotter1-G002
- nonlinearity at large amplitudes, simulation attempts.....1-G003
- feedback system, dual-Nyquist stability analysis.....1-H036
- pressure generators for study of gage responses.....1-H114
- high-speed potentiometer recorder.....1-R118
- central recording system.....1-H119
- to support integrated weapon-system development.....1-J013
- final report on Project ESP-27.....1-J058
- IGY satellite, application of microlock.....1-L100
- optical orientation system.....1-M044
- external for NAMTC, cost estimate.....1-P093
- external for NAMTC, selection considerations.....1-P094
- external for NAMTC, timing and communication.....1-P095
- external for NAMTC, selection considerations.....1-P099
- 1-P101
- for *Explorers 18* and *3*.....1-P123
- differential analyzers, advantages and description.....1-P154
- NAMTC for air-to-air intercept missile tests.....1-R038
- NAMTC mobile bases.....1-R039
- requirements of NAMTC test range.....1-R041
- semiautomatic, size differentiating droplet counter.....1-R125
- dynamic-head probe for evaluating properties of
free-liquid jets1-R128
- calorimeter for corrosive liquids.....1-S016
- apparatus for study of turbulent diffusion flames.....1-S017
- new class of discriminators.....1-S234
- central recording system; status, advantages and
disadvantages1-S271
- elutriator for separating particles in subsieve range.....1-T010
- ac and dc flow anemometer to study turbulence.....1-V088
- requirements of nonperiodic sawtooth pulse.....1-W187
- chopper-stabilized amplifier, applications.....1-Z018

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Instrumentation (Cont'd)

- digital voltage divider.....1-Z023
- 50- Ω coaxial termination, liquid-helium-cooled.....2-S27
- for *Ranger, Mariners R and B*, Jan.-Mar., 1962.....3-AB23
- supporting research and advanced development; progress summary.....3-AB50
- for study of Moon and planets, bibliography.....3-AC27
- for Venus atmospheric studies.....3-B02
- for frequency response testing of pressure transducers; methods.....3-I01
- for measuring width of elastomeric tensile specimen; development.....3-L15
- for humidity determination of ethylene oxide.....3-V01
- supporting research and advanced development; progress summary, 5/62-6/63.....4-AB10
4-AB16
4-AB22
4-AB34
4-AB40
- lunar soil and atmosphere: testing equipment and processes, bibliography.....4-AC15
- magnetic susceptibility, lunar surface and subsurface measurement.....4-B17
- systems reliability analysis based on partial success.....4-B27
- mechanism to constrain the output link to describe parallel lines.....4-D06
- soft-lander, lunar properties measurement.....4-E02
- Mariner R* Venus probe.....4-H13
- automatic torque balance for thin magnetic films.....4-H22
- Rangers 3, 4, and 5*.....4-J04
- Mariner 2*, measurements of Venus.....4-J07
- for seismological observation of lunar properties.....4-K10
- steady-state heat meter for determining heat-transfer rate to cooled surfaces.....4-L05
- for remote compositional analysis by neutron activation.....4-M20
- lunar surface rock and soil strength properties; techniques of measurement.....4-T04
- resonance tubes in a supersonic flow field.....4-V06
- Mariner R* Venus radiation emission experiments.....4-W15
- supporting research and advanced development; progress summary, 8/63-5/64.....5-AB09
5-AB15
5-AB21
5-AB27
5-AB33
5-AB38
- Surveyor* payload: design, development, operations; analysis; progress summary, 8/62-5/64.....5-AB04
5-AB10
5-AB16
5-AB22
5-AB28
5-AB34
- design, limitations, and reliability for space exploration.....5-H22
- for measuring solar plasma.....5-J16

- data translator, operation and maintenance manual.....5-M19
- normal-incidence reflective polariscope.....5-S03
- apparatus for tensile testing in vacuum to 5400°F.....5-T07

Interplanetary Matter

- Soviet rocket measurements, discussion.....2-AC32

Ion Propulsion Systems

- speculative discussion, translation.....1-AC47
- neutralization in ion-propelled spacecraft.....2-AB07
- feasibility of ion motors, space tests.....2-E04
- suitable trajectories and thrust-measurement techniques.....2-E04
- feasibility.....2-S10
- neutralization problem.....2-W03
- control and guidance.....3-H12
- ion beam neutralization problem in three dimensions.....3-K04
- electron bombardment ion engines, potentialities.....3-K06
- temperature control of nuclear-electric spacecraft.....3-V07

Iron

- porous, preparation and physical properties.....1-D099
- zener and magnetic relaxation effects.....3-F04

Iron Alloys

- sigma phase, kinetics of formation.....1-D130
- iron-cerium system, partial phase diagram.....1-J019
- porous, preparation and physical properties.....1-M064
- iron-chromium-vanadium system, phase relationships.....1-M065
- iron-chromium prepared by powder-metallurgy techniques.....1-M069
- iron-chromium, physical properties.....1-M069
- iron-chromium, effect of aging on mechanical properties.....1-M070
- aging at 475 C, effect on formation of sigma phase.....1-M076

Isocyanates

- determination of equivalent.....1-T030
- reactions with alcohols.....3-S10

Jung Project

- (see also *Explorer—, Pioneer—, Jupiter C*)
- Vidicon and tape recorder system, development.....1-A083
- 2, fourth-stage motor.....1-D072
- 1 and 2, second-stage motor.....1-J061
- Jupiter C* configuration; cosmic-ray experiment; proposal for modification.....1-V029
- third-stage rocket motor; propellant grain, and ignition system.....2-114
- history of program; high-speed stages, and early firings.....2-W19

Jupiter

- atmospheric chemical composition, pressure, temperature, and velocity.....5-S20

Jupiter Project

- radio-inertial guidance system.....1-G005
1-J041
1-J084
- CODORAC system.....1-R015

Jupiter Project (Cont'd)

- third-stage rocket motor; propellant grain, and ignition system 2-J14
- environment, summary of existing knowledge 3-F04

Jupiter C

- for launching *Explorers*, research program 1-R093

Langmuir Probe

- temperature effect on measurement 5-C07

Lasers

- theory and state-of-the-art 4-P14

Launching

- statistical determination of safety zones for NAMTC 1-D042
- by booster rocket, analytical treatment of problem 1-M151
- rudimentary launch guidance methods 1-P082
- and flight parameters, corrections to compensate for firing-time delays 2-K07
- orbital; analysis of intermittent thrust 2-L04
- orbital; analysis of constant tangential thrust 2-L04
- orbital; analysis of constant radial thrust 2-L04
- data for *Ranger I* 3-AB17
- 3-AB18
- statistical model of delays 3-L06
- three vehicles from two pads, Part I 4-S18
- Part II 4-S19
- Part III 4-S20
- launch vehicle vibration data correlated with wind-tunnel data 5-S07

Lead

- composition of chondrites, isotopic lead and lead-lead ages 3-M10
- origin in iron meteorites 4-M07
- primitive, from iron meteorites 4-M08

Linguistics

- extraterrestrial, communication and subject matter 2-G08

Liquid Jets

- pressure distribution 1-R128
- velocity 1-R128
- orientation 1-S094
- actual path under rotating conditions, examination 1-S094
- dynamic characteristics related to orifices, test methods 3-R12

Liquid Propellants

- ignition lag, apparatus for lab-scale determination 1-A006
- with red fuming nitric acid, ignition-lag characteristics 1-A008
- hydrazine-nitric acid, ignition-lag characteristics 1-A010
- hydrazine evaluation 1-A050
- bibliography 1-AC21
- gaseous hydrogen and LOX experimental investigation 1-B011
- storable, JPL research 1-B047
- as rocket-motor coolants, suitability study 1-B051
- as regenerative coolants, suitability 1-B059
- advantages of white fuming nitric acid and furfuryl alcohol 1-B093

- red fuming nitric acid hydrazine combination, experimental investigation 1-B132
- Liquid-ammonia-LOX, experimental testing 1-C006
- Underwater testing of jet units 1-C008
- Generation of high-pressure gases from chemical reactions 1-C010
- red fuming nitric acid, aniline and furfuryl alcohol-aniline mixture, specific heats 1-C011
- ammonia-LOX fuel systems, thermochemical calculations 1-C015
- spontaneous, ignition lag 1-C069
- $N_2O_4-NH_3(I)$, theoretical and experimental investigation 1-C080
- N_2O_4 -isopropyl alcohol, theoretical investigation 1-C081
- $N_2O_4-N_2H_4$, performance 1-C082
- isopropyl alcohol, theoretical performances of red fuming nitric acid 1-C084
- 1-C085
- performance of wide-temperature-range fuels and nitrogen oxides 1-C086
- storable, development of 600-lb thrust system 1-D027
- liquid fluorine as component, preliminary study 1-D055
- fluorine-hydrazine, performance 1-D061
- hydrazine, research and development of storability 1-E020
- influence of chamber pressure on theoretical performance 1-E023
- halogen-containing systems, performance calculations 1-E024
- $N_2O_4-N_2H_4$, performance calculations 1-E025
- effect of rapid liquid-phase reactions on injector design and combustion 1-E036
- F_2 and F_2O with ammonia and hydrocarbons, performance 1-F003
- nitric acid and aniline-furfuryl mixtures 1-F006
- F_2 and F_2O systems, performance calculations 1-F013
- fluorine, effect of external pressure variation on performance 1-F016
- thermodynamic properties 1-F020
- guns, experimental firings 1-F053
- regeneratively pumped gun, experimental firings 1-F057
- with hydrogen peroxide-nitromethane and hydrogen peroxide-methyl alcohol 1-F033
- 1-F065
- high-velocity firings in .60-caliber gun 1-F070
- research and development program 1-F093
- state of the art as of 1957 1-G077
- hydrazine as monopropellant and gas generant, development 1-G080
- mixture of furfuryl alcohol and aniline, thermal changes 1-G098
- spontaneous, ignition-lag study program 1-G104
- fluorine-ammonia, preliminary investigation 1-H030
- properties and qualities, for use with acid-type oxidizers 1-H080
- furfuryl alcohol-aniline mixtures, specific heats 1-H101
- heat capacity of furfuryl alcohol-aniline system 1-H105
- combustion studies 1-J090

JPL. CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Lunar Landings (Cont'd)

- direct-ascent vs. parking-orbit trajectory as related to
Surveyor 4-GC3
- soft, instrument for composition analysis by neutron
 activation 4-M20

Lunar Probes

- JPL method of tracking 1-C030
- tracking 1-E014
- terminal guidance 1-G017
- radiation instrument used 1-J146
- tracking and orbit determination, JPL program 1-I-140
- acquisition and reduction of minimum power data 1-M085
- coherent minimum-power telemetry system 1-M086
- soft landings, development 2-AE20
- vehicles, in design and fabrication stages, review 2-C07
- operational policy, organization and function of program 2-C03
- vehicles, propulsion maneuvers provided by
 - solid-propellant rocket motors 2-G04
- recommendations for observation programs 2-J15
- vehicles, computation of velocity in Moon-fixed
 coordinate system 2-K01
- manned, utilizing lunar-surface rendezvous, analysis 3-B18
- vehicles, injection locations for various launch sites 3-C11
- vehicles, requirements for guidance correction
 maneuvers 3-L09
- soft landings, instrument for composition analysis by
 neutron activation 4-M20

Lunar Trajectories

- analysis of ascent portion 2-C03
- preliminary standard trajectory, *Rangers R-1* and *R-2* 2-D02
- shaping, ascent, parking orbits; design 3-C08
- injection locations for various launch sites 3-C11

Lunik Project

- 2, flight coverage, translation 1-AC41
- 2, preliminary results of data, translation 1-AC42
- 3, description and data, translation 1-AC43
- 3, coverage of launching, translation 1-AC44

Magnetic Fields

- methods of measurement, bibliography 1-AC30
- lunar, existence 1-N008
- interaction with quantum plasma 2-W01
- simultaneous ionization and recombination of
 ionized gas 2-W26
- spin and exchange corrections to plasma dispersion
 relations 3-B17
- superconducting shells for uniform magnetic fields,
 configuration 3-H10
- solar, fluid issuing from center of magnetic dipole,
 theory 3-H11
- effect on plasmas 3-W20
- lunar surface and subsurface measurements 4-B17
- effect of a conducting fluid on two-dimensional flows 4-C12
- automatic torque balance for thin magnetic films 4-H24

- due to toroidal ring current around Earth 4-S15
- interplanetary, *Mariner R* experiments 4-W15
- intensity and distribution of currents, possible method
 of determination 5-R26

Magnetohydrodynamics

- bibliography 1-AC26
- role of viscosity and conductivity 1-G072
- steady flow and applied electric field interaction 1-C073
- formulation of energy equation 1-W198
- generalized Ohm's law of plasma 1-W199
- three-dimensional boundary layer equations 1-W200
- flow over a disk 2-G10
- 2-H12
- flow past a current-carrying flatplate 2-M01
- calculation of electron drift velocity and kinetic energy
 based on "collision time," approximation 2-W22
- rotating plasma transient characteristics 2-W25
- fluid issuing from center of magnetic dipole 3-H11
- detection of plasma component of MHD waves in space 3-N04
- research and analysis 3-W20
- perturbation analysis of certain periodic, inviscid fields 4-C11
- two-dimensional and axially symmetric flows of an
 incompressible, low-viscosity fluid in the inviscid limit 4-C13
- plasma flow away from Sun in slightly rotational
 magnetic field 4-H19

Magnetometers

- scalar, conversion into vector magnetometer 2-D04
- rubidium vapor, for use on *Ranger* 2-J13

Mariner Project

- design, development, operations; progress summary 2-AB21
- B*, study report of recommended mission 2-J17
- mission objectives and design constraints on
 communication system 2-M05
- B*, design, development, operations; progress summary,
 8/61-10/61 3-AB15
- 3-AB16
- 3-AB17
- 3-AB18
- proof-test model assembly fabrication 3-AB18
- B*, rescheduling during study period 3-AB19
- 3-AB20
- B*, reprogramming 3-AB19
- 3-AB20
- 2, Venus mission initiation 3-AB19
- 3-AB20
- A*, cancellation during study period 3-AB19
- 3-AB20
- B*, supporting research and advanced development;
 progress summary 3-AB21
- 3-AB22
- 2, design, development, operations; progress summary 3-AB21
- 3-AB22
- 2, instrumentation, telecommunication, auxiliary
 power 3-AB23

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Mariner Project (Cont'd)

- B, instrumentation, telecommunication, auxiliary power 3-AB23
- B, design, guidance 3-AB24
- 2, design, guidance 3-AB24
- design, development, operations; progress summary, 5/62-6/62 3-AB26
- 3-AB30
- instrumentation for Venus atmospheric studies 3-B02
- planetary areas observed from a probe, description 3-C04
- post-injection guidance systems 3-L09
- B, propelled capsule study 3-S20
- approach-correction propulsion system 3-S25
- design, development, operations; progress summary, 7/62-6/63 4-AB06
- 4-AB10
- 4-AB12
- 4-AB16
- 4-AB18
- 4-AB22
- 4-AB24
- 4-AB28
- 4-AB30
- 4-AB36
- 4-AB40
- 2, analysis of Venus trajectory preflight injection and midcourse maneuvers 4-B002
- 2, preliminary results of Venus measurements 4-C07
- 2, solar-plasma experiment 4-N03
- design, development, operations; progress summary, 7/63-5/64 5-AB05
- 5-AB11
- 5-AB17
- 5-AB23
- 5-AB29
- 5-AB35
- 2, IR radiometer experiment 5-C06
- 2, preliminary observations of mission 5-J08
- 2, flight performance 5-J09
- 2, progress report, Sept. 1962-Jan. 1963 5-J09
- 2, flight hardware and GSE 5-J09
- 2, packaging techniques 5-J13
- 2, basic principles and specific techniques of temperature control 5-L12
- 2, data on solar-wind velocity 5-S15
- A and B, comparison of telecommunication system reliability 5-T01
- 2, solar-panel design and flight performance 5-Z01

Mars

- possibilities of plant life, translation 1-AC46
- parametric study of 1964 Mars and 1965 Venus trajectories 1-C070
- 1961 observations 3-F07
- energy transfer equations, application to thermal history 3-K07
- geological knowledge and uncertainties 4-L18
- geological survey with TV camera 4-M03

- Soviet radar study, February 1963 5-AC07
- atmospheric entry, parametric study 5-B22
- spectrum analysis 5-K03
- mass of planets, method of determination 5-M06
- communication, blackout problem for blunt-entry capsule entering atmosphere 5-S19
- detection of water vapor 5-S21
- water vapor content of atmosphere, new upper limit 5-S22

Mars Probes

- adaptation of *Ranger* 2-J04
- conceptual design studies 3-B05
- vehicles, influence of shape on aerodynamic pitch damping of oscillatory motion 5-D04
- vehicle and landing capsule 5-G01
- manned vehicles, communication system 5-V03

Mars Trajectories

- parametric studies of characteristics 2-C04
- injection guidance 2-S03
- ballistic interplanetary; characteristics, 1962-1977 3-C09
- spacecraft encounter, 1964 5-C12
- optimum roundtrip using low-thrust power-limited system 5-S06

Masers

- bibliography 1-AC29
- engineering 1-H062
- observations of nonlinear phenomena 1-H064
- beam, techniques 1-H065
- solid state, Raman-type excitation 1-H66
- bibliography 1-K002
- oscillator, one beam through two cavities 1-W077
- negative resistance and noise spectra 2-W04
- operational 960-Mc maser system 3-S05
- 960-Mc ruby cavity, tracking and communications systems 3-S41
- theory and application 4-H16
- dual-cavity ruby, for planetary radar experiments 5-H23
- traveling-wave, noise performance 5-H24

Materials

- tensile properties, measurements 1-C065
- tensile properties, testing equipment 1-C065
- high-temperature, research 1-DC89
- 1-K036
- thermodynamic properties 1-M072
- 1-P048
- corrosive effects 1-M100
- damping 1-P131
- turbulent diffusion 1-S058
- supporting research and development; progress summary 2-AB07
- 2-AB10
- ceramics, graphite, and endothermal materials; research 2-AB13
- 2-AB16
- supporting research and development; progress summary 2-AP18

Mathematics (Cont'd)

- evaluation of the integral $\int_0^{\infty} v^n \exp \left[-(v-u)^2 - \frac{x}{v} \right] dv$. . . 5-C04
- partial solution of three-dimensional four-bar linkage . . . 5-C05
- two-electron, two-center integrals, Fourier convolution theorem method evaluation . . . 5-G03
- two-center integrals over solid spherical harmonics, Fourier convolution method . . . 5-G04
- table of integrals, exponentials, logarithms, and exponential integral . . . 5-G05
- segmented rational minmax approximation . . . 5-L04
- sequential estimation of correlated stochastic variables . . . 5-P04
- continuous estimation of sequentially correlated random variables . . . 5-P07

Matrix Algebra

- existence, construction, and properties of orthogonal matrices . . . 2-B06
- commutative theory, classification of commutative matrices . . . 2-K11
- nondiagonal symmetric mass matrix for free vibration . . . 4-B04
- numerical inversion with iterative improvement . . . 4-M24

Mercury

- energy transfer equations, application to thermal history . . . 3-K07
- mass of planets, method of determination . . . 5-M06

Metals

(see also **Iron**)

- porous, damping capacity . . . 1-A017
- improving physical properties of chrome plating . . . 1-A080
- magnetic properties and use in instrumentation . . . 1-AC27
- seal, for guided missile applications . . . 1-B086
- properties of mechanical model of plasticity . . . 1-B096
- problems in rocket-motor development . . . 1-B106
- refractory, phase studies . . . 1-B144
- porous stainless, permeability distribution . . . 1-C018
- forces acting in tension impact tests . . . 1-C065
- state-of-the-art in Europe, 1946 . . . 1-D089
- for sweat cooling, preparation and physical properties . . . 1-D091
- pressure distribution in compacting metal powder, measurements . . . 1-D094
- porous, gas flow . . . 1-D097
- porous, gas permeability . . . 1-D098
- recrystallization of beryllium oxide . . . 1-D100
- porous, liquid flow . . . 1-D101
- monoclinic and cubic zirconia mixtures, quantitative analysis . . . 1-D104
- refractory, for rocket chamber liners . . . 1-D105
- refractory oxide systems with zirconia, ceria, and thoria . . . 1-D110
- alloys, crystal structure of TaCr₂ and NbCr₂ . . . 1-D119
- crystal structure of V₃Co . . . 1-D140
- crystal structure of Ti₃Si₂, Ti₃Ge₂, and Ti₃Sn₂ . . . 1-D141
- controlled porosity, powder metallurgy . . . 1-D143
- propagation of plastic deformation under longitudinal impact . . . 1-D144
- behavior of long beams under impact loading . . . 1-D149
- powders, pressure distribution in compacting . . . 1-D150

- powder compacts, dilatometric study of sintering . . . 1-D151
- crystallography of sigma phase . . . 1-D152
- reaction with gaseous sulfur and hydrogen sulfide, thermodynamic stability . . . 1-F004
- high-temperature corrosion rates, with rocket exhaust gases . . . 1-F008
- and gases kinetic reactions, corrosion rates . . . 1-F017
- high-temperature corrosion rates, with hydrogen sulfide and sulfur dioxide . . . 1-F024
- tungsten filaments, dissociation of H₂ and N₂ . . . 1-F027
- photographic studies of particles combustion characteristics . . . 1-G065
- permeability of porous copper specimens . . . 1-G095
- porous fluid flow . . . 1-G096
- sweat-cooled, flow rate required for maintenance . . . 1-H074
- alloying nickel and copper by diffusion in powder compacts . . . 1-J138
- crystal structure of TiRu and TiOs . . . 1-J145
- corrosion, in red fuming nitric acid . . . 1-K004
- testing, suitable for bearing surfaces . . . 1-K006
- corrosion in red fuming nitric acid and mixed acid . . . 1-K014
- devitrification of high-SiO₂ glasses . . . 1-K031
- evaluation of tungsten extrusion producing processes . . . 1-K039
- ceramic liners for uncooled-rocket motor chambers . . . 1-L005
- compatibility with mixtures of hydrazine, hydrazine nitrate, and water . . . 1-L057
- chromium-nickel, rate of corrosion by nitric acid . . . 1-L088
- for rocket motors, criteria for choosing . . . 1-L107
- porous, hydrostatic pressing . . . 1-M060
- porous nickel, preparation and physical properties . . . 1-M062
- alloys, mechanical properties in 1000 to 1600°F range . . . 1-M063
- porous iron-nickel alloy, preparation and physical properties . . . 1-M64
- glass-reinforced plastics, resistance to high temperatures . . . 1-M072
- weldable, tension and bend properties . . . 1-M073
- effect of nitric acid on liquid- and gas-phase corrosion . . . 1-M121
- aluminum and steel alloys, liquid-phase corrosion inhibition . . . 1-M135
- extruded magnesium, abnormal grain growth . . . 1-M182
- science, current trends and future development . . . 1-M183
- study, for jet motor exhaust nozzles . . . 1-M189
- porous ceramic, permeability measurements . . . 1-O001
- free volumes of metallic elements at their melting points . . . 1-P054
- distributed parameter vibration with structural damping and noise excitation . . . 1-P131
- conducting, determination of physical properties at high temperatures . . . 1-P149
- thermodynamic study of liquid Pb-Zn solutions . . . 1-R113
- radiative properties of surfaces considered for *Explorer* and *Pioneer* . . . 1-S123
- satellite, radiation absorptivity and reflectance properties . . . 1-S124
- linear viscoelastic, interconverting various mechanical properties . . . 1-S167
- 1-S171

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Metals (Cont'd)

- elutriator for separating particles in subsieve range... 1-T010
- sweat-cooled porous, heat transfer1-W053
1-W055
- alloying by sintering1-W056
- sweat-cooled porous, heat transfer1-W058
- alloying of powders by diffusion1-W059
- porous, thermal conductivity1-W091
- pattern of gas flow leaving porous surfaces1-W092
- porous, machining method1-W094
- influence of wall material on sweat-cooling process...1-W095
- wound-wire porous, manufacturing processes and
 applications1-W099
- wound-wire porous, physical properties1-W099
- porous, preparation for sweat-cooling1-Z026
- porous, determination of modulus of elasticity1-Z027
- supporting research and development; progress
 summary, 8/60-5/61 2-AB07
2-AB10
2-AB13
2-AB16
2-AB18
- thermoelectric, bibliography2-AC28
- surface tension and heat vaporization2-AC33
- sheet, rapid rate compression testing, at high temperatures . .2-B10
- crushable, static and dynamic test results2-D01
- effects of space environment2-H03
- effects of space vacuum2-J02
- transport theory for electron-phonon interaction.....2-V08
- dispersion relation of sound waves as function of
 temperature2-V10
- supporting research and development; progress
 summary, 7/61-11/61 3-AB05
3-A506
3-AB09
- supporting research and advanced development;
 progress summary3-AB28
- behavior in space3-J01
- testing in space environment3-J01
- evaporation effects of space environment3-J02
- space environment effects on plastics and elastomers...3-J03
- sound waves dispersion3-V08
- supporting research and advanced development;
 progress summary, 8/62-6/63..... 4-AB08
4-AB14
4-AB20
4-AB26
4-AB32
4-AB38
- simulated lunar, thermal properties in air and vacuum...4-B15
- correlating percent shear-lip to relative plastic zone
 size in brittle fracture4-G05
- magnetic properties of ferromagnetic films studied
 by automatic torque balance4-H22
- lattice parameters calculated by IBM 7090 computer
 program4-L15

- thermal expansion in air of ceramic oxides to 2200°C...4-N04
- sliding friction measurements taken on *Ranger 1*....4-R06
- permeability to nitrogen tetroxide for use in bladders...4-S26
- temperature and strain rate on tensile properties.....5-T08
- pyrolytic tungsten, tensile properties5-T09
- tungsten-3% rhenium, tensile properties5-T10
- effects of electron spin paramagnetism on velocity
 of sound5-V05

Meteorites

- micro-, impact studies, bibliography1-AC22
- micro- distribution near Earth2-H10
- effects of cosmic rays on age and composition.....3-M09
- composition of chondrites, isotopic lead and lead-
 lead ages3-M10
- effect on lunar orbit due to accretion4-L20
- microstructures observed in carbonaceous chondrites ...4-M04
- iron, model based on three nucleosynthesizing events...4-M07
- iron, analyses of primitive lead content.....4-M08
- organic constituents of carbonaceous chondrites5-B24

Meteoroids

- damage to materials in space3-J01

Methane

- rotational motion in condensed phases5-E05

Microminiaturization

(see **Thin Films**)

Missiles

- warhead arming system, preliminary design and
 analysis1-B077
- steam boiler, development for auxiliary power units...1-B085
- sealing material, review1-B086
- phase coherent vibration1-B124
- evaluation of liquid propulsion systems1-B135
- surface temperature, in high-speed flight1-C034
- SUEL missile assembly and checkout facilities,
 requirements1-C094
- maintenance problems1-C139
- terminal maneuver1-C138
- state-of-the-art in England and France1-D131
- packaging of GSE equipment for weapon system1-E044
- stability evaluation, first-order perturbation method ..1-F001
- optimum burning program1-H042
- conferences, abstracts of papers1-J021
- proposed radio-inertial guidance system1-J034
- intermediate-range, application of CODORAC1-J035
- design characteristics1-J067
1-J068
- range-instrumentation vessels for testing1-J089
- equations of motion, for an oblate-spheroidal
 rotating Earth1-K061
- preliminary design of shore-to-ship1-K020
- shore-to-ship, tests of 1/20-scale model.....1-K021
- accuracy, asymmetrical distribution of impacts1-L094
- control forces required for stable vertical ascent.....1-L098
- state-of-the-art in England and France1-M038

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 SUBJECT INDEX

Nitric Acid (Cont'd)

- corrosive effects on carbon steel 1-R069
- corrosion and ignition of titanium alloys 1-R070
- and nitrogen dioxide-water, electrolytic conductance 1-R084
- solubility of oxygen in HNO₃ mixtures 1-R085
- liquid phase, kinetics of thermal decomposition 1-R086
- and oxides of nitrogen, and water mixtures; properties 1-S003
- and gasoline mixtures, ignition 1-S004
- physical properties 1-S006
- red fuming, starting fuels 1-T058

Nitrogen Compounds

- algebraic solution for species in system containing 1-A030
- boiloff system for generation of high pressure 1-B049
- propulsion systems based on nitrogen oxides 1-C090
- and nitric acid binary system, volumetric and phase behavior 1-C108
- as coolant on porous specimens, experimental study 1-D102
- tungsten filaments, dissociation of H₂ and N₂ 1-F027
- seven mechanisms in photolysis of nitrogen dioxide below 3700 Å 1-F040
- thermal mechanisms related to photolysis of nitrogen dioxide 1-F041
- nitromethane, thermal decomposition 1-G102
- specific heats of nitrogen tetroxide and organic compounds 1-H104
- heat transfer to N₂O₄ under turbulent pipe-flow conditions 1-K054
- for sweat cooling 1-L092
- optical absorbance of ternary HNO₃-NO₂-H₂O liquid-phase system 1-L163
- optical absorbance of NO₂ solutions in nitric acid, measurements 1-L164
- liquid propellants containing, performance calculations 1-M090
- HNO₃-NO₂-H₂O, conductometric method for chemical analysis 1-M111
- Heats of NO₂ solution in nitric acid-nitrogen dioxide system at 0°C 1-M114
- oxides, emission of radiation 1-P059
- nitric acid-nitrogen dioxide-water system, volumetric and phase behavior 1-R012
- and ammonia, phase behavior 1-R014
- dioxide thermal decomposition 1-R115
- NO₂ sensitization of H₂-O₂ mixtures, thermal reactions 1-R116
- kinetics of thermal decomposition of nitric dioxide 1-W159
- atmosphere, kinetics of fixation 1-W164
- atomic reactions with oxygen in chemosphere 2-B05
- density measurements with EPR 4-B07
- reaction with O(¹D) 4-D05
- nitrogen tetroxide, effect on potential bladder materials 4-S26
- nitryl fluoride, thermodynamic properties 4-T09
- photolysis of nitrogen dioxide at 3660 and 4047 Å at 25°C 5-F03

Nitromethane

- mixtures as fuel and hydrogen peroxides as oxidizer; rocket-motor tests 1-F061
- critical point, method of determination 1-G099
- thermal stability 1-G102
- critical point 1-G107
- methods of initiating and preventing propagation explosions 1-K010
- behavior in rocket motors of 50-lb thrust 1-K011
- thermal and shock sensitivity 1-K012
- starting-transient investigations 1-N006
- decomposition burning of monopropellant drops 1-R120
- heat capacity 1-S018
- injection studies 1-S066
- stopping of detonations 1-S136
- and oxygen, combination for propellant 1-W064
- as basic component, development 1-W066
- regenerative cooling of rocket motors 1-W067

Noise

- parametrically excited network for amplification 1-H002
- aerodynamic, in supersonic wind tunnels; hot-wire measurements 1-L048
- aerodynamic, in supersonic wind tunnels 1-L053
- effects in FM-FM telemetry systems 1-L064
- inadvertent circuit triggering, problem 1-L067
- expanding autocorrelation functions in power series 1-L073
- determination of noise temperature 2-S09
- temperature, determination in large antennas 3-S11
- additive, stationary, gaussian; phase-locked loop dynamics 4-V04
- performance, or traveling-wave maser 5-H24
- post-amplifier noise temperature contribution in low-noise receiving system 5-S26

Nondestructive Testing

- of solid-propellant rocket motors, progress summary 2-AB02
- 3-AB03
- 5-AB01
- 5-AB02
- 5-AB03

Nova Project

- C-3 lunar rendezvous and solid-propellant vehicle concepts 3-J11
- summary of solid-propellant vehicle studies, comparison with liquid-propellant vehicle 3-J12
- solid-propellants feasibility and comparison with equivalent liquid vehicle 4-J06

Nozzles

- chemical reaction during adiabatic flow 1-A044
- 1-A063
- protective coatings 1-A080
- compressible boundary-layer development and convective heat transfer 1-B053
- convective heat transfer coefficients, equation for estimation 1-B057
- water-cooled 1-C071

Nozzles (Cont'd)

- divergence-angle effect1-C118
 for hydrobombs, design and testing1-E004
 overexpanded exhaust, gas-flow separation1-F066
 overexpanded exhaust, static-pressure distribution1-F068
 contour, design1-L019
 conical, thrust1-L024
 study of materials for jet motor1-M189
 isentropic expansions, maintenance of near-
 equilibrium flow1-P031
 isentropic expansions near-equilibrium criteria
 for atomic and molecular reactions1-P032
 near-equilibrium criteria for chemical reactions
 during flow1-P033
 adiabatic flow of hydrogen gas1-P038
 flow with and without vibrational equilibrium1-P039
 adiabatic flow of hydrogen, with and without
 composition change1-P046
 equilibrium during isentropic expansions1-P047
 flow with and without vibrational equilibrium1-P051
 near-equilibrium criteria for complex chemical
 reactions during flow1-P058
 functions for Prandtl-Meyer angle for nozzle design1-R063
 adiabatic and isothermal expansion processes,
 comparison1-S095
 controlled thrust cancellation1-S096
 adiabatic and isothermal expansion processes
 comparison1-S104
 boundary layer thickness at throat and exit1-S129
 isentropic expansions and gas-mixture flow across
 shock waves1-W039
 expansions of gas mixtures carried in nitrogen1-W040
 water-vapor condensation process1-W042
 supersonic, experiments on chemical kinetics1-W044
 condensation in1-W047
 discharge coefficient of critical-flow1-W162
 thrust-vector effect of secondary injectants2-N05
 regeneratively cooled, design and fabrication3-N09
 gas flow, effects of particles3-S19
 calculation of turbulent boundary-layer growth and
 heat transfer4-E07
 local transient heat flux, method of determination4-P15
 contour, flow separation characteristics4-R08
 thrust-vector control by liquid injection4-S09
 local heat-transfer rates4-W10
 convergent-divergent, with two different geometries4-W10
 convergent-divergent, convective heat transfer5-B02
 supersonic, reaction between nitric oxide and ozone5-M07

Nuclear Converters

(see Converters)

Nuclear Magnetic Resonance

- spectroscopy, structures of dipropylene glycols1-H035
 discussion1-R052
 indene study using a proton-proton decoupling
 technique3-E09

- determination3-M04
 spectrum of chlorobutadiene, double resonance study3-M05
 geminal and vicinal fluorine-fluorine coupling3-M06
 relative signs of spin-spin coupling constants,
 techniques for determination5-E04
 relative signs of phosphorus proton coupling constants5-M04

Nuclear Physics

- study of energy sources1-M163
 relative signs of NMR coupling constants in styrene
 oxide by double resonance4-E05
 relative signs of NMR coupling constants in $F^{19}-F^{19}$
 and H^1-F^{19} by double resonance4-E09
 nonperturbative approach to the Many-Fermion system4-V05
 influence of correlations on the dielectric behavior of
 electron gas4-V05

Nuclear Propulsion Systems

- bibliography1-AC32
 feasibility and comparison with chemical1-S093
 feasibility1-S101
 integration considerations for spacecraft2-B08
 for Jupiter exploration, conceptual design2-B09
 power requirements2-D03
 need for space missions2-K06
 performance potential of gas-phase reactor2-M14
 feasibility of gaseous propulsion reactors2-M16
 instrumentation for engineering evaluation3-A05
 for unmanned spacecraft, design studies3-B05
 300-kwe powered spacebus for planetary missions3-B07
 for unmanned planetary probes3-B08
 control and guidance of spacecraft propelled
 with ion motor3-H12
 payload capabilities for solar-system exploration3-S31
 capabilities, analysis3-S31
 plasma-core reactor, thermal and critical analysis3-S33
 use in interstellar flight, feasibility3-S34
 fission-fragment energy loss from vortex tubes, analysis3-S47
 vortex- and cooling-tube design parameters for reactors3-S48
 thermal design limitations of gas-cooled solid-core
 reactor4-B10
 simulation of major elements of a two-loop nuclear
 turboplant concept5-D02
 fuel-containment requirements5-M11

Nuclear Reactors

- Monte Carlo methods applied to neutron-diffusion
 problem1-L082
 gas-cooled solid core, thermal design limitations4-B10
 10-Mw concept with nonsolid fuel element for electric
 propulsion application4-D01
 criticality calculations for fast liquid-metal-cooled
 reactor5-G11
 heterogeneous, containing moderating fuel elements,
 analysis5-T11

Orbital Launching

(see Launching)

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 SUBJECT INDEX

Orbital Transfer

- ultimate gain in altitude and velocity boost required...1-C052
- low acceleration takeoff1-L028
- injection guidance2-S03
- interplanetary problems, application of Lambert's theorem to solution5-J15

Orbits

- perturbation techniques and nonlinear mechanics.....1-C027
- determination and tracked program at JPL1-C028
- propellant consumption required to reach orbital velocity1-C042
- 1964 Mars and 1965 Venus, parametric study.....1-C070
- equations and differential corrections in spherical coordinates1-D049
- determination program, *Pioneer 4*1-E012
- post-injection phase and design criteria for *Ranger 3*.....1-J107
- preliminary standard, for *Ranger 1*.....1-J108
- lunar and interplanetary, method of describing miss distances1-K032
- satellite motion about unsymmetrical body.....1-L029
- two-dimensional analysis of interplanetary flight schedules1-L112
- determination using Goldstone 85-ft antenna1-M217
- determination, evaluation of electronic systems1-R037
- elliptic, effect of drag1-W132
- determination2-AB15
2-AB18
- parking, evaluation of payload capability and launch-time delay compensation2-C03
- powered-flight program for IBM 7042-G03
- parking, effect on injection-guidance accuracy2-G09
- determination and differential corrections in calculation.....2-K05
- launch and flight parameters, correction to compensate for firing time delays2-K07
- equations for three-dimensional optimum thrust.....2-M18
- low-thrust interplanetary analysis2-M19
- lunar and interplanetary, near-Earth portion3-C08
- interplanetary, thrust optimization analysis for Venus and Mars3-M24
- optimum interplanetary rendezvous with power-limited vehicle3-M25
- statistical mechanical estimate of orbital collision probabilities3-M26
- optimization, critical direction method3-P02
- perturbations of a hyperbolic orbit by an oblate planet.....3-S06
- low-thrust; optimization3-S31
- Venus; analyses of *Mariner 2* design, preflight injection guidance, midcourse maneuvers4-B02
- Mars and Venus one-way transfers, design parameters...4-C14
- Earth-Venus, key characteristics, 1964-1970.....4-C15
- direct ascent versus parking orbit for *Surveyor* lunar soft landing4-C03
- midcourse correction propulsion system for *Ranger*.....4-L11
- Mars rendezvous, optimum thrust equations for power-limited vehicles4-M17

- determination with large antennas.....4-M27
- hyperbolic, perturbations by an oblate planet4-S03
- theory of determination, classical methods5-A05
- theory of determination, parameter estimation formulas...5-A06
- Ranger* Block III5-AB04
5-AB10
5-AB16
5-AB22
5-AB28
5-AB34
- standard set of constants and ephemeride data for calculations5-C10
- Earth-Venus, 1968-1970, characteristics5-C11
- Earth-Mars, 19645-C12
- Moon-Earth, design and characteristics5-D01
- midcourse maneuvers, model of execution errors5-G02
- application of method of averages5-L19
- influenced by multiple planetary attractions, determination and characteristics5-M14
- determination, application of sequentially correlated processes5-P04
- optimum final value control technique of powered flight...5-P05
- dynamic programming analysis of multiple guidance corrections5-P06
- Earth-Mars roundtrip, with low-thrust power-limited system5-S06
- circular, out-of-plane perturbations5-S16
- design, unified guidance analysis5-S17
- JPL determination program5-W01

Organic Compounds

- semiconductivity1-S054

Orifices

- metering of LOX1-F039
- characteristics related to liquid jets3-R12
- effect of size on pressure measurements made with dynamic-head probe5-J07

Oscillators

- capable of telemetering voltages1-D050
- audio, for telemetering1-L060
- for telemetry system1-L065
- nonlinear negative resistance, effect on circuit frequency1-L066
- phase-stable, evaluation1-V036
- maser, one beam through two cavities1-W077
- phase-stable, for spectral measurements of Venus.....4-M02
- phase-stable; relationship between phase noise, spectrum, short-term stability and the *Q*.....4-M02
- tunable, high-stability microwave4-P17

Oscillographs

- device for identification of photographic traces.....1-S269

Oxidizers

- ammonium nitrate, for smokeless solid propellant1-A007
- nitric acid, ignition-lag characteristics of hydrazine propellants1-A010

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Oxidizers (Cont'd)

- liquid-propellant, review1-A028
- ammonium nitrate, ammonium perchlorate, and potassium perchlorate; evaluation1-B182
- determination of calcium and magnesium in perchlorates1-B183
- nitrogen oxides, performance evaluations1-C079
- fluorine, oxygen difluoride, and chlorine trifluoride; properties1-D056
- fluorine, heat of dissociation1-D058
- nitromethane mixtures as fuel, and hydrogen peroxide as oxidizer; tests1-F061
- ammonium nitrate1-H008
- hydrogen peroxide1-J123
- performance calculation method1-J130
- ammonium-nitrate, for solid propellants1-J133
- viscosities, measurements1-M103
- fuming nitric acid, applicability1-M116
- some aspects of oxygen fluoride1-M218
- ammonium perchlorate and ammonium nitrate1-N018
- practicality of various substances as fuels1-P021
- gas-phase oxidation of ammonia by nitrogen dioxide, kinetics1-R117
- investigation of liquid fluorine1-Z007
- experiments with liquid nitrogen tetroxide2-B11

Oxygen

- algebraic solution for species present in systems containing1-A030
- and hydrogen system, Mollier diagrams1-B014
- liquid, boiloff characteristics1-H027
- liquid propellants containing, performance calculations1-M090
- inhibiting corrosion reaction of titanium in fuming nitric acid1-R068
- solubility in nitric acid mixtures1-R085
- NO₂ sensitization of H₂-O₂ mixtures, thermal reactions1-F116
- and ammonia in quartz vessel, reaction kinetics1-W166
- LOX shock-sensitivity tests1-Z003
- atomic, the 5577 Å airglow emission mechanism2-B03
- atomic reactions with nitrogen in chemosphere2-B05
- inhibition of acetylene-oxygen flame with chlorine atoms3-F02
- atomic, density measurements with EPR4-B07
- reaction of O(¹D) with nitrogen4-D05
- presence in Venus atmosphere5-AC09
- electronically excited O₂ with CO5-R05

Particle Detectors

- for experiments on *Rangers 1* and *2*2-J13

Phase-Locked RF Loops

- threshold improvement and error reduction, application of discriminators1-G040
- telemetry application1-G041
- preceded by limiters, behavior1-J011
- discriminator, design and operations handbook1-J048
- response to sinusoid plus noise1-M046

- threshold improvement in FM subcarrier system1-M087
- acquisition range and tracking behavior1-V043
- digital-control techniques2-W07
- construction and nonlinear aspects4-B28

Phosphorous Compounds

- containing protons, signs of coupling constants5-M04

Photographic Equipment

- (see also **Cameras, Television Systems**)
- vidicon and tape recorder system for *Juno 2B*1-A083
- and techniques adaptable to space, bibliography1-AC25
- high-speed motion picture camera, construction1-B109
- use of Kerr cell in high-speed camera1-B113
- strobe control system for cameras1-L037
- strobe-control system for motion picture cameras1-L043
- system for lunar photography and data transmission1-S081
- multipulsed Kerr electro-optical shutter, development1-T050
- design of miniature camera for space probe instrumentation2-S32
- TV camera for a geological survey of Mars4-M03
- slow-scan vidicon, instrumentation requirements for Mars mission5-M01
- slow-scan vidicon, usability for space5-M01

Photography

- (see also **Photographic Equipment**)
- technique for rocket-motor combustion study1-A014
- bubble growth-and-collapse cycles1-G110
- pressure bomb for photographing burning strands of solid propellant1-M045
- trajectory effects on *Ranger* camera coverage3-C02
- spark schlieren wake studies4-D03
- of Moon from space probes4-E03

Photometers

- peak-reading1-B108
- satellite-borne, for extraterrestrial radiation measurements1-B194

Photometry

- application of photoelectric photometer to atomization study1-S060
- parameters for *Ranger* lunar photometric model4-H15
- adaptability to space reconnaissance5-AC03

Physics

- theory of nonlinear coupling in novel ferroelectric device1-H061
- absolute concentrations of free radicals in electric discharges1-H068
- supporting research and development; progress summary, 11/60-2/612-AB10
- 2-AB13
- 2-AC16
- fission electric cells2-AB18
- supporting research and development; progress summary, 7/61-11/613-AB05
- 3-AB06
- 3-AB09

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Physics (Cont'd)

- supporting research and advanced development;
 - progress summary3-AB28
- gravitating solid sphere, determination of free
 - oscillations3-C03
- supporting research and advanced development;
 - progress summary, 8/62-6/634-AB08
 - 4-AB14
 - 4-AB20
 - 4-AB26
 - 4-AB32
 - 4-AB38
- dielectric behavior of electron gas, influence of
 - correlations4-V05
- supporting research and advanced development;
 - progress summary, 8/63-4/645-AB07
 - 5-AB13
 - 5-AB19
 - 5-AB25
 - 5-AB31
- IR absorption of V_2 of liquid and solid CH_4 and CD_4 5-E05
- Landau damping and resonant energy absorption5-W10

Piers

- tilt measurement with quartz torsion fiber pendulum2-B07

Pioneer Project

- temperature control1-B202
- 3 and 4, description and experimental results1-C137
- 4, evaluation of orbit-determination program1-E012
- 3 and 5 firings, tracking and data handling1-E013
- scientific results1-H057
- 4, brochure1-J112
- 3 and 4, electronics for radiation instruments1-J147
- 4, tracking1-R055
- radiative properties of surface materials considered
 - for use1-S123
- 4, telemetering system, design and performance3-M13

Planetary Atmospheres

- bibliography1-AC31
- properties determined by molecular spectral lines3-B03
- Mars, coloring, polarimetric studies, observations,
 - 1961 data3-F07
- Mars, new upper limit to NO_2 content4-AB20
- testing equipment and processes, bibliography4-AC15
- Mars, analog investigation of nonlinear moment
 - coefficients4-B33
- Venus, preliminary model4-K01
- Venus, unsuccessful spectroscopic search for water
 - vapor and other gases4-S24
- Venus, telluric oxygen A-band5-AC09
- UV spectroscopy5-B03
- Mars entry, parametric study5-B22
- Venus, electrical properties from radar observations5-M20
- communication blackout problem for Mars-entry capsule5-S19

- chemical compositions, pressures, temperatures, and
 - velocities5-S20
- entry simulation by means of combustion5-W08

Planetary Probes

- (see also *Mariner Project, Pioneer Project, Ranger Project, Surveyor Project*)
- unmanned, with nuclear propulsion system3-B08
- spacecraft for unmanned missions3-S35

Planets

- exploration, possible objectives and engineering
 - feasibility1-H045
- supporting research and advanced development;
 - progress summary2-AB20
- JPL/NASA exploration programs, résumé2-H11
- ground-based and balloon-borne lunar-planetary
 - observation program, recommendation2-J15
- thermal state and stress history2-K08
- constants used in trajectory calculations3-C10
- thermal stress history of Moon, Mercury, Mars3-K07
- utilization of extraterrestrial resources for manned
 - flight4-AC17
- terrestrial, convection in interiors4-K08
- illumination, theoretical value vs. range and phase angle4-M16
- surface composition analysis by neutron activation4-M20
- oblate, causing perturbation of hyperbolic orbits4-S03
- terrestrial, internal constitution5-L20
- theory of origin5-L20
- ratios of mass, method of determination5-M06
- position-velocity ephemerides by special perturbations5-P01
- compositions, velocity fields, and thermal structures;
 - spectroscopic research5-S23

Plasmas

- (see also *Magnetohydrodynamics*)
- mathematical description and behavior predictions1-O025
- quantum corrections for longitudinal oscillations1-V063
- solution of collisionless Boltzmann equation1-V064
- electron-phonon interaction in metals2-V08
- influence of lattice vibrations on dielectric properties2-V10
- quantum, interaction with electromagnetic fields2-W01
- distribution function and mean energy of electrons2-W21
- calculation of electron drift velocity and kinetic energy
 - based on "collision time" approximation2-W22
- transient behavior of electrons with an impulsively
 - applied field2-Z01
- spin and exchange corrections to plasma dispersion
 - relations3-B17
- in ion propulsion systems, ion beam neutralization
 - problem3-K04
- statistical mechanics of many-electron atoms3-L11
- in a longitudinal magnetic field3-W20
- flow away from the Sun in a rotational magnetic field4-H19
- Langmuir probe measurements of the discharge in a
 - Kaufman-type ion motor4-S32
- damping of quantized longitudinal oscillations5-K10
- arc discharge in a parallel flow of argon5-S05

- Plotters**
 semiautomatic, design1-B02
 graphical, controlled by punched-paper tape1-B003
 device for identification of photographic traces.....1-S269
- Polymers**
 hydroxyl concentration in polypropylene glycols1-B184
 determination of unsaturation in polypropylene glycols...1-B186
 volumetric determination of hydroxyl in polypropylene glycols1-B189
 hydroxyl concentration in polypropylene glycols1-B191
 polyisobutylene-glass beads, mechanical properties of model-filled system1-L012
 polyurethane, dilute-solution properties and molecular-weight distribution1-M199
 mechanical-properties study1-S155
 GR-S rubber, properties dependence on strain rate and temperature1-S170
 polyurethane elastomers, composition and mechanical properties1-S173
 rapid manometric determination of water in polypropylene glycols1-T031
 solid propellant strain testing, degradation mechanisms, homogeneity3-AB01
 3-AB02
 3-AB03
 3-AB04
 4-AB01
 4-AB02
 4-AB03
 4-AB04
 5-AB01
 5-AB02
 5-AB03
 supporting research and development; progress summary3-AB09
 evaporation in space3-J02
 effects of space environment3-J03
 polyoxypropylene and polyoxyethylene glycols, molecular weights by ebulliometer and end group analysis4-H10
 electron transfer reactions and the formation of polyradicalanions4-R05
 vinyl aromatic, electrical properties5-E02
 degradation of homogeneous, exposed to high-heat fluxes...5-N01
 transient techniques for determining thermal conductivity at elevated temperatures5-N02
 undegraded and thermally degraded PPG-TDI, column-elution fractionation procedures5-R06
 graft and block copolymers of some vinyl aromatic hydrocarbons5-R08
 degradation of polyacenaphthylene-sodium complex5-R09
- Polyurethane**
 chemical modifications of polyurethane propellants1-H034
 elastomers, in rubber-to-glass transition zone.....1-L011
 resin for composite propellant binders1-M012
 processing and ballistic characteristics1-M049
 propellants, formulation and quality control1-M057
 polymer, dilute-solution, properties and molecular-weight distribution1-M199
 propellants, high performance1-N020
 physical properties, improvement1-R043
 elastomers; composition, mechanical and swelling properties; relationships1-S166
 elastines, chemical structures and mechanical properties...1-S172
 propellants; processing, physical properties, and ballistic characteristics1-W005
 volume change with tensile strain3-S39
 composite propellants, reproducibility of properties....5-C17
 JPL X600 composite propellant5-H15
 degradation of mechanical properties by irradiation doses5-S01
 normal-incidence reflective polariscope for viscoelasticity measurements5-S03
- Potassium Perchlorate**
 distribution of particle sizes1-H095
- Power Supplies**
 (see also **Batteries, Solar Cells**)
 auxiliary unit for guided missile steam boiler development1-B 85
 low-frequency generator1-B178
 heat-transfer studies1-D087
 secondary, requirements during the 1960's1-H013
 auxiliary for space probes1-H014
 hydrazine turboalternator auxiliary unit1-L055
 selection of solid-propellant power plants for ballistic rockets1-M162
 use of propellant strain analysis in evaluating solid-propellant rocket power plants.....1-T046
 for *Sergeant*, description and development program...1-T072
 stability and accuracy, performance improvement data...1-W024
 fast reactors with uranium fluoride fuel.....3-A03
 supporting research and advanced development; progress summary3-AB28
 turboelectric, optimization of condensing temperature...3-D01
 transient times in fission-electric power elements.....3-K02
 500-W solar-energy thermionic conversion systems for spacecraft3-S23
 supporting research and advanced development; progress summary, 8/62-6/634-AB08
 4-AB14
 4-AB20
 4-AB26
 4-AB32
 4-AB38
 design and performance for *Mariner Venus* 1962 spaceflight4-C21
 for *Surveyor*; design, development, operations; progress summary, 8/63-5/64.....5-AB04
 5-AB10
 5-AB16
 5-AB22
 5-AB28
 5-AB34

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Power Supplies (Cont'd)

- supporting research and advanced development, progress summary, 8/63-4/64. 5-AB07
- 5-AB13
- 5-AB19
- 5-AB25
- 5-AB31

Propellant Pumps

- generated-gas system for pumping propellants. 1-D039
- dual generated-gas system for propellants. 1-D040
- piston-type constant displacement, suitability for feeding aniline 1-V007
- for nitric acid and aniline, development. 1-V008
- power source 1-V055
- gas-drive jet pump, for rocket engines 2-E03
- thermal and capillary, for two-phase flow. 3-L07

Propellant Tanks

- Bumper Wac*, water tests of spinning scale model. 1-B075
- heated-hybrid generated gas pressurization system. 4-L013
- bladder materials, permeability to nitrogen tetroxide. 4-S26

Propellants

(see also **Binders, Liquid Propellants, Resins,**

Solid Propellants)

- ideal-gas performance calculations, corrections. 1-A041
- carbon and methane in cool flames, equilibrium formation 1-A051
- effect of local variations in mixture ratio on performance 1-A055
- specific impulse and density, relative importance. 1-C004
- effects of nonuniform burning rates on orbit attainment. 1-C042
- consumption conditions required to attain orbit, based on vertical trajectories. 1-C050
- generated-gas system for pumping. 1-D039
- dual generated-gas system for pumping. 1-D040
- dielectric heating of plastisol. 1-D050
- vinyl plastisol, development. 1-D051
- use of computers for performance calculations. 1-D069
- experimental methods for evaluating. 1-074
- composition, temperature, and thermodynamic performance parameters; method of determination. 1-H022
- heat transfer and coke deposition. 1-H029
- heat transfer to JP-3 and red fuming nitric acid, coke deposition 1-H031
- structures of dipropylene glycols. 1-H035
- comparison of liquids and solids. 1-H040
- effect of fuel sloshing on position of center of rotating missile 1-L120
- effect of density variation on rocket performance. 1-L121
- forces produced by fuel oscillations. 1-L133
- excitation of oscillations by chemical reactions. 1-L143
- ignition and combustion in laminar mixing zone. 1-M042
- heated chemical and working fluid, performance calculations 1-M095
- viscosities, measurements 1-M103
- fuming nitric acid as oxidizer. 1-M116

- properties of fuming nitric acid affecting storage and use 1-M131
- influence of specific impulse and density on rocket performance 1-M160
- high-performance polyurethane 1-N020
- composite, preparation of nitric ester plasticizers and resin intermediates for binders. 1-N034
- composite, stress-strain behavior. 1-N036
- increased performance by water injection, for use in torpedoes. 1-O021
- several combinations, selection considerations. 1-O023
- free volumes of metallic elements at their melting points. 1-P054
- impulse determinations by means of rotating system. 1-P056
- furfuryl alcohol-aniline mixtures, physical properties. 1-S006
- effect of variable density on rocket performance. 1-S105
- minimum gross weight ratio for launching trajectories. 1-S146
- mechanical property study. 1-S155
- composite, ultimate and small deformation properties. 1-S157
- chemical, performance characteristics and limitations. 1-S267
- towing channel for underwater research. 1-V056
- thermal decomposition of nitric oxide, reaction kinetics. 1-W150

- nitrogen, tetroxide-hydrazine, operational characteristics. 3-C06
- JPL 540, performance and properties in *Syncom 2*. 4-A02
- supporting research and advanced development; progress summary, 8/62-8/63 4-AB08
- 4-AB14
- 4-AB20
- 4-AB26
- 4-AB32
- 4-AB38

- polyoxypropylene and polyoxyethylene glycols, molecular weights by ebulliometry and end group analysis 4-H10
- ammonium perchlorate-polyurethane, moisture effects on mechanical properties. 4-L01
- Kaufman-type ion, probe measurements of discharge. 4-S32
- supporting research and advanced development; progress summary, 8/63-4/64. 5-AB07
- 5-AB13
- 5-AB19
- 5-AB25
- 5-AB31
- composite polyurethane, reproducibility of properties. 5-G17
- fuel containment requirements for gaseous-fuel nuclear rockets 5-M11

Propulsion Systems

(see also **Electrical—, Ion—, Liquid—, Nuclear—, Rocket Motors**)

- bibliography 1-AC32
- underwater propulsion by direct gas injection. 1-B021
- preliminary theoretical calculation, for hydrobomb. 1-C043
- based on nitrogen oxides. 1-C090
- hydroaer research and development program. 1-D081
- state-of-the-art in England and France. 1-D131
- comparison 1-G020

Propulsion Systems (Cont'd)

JPL space science seminar, 1960..... 1-J103
 for *Corporal* 1-J110
 jet and rocket, effect on engineering education..... 1-M016
 escape from Earth, performance parameters..... 1-M017
 state-of-the-art in England and France..... 1-M038
 performance calculations of working fluid and heated
 chemical propellant 1-M095
 of *Wac Corporal*; design, performance, and servicing... 1-M154
 practicality of various substances as fuels..... 1-P021
 application of near-equilibrium criteria during
 adiabatic flow 1-P053
 development for *Loki*..... 1-R096
 liquid phase mixing of a pair of impinging streams..... 1-R126
 spray characteristics and injector design parameters,
 correlation 1-R127
 containing C, H, O, N, F, performance
 calculation method 1-S082
 using atomic energy plus working fluid, feasibility..... 1-S086
 ARPA seminar 1958, JPL contributions..... 1-S159
 applied to missiles and airplanes, comparative study... 1-V051
 jet systems applied to missiles and aircraft,
 comparative study 1-V058
 dynamics and stability, effect of vehicle structure..... 1-W126
 requirements for lunar-landing vehicle..... 1-W197
 vortex containment for gaseous fission rocket..... 2-K04
 trajectories and payload capabilities, analysis..... 2-M19
 power-limited, optimum thrust programs..... 2-M20
 supporting research and development;
 progress summary 3-AB05
 3-AB06
 JPL research progress for June and July, 1961..... 3-AB07
 3-AB08
 supporting research and advanced development;
 progress summary 3-AB29
 four propulsion systems for space probe, orbiting
 and landing requirements..... 3-H04
 structural analysis 3-L05
 thermal radiation in gaseous fission reactors..... 3-M22
 optimization of payload for power-limited vehicles..... 3-M26
 secondary injectants 3-N05
 liquid, ALPS program 3-P05
 supersonic exhaust diffuser for use in testing..... 3-R11
 payload separation and thrust termination in
 solid-propellant motor 3-S16
 trajectory optimization 3-S31
 supporting research and advanced development;
 progress summary, 6/62-5/63 4-AB09
 4-AB15
 4-AB21
 4-AB27
 4-AB33
 4-AB39
Ranger 4-L11
 payload maximization by optimization of
 control variables 4-M18

liquid injection into rocket nozzles..... 4-S09
 fusion, requirements for an interstellar probe..... 4-S23
 Kaufman-type ion, probe measurements of discharge..... 3-S32
 for *Ranger* and *Surveyor*; design, development,
 operations; progress summary, 8/63-5/64..... 5-AB04
 5-AB10
 5-AB16
 5-AB22
 5-AB28
 5-AB34
 supporting research and advanced development;
 progress summary, 8/63-6/64..... 5-AB08
 5-AB14
 5-AB20
 5-AB26
 5-AB32
 5-AB37

Prospector Project

hardware development, preliminary design, and
 advanced study phases 2-AB21
 supporting research and advanced development;
 progress summary 2-AB22

Protons

fluorine-fluorine nuclear spin-spin decoupling..... 3-E08
 NMR study using a proton-proton decoupling
 technique 3-E09
 experiments to determine certain chemical shifts
 by decoupling method 3-M04
 geminal proton-proton coupling constants in
 CH₂=N—systems 5-S11

Psychology

human decision processes, general theory..... 4-B30

Quality Control

economics and logistics of throw-away modules..... 1-C095
 accuracy requirements for acceptance testing..... 1-G016
 quality assurance diode evaluation..... 3-C16

Quantum Electronics

heterodyne properties of three-level quantum system... 3-V10

Quantum Mechanics

quantum corrections for longitudinal plasma oscillations... 1-V03
 quantum formalism adapted to radiation in:
 coherent field 1-W076
 quantum theory of coupled systems..... 1-W079
 statistical mechanics of many-electron atoms 3-L11

Radar Astronomy

lunar and planetary echo theory..... 1-B152
 status of JPL radar system as of 1951..... 1-J016
 Venus, lunar radar depolarization; DSIF experiments... 3-L14
 AU determinations by Venus radar reflections..... 3-M21
 large ground antennas, DSIF, systems, parameters,
 design 3-R01
 Venus radar experiment 3-V03

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Radar Astronomy (Cont'd)

- Soviet study of Mars, Feb. 1963.....5-AC07
- application of dual-cavity maser to radar experiments.....5-H23
- Venus 1962 conjunction, radar and radiometric observations5-J11

Radiation

(see also **Solar Corpuscular—**)

- integrated extraterrestrial, photometer for measurement..1-B194
- proposed measurements from satellite.....1-J039
- of rocket-motor combustion gases.....1-O029
- effect on liquid-fuel motors.....1-P035
- emission from diatomic gases, calculations.....1-P041
- effect on performance of liquid rockets.....1-P055
- gamma, measurement; bibliography.....2-AC30
- detectors, for experiments on *Rangers 1* and 2.....2-J13
- effects on microorganisms; bibliography.....3-AC25
- effects on properties of propellants and binders.....3-G01
- thermal, configuration determination techniques.....3-H08
- effects on materials in space environments.....3-J01
- thermal, exchange in absorbing gas layer between 2 plates..3-M23
- thermal, configuration factors for spacecraft.....3-P04
- UV effects on temperature control surfaces.....4-C07
- IR, spectra of liquid and solid CO forms.....4-E10
- IR; of pure liquids in the fundamental region, temperature cell for4-E10
- gamma, flux to dose rate conversion factors.....4-S16
- gamma, least-square analysis of pulse height spectra....4-T08
- Mariner 2* IR radiometer experiment.....5-C06

Radiographic Astronomy

- bibliography1-AC18
- calibration, instruments2-S27
- radio observations of Venus, ionospheric interpretation of data5-AC06

Radio Signals

- phase stabilization to microwave frequency standards...1-D016
- optimum demodulation1-L074
- semiconductivity of organic compounds.....1-S054
- coherent detection by semiorthogonal square-wave pulse function1-T063
- modulation by random and pseudorandom sequences...1-T064
- estimating continuous-modulated intelligence corrupted by noise1-Y601
- measurements on time-variant communication channels...3-K01
- power spectra, modulated by random and pseudorandom sequences3-T03
- error-correcting codes at low signal-to-noise ratios, properties5-F23

Radiometers

- microwave, experiment for Venus.....2-J20
- planetary atmospheric properties, determination.....3-B03
- adaptability to space reconnaissance.....5-AC03
- for *Mariner 2*, description and operation.....5-C06

RAFT Project

- progress to Jan. 1, 19461-D013

Ramjets

- RAMCIT 1, wind-tunnel tests1-A023
- solid-fuel, theoretical calculations of thrust.....1-A025
- solid-fuel combustion process1-B028
- test facilities at JPL1-B155
- burners, closed duct experiments1-D032
- chemical influences in air-fuel combustion1-D056
- summary of activities at JPL1-J074
- subsonic, theoretical investigation of fuel vaporizers.....1-L080
- subsonic, theoretical results on performance.....1-L114
- limits of performance1-L117
- survey of German developments1-M180
- wind-tunnel tests and performance correlation with component tests1-S257
- estimated performance at subsonic speeds.....1-T001
- extrapolation of sea-level performance to altitude operating condition1-T002
- exhaust-gas thermo charts useful in performance analyses..1-T003
- RAMCIT 1, research and development studies.....1-T004
- estimated performance1-T005
- wind-tunnel test model1-T006
- effect of wing and power loading on ramjet-propelled aircraft1-T007
- problems of fluid mechanics in design1-T067
- combustion of air-fuel mixtures1-W032
- pilot burner devices, preliminary study.....1-W033
- unstable combustion of homogeneous propane-air mixtures1-W055

Ranger Project

- 1 and 2, scientific experiments1-J105
- 3, preliminary standard trajectory, post-injection.....1-J107
- 1, preliminary standard trajectory1-J108
- design, development, operations; progress summary, 8/60-12/602-AB19
2-AB21
- 1, environmental testing2-A022
- 1 and 2, preliminary standard trajectory.....2-D002
- structural materials2-H03
- scientific experiment plan2-H11
- 1 and 2, dust particle detectors2-J03
- 1 and 2, instrumentation for on-board experiments.....2-J13
- sensors and actuators2-S12
- development of attitude-control system2-S12
- 3, 4, and 5, lunar seismograph experiment3-A02
- design, development, operation; progress summary 8/61-2/623-AB15
3-AB16
3-AB17
3-AB18
3-AB19
3-AB20
3-AB21
3-AB22
- 1, launching and tracking; progress summary.....3-AB17
3-AB18

Ranger Project (Cont'd)

2, failure during study period, review.....3-AB19
 3-AB20
 2, launching and tracking; progress summary.....3-AB21
 3-AB22
 telecommunications, guidance, auxiliary power.....3-AB23
 3-AB24
 design, development, operations; progress summary,
 5/62-6/623-AB25
 3-AB30
 trajectory effects on photographic coverages3-C02
 research papers3-J06
 3, scientific experiments3-J07
 annual report for 1961, coverage from inception.....3-J08
 post-injection guidance3-L09
 telemetering systems for conversion of tracking data.....3-M30
 tracking and communication by DSIF3-R03
 3, 4, and 5, scientific flight and ground instrumentation...3-W02
 design, development, operations; progress summary,
 7/62-6/634-AB05
 4-AB10
 4-AB11
 4-AB16
 4-AB17
 4-AB22
 4-AB23
 4-AB28
 4-AB29
 4-AB34
 4-AB35
 4-AB40
 follow-on; mission description, experiments, components...4-D04
 4, flight-path determination from tracking data4-H01
 TV system, lighting parameters for lunar photometric
 model4-H15
 3, 4, and 5, scientific experiments.....4-J04
 midcourse trajectory-correction propulsion system.....4-L11
 1, friction measurements for materials4-R06
 solar-cell power systems testing4-Z01
 design, development, operations; progress summary,
 1/63-5/645-AB04
 5-AB09
 5-A310
 5-A315
 5-AB16
 5-AB21
 5-AB22
 5-AB27
 5-AB28
 5-AB33
 5-AB34
 5-AB38
 5, flight path, determination5-S13
 4, tracking system data analysis5-W06

Ranging Devices

precision real-time continuous measuring3-E01
 Earth-based digital equipment to control flight and
 ground portions4-B13
 Mod 2, feasibility of real-time precision measurements
 at planetary distances4-B13
 skin tracking, experiment with *Echo* and *Courier*.....4-E01
 continuous coded ranging scheme, analysis.....5-T14

Reactors

(see also **Nuclear—**)
 multigroup diffusion with periodic arrays of line sources...2-E07
 efficiency of fission electric cells.....2-H09
 gaseous fission, performance potential.....2-M12
 gas-phase, performance potential.....2-M14
 gaseous fission, for booster propulsion.....2-M15
 gaseous propulsion, feasibility2-M16
 employing uranium fluoride fuels.....3-A03
 space, comparison of fission electric cell geometries.....3-H07
 gaseous fission for propulsion, thermal radiation.....3-M22
 plasma core, thermal and criticality analysis.....3-S33
 fission-fragment energy loss from vortex tubes, analysis...3-S47
 vortex and cooling tubes design parameters.....3-S43
 35-kwe *Snap-8* satellite testcraft, preliminary design...3-W17

Receivers

RBF-3, design of adapter unit.....1-C126
 RBF-3, operation improvements1-D017
 new class of discriminators.....1-S234
 Rician fading multichannel reception of binary and
 N-ary signals, error probability.....5-L14
 nonlinear and linear multireceiver, comparison5-L15
 error-correcting codes at low signal-to-noise
 ratios, properties5-P23

Recording Systems

magnetic tape transcriber.....1-L039
 for rocket-motor tests.....1-S272

Re-entry Vehicles

proposed RTU-G-2, scale-model test flights.....1-B176
 equations of motion of a coasting tumbling rocket.....1-D048
 test vehicle, development of high-speed stages.....1-H039
 preliminary study of aerodynamic heating.....1-L157
 ORDCIT RTU-G-2, field-test summary of Round 5.....1-M159
 aerodynamic characteristics, effects of carbon dioxide...5-J04

Reflectors

parabolic, determination of radiation configuration
 factors3-H08
 parabolic, radiation-field computation3-R13
 hyperbolic, scattered-field calculation by integrating
 the surface current density over front.....4-R18
 spherical wave scattering by an arbitrary truncated
 surface of revolution4-R19

Relativity Theory

perturbation techniques and nonlinear mechanics.....1-C027
 accelerating frames of reference and clock paradox.....4-L06

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Reliability

- of redundant systems1-G009
- accuracy requirements for acceptance testing.....1-G016
- versus weight in spacecraft design.....3-A04
- nuclear-electric spacecraft for unmanned planetary missions3-S35
- analysis based upon criteria of partial success.....4-B27
- complex systems, analysis based on partial success.....4-B27
- of *Surveyor* systems, analysis and testing.....5-AB04
5-AB10
5-AB16
5-AB22
5-AB28
5-AB34
- requirements for space exploration instruments.....5-H22
- Mariner B* telecommunication systems.....5-T01

Rendezvous

- lunar-surface, analysis3-B18
- optimum interplanetary trajectories with power-limited vehicle3-M25

Reports

- form and style manual.....1-N013
- automatic distribution methods at JPL.....4-L19

Research and Development Programs

- JPL portion of NASA program.....1-B048
- JPL ordnance research, Jan. 1955-Dec. 1956.....1-J044
- JPL research and development activities.....1-J046
- JPL ordnance research, Jan. 1957-Dec. 1958.....1-J052
- JPL 10-year supporting research program.....1-J059
1-J065
- JPL, 1939-19401-M024
- JPL ordnance research, Jun. 1953-Dec. 1954.....1-P091
- JPL ordnance research, 1945-1953.....1-S087
- JPL facilities as of 1941.....1-V053
- supporting research and advanced development; progress summary, 6/62-6/63.....3-AB30
4-AB10
4-AB16
4-AB22
4-AB28
4-AB34
4-AB40
5-AB08
5-AB09
5-AB14
5-AB15
5-AB20
5-AB21
5-AB26
5-AB27
5-AB32
5-AB33
5-AB37
5-AB38

Research Facilities

- JPL research and development, 1946.....1-J091
- analysis of existing JPL facilities, 1950.....1-J093
- analysis of future JPL facilities.....1-J095
- ordnance construction program at JPL facilities, Fiscal Year 19531-J096
1-J097
- specifications for additions and alterations of JPL facilities1-J098
- ordnance construction program at JPL facilities, Fiscal Year 19541-J099
- JPL, description1-S106
1-V054

Resins

- relatively fast-burning epoxide, development.....1-H011
- intermediates, synthesis by reactions with ethylene oxide..1-I005
- mechanical property investigations; JPL, 1954-1955.....1-J025
- factors affecting formation and deposition on heat-exchanger walls1-M110
- intermediates, synthesis by reactions with ethylene oxide..1-N032
- preparation of nitric ester plasticizers and resin intermediates for composite propellants....1-N034
- application of casting, control of chemical and physical factors1-N044
- composite and rubberlike, mechanical properties.....1-S154
- viscoelastic properties1-S164
- tensile testing with instron tester.....1-S165
- glassbead-polyvinyl chloride elastomeric composites, volume changes and dewetting1-S168
- low-modulus birefringent5-S02

Resonance Tubes

- in a supersonic flow field.....4-V06

Resonators

- magnetostrictive, operating principles and design criteria1-W142

Rocket Motors

- photographic technique to study combustion.....1-A014
- effect of local variations in mixture ratio on performance..1-A055
- experimental investigation of gaseous hydrogen and LOX.....1-B011
- regenerative cooling tests, using liquid hydrogen and LOX.....1-B012
- combustion chambers; mixture ratio and temperature surveys of ammonia-oxygen.....1-B013
- ammonia-oxygen, combustion studies1-B015
- combustion chambers: method for radial temperature surveys1-B015
1-B016
- combustion chambers; mixture ratio and temperature surveys of ammonia-oxygen1-B017
- mixing high-temperature jet with air in cylindrical duct...1-B029
- liners to be used with asphalt-base solid propellant....1-B036
- using storable and liquid propellants, heat-transfer and cooling1-B046

Rocket Motors (Cont'd)

- structural dynamic properties of liquid propellant..... 3-L05
- strain testing 3-L16
- combustion chambers; brazed rib stainless steel and
inconel, regeneratively cooled, liquid propellant..... 3-N09
- static testing, application of vibration data..... 3-T05
- supporting research and advanced development;
progress summary 8/62-6/63 4-AB09
4-AB15
4-AB21
4-AB27
4-AB33
4-AB39
- testing with supersonic exhaust diffusers..... 4-M13
- local transient heat flux, method of determination..... 4-F15
- thrust vector control by liquid injection into nozzles..... 4-S09
- solid-propellant, for large payload space missions..... 4-S33
- local heat-transfer rates using convergent-divergent
nozzles of two different geometries..... 4-W10
- Syncom 1*; design, development, performance, and
applications 5-A07
- nondestructive testing of solid-propellant..... 5-AB01
5-AB02
5-AB03
- supporting research and advanced development;
progress summary, 8/63-6/64 5-AB08
5-AB14
5-AB20
5-AB26
5-AB32
5-AB37
- storable liquid propellant, comparative merits
of materials 5-R24
- combustion chambers; monopropellant hydrazine, effects
of fuel inlet temperature on performance..... 5-W08

Rockets

- (see also Missiles)
- investigation of stratosphere, a translation..... 1-AC37
- relative importance of specific impulse and
propellant density 1-C004
- vertical flight performance and horizontal range estimate..... 1-C048
- Private F*, flight characteristics..... 1-C049
- trajectories, computations 1-C053
- stability considerations 1-F045
- unguided antiaircraft, aerodynamic design problems..... 1-F101
- Private A*, firing tests..... 1-G047
1-G048
- RAFT, firing tests 1-G049
- solid-propellant feasibility 1-J080
- Private A*, exterior ballistics..... 1-L093
- RAFT, firing tests 1-L158
- sounding, flight analysis 1-M031
- Private A*, thrust and inertial characteristics..... 1-M191
1-M192
- vertical sounding, performance 1-M212
- manual, view 1-R056

- Private A*; design features, booster, and launcher..... 1-S045
1-S046
- physics of 1-S099
- in-flight measurement of X-band attenuation and
phase jitter 1-S197
- sounding, propulsion by successive impulses..... 1-T070

Rubber

- GR-S, strain rate and temperature, dependence
of ultimate properties 1-S167
- stress relaxation at large strains..... 2-L03
- properties, time and temperature dependence
at constant elongations 2-S13

Satellites

- (see also *Mariner Project*, *Ranger Project*, *Spacecraft*,
Surrey Project)
- USSR research, translation 1-AC38
- propellant consumption required to attain
orbital velocity 1-C042
- preliminary performance calculations 1-C047
- propellant consumption conditions required
for orbit attainment 1-C050
- elliptical orbital motion in vacuum and influence
of air resistance 1-C052
- equipment in orbiting missile, temperature control..... 1-R050
- high-velocity stages of minimum orbiting missile,
feasibility study 1-J024
- preliminary study, 1956 1-J038
- proposed measurements of cosmic light and radiation... 1-J039
- feasibility study 1-J042
- final report on project ESP-27..... 1-J058
- equations of motion, for an oblate-spheroidal
rotating Earth 1-K001
- of Moon, motion 1-L027
- motion about unsymmetrical body..... 1-L029
- attitude control 1-N050
- motions, implied from radio signal strength..... 1-P125
- Soviet program 1-R034
- and missiles, discussion 1-R035
- radio instrumentation, feasibility study
for minimum weight 1-S041
- performance studies for high-altitude orbiting missile... 1-S221
- engineering of experiments 1-V038
- fourth Soviet spaceship-satellite 2-AC38
- motion under influence of constant normal thrust..... 2-L06
- ground tracking equipment 3-V04
- temperature control of nuclear-electric spacecraft..... 3-V04
- 35-kwe *Snay-5* satellite testcraft, preliminary design... 3-W17
- artificial lunar, behavior and orbit determination..... 4-G02
- libration point, objectives and feasibility..... 5-K11
- Saturn Project**
propulsion systems for space probes, orbiting
and landing requirements 3-H04
- C-3 rendezvous technique and *Nova* direct approach,
interrelationships 3-L09

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Seismometers

- lunar experiment 1-P152
- experiment in *Rangers 3, 4, 5* 3-A02
- observation of lunar properties 4-K10

Semiconductors

(see also **Thin Films**)

- applications to microelectronics 2-M06
- organic, properties and applications 3-AC26

Sensors

- inertial 1-S140
- optical; trade-off on sensitivity, accuracy,
and field of view 3-S17

Sergeant Project

- high-accuracy telemetry for weapons system 1-A052
- supporting research and development
 - progress summary 1-AB03
 - preliminary design and analysis of warhead 1-B078
 - modification of maintenance concept for optimum
 - allocation of capabilities 1-F033
 - testing, maintenance and supply 1-G051
 - instrumentation to support integrated weapon-system
 - development 1-J013
 - testing, maintenance, and supply philosophy 1-J014
 - sustainer 1-J027
 - Loki* booster, Phase 2 1-J028
 - scale motor 1-J032
 - warhead meeting; JPL, 1955 1-J033
 - surface-to-surface guided missile system 1-J077
 - utilizing inertial guidance 1-J078
 - in tactical use 1-J079
 - engineering model 1-J088
 - annual report, 1956 1-J113
 - 1957 1-J114
 - 1958 1-J115
 - guidance test station 1-K038
 - scale-model and full-size motors, comparison
 - of ballistic properties 1-L015
 - effect of tilt on polarization of three-phase antenna 1-L062
 - model test program, maintenance support plan 1-L076
 - rocket motor, laboratory and scale-motor tests,
 - surveillance characteristics 1-L090
 - flutter characteristics of tail surfaces 1-L130
 - percussion ignition system 1-M047
 - sustainer, design 477 1-P084
 - accuracy requirements 1-P130
 - instrumentation on-board and GSE 1-R058
 - creep failure in motor 1-R090
 - motor jet vanes 1-R099
 - firing test program 1-S037
 - 1-S038
 - weapons system maintenance concept 1-S039
 - Standard-8 Trajectory program for IBM 704 1-S067
 - sustainer, design 500 1-S070

- final 500 design motor characteristics 1-S071
 - 1-S072
 - 1-S073
- measured vibration environment 1-S122
- system description 1-S240
- alleviation of aerodynamically induced vibration 1-T060
- battery, description and development program 1-T072
- supporting research and development,
 - progress summary 2-AB01
 - development and recommendations for
 - follow-on activities 2-J09
 - vulnerability to battlefield surveillance, test program 2-S02
 - foresection container design 2-S07
 - "brute force" trajectory program for the
 - IBM 704 computer 2-S08

Servomechanisms

- servomultiplier error study 1-B162
- vibration exciter 1-L040
- position control system with incremental motor 3-N07

Shear Layers

- horizontal heterogeneous, in a vertical magnetic
field of constant magnitude 4-M19

Shells

- supersonic lift and moment characteristics 1-L095
- superconducting, magnetic fields 2-AB17
- short-tapered conical, analysis 2-R01
- thin, axisymmetric shallow loading 2-W09
- pressurized, effect of rigid inserts 2-W10
- supported at isolated points 2-W11
- of revolution, approximate solution for
 - stress and deflections 2-W12
- shallow, influence coefficients 2-W13
- of revolution; axisymmetric pressure loading,
 - approximate membrane solution 2-W14
- of revolution, approximate solution for stress and
deflection in tapered shells 3-W14
- parabolic, thermoelastic analysis 5-S27
- thin spherical, exact solutions of axisymmetric
 - bending problem 5-W03
- geometrically nonlinear theory, formulation 5-W04

Shock Tubes

- for pressure-gage performance, schlieren evaluation 1-H032
- for pressure-gage performance studies 1-W178
 - 1-W179
- JPL facility development 4-C17
- constant-area, theoretical noble-gas performance 5-M13
- free-piston driver; methods of control and design
 - optimization, theoretical study 5-R13

Shock Waves

- detached, due to supersonic motion of blunt bodies 1-A024
- two-dimensional detached 1-A026
- exhaust of 50-lb thrust motor, measurements 1-A043
- effect on a burning solid propellant 1-L022
- stability of plane deflagration wave 1-M164

Shock Waves (Cont'd)

- excitation of electron oscillations2-AC34
- solution of the complete Bhatnagar-Gross-Krook kinetic equation by numerical techniques4-C09
- plane, structure and mathematical analysis4-L16
- structure, in Krook collision model5-C03
- oblique angle chart for a perfect gas5-L17

Silicon Compounds

- synthesis and new compounds for silanes5-K09

Simulation

- of complex-wave and wave-vibration1-B123
- of missile flights on digital computer1-C026
- of missile flights on differential analyzer1-C131
- of large-amplitude nonlinearities in engineering systems1-C003
- hypervelocity flight, test facility development1-H005
- interpretative digital-computer routine simulating differential-analyzer1-L081
- perception, learning, and decision making; bibliography2-AC27
2-AC31
- lunar material in air and vacuum, thermal properties4-B15
- lunar surface, bearing capacity in vacuum5-B07
- of major elements of a two-loop nuclear turboplant concept5-D02
- of planetary entry by means of combustion5-W08

Snap Project

- thermoelectric generator, evaluation for spacecraft secondary power2-M23
- reactor and power conversion system, use with ion motor2-S10
- test methods3-B06
- 8, propulsion systems analysis3-S31
- 35-kwe Snap-8 satellite testcraft, preliminary design3-W17

Soil

- lunar and planetary; testing equipment and processes, bibliography4-AC15
- involving current aspects of space science4-C02
- microflora of desert soil ecosystems4-C02
- microflora of desert regions; autoclave colorimetric method for organic matter determination4-C03

Solar Cells

- method for predicting current and degradation in space3-Z01
- power system tests for Ranger and Mariner4-Z01
- Mariner 2, solar-panel design and flight performance5-Z01

Solar Converters

(see Converters)

Solar Corpuscular Radiation

- effect of lunar surface on luminescence2-AC35
- preliminary results from Mariner 2 experiment4-N03
- measuring devices5-J16
- Mariner 2 data5-S15
- velocity, correlation with cosmic-ray variations and solar and geomagnetic activity5-S15

Solar Flares

- effects on plastics and elastomers3-J03

Solid Propellants

- smokeless JPL 3101-A007
- ramjets, theoretical thrust calculations1-A025
- ignition1-A037
- thermodynamic study of potassium and sulfur compounds1-A042
- thermal diffusivities, method and theory of measurement1-A053
- thermal history of initiator by hot wires1-A069
- combustion as applied to ramjets1-B028
- applicability to high-performance rockets1-B032
- polysulfide-rubber; preparation, properties, and internal-ballistic characteristics1-B034
- polysulfide-rubber fuel charges, temperature limits for internal burning1-B035
- rubber-base Ordet 21, preliminary investigation1-B037
- restricted-burning wrapped charges of Galcit 651-B038
- neoprene-potassium perchlorate restricted-burning1-B039
- polysulfide-rubber fuel base, development1-B040
- polysulfide-rubber fuel, containing no plasticizers1-B041
- burning characteristics1-B042
- photography of burning strands1-B120
- experimental investigation of unstable combustion, Part I1-B156
- evaluation of oxidizers1-B182
1-B183
- determination of calcium and magnesium in perchlorates1-B183
- determination of water in ammonium nitrate, Karl Fischer method evaluated1-B187
- underwater testing of jet units1-C008
- burning rates, using closed bomb1-C096
- torsion testing1-D074
- survey of research status1-D083
- restricted burning motors, design limitations imposed1-E003
- composite, compilation of performance calculations1-F009
- ammonium nitrate as oxidizer and methoxyethyl acrylate as binder1-H008
- burning characteristics of ammonium nitrate1-H009
- ammonium nitrate as oxidizer and methoxyethyl acrylate as resin binder1-H010
- chemical modifications of polyurethane propellants1-H034
- asphalt-base; penetration and specific weight, method of determination1-H090
- vacuum-mixed asphalt base, physical properties1-H091
- addition of azide ion to epoxides1-I003
- high-performance polyglycidyl nitrate-polyurethane1-I004
- weight-fraction importance of condensables in exhaust1-I008
- rocket survey at JPL, 19541-J022
- mechanical property investigations: JPL, 1954-19551-J025
- JPL research and development capabilities1-J049
- summary of activities at JPL1-J074
- ignition studies on restricted-burning jet motors1-J119
- cartridge-type restricted-burning charges1-J120
- igniters for ammonium nitrate1-J128
- ammonium nitrate smokeless, development1-J132
- ammonium nitrate, burning characteristics1-J132

Solid Propellants (Cont'd)

- nondestructive testing of solid-propellant rocket motors;
 - progress summary 5-AB01
 - 5-AB02
 - 5-AB03
- JPL X600 polyurethane, development 5-H15
- degradation of mechanical properties by irradiation doses... 5-S01
- inflated cylinder test via continuous-media theory 5-S04

Solid Propulsion Systems

- comparative performance for boosters and rockets..... 1-D037
- discussion 1-S121
- staging for spacecraft retardation 2-A03
- nondestructive testing of solid-propellant rocket motors;
 - progress summary 2-AB02
 - 2-AB03
 - 2-AB04
- supporting research and development; progress
 - summary, 8/60-2/61 2-AB07
 - 2-AB13
 - 2-AB17
- approximate stored energy function for elastomers..... 2-AB10
- stress and strain, mathematical analysis..... 2-AB14
- review of capabilities 2-G05
- corabustion efficiency 2-R03
- nondestructive testing of solid-propellant rocket
 - motors; progress 3-AB04
 - solid propellant for *Nova* 3-J12
 - strain testing, pressurization rate and level effects,
 - deformation 3-L16
 - payload separation and thrust termination in solid-
 - propellant motor 3-S18
 - static firings for vibration tests 3-T05
 - design for low-pressure operation, requirements 5-A02

Sound

- velocity in liquid propellants..... 1-W115

Space Flight Operations Facility

- basic objectives; analysis of requirements; development
 - plan; facility utilization 4-AB54
- data processing system; hardware; central computing
 - complex; telemetry processing system; data control
 - and display 4-AB34
- facility general layout; functional composition of initial
 - configuration; DSIF control room 4-AB34
- functional considerations: operational, technical,
 - functional relationships 4-AB34
- IBM 7040 system, IBM 7094 system; data control
 - system 4-AB34
- industrial design; human factors development analysis;
 - personnel system development; information
 - coordination 4-AB34
- mission status board; technical area displays; command
 - and control displays 4-AB34
- subsystems; teletype switching; operational voice
 - communication: closed circuit TV; recording;
 - Goldstone microwave 4-AB34

- data processing and display system; spacecraft
 - performance analysis area 4-AB40
- PERT system, scheduling 4-AB40

Space Research

- translation from *Pravda* 1-AC34
- translation from *Izvestia* 1-AC35
- Russian newspaper articles, translation..... 1-AC39
- Russian discoveries, translation 1-AC40
- JPL portion of NASA program 1-B048
- state-of-the-art in Europe, 1946 1-D089
- European activities, 1951 1-D:32
- European activities, 1953 1-D133
- JPL, ordnance research, Jan. 1955-Dec. 1956..... 1-J044
- JPL research and development activities..... 1-J046
- JPL, ordnance research, Jan. 1957-Dec. 1958..... 1-J052
- JPL 10-year supporting research program..... 1-J059
- 1-J065
- JPL, summary of activities as of Feb. 1951..... 1-J072
- JPL research and development, 1946..... 1-J031
- JPL space science seminar, 1960..... 1-J103
- 1-J104
- JPL, organization and facilities..... 1-M023
- Galcit rocket research group, plans and progress..... 1-M033
- JPL, summary of propellant research..... 1-M153
- JPL, ordnance research, Jun. 1953-Dec. 1954..... 1-P091
- JPL, ordnance research, 1945-1953..... 1-S087
- manned space-flight capability for engineering research..... 1-S233
- JPL research and development activities..... 2-AB23
- supporting research and advanced development;
 - progress summary, 4/61-6/61 2-AB24
 - 2-AB25
 - 2-AB26
- JPL lunar and planetary exploration plans..... 2-J07
- information in support of JPL operating budget..... 2-J08
- function of design in advanced technology industry..... 4-S06

Spacecraft

- (see also *Mariner Project, Ranger Project, Satellites, Surveyor; Project*)
- environmental design 1-C098
- attitude control 1-G018
- secondary power requirements during the 1960's..... 1-H013
- fundamental flight dynamics and staging..... 1-H059
- environment via 1-mw oscillators..... 1-R062
- engineering of satellite experiments..... 1-V038
- lunar and planetary, review..... 2-C07
- propulsion maneuver for lunar and planetary
 - exploration 2-G04
- instrument calibration and system test problems..... 2-H08
- injection guidance and control aspects..... 2-J16
- attitude control 2-S12
- propulsion and power requirements for planetary
 - missions 2-S20
- miniature camera for space probe instrumentation..... 2-S32
- analysis of radio-command midcourse guidance..... 2-W06
- weight versus design reliability..... 3-A04

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Spacecraft (Cont'd)

- nuclear-electric, instrumentation for
 - engineering evaluation 3-A05
 - electrically propelled, bibliography 3-AC29
 - nuclear-electric, conceptual design studies 3-B05
 - 300-kwe-powered spacebus for planetary missions 3-B07
 - constraints on telemetering system design by
 - various parameters 3-M17
 - optimization of payload for power-limited vehicles 3-M26
 - thermal radiation configuration factors 3-P04
 - optical sensors 3-S17
 - Mariner B* propelled-capsule study 3-S20
 - 500-w solar-energy thermionic conversion system 3-S23
 - forced flexural motion including fuel slosh and engine
 - nozzle rotation 4-A03
 - model construction for aeroelasticity tests, bibliography 4-AC14
 - hardware and associated problems confronting
 - the engine 4-AC16
 - mechanical design, 1962 conference 4-AC16
 - nuclear-electric, for unmanned exploration
 - of solar system 4-B14
 - systems reliability analysis based on partial success 4-B27
 - reliability analysis for complex systems 4-B27
 - mechanism for limited parallel motion 4-D06
 - sterilization of unmanned lunar and planetary vehicles 4-J01
 - static power converters, characteristics and problems 4-K06
 - tracking techniques 4-M14
 - payload optimization for power-limited vehicles 4-M18
 - launching of three vehicles from two pads,
 - statistical analysis, Part I 4-S18
 - Part II 4-S19
 - Part III 4-S20
 - interstellar probes, fusion propulsion
 - system requirements 4-S23
 - command techniques for remote control 4-S25
 - look-angle problem, a design solution 4-W09
 - for Mars fly-by 5-G01
 - temperature control surfaces, hemispherical
 - emittance measurement 5-H01
 - thermal-scale modeling techniques 5-V02

Spectral Analyses

- analyzer for combustion stability studies 1-S273
- 5577-A airglow emission mechanism 2-B0
- spectrum analyzer, for data reduction 2-H17
- general theory of collision-broadening 2-V09
- NMR spectrum of chlorobutadiene, double resonance
 - study 3-M05
- UV, laboratory spectra of oxygen airglow 4-B08
- IR, of liquid and solid CO foams 4-E10
- IR, spectra of pure liquids in the fundamental region;
 - low-temperature cell 4-E10
- new radar technique for estimation of Venus 4-G07
- tunable-high-stability microwave oscillator 4-P17
- IR emission spectra of organic solids 5-H25
- of Mars 5-K03

Spectrometers

- R-F mass, operational characteristics 1-B112
- R-F, for analysis of gas mixtures 1-K016
- improved R-F, and method for interpreting data 1-K017
- for gas analysis in visible region 1-M197
- for studies of low-pressure combustion flame 1-P043
- Perkin-Elmer IR, improvement 1-W019
- R-F mass, design and operation 3-AC33

Spectroscopy

- research on major planets 5-S23

Spin-Stabilized Rockets

- column stability against buckling 1-L138
- dynamic effects of spin on thrust misalignment due to
 - elastic deformation 1-S189

Sputnik Project

- modulation patterns 1-Bi53
- 10, Soviet news coverage of flight 2-AC38

Steel

- stainless, gold plating 1-B061
- porous stainless, permeability distribution 1-C018
- porous stainless, for sweat-cooling rocket motors 1-D092
- stainless; by powder metallurgy, fatigue properties 1-D093
- stainless, resistance to fluid flow 1-G094
- temperability, method of calculation 1-J003
- temperability 1-J010
- SAE 4340, fracture toughness 2-G02
- tensile properties under high-heating rate and constant
 - temperature 3-G04
- stainless; brazed-rib combustion chamber, regeneratively
 - cooled 3-N09

Sterilization

- to prevent extraterrestrial biological contamination 1-D015
- analyzing ethylene oxide content in sterilizing gas
 - mixtures 2-V01
- effects of agents on microorganisms, bibliography 4-AC13
- unmanned planetary and lunar vehicles 4-J01
- effect of ultra-high vacuum on *Bacillus subtilis* var.
 - niger* 4-M25

Stress Analysis

- GR-S rubber, dependence of ultimate properties on
 - strain and temperature 1-S167
- stress relaxation of SBR rubber at large strains 2-L03
- shells of revolution 2-W12
- approximate membrane solution for thin shells of
 - revolution 2-W14
- nondestructive testing of solid-propellant motors,
 - progress research 3-AB01
 - 3-AB02
 - 3-AB03
 - 3-AB04
- of a growing crack, photoelastic coating method 3-G03
- crushing of hexagonal structures 3-M01
- of propellant grains by photoelastic techniques 3-S03
- quasi-cylindrical shells, stresses and deflections 3-W14

Stress Analysis (Cont'd)

- Irwin's fracture toughness equations, theoretical limits...4-G05
- strain energy function W , experimental measurement...4-S02
- of thin spherical shell loaded as a cantilever beam...4-W06
- edge influence coefficients for cylinders with linearly
varying wall thickness...4-W11
- dynamic analysis of systems by component mode
synthesis...5-H27

Structures

- crystal, metal whiskers, and microwires; comparison...1-S127
- containing propellant feed tanks, dynamic response
of propellant compressibility...1-W121
- effect on combustion stability of liquid-propellant
rockets...1-W122
- vehicle, effect on propulsion system dynamics and
stability...1-W126
- sheet-material compression properties, testing...2-B10
- stiffness matrix computer program...3-B04
- gravitating solid sphere, determination of free
oscillations...3-C03
- configurations of superconducting shells...3-H10
- structural dynamic properties of liquid-propellant engine...3-L05
- crushing stress of hexagons...3-M01
- rings, mathematical analysis...3-M20
- quasi-cylindrical shells, stresses and deflections...3-W14
- free vibrations with nondiagonal symmetric mass matrix...4-B04
- gravitating solid sphere, free spheroidal oscillations...4-C05
- gravitating solid sphere, free oscillations determined
by Frobenius series...4-C06
- rings, modal characteristics of nonuniform thin circular...4-L02
- rings, modal characteristics of nonuniform thin circular,
with additional boundary condition...4-L03
- rings, solutions for modal characteristics and forced
excitation of thin circular...4-L04
- rings, modal functions and eigenvalues of constrained
semicircular...4-L05
- lattice parameters calculated by 7090 program...4-L15
- strain energy function W , experimental measurement...4-S02
- shells; stress analysis of thin spherical, loaded as
a cantilever beam...4-W06
- cylinders with linearly varying wall thickness, edge
influence coefficients...4-W11
- partial mathematical solution of three-dimensional
four-bar linkage...5-C05
- transformation in pyrolytic carbons...5-F01
- dynamic analysis of systems by component mode
synthesis...5-H27

Supersonic Wind Tunnels

- graphical plotters...1-B003
- multipressure measuring system...1-B004
- use of force measuring system...1-B177
- maximum model size, method of prediction...1-D024
- blocking...1-D025
- prediction of blocking, during attempted start...1-D026

- tests of two rocket-propelled projectile models...1-F050
- calibration of flexible-plate nozzle...1-G062
- method for calibration...1-G063
- two-dimensional adjustable inlet, development...1-G112
- adjustable inlet, development...1-G113
- heat addition in supersonic channeled flow...1-H001
- data accumulation equipment...1-H110
- experiments on spheres, disks, and blunted cones...1-K019
- tests on $1/16$ -scale model of shore-to-ship guided missile...1-K021
- transition Reynolds-number measurements on insulated
cones and flat plates...1-L045
- aerodynamic noise in tunnel, hot-wire measurements...1-L048
- factors affecting transition Reynolds numbers on
models...1-L049
- aerodynamic noise...1-L053
- tests of fin-stabilized projectile, comparison...1-L159
- fixing boundary-layer transition on models...1-L160
- models, fixing boundary-layer transition...1-L161
- 1-L162
- JPL 12-in., performance...1-P164
- and compressor plant, performance...1-P166
- functions of Prandtl-Meyer angle for design...1-R063
- two-dimensional, flexible-plate nozzle design...1-R065
- tests of welded pipe fittings...1-S048
- resonance-tube experiments...1-S132
- test and performance of air compressors...1-S276
- with low free-stream disturbances...1-V073
- BH-6 flashlamp system...1-W022
- data processing systems...1-W028
- paper-tape storage media for wind-tunnel data
reduction...1-W031
- tests in 20-in...2-AB14
- development...2-AB17
- low-density, sphere drag measurements...2-W02
- continuous-flow multigas facilities with CO_2 as
contaminant...4-K07
- resonance-tube experiments...4-V06
- boundary layer thicknesses on curved walls,
calculations...5-D03

Surveyor Project

- design, development, operations; progress summary,
12/60-6/62...2-AB21
- 2-AB22
- 3-AB15
- 3-AB16
- 3-AB20
- 3-AB21
- 3-AB22
- 3-AB24
- 3-AB25
- 3-AB30
- bus as *Centaur* third stage for *Advent* mission...3-C12
- design and performance, feasibility study...3-J13
- elevated television experiment...3-R02

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Surveyor Project (Cont'd)

design, development, operations; progress summary,
 5/62-6/63 4-AB05
 4-AB10
 4-AB11
 4-AB16
 4-AB17
 4-AB22
 4-AB23
 4-AB28
 4-AB29
 4-AB34
 4-AB35
 4-AB40

direct-ascent vs. parking-orbit trajectory 4-C03
 design, development, operations; progress summary
 7/63-5/64 5-AB04

5-AB09
 5-AB10
 5-AB15
 5-AB16
 5-AB21
 5-AB22
 5-AB27
 5-AB28
 5-AB33
 5-AB34
 5-AB38

alpha-scattering experiment, data interpretation 5-L18
 development of gas chromatograph; design, packaging,
 and thermal control 5-W02

Syncom Project

research and development; progress summary 3-AB29
 2 performance of IPL 540 propellant 4-A02
 research and development; progress summary,
 8/62-6/63 4-AB09

4-AB15
 4-AB21
 4-AB27
 4-AB33
 4-AB39

I, igniter: quib development 4-C20
 research and development; progress summary,
 8/63-5/64 5-AB06

5-AB14
 5-AB20
 5-AB26
 5-AB32
 5-AB37

design, development, performance and applications
 of *Apogee* rocket motor 5-A07

Teflon

tests of sleeve bearings made of DU material 3-N10
 tests of permeability to nitrogen tetroxide and hydrazine 3-V02

Tektites

formation due to cometary mechanism 4-L21

Telemetry

high-accuracy, for *Sergeant* weapons system 1-A082
 adapter unit for RBF-3 receiver 1-C126
Wac Corporal nose equipment 1-C127
 RBF-3 receivers, operation improvements 1-D017
 FM-FM, use of magnetic wire recorder 1-D018
 FM-FM, ground equipment 1-D019
 threshold improvement and error reduction, application
 of discriminators 1-G040
 application of phase-locked loops 1-G041
 site checkouts for stations 1-H024
 application of transistors, development and
 design criteria 1-J082
 ground receiving station 1-K029
 eighteen-channel research and development
 type, for missiles 1-K041
 1-K042
 application of audio oscillator 1-L060
 FM-FM, effect of noise 1-L064
 use of transistor-oscillator 1-L065
 expected number of axis crossings by linearly
 increasing function plus noise 1-L072
 coherent minimum-power 1-M086
 high-accuracy FM-FM 1-M176
 gage for pressure measurements, performance
 characteristics 1-N009
 for *Corporal* 1-N011
 in rockets 1-N012
 and control for *Corporal E* 1-P092
 transistorized, as "watch dog" on missile performance 1-R057
 transistors 1-R059
 temperature stable transistor VCO 1-R060
 transistorized, observations of guided missile
 performance 1-R061
 low-speed time-multiplexing, design 2-M24
 coherent synchronous sampled data, analysis 2-V07
 for *Ranger*, *Mariner*, *Surveyor* 3-AB24
 minimum power; for lunar missions, design
 parameters 3-C07
Pioneer 4 design and performance 3-M13
 engineering constraints affecting design 3-M17
 format conversion of *Ranger* tracking data 3-M30
 1962 National Telemetry Conference, JPL contributions 3-R05
 effects of code synchronization 3-S45
 spectral distribution of signals 3-T03
 high-speed low-cost printer system; design and
 operation 5-N09

Telescopes

microwave radio reflector 3-AC31
 diffraction, application in space 3-W11

Television Systems

vidicon and tape recorder system for *Juno 2B* 1-A083

Television Systems (Cont'd)

equipment and techniques adaptable to space,
 bibliography 1-AC25
 for deep space, design techniques 1-V041
 on *Ranger*; design, development, operations; progress
 summary 3-AB24
 equipment, elevated system for *Surveyor* 3-R02
Ranger TV subsystem; environmental testing 4-AB05
 4-AB11
 4-AB17
 4-AB23
Ranger TV subsystem; analysis; structure; GSE;
 thermal control 4-AB05
 4-AB11
 4-AB17
 4-AB23
 4-AB29
 4-AB35
Ranger TV subsystem; mechanical integration 4-AB35
 digital data storage and processing systems for *Mariner* 4-G01
Ranger, lighting parameters for lunar photometric model 4-H15
 for Mars geological survey 4-M03
 application of A-D converter and sync generator 5-A01
 supporting research and advanced development;
 progress summary, 7/63-5/64 5-AB09
 5-AB15
 5-AB21
 5-AB27
 5-AB33
 5-AB38
Ranger Block III, development, testing 5-AB04
 5-AB10
 5-AB16
 5-AB22
 5-AB28
 5-AB34
 adaptability to space reconnaissance 5-AC03
 iris requirements for lunar approach camera 5-M18

Temperature Control

hydrogen gas as coolant for LOX propulsion system,
 advantages 1-A046
 chemical processes to achieve high temperatures 1-A075
 regenerative cooling tests, using liquid hydrogen
 and LOX 1-B012
 hydrazine as regenerative coolant 1-B045
 heat transfer and cooling of rocket engines 1-B046
 liquid propellants as regenerative coolants suitability 1-B051
 1-B059
 1-B060
 film cooling of a rocket-motor chamber 1-B091
 in *Explorer* and *Pioneer* 1-B202
 gaseous transpiration cooling of rocket motors 1-C017
 water-cooled rocket nozzles 1-C071
 sweat-cooling method, preliminary experiments 1-D090
 porous stainless steel for sweat cooling 1-D092
 sweat cooling with nitrogen and hydrogen 1-D102

hydrogen peroxide cooled rocket motors 1-F062
 of rocket motors with hydrogen peroxide-nitromethane
 and hydrogen peroxide-methyl alcohol 1-F063
 hydrazine as rocket-motor coolant 1-F064
 of rocket motors with hydrogen peroxide-nitromethane
 and hydrogen peroxide-methyl alcohol 1-F065
 of equipment in orbiting missile 1-H050
 sweat-cooled metals, flow rate required for
 maintenance 1-H074
 mechanics of liquid films, applied to film cooling 1-K035
 sweat cooling with nitrogen 1-L092
 wall temperature in regenerative-cooled motors 1-L124
 film cooling in flame tube 1-S079
 transpiration cooling in motor chamber 1-T076
 gasoline-LOX motors, regenerative cooling 1-W061
 liquid nitrogen tetroxide as regenerative coolant 2-B11
 ultra-high frequency oxide induction-heating furnace 2-L13
 heat-transfer test apparatus for liquid-propellant engines 2-M07
 thermal efficiency of coated fins 2-P05
 liquid film coolant for rocket engines 2-W06
 optimization, for nuclear turboelectric power plants 3-D01
 thermal radiation configuration factors 3-P04
 of nuclear-electric spacecraft 3-V07
 automatic system for water-cooled strain gage balance 3-W06
Ranger 3-9 4-AB05
Mariner R, measurement of absorptivity 4-AB12
 heat rejection from spacecraft 4-AB14
 radioisotope heat source 4-AB20
 louver array analysis for diffusely reflecting, louver
 blades 4-AB32
 white paints and non-paint "white" systems under
 high-intensity UV radiation 4-C07
 for *Surveyor*; design, development, operations;
 progress summary, 8/63-5/64 5-AB04
 5-AB10
 5-AB16
 5-AB22
 5-AB28
 5-AB34
Ranger Block III TV subsystem; design, development,
 operations; progress summary, 8/63-5/64 5-AB04
 5-AB10
 5-AB16
 5-AB22
 5-AB28
 5-AB34
 surfaces, hemispherical emittance measurement 5-H01
 basic principles and techniques on *Mariner* 2 5-L12
 by movable shutters or louvers, analysis 5-P20
 preservation techniques from spacecraft prototype
 to flight model 5-V02

Test Facilities
 for ramjet testing, at JPL 1-B155
 SUEL missile assembly and checkout facilities,
 requirements 1-C094
 elastic measuring system to record rocket-motor thrust 1-E002

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Test Facilities (Cont'd)

- development for hypervelocity flight simulation 1-H005
- JPL, summary of activities as of 1951..... 1-J072
- JPL, analysis of facilities as of 1950..... 1-J093
- JPL, analysis of future facilities 1-J095
- JPL ordnance construction program for Fiscal Year 1953... 1-J096
- 1-J097
- JPL, specifications for additions and alterations..... 1-J098
- JPL ordnance construction program for Fiscal Year 1954... 1-J099
- JPL, organization and facilities 1-M023
- for liquid-propellant rocket motors, ORDCIT station... 1-P142
- JPL and its work, as of 1952..... 1-S106
- oceanographic conditions in NAMTC sea test range.... 1-T059
- JPL, description of facilities as of 1941..... 1-V053
- supporting research and advanced development;

- progress summary 3-AB30
- 4-AB10
- 4-AB16
- 4-AB22
- 4-AB28
- 4-AB34
- 4-AB40
- 5-AB09
- 5-AB15
- 5-AP21
- 5-AB27
- 5-AB33
- 5-AB38

Thermionic Converters

(see Converters)

Thermodynamics

(see also Temperature Control)

- of potassium and sulfur compounds 1-A042
- properties of titanium chlorides 1-A072
- properties of diatomic interhalogens, spectroscopic data... 1-C088
- heat addition in supersonic channeled flow..... 1-H001
- glass-reinforced plastics, resistance to high temperatures... 1-M072
- data and performance calculations 1-N028
- transient response and temperature distribution
- in circular plate 3-H09
- thermal stress history of Moon, Mercury, Mars..... 3-K07
- thermoelastic analysis of parabolic shell 5-S27

Thermoelectric Converters

(see Converters)

Thin Films

- mechanics of cooling 1-K034
- liquid, as applied to cooling 1-K035
- evaporation into turbulent gas stream 1-K038
- flux reversal by Néel wall motion..... 4-C19
- ferromagnetic, properties studied by automatic
- torque balance 4-H22
- permalloy, magnetic properties studied by automatic
- torque balance 4-H24
- IR emission spectra of organic solids..... 5-H25
- single-crystal germanium, growth by micro-zone melting... 5-M09

Three-Body Problem

- restricted, examination and implications 3-AC34
- orbital collision probabilities, statistical
- mechanical estimate 3-M28
- reactions in upper atmosphere..... 5-B04

Titan

- applicability for JPL programs..... 3-J14

Titarius

- state-of-the-art of metallurgy in Europe..... 1-D088
- in fuming nitric acid, inhibition of corrosion reaction... 1-R068

Titanium Alloys

- dynamic properties 1-A038
- for rocket-motor cases 1-B139
- response to heat treatment..... 1-B140
- zirconia-titania, phase studies 1-B143
- stability of titanium diboride and zirconium diboride in
- air, oxygen, and nitrogen..... 1-B145
- with iron, cobalt, and nickel, structure of
- intermediate phases 1-D111
- TiCr₂, partial phase diagram and crystal structure..... 1-D115
- crystal structure of TiAl..... 1-D117
- crystal structure of Ti₂Au and Ti₂Pt..... 1-D118
- nitrides and carbides, phase relationships in
- binary systems 1-D136
- structure of intermediate phases..... 1-D137
- titanium-chromium-aluminum, constitution of
- titanium richness 1-D154
- disproportionation and vapor pressure of TiCl₃..... 1-F022
- 1-F030
- titanium tetrachloride, heat of formation and entropy... 1-F031
- disproportionation and vapor pressure of TiCl₃..... 1-F032
- tempered, microstructural differences 1-J009
- crystal structures of binary intermetallic phases..... 1-J141
- titanium-vanadium-aluminum, phase relationships..... 1-J142
- crystal structure of TiRu and TiOs..... 1-J145
- equilibrium of reaction, measurements..... 1-K057
- structure and hardness, effect of isothermal treatments... 1-M067
- hardness and structure, effect of cooling rate..... 1-M068
- weldable, tension and bend properties..... 1-M073
- hardness and structure, effect of cooling rate..... 1-M083
- crystal structure of Ti₂Sn..... 1-P114
- titanium-vanadium system 1-P115
- intermed. phase study by X-ray powder diffraction... 1-P117
- titanium-tin phase diagram, thermal-analysis
- method of investigation 1-P118
- Ti-TiAu, partial constitution diagram..... 1-P119
- corrosion and ignition in fuming nitric acid..... 1-R070
- corrosion and ignition in fuming nitric acid, chemical
- and metallurgical factors, Part I..... 1-R071
- Part II 1-R072
- Part III 1-R073
- Part IV 1-R074
- Part V 1-R075
- corrosion and ignition in fuming nitric acid..... 1-R079

Titanium Alloys (Cont'd)

- ignition and stress corrosion cracking 1-R080
- corrosion in fuming nitric acid 1-R081
- inhibition in fuming nitric acid 1-R082
- titanium-aluminum-chromium, phase studies
 - at 1800 and 1400°F 1-T016
- titanium-cerium, preliminary study 1-T017
- titanium-vanadium-molybdenum, beta phase parameters 1-T018
- welded high-strength, bend properties 2-B13
- hardenability, method of estimating 5-J02

Titanium Chlorides

- thermo dynamic properties 1-A072
- heat of formation and entropy 1-K053
- heats of formation, calorimetric determination 1-K056
- measurement of optical absorbancy in UV region 1-M132

Tracking

- baseline systems, position error studies 1-B081
- baseline systems, NAMTC configurations 1-B083
- data-relay problem, theoretical investigation 1-B084
- extraterrestrial, and communication 1-B137
- microlock 1-B195
- and orbit-determination program at JPL 1-C028
- lunar probes, JPL methods 1-C030
- Pioneers 3 and 5* firings, tracking and data handling 1-E013
- tracking the lunar probes 1-E014
- NAMTC correlation of radio propagation with
 - refractive indices 1-F081
- on-site data processing for world network 1-G003
- status of JPL radar system as of 1951 1-J016
- DOVAP radio beacon, design, construction, and
 - evaluation 1-J017
- world network 1-J050
- range-instrumentation vessels for guided missile testing 1-J089
- external instrumentation for NAMTC 1-P096
 - 1-P098
- U. S. tracking program 1-P108
- microlock system 1-R017
- for interplanetary network, proposal 1-R018
- radio wave propagation considerations 1-R021
 - 1-R022
 - 1-R023
- satellite tracking 1-R033
- NAMTC instrumentation for mobile bases 1-R039
- intercept instrumentation problem 1-R040
- employing microlock 1-R046
- deep-space, elements 1-R055
- for NAMTC operations, effects of weather conditions 1-R101
- satellite instrumentation, feasibility for minimum weight 1-S041
- microlock: design, construction, and testing 1-S044
- for NAMTC, geometric aspects 1-W135
- for real-time continuous long-range precision ranging 3-E01
- 1962 National Telemetry Conference, JPL contributions 3-R05
- operational 960-Mc maser system 3-S05
- applicability of 960-Mc maser amplifier system 3-S41

- skin tracking radar used on *Echo and Courier* 4-E01
- interplanetary spacecraft, techniques 4-N14
- station location; determination by doppler and range
 - measurements 5-C01
- optimal search procedures 5-P21
- Ranger 5* flight path determination 5-S13
- station; selection of Madrid site 5-T02
- data analysis, *Ranger 4* 5-W06

TRADIC

- assembly of logic packages utilizing circuitry
 - of TRADIC 1-S042
- transistor pseudonoise generator 1-S043

Training Programs

- JPL in-plant, resumé 1-C031
- JPL in-plant, progress 1-C032

Trajectories

- (see also **Lunar—, Mars—, Orbits, Venus—**)
- Corporal E*, differential corrections 1-B068
- calculations and differential corrections 1-B070
- computer simulation of missile flights 1-C026
- vertical, propellant consumption conditions
 - to attain orbit 1-C050
- differential corrections 1-C054
- approximate method of integration of ballistic equations 1-C055
- simulation of missile flights 1-C131
- equations of motion of a tumbling reentry body 1-D043
- Explorers 1 and 3* launching 1-F097
- design methods, tools and techniques 1-J064
- coasting, velocity increments to reduce target miss 1-L110
- patched-conic computer program 1-L111
- preflight determination, use of patched conics 1-L147
- of *Corporal E* 1-M213
- Sergeant* Standard-8, program for IBM 704 1-S067
- launching, minimum propellant-gross weight
 - ratio required 1-S146
- impact point of missiles, effects of Earth's oblateness 1-W201
- ascent, lunar and interplanetary; geometrical
 - constraints and shaping 2-C03
- Sergeant*, computer program 2-S08
- ballistic interplanetary, characteristics 3-C09
- constants used in trajectory calculations 3-C10
- IBM 7090 program 3-H15

Transducers

- frequency response, digital computer calculation 1-B116
- frequency response pressure, calibration 1-B121
- missile-borne, problems of integrating capacitor 1-M203
- analytical study of frequency response 1-P156
- frequency response of pressure-transducer systems 1-P160
- digitization using programmed attenuator 1-Z020
- pressure, frequency response testing 3-I001

Transistors

- irradiation effects 1-P122
- emitter-coupled, amplifier applications 1-S141

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Transmitters

- 960-Mc lunar 1-M040
- transistorized, for satellite use 1-R003
- minimum power, for lunar missions, design parameters... 3-C07

Tubes

(see Resonance—, Shock—)

Turbojets

- at supersonic speeds: with tail-pipe burning, performance estimate 1-A022
- thrust increase by fuel combustion in tail pipe 1-G023
- acceleration, theoretical investigation 1-S050
- exhaust gases in tail-pipe, "total head" survey 1-W034

Unsymmetrical Dimethylhydrazine

- and water in Nike fuels 1-M226
- water, and toluene, phase diagrams 1-M227
- exhaust from gas generator employing, analysis 1-M236
- as motor propellant, preliminary study 1-P004
- mixtures with hydrazine, heat flux 2-W18
- hypergolic ignition experiments 3-E11

Upper Atmosphere

- Russian newspaper articles, translation 1-AC39
- 1946 conference, abstracts of papers 1-J021
- study by means of rockets 1-PC89
- physics research 2-AF07
- 2-AB10
- 2-A313
- nature of matter 2-AC32
- reaction rates of atomic nitrogen and oxygen between 60 and 160 km 2-B05
- reaction rates of chemical reactions, analysis with digital computer 2-K03
- three-body reactions 5-B04

V-2

- combination V-2 Wac step-rocket, feasibility study 1-S216

Vacuum

- effects on design of space vehicle hardware 2-J02
- effects on *Bacillus subtilis* var *niger* 4-M25

Valves

- automatic scanning, for wind-tunnel pressure measurements 1-B010
- British subminiature, evaluation 1-F076
- selection, for WAC Corporal 1-M158
- JPL wind-tunnel index 1-S277

Van Allen Radiation Belt

- Russian discoveries, translation 1-AC40
- Russian observations, translation 1-AC45
- effects on plastics and elastomers 3-J03

Vaporization

- maximum possible rate, of liquids 1-P037
- of liquid droplets in rocket-motor chamber 1-P040

Vega

- JPL program 1-J086
- 1-J087

Venus

- 1964 and 1965 trajectories, parametric study 1-C070
- Soviet reports of the launching, progress, and failure of the Automatic Interplanetary Station; translations 2-AC37
- surface and atmosphere study of microwave radiometer 2-J20
- radiation balance 2-S01
- radio location by USSR 3-AC32
- characteristics, *Mariner* experiments 3-B02
- radar exploration at Goldstone 3-C13
- and lunar radar depolarization, DSIF experiments 3-L14
- atmospheric transparency and AU determination 3-M31
- spectroscopic temperature and pressure measurements in atmosphere 3-S36
- radar experiment 3-V03
- spectral results on rotation, scattering, and time-of-flight 4-G07
- experiments and instruments for *Mariner R* 4-H13
- measurements by *Mariner 2* 4-J07
- spectral measurements with phase-stable oscillators 4-M02
- radiation emission experiments from *Mariner R* 4-W15
- radio observations, ionospheric interpretation of data 5-AC06
- telluric oxygen A-band in atmosphere 5-AC09
- Mariner 2* IR radiometer experiment and results 5-C06
- characteristics of Earth-Venus trajectories, 1960-1970 5-C11
- 1962 conjunction, radar and radiometric observations 5-J11
- mass of planets, method of determination 5-M06
- electrical properties of atmosphere and surface, radar observations 5-M20

Venus Probes

- translation of reports on USSR Venus launching of Feb. 1961 2-AC37
- adaptation of *Ranger* 2-J04
- design of *Mariner 1* communication system 2-M05
- nuclear electric, instrumentation for engineering evaluation 3-A05
- conceptual design studies 3-B05
- problem of describing planetary areas observed from a probe 3-C04
- trajectories, flight times, launch dates, 1962-1977 3-C09

Venus Trajectories

- parametric studies of characteristics 2-C04
- Earth-Venus, 1968-1970, characteristics 5-C11

Vibration Testing

- complex-wave and noise-vibration simulation 1-B123
- static firings of solid rockets, effects on data 3-T05
- discrete structures with nondiagonal symmetric mass matrix 4-B04
- aerodynamic stability, Allen's solution for envelope of oscillation 4-B33

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-7
SUBJECT INDEX

Vibration Testing (Cont'd)

- oscillations of a gravitating solid sphere 4-C05
- 4-C06
- modal characteristics of nonuniform thin circular rings 4-L03
- of thin circular rings, modal characteristics and
forced excitation 4-L04
- modal functions and eigenvalues of constrained
semicircular rings 4-L05

Vidicon

(see **Photographic Equipment**)

Vortices

- plane, laminar vortex flow of viscous heat-conducting
gas 1-M006
- retention of fissionable material in pressure field 2-K04
- tangential velocity distribution within a chamber 3-K05
- laminar boundary layer on disk of finite radius,
mathematical analysis 3-M02

Vostok Project

- Soviet radio and newspaper reports 2-AC39
- flight description, translation 2-AC40
- flight and instrumentation, translation 3-AC30

Voyager Project

- design, development, operations; progress summary 3-AB21
- 3-AB22
- preliminary concepts, 1962 3-AB24
- design, development, operations; progress summary,
5/62-5/64 3-AB26
- 3-AB30
- 4-AB06
- 4-AB10
- 4-AB12
- 4-AB16
- 4-AB18
- 4-AB22
- 4-AB24
- 4-AB28
- 4-AB30
- 4-AB34
- 4-AB36
- 4-AB40
- 5-AB05
- 5-AB11
- 5-AB17
- 5-AB23
- 5-AB29
- 5-AB35

Wac

- combination W-2 Wac step-rocket, feasibility study 1-S216

Wac Corporal

- 1/2-scale, design and testing 1-B023
- gas pressurization for possible weight reduction 1-B076
- advantages of white fuming nitric acid and furfuryl
alcohol 1-B093

- lateral dispersion 1-C057
- telemetry, nose equipment 1-C127
- spinning, some stability considerations 1-F047
- additional studies of lateral dispersion 1-F048
- field preparations, firing procedure, and results 1-G050
- development feasibility 1-M018
- development and flight performance 1-M030
- propulsion systems; design, performance, and servicing 1-M154
- B; design, development, and field tests 1-M155
- selection of control valves 1-M158
- exterior ballistic and aerodynamic characteristics 1-M208
- B; drag coefficients 1-M211
- missile, launcher, booster, and handling facilities;
design and fabrication 1-S047
- exterior ballistics and aerodynamic characteristics 1-S222
- ballistic form factor and flight performance 1-S221

Wakes

- spark schlieren photographic studies 4-D03
- circular cylinder and sphere, at $M = 3.7$ 4-K02

Waves

- (see also **Electromagnetic —, Shock —**)
- dispersion of long-period Love waves in a spherical
Earth 4-K11

Wind Tunnels

- (see also **Hypersonic—, Supersonic—**)
- multi-pressure measuring and recording system 1-B007
- force and pressure tests, on-line-data-reduction system 1-B009
- pressure measurements, automatic scanning valves 1-B010
- provisions for wind-tunnel data reduction 1-B158
- 20-in., 12-in., and hypersonic; description 1-J081
- cone temperature recovery factor data 1-M007
- for study of ramjet supersonic flow 1-P161
- ramjet, alternate compressor system, performance study 1-P162
- real-time presentation of reduced data 1-S083
- test on jet-propelled missile model 1-S226
- JPL air valve index 1-S277
- automatic data-accumulation system 1-W030
- supporting research and development;
progress summary, 7/60-5/61 2-AB05
- 2-AB07
- 2-AB08
- 2-AB10
- 2-AB11
- 2-AB13
- 2-AB16
- 2-AB18
- JPL facilities as of 1961 2-J18
- supporting research and development;
progress summary, 7/61-6/62 3-AB05
- 3-AB06
- 3-AB09
- 3-AB10
- 3-AB11
- 3-AB29

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
SUBJECT INDEX

Wind Tunnels (Cont'd)

- auto temperature control system for water-cooled
 strain gage balance3-W06
- free-flight testing, simplified technique.....4-D02
- continuous-flow multigas facilities with CO₂
 as contaminant4-K07
- testing; supporting research and advanced
 development; progress summary, 10/62-6/64.....4-AB09
 4-AB15
 4-AB21
 4-AB27
 4-AB33
 4-AB39
 5-AB08
 5-AB14
 5-AB20
 5-AB26
 5-AB32
 5-AB37
- combustion-heated, for planetary entry
 simulation research5-W08

Zirconium Alloys

- zirconia-lanthana and zirconia-neodymia systems,
 phase studies1-B144
- stability of titanium diboride and zirconium diboride
 in air, oxygen, and nitrogen.....1-B145
- for refractory liners in rocket motors.....1-D110
- zirconia stabilization with calcia and magnesia.....1-D116
- phase relationships in zirconia-ceria system.....1-D135
- nitrides and carbides, phase relationships
 in binary systems1-D136
- zirconia-yttria system1-D139
- cubic monoclinic zirconia, analysis by X-ray diffraction...1-D147
- structure of ZrMo₂1-D153
- with iron, cobalt, and chromium, crystal structure.....1-J140
- crystal structures of binary intermetallic phases.....1-J141
- zirconium-rich compounds with silicon and tin,
 crystal structure1-P116
- intermediate phase study by X-ray powder diffraction...1-P117
- diffusion, preliminary investigation1-W093
- carbide, mechanical and thermal properties,
 tested at 2600°C5-L49
- yttria-stabilized, thermal expansion5-N11

NUMERICAL INDEX

Publications

Publication	Entry No.	Publication	Entry No.	Publication	Entry No.
2	1-M016	33	1-J029	114	1-J046
3	1-J021	54	1-J030	115	1-V029
4	1-S086	55	1-J031	116	1-S236
5	1-M017	56	1-J032	119	1-L157
6	1-F051	57	1-J033	122	1-P132
7	1-D078	58	1-B158	124	1-N025
8	1-F389	59	1-F094	125	1-L014
9	1-S207	60	1-N020	126	1-C061
10	1-D088	62	1-J034	127	1-J048
11	1-S208	63	1-R046	128	1-C138
12	1-S279	64	1-K015	129	1-S211
13	1-P151	65	1-S154	130	1-R001
14	1-M097	66	1-S259	132	1-S197
15	1-G076	67	1-J035	134	1-J049
16	1-L104	68	1-H039	135	1-J050
17	1-N015	69	1-F037	137	1-S159
18	1-S111	70	1-F039	138	1-S160
19	1-W143	71	1-J038	139	1-L090
22	1-S087	72	1-A029	140	1-R018
23	1-O013	73	1-S292	141	1-L015
24	1-F092	74	1-J040	142	1-G051
25	1-S088	75	1-J041	143	1-C031
26	1-R063	76	1-S235	144	1-N026
27	1-R064	77	1-R615	145	1-R093
28	1-H038	78	1-G005	148	1-J052
29	1-F052	79	1-C124	149	1-B046
30	1-H006	81	1-L055	151	1-B194
31	1-S258	82	1-J042	153	1-S070
32	1-N017	83	1-B060	154	1-G008
33	1-F076	85	1-M218	156	1-D072
34	1-P090	87	1-S210	158	1-H071
35	1-F095	88	1-R017	160	1-N027
36	1-G004	89	1-M001	161	1-B195
37	1-J022	90	1-S155	162	1-N028
38	1-J023	91	1-R059	163	1-J058
38 Supp. 1	1-J036	92	1-S156	164	1-S071
38 Supp. 2	1-J045	93	1-I004	164, Rev. 1	1-S072
38 Supp. 3	1-J047	94	1-S157	164, Rev. 2	1-S073
38 Supp. 4	1-J051	96	1-P084	165	1-C094
39	1-N018	97	1-H040	167	1-R153
40	1-R088	99	1-J044	168	1-L076
41	1-L105	100	1-B077	169	1-J061
42	1-V005	101	1-B174	170	1-S268
43	1-B129	102	1-J013	171	1-S074
44	1-A028	103	1-G077	172	1-L016
45	1-P091	104, Rev.	1-J014	173	1-M047
46	1-J025	105	1-N022	174	1-S179
47	1-J024	107	1-N023	175	1-S075
48	1-S041	108	1-S158	176	1-C044
49	1-I003	109	1-K038	177	1-S052
50	1-J026	110	1-R090	178	1-S037
51	1-J027	111	1-B045	178, Rev. 1	1-S038
52	1-J028	112	1-S056	179	2-S07

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

Publication	Entry No.	Publication	Entry No.	Publication	Entry No.
30-1	1-D073	30-3	1-B048	30-15	1-J062
30-2	1-L009	30-9	1-S177	30-18	1-J064
30-3	1-J057	30-10	1-W005	30-19	1-M148
30-4	1-D074	30-11	1-S176	30-20	1-J033
30-5	1-E020	30-12	1-M173	30-21	1-H007
30-6	1-B047	30-13	1-J060	31-1	1-J059
30-7	1-D027	30-14	1-C032	31-2	1-J065

Memorandums

Memorandum	Entry No.	Memorandum	Entry No.	Memorandum	Entry No.
1-1	1-S212	4-25	1-T043	9-5	1-D055
1-2	1-M184	4-26	1-L005	9-6	1-C098
1-3	1-S089	4-27	1-M181	9-7	1-F003
1-4	1-K003	4-28	1-N009	9-8	1-F032
1-5	1-S092	4-29	1-D017	9-9	1-P031
1-6	1-S135	4-30	1-C133	9-10	1-P030
1-7	1-W105	4-31	1-L061	9-11	1-C099
2-1	1-V049	4-32	1-W020	9-12	1-T052
2-2	1-D080	4-33	1-F004	9-13	1-M244
2-3	1-D061	4-34	1-T050	9-14	1-F033
2-4	1-O021	4-35	1-S269	9-15	1-S095
3-1	1-P024	4-36	1-N010	9-16	1-D056
3-2	1-S215	4-37	1-L062	9-17	1-M197
3-3	1-H084	4-38	1-W051	9-18	1-W145
3-4	1-S093	4-39	1-L108	9-19	1-O020
3-5	1-HG74	4-40	1-W021	9-20	1-H085
3-6	1-C059	4-41	1-W052	11-1	1-P163
3-7	1-B154	4-42	1-S094	11-2	1-W022
3-8	1-D041	4-43	1-C126	11-3	1-B177
3-9	1-S050	4-44	1-D018	17-1	1-G100
4-1	1-J067	4-45	1-B064	20-64	1-B109
4-2	1-J068	4-46	1-S270	20-65	1-W024
4-3	1-P161	4-47	1-L064	20-66	1-A003
4-4	1-M018	4-48	1-L065	20-67	1-T053
4-5	1-D083	4-49	1-D019	20-68	1-H114
4-6	1-M173	4-50	1-B108	20-69	1-B110
4-7	1-M019	4-51	1-G024	20-70	1-W025
4-8	1-S090	4-52	1-P164	20-71	1-W146
4-9	1-D084	4-53	1-V045	20-72	1-B049
4-10	1-P162	4-54	1-W023	20-73	1-J018
4-11	1-K020	4-55	1-S199	20-75	1-S096
4-12	1-C046	4-56	1-S234	20-76	1-G004
4-13	1-T067	4-57	1-B178	20-77	1-B171
4-14	1-S217	4-58	1-L066	20-78	1-Z018
4-15	1-K021	4-59	1-D085	20-79	1-E021
4-16	1-S216	4-60	1-L067	20-80	1-C021
4-17	1-B032	4-61	1-S291	20-81	1-H018
4-18	1-L060	4-62	1-H042	20-82	1-S271
4-19	1-H106	4-63	1-A011	20-83	1-A002
4-20	1-P001	9-1	1-C047	20-84	1-W115
4-21	1-C073	9-1	1-A030	20-85	1-K034
4-22	1-B089	9-2	1-K045	20-86	1-Z019
4-23	1-F050	9-3	1-C069	20-87	1-H109
4-24	1-L107	9-4	1-C096	20-88	1-E016

**JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX**

Memorandum	Entry No.	Memorandum	Entry No.	Memorandum	Entry No.
20-89	1-W176	20-121	1-M090	20-157	1-K002
20-90	1-F077	20-122	1-S273	20-158	1-B182
20-91	1-P154	20-123	1-H110	20-159	1-E024
20-92	1-F006	20-124	1-M091	20-160	1-S'22
20-93	1-S114	20-125	1-S153	20-161	1-L058
20-94	1-S238	20-126	1-C131	20-162	1-S054
20-95	1-L037	20-127	1-S109	20-163	1-M044
20-96	1-C021	20-128	1-C026	20-164	1-M163
20-97	1-G002	20-129	1-L049	20-167	1-C104
20-98	1-H036	20-130	1-E023	20-169	1-L019
20-99	1-C025	20-131	1-M043	20-170	1-B163
20-100	1-S043	20-132	1-A034	20-172	1-C027
20-101	1-S042	20-133	1-C071	20-173	1-B183
20-102	1-S293	20-135	1-P087	20-174	1-E025
20-103	1-S153	20-136	1-G003	20-176	1-S162
20-104	1-W116	20-137	1-B019	20-178	1-S163
20-105	1-S239	20-138	1-H027	20-187, Pt. I	1-B156
20-106	1-L159	20-139	1-B051	20-187, Pt. II	1-L020
20-107	1-W102	20-140	1-R068	20-189	1-G055
20-108	1-B062	20-141	1-L081	20-190	1-H078
20-109	1-L038	20-142	1-K001	20-191	1-S076
20-110	1-S272	20-143	1-L082	20-192	1-M139
20-111	1-R115	20-144	1-S082	20-193	1-T063
20-112	1-L039	20-145	1-B065	20-194	1-S123
20-113	1-B161	20-147	1-R067	30-1	1-L083
20-114	1-D069	20-148	1-L018	30-3	1-F001
20-115	1-Z020	20-149	1-G054	30-4	1-A083
20-116	1-S129	20-150	1-L041	30-5	1-E026
20-117	1-R116	20-151	1-D070	30-8	1-B026
20-118	1-B162	20-152	1-L057	30-9	1-L110
20-119	1-B003	20-155	1-W069	30-10	1-L111
20-120	1-J003	20-156	1-S110	30-11	1-E072
				30-13	1-L112

General Reports

General Report	Entry No.	General Report	Entry No.	General Report	Entry No.
1-3	1-M024	1-21	1-P137	3-2	1-W032
1-4	1-V032	1-22	1-M190	3-3	1-R006
1-5	1-M179	1-23	1-K006	3-4	1-T001
1-6	1-V053	1-24	1-P138	3-5	1-C033
1-7	1-F038	1-25	1-S098	3-6	1-T002
1-8	1-D001	1-26	1-W061	3-7	1-T003
1-9	1-M027	1-27	1-P140	3-8	1-L113
1-10	1-S282	1-28	1-P141	3-9	1-A022
1-11	1-J075	1-29	1-A080	3-10	1-L080
1-12	1-M028	1-30	1-T036	3-11	1-L114
1-13	1-S283	1-31	1-M160	3-12	1-L117
1-13, Supp.	1-S284	1-32	1-S136	3-13	1-L118
1-14	1-H086	1-33	1-C005	3-14	1-A023
1-15	1-P020	1-34	1-C006	3-15	1-T004
1-16	1-K004	1-35	1-T076	3-16	1-S257
1-17	1-P135	2-1	1-D029	3-17	1-D021
1-18	1-M189	2-2	1-P139	3-18	1-S128
1-19	1-S097	2-3	1-D052	4-1	1-S045
1-20	1-M029	3-1	1-G023	4-2	1-M191

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

General Report	Entry No.	General Report	Entry No.	General Report	Entry No.
4-3	1-G047	4-56	1-V047	20-93	1-D039
4-4	1-L093	8-1	1-C050	20-95	1-W028
4-5	1-S046	3-2	1-S146	20-96	1-L045
4-6	1-M192	8-3	1-C042	20-97	1-S131
4-7	1-C048	8-4	1-C052	20-98	1-F096
4-8	1-C049	8-5	1-S221	20-99	1-S240
4-9	1-C049	9-1	1-G080	20-100	1-J083
4-11	1-C048	9-2	1-P034	20-101	1-L046
4-12	1-P165	17-1	1-G101	20-102	1-J079
4-13	1-L094	17-2	1-F057	20-104	1-A039
4-14	1-L095	20-57	1-S224	20-105	1-J080
4-17	1-L158	20-58	1-B034	20-106	1-A040
4-18	1-M030	20-59	1-J076	20-107	1-S003
4-19	1-K023	20-60	1-A024	20-108	1-J082
4-20	1-M154	20-61	1-D058	20-109	1-D024
4-21	1-S047	20-62	1-B035	20-110	1-G062
4-22	1-C050	20-63	1-N011	20-113	1-G045
4-23	1-M208	20-64	1-L122	20-115	1-H032
4-24	1-C051	20-65	1-L120	20-116	1-L047
4-25	1-P142	20-66	1-L121	20-117	1-J084
4-26	1-S220	20-67	1-F008	20-118	1-F097
4-27	1-C003	20-68	1-N030	20-119	1-M045
4-29	1-C004	20-69	1-C091	20-120	1-J085
4-30	1-P143	20-70	1-C092	20-121	1-C023
4-31	1-L115	20-71	1-C093	20-122	1-M004
4-32	1-F045	20-72	1-M100	20-124	1-T060
4-33	1-F056	20-73	1-F009	20-125	1-J088
4-34	1-F046	20-74	1-R065	20-127	1-B014
4-37	1-L116	20-75	1-Z015	20-129	1-D071
4-38	1-M210	20-76	1-J077	20-130	1-S039
4-39	1-B130	20-77	1-G081	20-132	1-F033
4-40	1-C040	20-78	1-S130	20-134	1-W038
4-41	1-M155	20-79	1-A001	20-136	1-R099
4-42	1-M212	20-80	1-M003	20-137, Vols. I & II	2-J09
4-43	1-K024	20-81	1-V068	20-138	1-S02
4-44	1-F047	20-82	1-L002	25-1	1-A014
4-45	1-D066	20-83	1-J081	25-2	1-B013
4-46	1-M211	20-84	1-N032	25-3	1-B112
4-47	1-B066	20-85	1-A037	26-1	1-R070
4-48	1-B011	20-86	1-D050	30-1	1-H045
4-49	1-B090	20-87	1-W178	30-2	1-L148
4-51	1-F039	20-88	1-A038	30-3	1-H022
4-52	1-L119	20-89	1-B164	30-5	1-B138
4-53	1-E012	20-90	1-H116	30-6, Pre-release	1-J086
4-54	1-G025	20-91	1-P156	30-6	1-J087
4-55	1-V046	20-92	1-J078	30-8	1-B139

Progress Reports

Progress Report	Entry No.	Progress Report	Entry No.	Progress Report	Entry No.
1-1	1-P023	1-6	1-V007	1-11	1-H089
1-2	1-C008	1-7	1-V055	1-12	1-S078
1-3	1-S004	1-8	1-S006	1-13	1-J119
1-4	1-V054	1-9	1-W062	1-14	1-C010
1-5	1-S005	1-10	1-K008	1-15	1-H091

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

Progress Report	Entry No.	Progress Report	Entry No.	Progress Report	Entry No.
1-16	1-W063	1-75	1-C017	4-15	1-P092
1-17	1-J120	1-76	1-C018	4-16	1-S018
1-18	1-J090	1-77	1-T058	4-17	1-H095
1-19	1-W140	1-78	1-G106	4-18	1-B037
1-20	1-M157	1-79	1-K035	4-19	1-P091
1-21	1-V008	1-80	1-H030	4-20	1-C058
1-22	1-W064	1-81	1-B134	4-21	1-K027
1-23	1-T038	1-82	1-V009	4-22	1-M213
1-24	1-J123	1-83	1-C020	4-23	1-C014
1-25	1-S261	1-84	1-E018	4-24	1-C035
1-26	1-F058	2-1	1-E002	4-25	1-B039
1-27	1-K010	2-2	1-C043	4-26	1-S229
1-28	1-S014	2-3	1-M194	4-27	1-D013
1-29	1-H093	2-4	1-E003	4-28	1-M214
1-30	1-W066	2-5	1-E004	4-29	1-L124
1-31	1-J125	2-6	1-C044	4-30	1-D095
1-32	1-K011	2-7	1-C045	4-31	1-T010
1-33	1-J127	2-8	1-B036	4-32	1-S134
1-34	1-F059	2-9	1-B038	4-33	1-C127
1-35	1-K012	2-10	1-D053	4-34	1-C016
1-36	1-C012	3-1	1-T005	4-35	1-M215
1-37	1-W067	3-2	1-T006	4-36	1-L001
1-38	1-A041	3-3	1-W033	4-37	1-B040
1-39	1-T039	3-4	1-T007	4-38	1-D100
1-40	1-K013	3-5	1-K026	4-39	1-N001
1-41	1-Z004	3-6	1-S227	4-40	1-S228
1-42	1-R104	3-7	1-W034	4-41	1-B041
1-43	1-F061	3-8	1-D031	4-42	1-C080
1-44	1-B074	3-9	1-B155	4-43	1-D105
1-45	1-R105	3-10	1-D032	4-44	1-A026
1-46	1-R100	3-11	1-C013	4-45	1-F064
1-47	1-A042	3-12	1-B028	4-46	1-D104
1-48	1-F060	3-13	1-D090	4-47	1-D102
1-49	1-C015	3-14	1-D091	4-48	1-D103
1-50	1-Z003	3-15	1-S060	4-49	1-W089
1-51	1-B061	3-16	1-W035	4-50	1-R005
1-52	1-S016	3-17	1-P043	4-51	1-W056
1-53	1-N006	3-18	1-S061	4-52	1-A017
1-54	1-R107	3-19	1-C059	4-53	1-J138
1-55	1-D092	3-20	1-A025	4-54	1-S231
1-56	1-D093	3-21	1-W189	4-55	1-T044
1-57	1-D094	3-22	1-D022	4-56	1-L069
1-58	1-W053	3-23	1-W190	4-57	1-C129
1-59	1-W082	3-24	1-H003	4-58	1-P008
1-60	1-S066	3-25	1-W191	4-59	1-C074
1-61	1-F062	4-1	1-C053	4-60	1-L071
1-62	1-W055	4-2	1-C054	4-61	1-D033
1-63	1-P144	4-3	1-L099	4-62	1-T008
1-64	1-F063	4-4	1-S225	4-63	1-W057
1-65	1-M060	4-5	1-S226	4-64	1-M216
1-66	1-D097	4-6	1-C055	4-65	1-K046
1-67	1-D098	4-7	1-C056	4-66	1-M062
1-68	1-F065	4-8	1-L099	4-67	1-B093
1-69	1-T041	4-9	1-W141	4-68	1-K047
1-70	1-O001	4-10	1-C057	4-69	1-S119
1-71	1-D099	4-11	1-C011	4-70	1-B067
1-72	1-S017	4-12	1-M158	4-71	1-W091
1-73	1-D101	4-13	1-C034	4-72	1-M063
1-74	1-S079	4-14	1-H026	4-73	1-W090

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

Progress Report	Entry No.	Progress Report	Entry No.	Progress Report	Entry No.
4-74	1-Z026	9-6	1-P038	17-4	1-G105
4-75	1-G111	9-7	1-F013	17-5	1-L128
4-76	1-S118	9-9	1-S262	17-6	1-L131
4-77	1-W029	9-10	1-P037	17-7	1-L132
4-78	1-B132	9-13	1-P040	17-8	1-F020
4-79	1-B075	9-14	1-T054	17-9	1-F070
4-80	1-R124	9-15	1-A046	17-10	1-L135
4-81	1-J015	9-16	1-P039	17-11	1-G069
4-82	1-H103	9-17	1-Z006	17-12	1-F072
4-83	1-W092	9-18	1-Z005	17-13	1-F073
4-84	1-F099	9-19	1-J132	18-1	1-P101
4-85	1-G093	9-20	1-F014	18-2	1-R037
4-86	1-L130	9-21	1-F016	18-3	1-B081
4-87	1-W093	9-22	1-J133	18-4	1-R021
4-88	1-K048	9-23	1-C079	18-5	1-R038
4-89	1-N003	9-24	1-G102	18-6	1-R039
4-90	1-W095	9-25	1-Z007	18-7	1-J089
4-91	1-B076	9-26	1-A047	18-8	1-F081
4-92	1-M206	9-27	1-D061	18-9	1-B083
4-93	1-M064	9-28	1-A049	18-10	1-B084
4-94	1-S062	9-29	1-H100	18-11	1-R040
4-95	1-K049	9-30	1-G104	18-12	1-R022
4-96	1-B018	9-31	1-C081	18-13	1-R023
4-97	1-W094	9-32	1-A053	18-14	1-T059
4-98	1-F049	9-33	1-A052	18-15	1-R041
4-99	1-S232	9-34	1-H101	19-1-19-10	1-J090
4-100	1-W096	9-35	1-A051	20-129	1-M149
4-101	1-S063	9-36	1-A050	20-130	1-Z010
4-102	1-D110	9-37	1-P041	20-131	1-P011
4-103	1-F066	9-38	1-P042	20-132	1-D114
4-104	1-Z027	9-39	1-F017	20-133	1-M005
4-105	1-M248	9-40	1-H102	20-134	1-C118
4-106	1-M103	9-41	1-Z008	20-135	1-C134
4-107	1-G094	9-42	1-H104	20-136	1-D115
4-108	1-S058	9-43	1-D062	20-137	1-P113
4-109	1-G097	9-44	1-J134	20-138	1-A008
4-110	1-G095	9-45	1-A054	20-139	1-C084
4-111	1-G096	9-46	1-W150	20-140	1-D116
4-112	1-D036	9-48	1-C082	20-141	1-V048
4-113	1-D035	9-49	1-A007	20-142	1-F101
4-114	1-B113	9-50	1-T057	20-143	1-K029
4-115	1-K050	9-51	1-A055	20-144	1-C085
4-116	1-M207	9-52	1-A006	20-145	1-D117
4-117	1-G019	10-1	1-P093	20-146	1-D118
4-118	1-M162	10-2	1-F094	20-147	1-D119
4-119	1-B029	10-3	1-P095	20-148	1-B087
4-120	1-G110	10-4	1-R101	20-149	1-L133
4-121	1-H118	10-5	1-P096	20-150	1-W151
4-122	1-D111	10-6	1-P098	20-151	1-P115
4-123	1-B068	10-7	1-P097	20-152	1-P114
4-124	1-H002	10-8	1-W135	20-153	1-B042
4-125	1-F068	10-9	1-P099	20-154	1-J016
4-126	1-M159	10-10	1-D042	20-155	1-R084
4-127	1-B176	11-1	1-P166	20-156	1-B133
4-128	1-P106	11-2	1-S048	20-157	1-H029
9-1	1-P035	11-3	1-S276	20-158	1-M067
9-3	1-A043	17-1	1-L125	20-159	1-W003
9-4	1-F012	17-2	1-L126	20-160	1-W097
9-5	1-A044	17-3	1-F018	20-161	1-R008

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 NUMERICAL INDEX

Progress Report	Entry No.	Progress Report	Entry No.	Progress Report	Entry No.
20-162	1-R125	20-221	1-P127	20-282	1-R118
20-163	1-G026	20-222	1-B144	20-284	1-M223
20-164	1-A010	20-223	1-R063	20-285	1-F147
20-165	1-J128	20-224	1-E034	20-286	1-W192
20-166	1-G022	20-225	1-W154	20-287	1-L161
20-167	1-C086	20-226	1-M068	20-288	1-R057
20-168	1-P044	20-227	1-W142	20-289	1-M072
20-169	1-W009	20-228	1-R135	20-290	1-L139
20-170	1-P116	20-229	1-M116	20-291	1-A015
20-171	1-S051	20-230	1-S150	20-292	1-S165
20-172	1-W098	20-231	1-W118	20-293	1-M095
20-173	1-C108	20-232	1-J142	20-294	1-H050
20-174	1-E031	20-233	1-Z012	20-295	1-P129
20-175	1-L164	20-234	1-B053	20-296	1-F011
20-176	1-R085	20-235	1-D076	20-297	1-R096
20-177	1-S243	20-236	1-F022	20-298	1-G031
20-178	1-H009	20-237	1-L137	20-299	1-R128
20-179	1-C108	20-238	1-P078	20-300	1-L078
20-180	1-B143	20-239	1-M069	20-301	1-B004
20-181	1-T016	20-240	1-D040	20-302	1-H011
20-182	1-G053	20-241	1-T018	20-303	1-A061
20-183	1-N033	20-242	1-I005	20-304	1-D046
20-184	1-R009	20-243	1-J011	20-305	1-R120
20-185	1-F010	20-244	1-S152	20-306	1-L149
20-186	1-M141	20-245	1-S141	20-308	1-S044
20-187	1-L163	20-246	1-P014	20-309	1-M124
20-188	1-N034	20-247	1-G112	20-310	1-M225
20-189	1-P013	20-248	1-W119	20-311	1-M228
20-190	1-B070	20-249	1-C097	20-312	1-B123
20-191	1-J129	20-250	1-S189	20-313	1-J017
20-192	1-W152	20-251	1-L138	20-314	1-B184
20-193	1-P117	20-252	1-B145	20-315	1-M226
20-194	1-G027	20-253	1-L088	20-316	1-M227
20-195	1-R126	20-254	1-T040	20-317	1-M073
20-196	1-J140	20-255	1-M121	20-318	1-G032
20-197	1-N035	20-256	1-L180	20-319	1-S124
20-198	1-W099	20-257	1-M070	20-320	1-P130
20-199	1-L092	20-258	1-P119	20-321	1-C113
20-200	1-H048	20-259	1-M119	20-322	1-P148
20-201	1-T049	20-260	1-O017	20-323	1-B140
20-202	1-J130	20-261	1-E035	20-324	1-P149
20-203	1-O016	20-262	1-P146	20-225	1-V059
20-204	1-M042	20-264	1-M012	20-326	1-M075
20-205	1-M111	20-265	1-M049	20-327	1-W193
20-206	1-J141	20-266	1-R043	20-328	1-R012
20-207	1-T017	20-267	1-W121	20-239	1-B085
20-208	1-N036	20-268	1-B054	20-330	1-T030
20-209	1-R127	20-269	1-D130	20-331	1-B116
20-210	1-M110	20-270	1-R011	20-333	1-D049
20-211	1-H010	20-271	1-P128	20-334	1-T031
20-212	1-P118	20-272	1-M096	20-335	1-R130
20-213	1-D051	20-273	1-R117	20-336	1-G033
20-214	1-M113	20-274	1-W122	20-337	1-R013
20-215	1-W180	20-275	1-S164	20-338	1-M233
20-216	1-M114	20-276	1-G026	20-339	1-D048
20-217	1-J019	20-277	1-G029	20-340	1-B086
20-218	1-C136	20-278	1-G030	20-343	1-M231
20-219	1-K053	20-279	1-W123	20-344	1-B185
20-220	1-Z016	20-280	1-M222	20-345	1-B186
		20-281	1-S190	20-346	1-B078

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 NUMERICAL INDEX

Progress Report	Entry No.	Progress Report	Entry No.	Progress Report	Entry No.
20-347	1-M235	20-372	1-K018	26-1	1-R071
20-348	1-M236	20-373	1-M077	26-2	1-R072
20-349	1-W039	20-374	1-B147	26-3	1-R073
20-350	1-M076	20-376	1-V060	26-4	1-R074
20-351	1-M238	20-378	1-L048	26-5	1-R075
20-352	1-M005	20-379	1-R058	30-1	1-P004
20-353	1-L030	20-382	1-M006	30-2	1-S168
20-354	1-B167	20-386	1-G057	30-3	1-M239
20-355	1-T073	20-387	1-T064	30-4	1-E036
20-356	1-B022	20-388	1-W041	30-5	1-A016
20-358	1-R014	20-389	1-G058	30-6	1-M199
20-359	1-F102	20-390	1-T072	30-9	1-W113
20-380	1-M164	20-391	1-T065	30-10	1-M166
20-361	1-M165	20-392	1-S067	30-11	1-B189
20-362	1-H028	20-393	1-F040	30-12	1-B190
20-364	1-R044	20-394	1-F041	30-13	1-F080
20-365	1-F188	20-395	2-S08	30-14	1-L031
20-366	1-K054	24-1	1-B015	30-15	1-V061
20-367	1-S166	24-2	1-T079	30-16	1-J121
20-368	1-S167	24-3	1-K016	30-17	1-M167
20-369	1-S133	24-4	1-K017	30-18	1-M078
20-370	1-W040	24-5	1-B016	30-20	1-A018
20-371	1-E167	24-6	1-S264	30-21	1-C032

Technical Releases

Technical Release	Entry No.	Technical Release	Entry No.	Technical Release	Entry No.
34-1	1-F037	34-56	1-L027	34-113	2-S25
34-2	1-W201	34-57	1-K045	34-114	2-M27
34-3	1-G059	34-59	1-M138	34-118	2-W03
34-8	1-S126	34-64	2-L09	34-119	2-L18
34-10	1-M174	34-66	1-W197	34-120	2-Z01
34-11	1-C137	34-67	1-B125	34-121	2-S12
34-12	1-V034	34-68	1-R028	34-122	2-W25
34-16	1-L140	34-69	1-S194	34-123	2-L05
34-17	1-W194	34-69, Rev. 1	2-S26	34-128	2-M08
34-18	1-W186	34-74	1-L034	34-137	2-S32
34-20	1-W076	34-77	1-M080	34-141	2-V03
34-21	1-S057	34-80	2-M21	34-142	1-S081
34-23	1-P152	34-81, Rev. 1	2-J19	34-143	2-H03
34-26	1-E012	34-84	2-K05	34-146	2-E04
34-27	1-M217	34-88	2-S03	34-158	2-G04
34-29	1-M079	34-82	2-K03	34-159	2-B15
34-30	1-G060	34-94	1-H052	34-160	2-W02
34-31	1-C098	34-95	2-W23	34-167	2-M16
34-32	2-E03	34-97	1-L022	34-169	2-L10
34-33	1-L033	34-99	2-L04	34-174	2-L11
34-38	1-H013	34-100	2-H04	34-201	2-H10
34-42	1-L021	34-102	2-P06	34-205	2-K04
34-43	1-F082	34-103	2-G10	34-206	2-M06
34-50	1-M169	34-104, Rev	3-V08	34-209	2-J02
34-51	1-S140	34-107	2-C07	34-215	2-W26
35-54	1-B152	34-108	2-C06	34-217	2-A03
34-55	1-B027	34-112	2-J20	34-219	5-F03

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

Technical Release	Entry No.	Technical Release	Entry No.	Technical Release	Entry No.
34-224	2-S27	34-229, Add. 1	3-N03	34-242	2-H05
34-225	2-W04	34-230	2-K06	34-243	2-N05
34-227	2-P05	34-232	2-C08	34-249	2-K02
	3-P03	34-238	2-A01	34-250	2-H06
34-229	2-N02	34-241	2-H11	34-257	2-J18

External Publications

External Publication	Entry No.	External Publication	Entry No.	External Publication	Entry No.
1	1-P046	61	1-P067	155	1-C089
3A	1-G107	61A	1-P068	137	1-W163
4	1-P047	61B	1-P069	138	1-E040
6	1-P048	62	1-P070	140	1-A969
7	1-P049	63	1-H120	141	1-C090
9	1-H004	64	1-D087	143	1-P025
12	1-A063	65	1-L072	145	1-S106
13	1-P051	72	1-D139	147	1-W017
15	1-P052	73	1-D140	149	1-W164
17	1-P053	76	1-L141	151	1-E019
18	1-K014	78	1-C102	154	1-W018
19	1-P054	80	1-P120	156	1-W165
20	1-W058	81	1-S246	158	1-F027
21	1-W059	83	1-V057	159	1-T021
22	1-P055	84	1-D143	161	1-P026
23	1-D134	85	1-D144	162	1-G011
24	1-P056	86	1-D145	164	1-L074
25	1-C021	87	1-C065	166	1-N038
27	1-H119	88	1-G147	168	1-I010
28	1-A064	89	1-B096	169	1-S142
29	1-W185	90	1-D149	170	1-A070
30	1-T009	91	1-D150	172	1-W166
31	1-P057	92	1-D151	174	1-A071
32	1-I01	93	1-P121	175	1-P157
33	1-P074	94	1-P071	176	1-K036
34	1-P058	96	1-D066	177	1-H020
36	1-D037	98	1-B117	178	1-N012
37	1-D135	100	1-S104	180	1-K041
38	1-B080	101	1-D067	184	1-R059
39	1-P060	105	1-S105	185	1-Y017
40	1-P061	103	1-A067	186	1-G012
41	1-D136	107	1-D153	191	1-L143
43	1-P062	109	1-P072	192	1-B118
45	1-D137	114	1-C087	193	1-Z022
46	1-J143	115	1-P073	194	1-F078
48	1-Z011	118	1-V058	197	1-S143
52	1-P063	119	1-H031	200	1-J137
53	1-G114	121	1-A068	203	1-Z023
54	1-H105	124	1-C088	204	1-R029
55	1-W159	126	1-L073	208	1-A012
56	1-P064	127	1-W161	209	1-N040
58	1-F024	128	1-F026	210	1-C103
59	1-A065	131	1-G035	211	1-P159
60	1-P065	132	1-W162	212	1-F079
60A	1-P066				

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 NUMERICAL INDEX

External Publication	Entry No.	External Publication	Entry No.	External Publication	Entry No.
214	1-Y001	316	1-R122	411	1-G016
216	1-W169	318	1-J009	412	1-L084
217	1-F029	319	1-H061	415	1-S083
218	1-W019	320	1-R061	417	1-J110
220	1-P081	324	1-W195	418	1-S132
221	1-I011	326	1-W043	420	1-G039
222	1-L049	327	1-C100	421	1-S171
224	1-G013	328	1-B166	422	1-L012
225	1-K042	329	1-J010	424	1-B009
228	1-W042	331	1-R097	426	1-B168
234	1-W170	332	1-B036	427	1-F094
236	1-L003	334	1-B167	428	1-C130
236A	1-L004	337	1-V036	440	1-S250
237	1-B017	339	1-B007	445	1-W045
239	1-M127	342	1-G037	446	1-G046
240	1-M083	343	1-A075	447	1-B095
242	1-W183	345	1-L162	448	1-W196
243	1-P056	347	1-L011	449	1-L152
251	1-S144	348	1-M046	451	1-S121
253	1-N043	349	1-B124	456	1-R032
254	1-C099	350	1-L052	457	1-C095
256	1-R060	351	1-B057	458	1-S055
257	1-F030	352	1-P017	459	1-B148
259	1-M007	353	1-R113	459, Rev.	1-B149
260	1-F031	354	1-B119	461	1-J111
262	1-L145	355	1-S249	462	1-W073
263	1-J012	356	1-R079	463	1-C061
264	1-S145	359	1-S170	464	1-S172
266	1-J145	364	1-G040	467	1-V065
268	1-B073	366	1-P122	469	1-M183
271	1-S247	368	1-B059	471	1-H054
274	1-W030	369	1-L150	477	1-H065
277	1-K055	379	1-R052	479	1-M084
277A	1-A072	380	1-D016	481	1-B200
278	1-E043	381	1-H062	483	1-P123
281	1-L043	382	1-G038	485	1-L023
282	1-W179	383	1-R060	487	1-K043
283	1-L050	384	1-R081	489	1-S232
286	1-K056	385	1-L151	490	1-R033
288	1-H060	386	1-G041	491	1-V037
289	1-W125	387	1-E044	492	1-R053
290	1-W126	388	1-R129	492	1-P107
293	1-W031	389	1-M203	506	1-M039
294	1-P160	390	1-H063	501	1-V038
298	1-S267	392	1-M182	502	1-R062
299	1-K057	394	1-D025	504	1-S251
300	1-S169	395	1-G063	505	1-N050
301	1-F032	396	1-G015	506	1-G017
302	1-N044	398	1-R083	510	1-H068
303	1-B006	399	1-M135	511	1-B192
307	1-M131	401	1-H064	512	1-R034
309	1-M132	402	1-W077	514	1-H055
310	1-M133	404	1-L100	518	1-P108
311	1-L089	405	1-B058	519	1-H024
312	1-R121	406	1-S290	520	1-H035
314	1-B165	407	1-B191	523	1-R054
315	1-L051	410	1-W044	525	1-P131

**JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX**

External Publication	Entry No.	External Publication	Entry No.	External Publication	Entry No.
526	1-F103	610, Rev.	1-M086	679	2-L08
530	1-B120	613	1-V036	682	1-V073
532	1-M170	622	1-H066	685	1-R055
537	1-W132	623	1-V041	698	1-D015
538	1-B201	627	1-V040	699	1-L036
539	1-W073	630	1-M050	701	1-E013
545	1-S127	633	1-L154	701, Rev.	1-H058
547	1-R035	634	1-L054	702	1-B010
548	1-D014	635	1-V146	703	1-W079
551	1-P125	638	2-H14	704	1-H014
552	1-R153	639	1-L028	705	1-H059
553	1-L035	641	1-J112	718	1-B193
554	1-M147	646	1-L029	720	1-M172
558	1-B121	647	1-B202	769	1-S277
560	1-L024	648	1-W133	789	1-R056
571	1-H070	649	1-H057	790	1-W187
572	1-R003	650	1-L155	792	1-T074
574	1-P109	653	1-N051	793	1-C030
576	1-B001	655	1-L013	795	1-C018
581	1-L153	656	1-P083	800	1-N008
586	1-V039	664	1-W047	801, Rev. 1	2-W07
589	1-K030	669	1-D026	804	1-H073
591	1-W046	670	1-L147	806	1-J147
593	1-H005	671	1-S175	808	1-B137
596	1-M040	672	1-L085	809	1-M087
598	1-S173	673	1-V043	810	1-L101
603	1-F104	674	1-K032	821	1-W048
606	1-M176	675	1-V067	824	1-B157
608	1-L053	676	1-M171	831	1-A082
610	1-M085	677	1-W075	832	1-S077

Miscellaneous Documents

JPL Memorandum	Entry No.	JPL "R" Report	Entry No.	JPL Miscellaneous	Entry No.
JPL-1	1-V050	R-4	1-P022	10	1-B021
JPL-2	1-V051	R-5	1-B098	13	1-J091
JPL-3	1-M023	R-6	1-M034	14	1-S099
JPL-7	1-D089	R-7	1-P021	15	1-N013
JPL-9	1-J069			18	1-J092
JPL-9, Supp. 1	1-J070			19	1-T046
JPL-9, Supp. 2	1-J071	Planning Report		20	1-J093
JPL-9, Supp. 3	1-J073			21	1-J094
JPL-10	1-J072	35-1	2-J07	22	1-J095
JPL-11	1-M153	35-2	2-J08	23	1-J096
JPL-11, Add 1	1-J074			24	1-J097
		JPL Miscellaneous		25	1-J090
JPL "R" Report				26	1-J098
R-1	1-M033	2	1-V056	27	1-D132
R-2	1-M031	4	1-M028	28	1-J100
R-3	1-T070	5	1-D131	29	1-D133
		7	1-M180	30	1-J101
				31	1-J102

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 NUMERICAL INDEX

Technical Reports

Technical Report	Entry No.	Technical Report	Entry No.	Technical Report	Entry No.
32-1	1-L032	32-59	2-S30	32-120	2-D01
32-2	1-W198	32-60	2-B03	32-122	3-F02
32-3	1-G072	32-61	2-L12	32-123	2-V07
32-4	1-O025	32-62	2-W15	32-124	3-L06
32-5	1-G073	32-63	2-B05	32-125	3-N08
32-6	1-C974	32-64	3-W12	32-126	3-W20
32-7	1-C028	32-65	3-L20	32-127	3-P04
32-9	1-K039	32-66	2-N01	32-128	3-P01
32-10	1-V062	32-67	2-B06	32-129	3-S10
32-11	2-L03	32-68	2-M19	32-130, Rev.	3-F04
32-12	1-M168	32-69	3-N06	32-131, Rev.	3-S06
32-13	1-W004	32-70	2-G05		4-S03
32-14	2-W21	32-71	2-K09	32-132, Rev. 1	3-V03
32-15	1-G065	32-73	2-H08	32-133	3-D01
32-16	1-V063	32-74	2-C09	32-134	3-H01
32-17	1-W200	32-76	2-B10	32-135	3-L11
32-18	1-G075	32-77	4-C14	32-136	3-J17
32-19	1-V064	32-78	2-W18	32-137, Rev.	3-V04
32-20	2-W22	32-79	2-L06	32-138	3-K03
32-21	1-A013	32-80	3-E01	32-139	3-M22
32-22	1-B106	32-81	2-W01	32-140	3-T03
32-23	1-W199	32-82	3-W03	32-141	3-J06
32-24	2-B14	32-84	2-P01	32-146	3-L03
32-25	2-V05	32-85, Rev. 1	2-M05	32-147	3-M09
32-26	1-O023	32-86	4-M19	32-148	3-R03
32-28	2-N06	32-87	2-R02	32-149	3-P06
32-29	2-K07	32-88	3-W13	32-150	3-J01
32-30	2-C03	32-90	2-G09	32-151	3-F07
32-30, Rev. 1	3-C08	32-91	3-S15	32-152	3-T05
32-31, Vols. I & II	2-W19	32-92	3-W14	32-153	3-C07
32-31, Vol. III	3-M29	32-93	5-G01	32-154	3-H08
32-32	2-L13	32-94	2-M15	32-155	3-P02
32-33	2-S06	32-95	2-L07	32-156	3-B02
32-34	2-S01	32-96	2-G02	32-157	3-W10
32-35	2-H17	32-97	2-S09	32-158	3-B05
32-36	2-S13	32-97, Rev.	3-S11	32-159	3-S31
32-37	2-B11	32-98	2-M18	32-160	3-A05
32-38	2-G03	32-99	2-A02	32-161	3-J02
32-39	2-B13	32-100	2-V09	32-162	3-G02
32-40	2-E07	32-101	3-H07	32-163	3-M04
32-41	2-K01	32-102	2-Z02	32-164	3-C03
32-42	2-M12	32-103	2-H12	32-165	3-F05
32-43	2-W05	32-104	2-S19	32-166	3-H12
32-44	2-B07	32-105	2-H09	32-168	5-S39
32-45	2-K11	32-106	2-V10	32-169	3-H09
32-47	2-N07	32-107	2-O03	32-170	3-R13
32-48	2-V09	32-108	2-K08	32-171	3-S23
32-49	2-W10	32-109	2-N03	32-172	3-G06
32-50	2-W12	32-110	3-A04	32-173	3-M24
32-51	2-W13	32-112	4-G05	32-174	3-I.09
32-52	2-W14	32-113	2-R01	32-175	3-S18
32-53	2-W11	32-114	2-D03	32-176	3-J03
32-54	2-M24	32-115	2-B09	32-178	3-M20
32-55	2-J13	32-116	2-E06	32-179	3-S41
32-56	2-V08	32-117	2-E05	32-180	3-H05
32-57	2-M01	32-118	2-M20	32-181	3-M11
32-58	2-W06	32-119	3-L08	32-182	3-S02
				32-183	4-M15

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

Technical Report	Entry No.	Technical Report	Entry No.	Technical Report	Entry No.
32-186	3-M01	32-248	4-M27	32-311	4-W09
32-187	3-M05	32-250	3-M26	32-313	4-K05
32-188	3-S47	32-250, Abridged	4-M18	32-314	4-S25
32-189	3-S33	32-251	3-S36	32-315	4-W15
32-190	3-B06	32-252	4-L02	32-316	4-B27
32-191	3-B16	32-252, Add. 1	4-L03	32-317	4-R08
32-192	3-H10	32-253	4-T09	32-318	4-W06
32-194	3-L05	32-254	3-K02	32-319	4-T02
32-195	4-M02	32-255	3-N02	32-320	4-H10
32-196	3-L07	32-256	4-S24	32-321	4-H22
32-197	3-M23	32-257	4-P15	32-322	4-C04
32-198	3-A03	32-259	3-Z01	32-324	4-P04
32-199	5-J07	32-260	3-M17	32-325, Rev.	4-J01
32-199, Rev.	4-J04	32-261, Part I	4-L04	32-326	5-B07
32-200	3-C05	32-261, Part II	4-L05	32-327	5-C03
32-201	3-S48	32-262	3-E08	32-328	4-K10
32-202	3-N01	32-263	3-S38	32-329	4-B01
32-203	3-N05	32-264	4-M07	32-330	4-K11
32-204	3-H02	32-265	3-F09	32-332	4-S15
32-205	3-S25	32-266	5-E04	32-333	5-T11
32-206	3-N07	32-267	3-K01	32-334	4-H11
32-207	3-R12	32-268	3-I01	32-335	4-L11
32-208	3-G03	32-269	3-D04	32-337	4-B13
32-209	3-C09	32-270	5-W10	32-338	4-B33
32-210	3-R11	32-271	3-M03	32-339	4-B35
32-211	3-M28	32-272	3-A02	32-340	4-C07
32-212	3-C06	32-273	3-C10	32-341	4-B36
32-213	3-R01	32-274	3-S17	32-342	4-L16
32-214	3-P07	32-275	4-C11	32-343	4-B17
32-215	3-M13	32-276	4-K08	32-344	4-W07
32-216	3-M10	32-277	4-K04	32-345	4-H01
32-217	4-B10	32-278	4-S22	32-346	4-D02
32-218	3-V01	32-279	5-W11	32-347	4-E03
32-219	3-N09	32-280	4-G07	32-348	4-L12
32-220	5-K09	32-281	3-S35	32-349	5-D03
32-221	3-M31	32-282	4-E02	32-350	4-Z01
32-222	3-C04	32-283	4-R18	32-351	4-C13
32-223	3-H15	32-284	4-M14	32-352	4-S33
32-224	3-M02	32-286	4-M20	32-353	4-J05
32-225	3-K07	32-288	4-D05	32-354	4-P13
32-226	3-M25	32-280	4-M25	32-355	4-J06
32-226, Rev.	4-M17	32-290	3-K05	32-356	4-L21
32-227	3-L04	32-291	4-B07	32-357	4-E10
32-228	3-W06	32-293	4-L20	32-358	5-T07
32-229	3-V10	32-294	3-K04	32-359	5-T08
32-230	3-W11	32-295	3-P08	32-360	4-K09
32-231	3-B07	32-296	4-C12	32-361	4-M16
32-232	3-V07	32-297	4-N04	32-362	4-K15
32-233	3-S34	32-298	4-E01	32-363	4-K02
32-234	3-G01	32-299	5-K13	32-364	4-D03
32-235	3-H04	32-300	4-B08	32-365	4-S02
32-236	3-M19	32-301	3-K06	32-366	4-M01
32-237	3-M06	32-302	4-V05	32-368	4-B15
32-238	3-S19	32-303	3-B08	32-369	4-E09
32-239	4-H17	32-304	3-S45	32-371	4-M08
32-241	3-J08	32-305	4-P16	32-372	4-C05
32-242	3-R10	32-306	3-S05	32-373	4-T08
32-244	4-W10	32-309	4-S01	32-374	4-T04
32-245	3-L14	32-310	4-E04	32-375	4-L13
32-247	3-B17			32-376	5-S06

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
 NUMERICAL INDEX.

Technical Report	Entry No.	Technical Report	Entry No.	Technical Report	Entry No.
32-377	4-B34	32-439	4-S16	32-523	5-WC6
32-378	4-V06	32-440	4-L17	32-524	5-P07
32-379	4-K01	32-441	5-M11	32-525	5-H22
32-380	5-D04	32-442	5-A08	32-527	5-N01
32-381	4-T06	32-443	4-C03	32-529	5-R25
32-383	5-J08	32-444	4-C20	32-530	5-L27
32-384, Rev.	4-H15	32-445	5-P04	32-531	5-M01
32-385	4-D01	32-446	5-S26	32-532	5-F01
32-386	5-C05	32-447	5-P05	32-533	5-J11
32-387	4-E07	32-448	4-L10	32-534	5-C01
32-388	5-T13	32-450	5-L14	32-535	5-B26
32-389	4-L01	32-451	5-J13	32-538	5-S11
32-390	4-B29	32-452	5-L09	32-539	5-H20
32-391	4-B30	32-454	5-S21	32-540	5-T21
32-392	4-P17	32-455	5-Z01	32-542	5-D08
32-393	4-R05	32-458	5-B22	32-543	5-J04
32-394	4-M24	32-458, Rev. 1	5-B23	32-544	5-J05
32-395	4-B02	32-459	5-C04	32-545	5-P01
32-397	4-S23	32-462	5-S22	32-546	5-A09
32-398	4-M04	32-463	5-T09	32-547	5-H25
32-399	4-C02	32-464	5-M14	32-548	5-B08
32-400	4-L18	32-465	5-N09	32-550	5-S23
32-401	5-F03	32-468	5-L01	32-551	5-E05
32-402	4-R06	32-469	5-G05	32-552	5-N02
32-403	5-S25	32-474	5-R08	32-553	5-K10
32-404	4-B14	32-475	5-P21	32-554	5-K03
32-405	4-C19	32-477	5-M21	32-555	5-P20
32-406	4-H24	32-479	5-S27	32-556	5-S02
32-407	4-L06	32-480	5-C08	32-560	5-R13
32-408	5-G03	32-481	5-C17	32-561	5-R24
32-409	5-G04	32-482	5-L19	32-562	5-S13
32-411	4-T07	32-484	5-C06	32-564	5-B05
	5-T14	32-485	5-M04	32-565	5-L11
32-412	5-D01	32-488	5-P24	32-567	5-D05
32-415	5-B02	32-489	5-C09	32-569	5-A01
32-416	5-V03	32-492	5-J16	32-570	5-F02
32-417	4-S32	32-493	5-T03	32-571	5-R04
32-418	5-M09	32-494	5-M07	32-572	5-R05
32-420	5-S16	32-496	5-Y01	32-573	5-S03
32-421	4-C09	32-497	5-A05	32-576	5-E02
32-422, Vol. 1	5-J09	32-498	5-A06	32-577	5-S17
32-422, Vol. 2	5-J10	32-499	5-T04	32-579	5-L04
32-423	5-M20	32-501	5-V03	32-580	5-P02
32-424	4-C21	32-504	5-C02	32-584	5-W04
32-425	5-W02	32-505	5-K08	32-587	5-K05
32-426	4-K06	32-506	5-H24	32-588	5-T10
32-427	4-V04	32-507	5-V05	32-589	5-J02
32-429	4-J07	32-508	5-D02	32-593	5-B04
32-430	4-C06	32-509	5-A02	32-594	5-S19
32-431, Part I	4-S18	32-510	5-E03	32-596	5-H01
32-431, Part II	4-S19	32-512	5-C11	32-597	5-L15
32-431, Part III	4-S20	32-513	5-P06	32-600	5-N11
32-432	5-H23	32-514	5-S15	32-602	5-P23
32-433	5-R06	32-515	5-N04	32-604	5-C10
32-434	4-R19	32-516	5-B03	32-606	5-L18
32-435	4-W11	32-517	5-R09	32-608	5-R26
32-436	5-B24	32-518	5-S01	32-609	5-R06
32-437	5-S20	32-520	5-S05	32-614	5-W08
32-438	5-H15	32-521	5-J15	32-617	5-J07
		32-522	5-L20	32-619	5-S07

Technical Memorandums

Technical Memorandum	Entry No.	Technical Memorandum	Entry No.	Technical Memorandum	Entry No.
33-1	1-H034	33-52, Add. A	3-J10	33-104	4-C01
33-2	2-M17	33-52, Add. B	3-J11	33-105	4-V02
33-4	1-J103	33-52, Add. C	3-J12	33-106	4-D06
33-4, Add. 1	2-J03	33-53	3-B18	33-107	4-G02
33-5	1-J105	33-54	3-J13	33-109	4-L15
33-6	1-I008	33-55	3-V02	33-110	4-L19
33-8	1-J104	33-56	3-R02	33-111	4-N03
33-9	1-J106	33-57	3-S03	33-112	4-M23
33-10	1-D075	33-58	3-P05	33-113, Rev.	4-P19
33-11	1-J107	33-59	3-C13	33-114	4-G03
33-12	1-J108	33-60	3-L15	33-116	4-B04
33-12, Add. A	2-D02	33-61	3-L16	33-118	4-B05
33-13	1-D075	33-62	3-L02	33-119	4-B06
33-13, Vol. I, Rev. 3	2-J10	33-63	3-H11	33-120	4-L08
33-13, Vol. II, Rev. 3	2-J12	33-64	3-E10	33-121	4-L09
33-13, Vol. III, Rev. 2	2-J11	33-65	3-E11	33-122	4-V03
33-14	1-C070	33-66	3-M30	33-123	4-S26
33-14, Rev. 1	2-C04	33-67	3-B03	33-126	4-R07
33-15	1-N049	33-68	3-Y02	33-127	4-D04
33-16, Rev. 1	2-J04	33-69	3-L17	33-128	5-L06
33-16, Rev. 2	2-J06	33-71	3-C16	33-130	4-S08
33-17	2-C06	33-72	3-C01	33-131	4-A02
33-18	1-J109	33-73	3-C04	33-132	5-W09
33-19	2-S21	33-75	3-B04	33-133	4-R02
33-20	2-M11	33-76	4-M03	33-134	5-A03
33-21	2-S10	33-77	3-T04	33-137	4-H20
33-22	2-L15	33-78	3-C02	33-138	4-S09
33-23	2-E01	33-79	3-J14	33-139	5-R01
33-24	2-C05	33-80	3-W02	33-140	5-L12
33-25	2-P03	33-81	3-S46	33-141	4-B03
33-26, Vols. I & II	2-J05	33-82	3-C12	33-142	5-L05
33-27	2-H01	33-83	3-J15	33-143, Rev. 1	5-A07
33-28	2-C02	33-83, Rev. 1	5-J12	33-144	4-C17
33-30	2-R03	33-84	3-W17	33-145	4-K07
33-31	2-H19	33-85	4-P14	33-146	5-T01
33-32	2-C08	33-86	3-S20	33-147	4-A03
33-33	2-M23	33-87	3-N10	33-149	5-T02
33-34	2-J17	33-88	3-R05	33-151	5-M18
33-36	2-V01	33-89	4-H13	33-153	5-V02
33-37	2-J15	33-90	5-M19	33-154	5-K11
33-38	2-J14	33-92	4-B12	33-156	5-S04
33-39	2-J16	33-93	3-N04	33-157	5-C07
33-40	2-M14	33-94	4-S30	33-157	5-C07
33-41	2-B08	33-95	4-H16	33-158	5-J14
33-42	2-S17	33-96	4-H19	33-159	5-T12
33-43	2-J01	33-97	4-M13	33-161	5-H19
33-45	3-U01	33-98	4-B28	33-162	5-L17
33-47	2-S20	33-99	4-C15	33-163	5-M13
33-48	3-C11		5-C11	33-165	5-M06
33-49	2-D02	33-100, Vol. I, Part A	5-C12	33-167	5-P03
33-52	3-J00	33-101	4-S06	33-168	5-W01
		33-103	4-V01	33-171	5-R12

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

Summaries

	Entry No.	Research Summary	Entry No.	Space Programs Summary	Entry No.
Ranger Annual Report					
1	3-AB33	36-5, Vol. II	2-AB10	37-17, Vol. II	4-AB12
		36-5, Vol. III	2-AB11	37-17, Vol. III	4-AB13
Sergeant Annual Report		36-6, Vol. I	2-AB12	37-17, Vol. IV	4-AB14
		36-6, Vol. II	2-AB13	37-17, Vol. V	4-AB15
		36-6, Vol. III	2-AB14	37-17, Vol. VI	4-AB16
1	1-J113	36-7, Vol. I	2-AB15	37-18, Vol. I	4-AB17
2	1-J114	36-7, Vol. II	2-AB16	37-18, Vol. II	4-AB18
3	1-J115	36-7, Vol. III	2-AB17	37-18, Vol. III	4-AB19
		36-8	2-AB18	37-18, Vol. IV	4-AB20
Combined Bimonthly Summary		36-9, Vol. I	3-AB05	37-18, Vol. V	4-AB21
		36-9, Vol. II	3-AB06	37-18, Vol. VI	4-AB22
1 to 68	1-AB01	36-10, Vol. I	3-AB07	37-19, Vol. I	4-AB23
Series A, Nos. 19-A to 44-A	1-AB02	36-10, Vol. II	3-AB08	37-19, Vol. II	4-AB24
		36-11	3-AB09	37-19, Vol. III	4-AB25
Guided Missile Summary		36-12, Vol. I	3-AB10	37-19, Vol. IV	4-AB26
		36-12, Vol. II	3-AB11	37-19, Vol. V	4-AB27
45 to 77	1-AB03	36-13	3-AB12	37-19, Vol. VI	4-AB28
78	2-AB01	36-14	3-AB13	37-20, Vol. I	4-AB29
				37-20, Vol. II	4-AB30
		Space Programs Summary		37-20, Vol. III	4-AB31
Jupiter Bimonthly Summary		1 to 3	1-AB06	37-20, Vol. IV	4-AB32
		1 to 6; 37-1 to 37-3	1-AB07	37-20, Vol. V	4-AB33
1 to 12	1-AB05	37-4	2-AB19	37-20, Vol. VI	4-AB34
		37-5	2-AB20	37-21, Vol. I	4-AB35
Nuclear Propulsion Summary		37-6	2-AB21	37-21, Vol. II	4-AB36
		37-7	2-AB22	37-21, Vol. III	4-AB37
1 to 9	1-AB04	37-8, Vol. I	2-AB23	37-21, Vol. IV	4-AB38
		37-8, Vol. II	2-AB24	37-21, Vol. V	4-AB39
Quarterly Summary Report		37-9, Vol. I	2-AB25	37-21, Vol. VI	4-AB40
		37-9, Vol. II	2-AB26	37-22, Vol. I	5-AB04
38-1	2-AB02	37-10, Vol. I	3-AB14	37-22, Vol. II	5-AB05
38-2	2-AB03	37-10, Vol. II	3-AB15	37-22, Vol. III	5-AB06
38-3	2-AB04	37-11, Vol. I	3-AB16	37-22, Vol. IV	5-AB07
38-4	3-AB01	37-11, Vol. II	3-AB17	37-22, Vol. V	5-AB08
38-5	3-AB02	37-12, Vol. I	3-AB18	37-22, Vol. VI	5-AB09
38-6	3-AB03	37-12, Vol. II	3-AB19	37-23, Vol. I	5-AB10
38-7	3-AB04	37-13, Vol. I	3-AB20	37-23, Vol. II	5-AB11
38-8	4-AB01	37-13, Vol. II	3-AB21	37-23, Vol. III	5-AB12
38-9	4-AB02	37-14, Vol. I	3-AB22	37-23, Vol. IV	5-AB13
38-10	4-AB03	37-14, Vol. II	3-AB23	37-23, Vol. V	5-AB14
38-11	4-AB04	37-15, Vol. I	3-AB24	37-23, Vol. VI	5-AB15
38-12	5-AB01	37-15, Vol. II	3-AB25	37-24, Vol. I	5-AB16
38-13	5-AB02	37-15, Vol. III	3-AB26	37-24, Vol. II	5-AB17
38-14	5-AB03	37-15, Vol. IV	3-AB27	37-24, Vol. III	5-AB18
		37-15, Vol. V	3-AB28	37-24, Vol. IV	5-AB19
Research Summary		37-15, Vol. VI	3-AB29	37-24, Vol. V	5-AB20
		37-16, Vol. I	3-AB30	37-24, Vol. VI	5-AB21
1 to 6; 36-1 to 36-3	1-AB08	37-16, Vol. II	4-AB05	37-25, Vol. I	5-AB22
36-3, Vol. II	2-AB05	37-16, Vol. III	4-AB06	37-25, Vol. II	5-AB23
36-4, Vol. I	2-AB06	37-16, Vol. IV	4-AB07	37-25, Vol. III	5-AB24
36-4, Vol. II	2-AB07	37-16, Vol. V	4-AB08	37-25, Vol. IV	5-AB25
36-4, Vol. III	2-AB08	37-16, Vol. VI	4-AB09	37-25, Vol. V	5-AB26
36-5, Vol. I	2-AB09	37-17, Vol. I	4-AB10	37-25, Vol. VI	5-AB27
			4-AB11	37-26, Vol. I	5-AB28
				37-26, Vol. II	5-AB29

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

Space Programs Summary	Entry No.	Space Programs Summary	Entry No.	Space Programs Summary	Entry No.
37-26, Vol. III	5-AB30	37-26, Vol. VI	5-AB33	37-27, Vol. III	5-AB36
37-26, Vol. IV	5-AB31	37-27, Vol. I	5-AB34	37-27, Vol. V	5-AB37
37-26, Vol. V	5-AB32	37-27, Vol. II	5-AB35	37-27, Vol. VI	5-AB38

Astronautics Information

Documents

Abstract	Entry No.	Abstract	Entry No.	Open Literature Survey	Entry No.
Vol. I, Part A (Abstracts 1,001-1,175)	1-AC01	Vol. IV, No. 3 (Abstracts 4,202-4,321)	3-AC03	Vol. II, No. 8 (Entries 22,421-22,670)	2-AC14
Vol. I, Part B (Abstracts 1,176-1,329)	1-AC02	Vol. IV, No. 4 (Abstracts 4,322-4,427)	3-AC04	Vol. II, No. 9 (Entries 22,671-22,870)	2-AC15
Vol. I, Part C (Abstracts 1,330-1,503)	1-AC03	Vol. IV, No. 5 (Abstracts 4,428-4,521)	3-AC05	Vol. II, No. 10 (Entries 22,871-23,094)	2-AC16
Vol. I, Part D (Abstracts 1,504-1,726)	1-AC04	Vol. IV, No. 6 (Abstracts 4,522-4,616)	3-AC06	Vol. II, No. 11 (Entries 23,095-23,310)	2-AC17
Vol. II, Nos. 1-3 (Abstracts 2,001-2,185)	1-AC05	Vol. V, No. 1 (Abstracts 5,000-5,100)	3-AC07	Vol. II, No. 12 (Entries 23,311-23,514)	2-AC18
Vol. II, No. 4 (Abstracts 2,186-2,335)	1-AC06	Vol. V, No. 2 (Abstracts 5,101-5,200)	3-AC08	Vol. III, No. 1 (Entries 30,001-30,201)	2-AC19
Vol. II, No. 5 (Abstracts 2,336-2,431)	1-AC07	Vol. V, No. 3 (Abstracts 5,201-5,330)	3-AC09	Vol. III, No. 2 (Entries 30,202-30,404)	2-AC20
Vol. II, No. 6 (Abstracts 2,432-2,529)	1-AC08	Vol. V, No. 4 (Abstracts 5,331-5,455)	3-AC10	Vol. III, No. 3 (Entries 30,405-30,624)	2-AC21
Vol. II, No. 7 (Abstracts 2,530-2,623)	2-AC01	Vol. V, No. 5 (Abstracts 5,456-5,566)	3-AC11	Vol. III, No. 4 (Entries 30,625-30,844)	2-AC22
Vol. II, No. 8 (Abstracts 2,624-2,715)	2-AC02	Vol. V, No. 6 (Abstracts 5,567-5,682)	3-AC12	Vol. III, No. 5 (Entries 30,845-31,145)	2-AC23
Vol. II, No. 9 (Abstracts 2,716-2,807)	2-AC03			Vol. III, No. 6 (Entries 31,146-31,373)	2-AC24
Vol. II, No. 10 (Abstracts 2,808-2,899)	2-AC04	Open Literature Survey		Vol. IV, No. 1 (Entries 40,001-40,202)	3-AC 3
Vol. II, No. 11 (Abstracts 2,900-2,990)	2-AC05	Vol. I, Part A (Entries 10,001-11,575)	1-AC09	Vol. IV, No. 2 (Entries 40,203-40,453)	3-AC14
Vol. II, No. 12 (Abstracts 2,991-3,081)	2-AC06	Vol. I, Part B (Entries 11,576-12,483)	1-AC10	Vol. IV, No. 3 (Entries 40,454-40,728)	3-AC15
Vol. III, No. 1 (Abstracts 3,082-3,184)	2-AC07	Vol. I, Part C (Entries 12,484-13,165)	1-AC11	Vol. IV, No. 4 (Entries 40,729-41,018)	3-AC16
Vol. III, No. 2 (Abstracts 3,185-3,294)	2-AC08	Vol. I, Part D (Entries 13,166-13,888)	1-AC12	Vol. IV, No. 5 (Entries 41,019-41,268)	3-AC17
Vol. III, No. 3 (Abstracts 3,295-3,395)	2-AC09	Vol. II, Nos. 1-2 (Entries 20,001-20,874)	1-AC13	Vol. IV, No. 6 (Entries 41,269-41,476)	3-AC18
Vol. III, No. 4 (Abstracts 3,396-3,496)	2-AC10	Vol. II, No. 3 (Entries 20,875-21,127)	1-AC14	Vol. V, No. 1 (Entries 50,001-50,205)	3-AC19
Vol. III, No. 5 (Abstracts 3,497-3,596)	2-AC11	Vol. II, No. 4 (Entries 21,128-21,590)	1-AC15	Vol. V, No. 2 (Entries 50,206-50,417)	3-AC20
Vol. III, No. 6 (Abstracts 3,597-3,698)	2-AC12	Vol. II, No. 5 (Entries 21,591-21,870)	1-AC16	Vol. V, No. 3 (Entries 50,418-50,639)	3-AC21
Vol. IV, No. 1 (Abstracts 4,001-4,109)	3-AC01	Vol. II, No. 6 (Entries 21,871-22,113)	1-AC17	Vol. V, No. 4 (Entries 50,640-50,951)	3-AC22
Vol. IV, No. 2 (Abstracts 4,110-4,201)	3-AC02	Vol. II, No. 7 (Entries 22,114-22,420)	2-AC13	Vol. V, No. 5 (Entries 50,952-51,270)	3-AC23
				Vol. V, No. 6 (Entries 51,271-51,483)	3-AC24

JPL CUMULATIVE BIBLIOGRAPHIC INDEX NO. 41-1
NUMERICAL INDEX

Reports and Open Literature	Entry No.	Literature Search	Entry No.	Translation	Entry No.
Vol. VI, No. 1 (Abstracts 60,001-60,307)	4-AC01	102	1-AC19	5	1-AC36
		143	1-AC22	6	1-AC37
Vol. VI, No. 2 (Abstracts 60,308-60,603)	4-AC02	149	1-AC23	7	1-AC45
		152	1-AC24	8	1-AC46
Vol. VI, No. 3 (Abstracts 60,604-60,929)	4-AC03	160	1-AC25	9	1-AC39
		177	1-AC33	10	1-AC41
Vol. VI, No. 4 (Abstracts 60,930-61,248)	4-AC04	183	1-AC26	11	1-AC47
		186	1-AC27	12	1-AC42
Vol. VI, No. 5 (Abstracts 61,249-61,601)	4-AC05	195	1-AC30	13	2-AC32
		196	1-AC31	14	1-AC44
Vol. VI, No. 6 (Abstracts 61,602-61,885)	4-AC06	205	2-AC30	16	2-AC33
		207	1-AC32	17	2-AC34
Vol. VII, No. 1 (Abstracts 70,001-70,344)	4-AC07	230	1-AC28	18	2-AC35
		247	2-AC25	19	2-AC36
Vol. VII, No. 2 (Abstracts 70,345-70,608)	4-AC08	254	2-AC27	20	2-AC37
		254, Supp.	2-AC31	21	2-AC38
Vol. VII, No. 3 (Abstracts 70,609-70,930)	4-AC09	260	3-AC29	22	2-AC39
		260, Supp.	4-AC13	23	2-AC40
Vol. VII, No. 4 (Abstracts 70,931-71,239)	4-AC10	280	2-AC26	24	3-AC30
		294	2-AC28	25	3-AC31
Vol. VII, No. 5 (Abstracts 71,240-71,645)	4-AC11	308	2-AC29	26	3-AC32
		341	3-AC26	27	3-AC33
Vol. VII, No. 6 (Abstracts 71,646-72,015)	4-AC12	345	3-AC27	28	3-AC34
		392	3-AC23	29	5-AC05
Vol. VIII, No. 1 (Abstracts 80,001-80,367)	5-AC01	428	3-AC29	30	5-AC06
		464	4-AC15	31	5-AC07
Vol. VIII, No. 2 (Abstracts 80,368-80,778)	5-AC02	490	5-AC03	32	5-AC08
		523	4-AC14	33	5-AC09
		587	5-AC04		
Literature Search		Translation		Seminar Proceedings	
57	1-AC29	1	1-AC40	AI/SP	1-AC48
60	1-AC18	2	1-AC38	AI/SP	4-AC16
67	1-AC21	3	1-AC34	AI/SP	4-AC17
74	1-AC20	4	1-AC35	AI/SP	4-AC18

END .

DATE

FILMED

SEP 8 1969