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MSJ Memo #7-69

TO: Distribution

FROM: Madeline S. Johnson

DATE: 24 June 1969

SUBJECT: A list of titles and authors

As you gather your thoughts together to write your respective parts in the Apollo Final Report (Software), you may find it helpful to refresh your collective memories with a list of titles and authors of all of the E, R and T notes pertaining to Apollo and a list of all of the SGA memos. That list is attached.

MSJ/sew
Enclosure

Madeline

cc:

R. R. Bairnsfather
R. H. Battin
L. Berman
H. Blair-Smith
T. J. Brand
G. W. Cherry
S. L. Copps
J. M. Dahlen
D. Densmore
C. S. Draper
A. G. Engel
P. G. Felleman
F. K. Glick
R. D. Goss
E. J. Grace
A. I. Green
K. W. Greene
M. H. Hamilton
D. G. Hoag
M. W. Johnston
J. E. Jones
P. F. Jopling
P. Kachmar
G. R. Kalan
D. Keene
L. B. Johnson
J. E. Kernan
A. Klumpp
A. L. Kosmala
B. A. Kriegsman
W. S. Kupfer
A. Laats
J. H. Laning, Jr.
L. E. Larson
R. A. Larson
G. M. Levine
W. F. Marscher
F. H. Martin
R. C. Millard
P. R. Mimno
J. A. Morse
R. H. Morth
E. S. Muller
J. L. Nevins
J. T. O'Connor
P. E. Peck
A. Penchuk
J. M. Reber
J. Reed
W. M. Robertson
R. J. Russell
P. Rye
R. Schlundt
G. T. Schmidt
G. W. Schulenberg
N. E. Sears
G. L. Silver
W. A. Stameris
R. F. Stengel
G. Stubbs
J. B. Suomala
W. Tempelman
R. K. Tinkham
M. B. Trageser
J. F. Turnbull
J. E. Vella
W. A. Walsh
R. E. Weatherbee
R. L. White
W. S. Widnall
C. C. Work
S. Zeldin
E. M. Copps (Intermetrics)
D. J. Lickly (Intermetrics)
J. S. Miller (Intermetrics)
C. F. Ide (CCA)

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E-NOTES

No.		
E-1105	Eldon Hall	Computer Displays
E-1106	P. G. Felleman	Analysis of Guidance Techniques for Achieving Orbital Rendezvous
E-1118	R. Scholten P. Philliou	Investigation of Midcourse Maneuver Fuel Requirements
E-1124	J. S. Miller J. Deyst	Preliminary Study of Aborts from Circumlunar Trajectories
E-1131	J. S. Miller R. Battin	Preliminary Summary of Data for a Variety of Circumlunar Trajectories
E-1192	N. Sears	Earth Orbital Rendezvous
E-1192	M. Johnston	Analysis of Two Lunar Landing Techniques, Providing Direct Landing Site Visibility Prior to Touchdown published 7/62
E-1256	J. Hursh	Apollo Midcourse Guidance published 11/62
E-1261	G. Levine	Application of Midcourse Guidance Techniques to Orbit Determination published 12/62
E-1287	J. Dahlen Long	Backup Thrust Vector Control published 2/63
E-1250		Sect V & VI Midcourse Guidance and Navigation And Re-entry Guidance published 2/63 and 3/63
E-1353	E. Copps A. Koso Nordtvedt M. Trageser	The Horizon Photometer & Other Earth Marking Orbit G&N Measurements published 5/63

E-NOTES CONT'D

E-1359	J. Dahlen Heinsheimer J. Suomala	Flight Test Plane - Age 5
E-1374	J. Sciegienny	Propagation of Altitude & Altitude Rate Errors During Suborbital Flight - published 6/63
E-1398	J. Dahlen J. Suomala	Comments on the Lunar Landing Mission Design Plan of 15 April 1963 - published 8/63
E-1429	D. Baker N. Sears J. Suomala R. White	Lunar Orbit Determination by Star Occultations and MSFN Tracking - published 9/63
E-1473	J. Dahlen M. Johnston	Analysis of LEM Mission Inertial Uncertainties published 12/63
E-1540	Nordtvedt	A Preliminary Study of a Back Up Manual Navigation Scheme - published 8/64
E-1560	M. Johnston	A Manual LEM Backup Guidance System - published 4/64
E-1574	A. Green Rocchio	Keyboard & Display System Program for AGC Program SUNRISE - published 8/64
E-1634	M. Wolff	The Profile of an Exponential Atmosphere Viewed from Outer Space and Consequences for Space Navigation - published 9/64 (U)
E-1660	J. McNeil	AIDS (Abort Inertial Digital System) - published 11/64 (U)
E-1663	A. Klumpp	A Manual Abort Guidance Procedure Based On Range & Altitude Measurements - published 10/64 (U)
E-1687	M. Wolff	An Optical Earth Horizon Profile Based Upon Tabulated Solutions of Chandrasenkhar's Equations - published 10/64 (U)

E-NOTES CONT'D

E-1750	D. C. Dilworth	Computer Programs for Optical System Analysis and Design - published 2/65 (U)
E-1758	T. J. Lawton C. A. Muntz	Organization of Computation and Control in the Apollo Guidance Computer - published 4/65 (U)
E-1769	W. Tanner	Typical Missile and Satellite Radar Tracking Systems - published 4/65 (U)
E-1786	T. J. Lawton C. A. Muntz	Verification Plan for AGC/LGC Programs - published 5/65 (U)
E-1800	D. Fraser	A Sequence of Computer Programs Useful in the Analysing of Feedback Control Systems, published 5/65 (U)
E-1803	J. Sciegienny	System Analysis of Lunar Landing Radar, published 6/65 (C)
E-1903	N. E. Sears L. Johnson	PGNS Rendezvous Radar Functional and Performance Specifications, published 3/65 (C)
E-1904	N. E. Sears L. Johnson	PGNS Landing Radar Functional and Performance Specifications, published 3/65 (C)
E-1832	R. Crisp D. Keene	Attitude Maneuver Optimization to Conserve Reaction Control Propellants, published 8/65 (U)
E-1864	M. Sullivan	Presimulation Report - Apollo Mission 202 Dynamic Simulation Block I, published 9/65 (U)
E-1877	E. D. Smally	Show-Banksum and Final Block I AGC Selfcheck, published 11/65 (U)

E-NOTES CONT'D

E-1760	B. A. Kriegsman D. S. Millard	Performance Monitoring of the PGNS for Unpowered Lunar Orbit Flight Phases, published 12/65 (U)
E-1905	A. I. Green	Keyboard and Display Program and Operations, published 1/66 (U)
E-1906	J. Hallock	Fournier Analysis by the Method of Selected Ordinates, published 1/66 (U)
E-1922	A. Kosmala	Mission AS-202, AGC Software Verification, Summary of Results of Digital Simulation, published 2/66 (U)
E-1923	M. Sullivan James Cutter	Apollo Mission 202 Dynamic Solution Block I, published 1/66 (U)
E-1937	J. Sciegienny	Velocity Errors in Lunar Landing Radar Caused by Digital Processing, published 3/66 (U)
E-1899	J. L. Nevins	Apollo Operations Handbook - G&N System - Command and Service Module Mission AS-204B, Spacecraft 012, published 6/66 (U)
E-1964	R. Crisp D. Keene	Apollo Command and Service Module Reaction Control by the Digital Autopilot, published 5/66 (U)
E-1970	E. C. Hall	Case History of the Apollo Guidance Computer, published 6/66 (U)
E-1973	L. Brock G. Schmidt	Statistical Estimation in Inertial Navigation System, published 6/66 (U)
E-1974	D. McCabe	Apollo 16 Test Console Verification Test, published 6/66 (U)
E-1975	J. Wolf	Simulated LM Inflight IMU Alignment Sightings, published 6/66 (U)

E-NOTES CONT'D

E-1976	W. Tanner W. Satzberg	Radar Interface Evaluation Phase I Final Test Report, published 5/66 (U)
E-1982	B. Kriegsman N. E. Sears	LM PGNCS and Landing Radar Operations during the Powered Lunar Landing Maneuver, published 8/66 (U)
E-1983	D. S. Baker N. E. Sears R. L. White	Lunar Orbit Navigation Performance with Various Random and Systematic Errors, published 7/66 (U)
E-1989	A. I. Green R. J. Filene	Keyboard and Display Program and Operation, published 7/65 (U)
E-1981	N. E. Sears P. F. Hoffman	LM-PGNCS Guidance Equations for a Nominal Lunar Landing Mission, published 5/66 (U)
E-2000	J. Nevins	Apollo Operations Handbook G&N System Command and Service Module Mission AS-205A, Spacecraft 014, published 8/66 (U)
E-2031	R. H. Morth	Entry Flight Data for Mission AS-202, published 10/66 (U)
E-2065	E. D. Smally	Block II AGC Self-Check and Show-Banksum, published 12/66 (U)
E-2066	P. G. Felleman	Hybrid Simulation of the Apollo Guidance Navigation and Control System, published 12/66 (U)
E-2079	J. D. Goetzinger	Pre-Simulation Report: LM Dynamics Simulation, published 9/66 (U)
E-2052	B. I. Savage A. Drake	AGC-4 Basic Training Manual, published 1/67 (U)
		Part II Flight Test Data Package, published 9/67 (U)
E-2194	J. T. O'Connor	Hybrid Simulation of CSM Dynamics for AS-205, published 10/67 (U)

E-NOTES CONT'D

E-2246	J. Hand	Computer-Aided Inertial Platform Realignment in Manned Space Flight, published 5/68 (U)
E-2252	J. Feldman R. Cooper	Inertial Component Reliability and Population Statistics, published 3/68 (U)
E-2254		Auxiliary Memory System Final Report on Phase 1, published 4/68 (U)
E-2260		Guidance, Navigation, and Control Lunar Module - Using Flight Program LUMINARY, Vol. II, published 5/68 (U)
E-2262	D. Baker	Studies of On-Board Lunar Orbital Navigation with Unknown and Known Landmarks and Some Observations on Non-Linear Effects, published 8/68 (U)
E-2164		Guidance, Navigation, and Control Lunar Module - Using Flight Program SUNDANCE Vol. I & II, published 7/68 (U)

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R-NOTES

No.		
R-341	Richard H. Battin	Statistical Optimization for Space Flight published
R-353	Richard H. Battin James S. Miller	Circumlunar Trajectory Calculations
R-373	John M. Dahlen Philip G. Felleman Richard D. Goss Norman E. Sears Milton B. Trageser Robert L. White	Guidance and Navigation System for Lunar Excursion Module published 7/62
R-372	James H. Flanders	Velocity Steering Studies for the Apollo Mission published 8/62
R-376	Curry of NASA	Two Impulse Abort Trajectories from Translunar Flight published 10/62
R-382	Richard H. Battin	Universal Formulae for Conic Trajectory Calculations published 9/62
R-385	Hutchinson	Inertial Orientation of the Moon published 10/62
R-393	R. Alonso A. Hopkins H. Blair-Smith	Logic Description for AGC 4 published 3/63
R-404	Apollo Staff	Radar Requirements for Primary G&N Operation published 4/63

R-NOTES Con'td

R-408	Eldon Hall	Design Concept of the Apollo Guidance Computer published 6/63
R-410	Eldon Hall	General Characteristics of the AGC published 5/63
R-415	Dan Lickly Ray Morth Bard S. Crawford	Apollo Re-entry Guidance published 7/63
R-416	R. Alonso	Apollo Guidance Computer published 8/63
R-417	George Cherry	A Class of Unified Explicit Methods for Steering Throttleable and Fixed-Thrust Rockets published 1/64
R-445	N. E. Sears	Technical Development Status of Apollo Guidance and Navigation published 4/64 (U)
R-446	N. E. Sears	Primary G&N System for Lunar Orbit Operations Vol I & II published 4/64 (C)
R-447	John Dahlen Jim Nevins	Navigation for the Apollo Program published 5/64 (U)
R-456	Chang	Guidance - A General Explicit Optimizing Guidance Law for Rocket Propelled Spacecraft published 8/64
R-467	Richard Battin	The Complete Sunrise published 9/64

R-NOTES CONT'D

R-477	John Dahlen Alex Kosmala Dan Lickly John Shillingford Balraj Sokkappa	Guidance and Navigation System Operations Plan Apollo Mission 202 published 1/65 (C)
R-479	William Marscher	A Unified Method of General Conic Sections published 2/65 (C)
R-482	Gerald M. Levine	A Method of Orbital Navigation Using Optical Sightings to Unknown Landmarks published 3/65 (U)
R-489	Charles Muntz	Users Guide to the Block II AGC/LGC Interpreter published 4/65 (U)
R-491	Balraj Sokkappa	On Optimal Steering to Achieve "Required Velocity" published 4/65 (U)
R-495	Milton B. Trageser David G. Hoag	Apollo Spacecraft Guidance Systems published 6/65 (U)
R-500	C. S. Draper W. Wrigley D. G. Hoag R. H. Battin J. E. Miller A. Hopkins D. A. Koso W. Vander Velde	Space Navigation Guidance and Control AGARD Paper published 6/65 (U) Vols I & II
R-499	George Cherry Joe O'Connor	Design Principles of the Lunar Excursion Module Digital Autopilot published 7/65 (U)

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R-503	G. Stubbs	A Block II Digital Lead - Lag Compensation for the Pitch-Yaw Autopilot of the Command and Service Module published 10/65 (U)
R-507	Apollo Staff	G&N System Operation Plan Mission AS-204A, published 1/66 (C) Vol. I, 10/66 (C), Vol. II, Rev. 1 10/66 (C)
R-521	E. Copps	Powered Flight Guidance of the Apollo Command and Service Module published 11/65 (U)
R-525	M. Sullivan	Hybrid Simulation of the Apollo Guidance and Navigation System published 12/65 (U)
R-531	J. Pennypacker	Whole Number Strapdown Computation published 2/66 (U)
R-532	R. Morth	Reentry Guidance for Apollo, Vol. 1 (U), Vol. II (C), published 1/66
R-533	T. C. Lu	A Block II TVC Digital Autopilot Compensation for CSM Spacecraft published 1/66 (U)
R-537		GSOP Mission 501, published 7/66 (C), Rev. 1, 12/66 (U); Vol. II, Rev. 1 12/66 (C) Control Data and Error Analysis
R-539	A. Klumpp	A Manually Retargeted Automatic Descent and Landing System for LM, published 3/66 (U), Rev. 1, 8/67 (U)
R-527	John Dahlen	PGNC System Operations Plan, Mission AS-206, published 6/66 (C)

R-NOTES CONT'D

R-547	J. Dahlen	GSOP AS-278, Vol. 1, CM GNCS Operations, published 10/66 (U); Vol. II, LM PGNCS, published 10/66 (U); Vol. III, Control Data, published 10/66 (U); Vol. IV, Error Analysis, published 10/66 (C)
R-557		GSOP, Manned LM Earth Orbital using Program SUNDANCE, Section 1 through 6, (updated regularly)
R-567		GSOP, Manned LM Earth Orbital and Lunar Mission using Program LUMINARY, Sections 1 through 6, (updated regularly)
R-577		GSOP, Manned CM Earth Orbital and Lunar Mission using Program COLOSSUS, Sections 1 through 6 (updated regularly)
R-596		AS-205 Verification Results published 12/67 (U)
R-599	P. Mimno	Digital Simulation Manual published 1/68 (U)
R-600	J. H. Flanders D. Fraser F. Grant J. Lawson P. Bowditch R. Crisp J. Corrigan J. Gilmore A. Hopkins W. Kenkins J. S. Miller	Control, Guidance and Navigation for Advanced Manned Missions: Vol. 1, Systems; Vol. II Multiprocessor Computer System, Vol. III, Radiation Sensor Systems, published 1/68 (U); Vol. IV, Inertial Subsystems, published 11/68 (U)
R-618	R. H. Battin	A New Solution for Lambert's Problem, published 8/68 (U)

R-NOTES CONT'D

R-620	J. Flanders D. Fraser J. Lawson	Technology for Guidance and Navigation Unmanned Deep Space Missions in the 1970's, published 8/68 (U)
R-529	M. Johnston	Apollo Mission Simulations Utilizing Flight Software and Hardware published 7/68 (U)

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T-NOTES

No.		
T-297	Kennan Regenhardt	Star Occultation Measurement as an Aid to Navigation
T-298	Scott	Optimum Statistical Operations with Celestial Fix Data for Interplanetary Navigation
T-299	Mauldin Millard	Optimization of Interplanetary Midcourse Velocity Correction, published 6/62
T-326	Curry	Two Impulse Abort Trajectories from Translunar Flight published 10/62
T-329	A. Breck C. Wison	An Investigation of an Emergency Backup Guidance and Navigation Procedure for the Transearth Phase of the Apollo Mission, published June 1963 (C)
T-342	E. DeNezza M. Dittrich	Orbit and Landmark Determination Driving Lunar Orbit, published June 1963 (U)
T-355		Sampled-Data Velocity Vector Control of a Spacecraft - Bender - 6/63 (as E-1467 - 3/64)
T-369	J. Deyst	Optimum Continuous Estimation of Non-stationary Random Variables, published 1/64 (U)
T-375	E. Shaw	Non-rigid Single-Axis Space Integrator Dynamics, published 5/64 (U)
T-381	T. Blumenthal	Coordinate Transformation Matrix Errors on a Space Stabilized Inertial Non-System, published 6/64 (U)

T-NOTES CONT'D

T-384	R. Fitzgerald	A Gradient Method for Optimizing Stochastic Systems, published 6/64 (U)
T-385	C. Duke M. Jones	Human Performance During a Simulated Apollo Mid-Course Navigation Sighting, published 6/64 (U)
T-386	R. Phaneuf	Guidance System Monitoring for a Lunar Landing, published 6/64 (C)
T-394	D. W. Keene	Analysis of a Strapped-down Inertial Attitude Reference System, published 9/64 (C)
T-404	M. Dixon	Nonlinear Sampled-Data System Analysis using Describing Function, published 1/65 (U)
T-413	F. H. Martin	Closed-Loop Near-Optimum Steering for a Class of Space Mission, published 5/65 (U)
T-418	J. E. Bortz	Establishing Initial Attitude Conditions in a Gimballess Inertial Navigation System, published 6/65 (U)
T-414	L. Brock	Application of Statistical Estimation to Navigation Systems, published 6/65 (U)
T-422	R. L. Moorse, Jr.	The Human as a Vernier Control in Telescope Pointing, published 6/65 (U)
T-424	P. T. Skelly	A Thermal Gradient Generator, published 5/65 (U)
T-425	R. J. Filene	A Nonlinear Summation Threshold Device, published 5/65 (U)
T-426	T. J. Callahan	Computer Programming Techniques for Systems Testing, published 5/65 (U)
T-434	L. J. Casey	Landing Footprints for an Unmanned Lunar Vehicle, published 6/65 (U)

T-NOTES CONT'D

T-441	R. C. Rumold	An Attitude Control System for an Optical Earth Surveillance System in an Orbiting Vehicle, published 9/65 (U)
T-443	C. Whitman	The Implementation of Digital Filters in Computers of Small Word Length, published 2/66 (U)
T-471	L. B. Scheiber	Recomposition - A First Step in Computer Program Analysis, published 2/66 (U)
T-446	W. Widnall	On the Design of Nearly Optimal Linear Time - Varying Sampled - Data Stochastic Controllers, published 9/66 (U)
T-459	R. W. Snyder	Analysis of Detection Methods for the Oscillating Slit Star Tracker, published 6/66 (U)
T-461	S. R. Croopnick	Surface Irregularity Tracking System, published 6/66 (U)
T-462	H. C. Matthews	A Method of Determining A Satellite Position and Velocity by Tracking Unknown Landmarks, published 6/66 (U)
T-474	D. C. Fraser	On the Application of Optimal Linear Smoothing Techniques to Linear and Nonlinear Dynamic Systems, published 1/67 (U)
T-493	R. McKern	A Study of Transformation Algorithms for Use in a Digital Computer, published 1/68 (U)
T-495	C. B. Lory	Compensation of Pulse-Rebalanced Inertial Instruments, published 1/68 (U)
T-499	R. Phaneuf	Approximate Nonlinear Estimation, published 5/68 (U)
T-502	M. Dixon	Fuel-Time Optimal Spacecraft Reorientation, published 5/68 (U)

T-NOTES CONT'D

T-503	J. Krafchick	Positional Control of Remote Manipulators, published 6/68 (U)
T-504	E. Ascherman	Design Analysis of an Earth or Moon Orbit Optical Simulator, published 6/68 (U)
T-505	J. Deckert	Near Optimal Rate Estimation Using Quantized Position Measurements, published 5/68 (U)
T-511	R. P. O'Donnell	The Use of Nonlinear Bias Effects in Orbital Navigation, published 6/68 (U)

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SPACE GUIDANCE ANALYSIS MEMOS 1969

No.		
1-69	G. Levine	Guaranteeing Self-Contained Return-to-Entry Navigation or Get Me Home, MIT.
2-69	D. Baker	Inclusion of Biases in Statistical Midcourse Navigation

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SPACE GUIDANCE ANALYSIS MEMOS 1968

No.		
1-68	R. O'Donnell	An Error Analysis of the Gravity Vector Determination Routine
2-68	R. O'Donnell	Effect of Star Sighting Separation Angle on IMU Alignment Accuracy
3-68	R. White J. Heidenreich	Probability of Finding a Pair of Navigation Stars in a Given Optics Cone Size.
4-68	J. Heidenreich	User's Guide to JWH. GRAPH
5-68	W. Tempelman	A Modified Acceleration Expression for Bodies in Gravitation Fields
6-68	P. Brennan	Transearth Simulations
7-68	Muller & Kachmar	
8-68	W. Robertson	The "Fixed Memory" Constants in the Conic Subroutines
9-68	D. Baker	Studies of On-Board Lunar Orbital Navigation with 1. Unknown and Known Landmarks and 2. Some Observations on Non-Linear Propagation
10-68		
11-68	G. Levine	Recursive Navigation Theory Explained
12-68		

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13-68	B. Sokkappa	The Saga of b Δt or the "Dump b Movement".
14-68	W. Robertson	The Inherent Sensitivity of the Required Velocity to the Specified Transfer Time in Lambert's Problem.

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SPACE GUIDANCE ANALYSIS MEMOS 1967

No.		
1-67	K. Krause	User's Guide to CONICTIMEKK
2-67	G. Levine	Navigation by Means of Direction Measurements with CSM-Based Optics
3-67	P. Kachmar E. Muller	Constraints on Selecting b-Vectors to Represent Measurements
4-67	K. Krause	Generalized Slope Iterator
5-67	P. Brennan	Propagation of Landmark Portion of the W Matrix during Landmark Tracking Periods
6-67	T. Kornreich	Analysis of the Lunar Orbit Insertion Powered Flight Guidance Simulation for Mission AS-504
7-67	D. Fraser	Correcting Fixed Dimension Kalman Gain Vectors to Account for Colored Measurement Noise
8-67	W. Robertson	Explicit Universal Series Solutions for the Universal Variable X.
9-67	E. Womble	A Recursive CG Correction Scheme
10-67	P. Brennan	Earth Orbital Simulation
11-67	C. Newman	Powered Series Economization
12-67	T. Brand	User's Guide to TJB.STATE
13-67	W. Robertson	Time Series Expansions of the Universal Variable X.

Space Guidance Analysis Memos Cont'd 1967

14-67	C. Newman	The Inversion of Kepler's Equation
15-67	E. Womble	Preliminary Design of the RCS Autopilots Required for Task 2 of the Apollo Application Program
16-67	W. Tempelman	Pre-TPI Rendezvous Prediction Program
17-67	K. Krause	Inaccuracies in the Time-to-Pericenter Computation Due to Sensitivities
18-67	R. Schlundt	Performance of the Thrust Vector Control System for the CSM and CSM/LM Configurations
19-67	A. Penchuk	Evaluation of Two CSM TVC Autopilot Design Alternatives

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SPACE GUIDANCE ANALYSIS MEMOS 1966

No.		
1-66	T. C. Lu	"Apollo Spacecraft-Engine Equations and Actuator Load." 14 January 1966
2-66	Roy Beasley	"Some Minor Discrepancies Between the Performance of the AGC4 Block I Interpreter and its R-467 Specifications." Rev. #2 of SGA Memo #2 attached. 21 January 1966
3-66	William S. Widnall	"Derivation of the Optimum Control Program for Steering the LEM Using the Gimballed Descent Engine." 14 January 1966
4-66	George W. Cherry	"Controlling the Attitude and Attitude Rate of the LEM with the Gimballed Descent Propulsion System." 20 January 1966
5-66	Beverly J. Young	"A Clear-Perilune Guidance Scheme" (Errata sheet to SGA Memo #5 attached). 10 February 1966
6-66	Beverly J. Young	"Supplement to SGA Memo #5-66 7 March 1966
7-66	Beverly J. Young Robert L. White	"The Effects of Non-Spherical Graviational Fields on Some Typical Mission Trajectories". 25 February 1966
8-66	Wayne Tempelman	"Simulation of Deorbit Trajectory". 28 March 1966
9-66	Fred Martin	"TVC Digital Autopilot, Mode 0". 22 April 1966

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10-66	Kurth Krause	"The Minimum Fuel Return Problem". 28 April 1966
11-66	W. S. Widnall	"On Varying the Gain of Cross-Product Steering Laws to Optimize Short Burn Performance." 29 April 1966
12-66	Ray Morth	"Characteristics of Entry Starting at 300,000 Feet." (Errata sheet attached). 13 May 1966
14-66	William S. Widnall	"The Use of Optimal Linear Control Theory to Suggest Digital Autopilot Designs for the Apollo Command and Service Module in Powered Flight." 1 June 1966
15-66	David Baker	"Effects of IMU Drift and Misalignment on Lunar Navigation." 14 July 1966
16-66	Raymond Morth	"Gimbal Lock Avoidance Schemes." 18 August 1966
17-66	Donald C. Fraser	"A Computer Program for Block Diagram Reduction." 11 July 1966
18-66	Raymond Morth	"Impact of Low Lift-to-Drag Ratio on Mission AS-204 and AS-501." 30 September 1966
19-66	Gerald M. Levine	"Navigation by Means of Direction Measurements with CSM-Based Optics." 31 October 1966
20-66	Gerald M. Levine	"W Matrix Partial Reinitialization." 4 November 1966

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SPACE GUIDANCE ANALYSIS MEMOS 1965

No.		
1-65	Peter J. Phillíou	"Position and Velocity Uncertainties for Lunar Mission." 4 January 1965
2-65	William Marscher	"A Modified Enoke." 11 January 1965
3-65	Wayne Tempelman	"A Generalized Solution to the Impulsive Guidance Problem." 29 January 1965
4-65	George W. Cherry	"Landing Equations: Engine Ignition to Touchdown." 8 March 1965
5-65	Balraj G. Sokkappa	"Aborts with SPS Power During the Boost Phase of Flight 202." 16 March 1965
6-65	Edward M. Copps	"Display During Boost Into Orbit." 21 April 1965
7-65	Edward M. Copps	"Effect of Pointing Error on Outbound Trajectory" (See SGA Memo #25-64). 21 April 1965
8-65	Edward M. Copps	"An Analysis of Control of Track Deviation During Lunar Deboost." 3 May 1965
9-65	Edward M. Copps	"Effect of Pointing Error on Inbound Trajectory" (See SGA Memo #25-64 and 7-65). 6 May 1965
10-65	E. S. Muller	"b-Vectors for Angle and Angle Rate Measurements in Arbitrary Co-ordinate System." 4 June 1965

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11-65	Wayne Tempelman	"Aborts During the Boost Phase of Flight 204." 29 June 1965
12-65	Gerald Cook	"Deboost into Lunar Orbit – Effect of Variations in Steering Parameters on Apogee Error, Perigee Error and Plane Error." 28 June 1965
13-65	Bard S. Crawford	"Measuring L/D to Improve Accuracy on Flight 204." 29 June 1965
14-65	Edward M. Copps	"Time to Go and Delta-v" 16 August 1965
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19-65	Fred Martin	"CSM-DAP-I: Quantization of Engine Gimbal Commands for Block II Digital Autopilot (CSM)." 27 September 1965
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22-65	Peter J. Phillíou	"Back-up Guidance for Flight 207." 8 October 1965
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24-65	Allan R. Klumpp	"New LEM Landing Equations and Trajectories." 13 October 1965
25-65	E. S. Muller	"Equations for non-optimum estimate of mean square midcourse velocity correction." 20 October 1965
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31-65	Kurth Krause	"CONICSOLNS, A Subroutine for Solving Several Standard Conic Problems." 14 December 1965
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2-64	E. S. Muller N. E. Sears	"Primary G&N Rendezvous Guidance Equations." 13 January 1965
3-64	Edward M. Copps	"Effect of Venting on Midcourse ΔV Budget." 14 January 1964
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5-64	James E. Potter	"W Matrix Augmentation." 14 January 1964
6-64	Bard S. Crawford	"Effect of Bias Gyro Drift and G-Sensitive Gyro Drift on Reentry Accuracy." 15 January 1964
7-64	Robert L. White	"Use of the CSM Primary G&N System and Rendezvous Radar for LEM Aborts." 21 January 1964
8-64	Edward M. Copps Gerald M. Levine	"Earth Orbit Navigation - Effect of Venting." 29 January 1964
9-64	William F. Marscher	"Characteristics of Return to Earth Subroutines." 3 February 1964
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10-64	Larry Brock Roger Scholten	"Informal Visit by NAA and MIT to Jet Propulsion Laboratory Concerning Deep Space Tracking Facilities (DSIF), Physical Constants and JPL's Ephemerous Tape." 7 February 1964
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12-64	Robert Baker	"OPTFLIGHT - Program Usage." (Raytheon Resident) 10 February 1964
13-64	B. G. Sokkappa	"Analytical Description CSM Powered Flight Phases." 14 February 1964
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15-64	Peter J. Philliou	"Effect of Incorrect Measurement Variance on Midcourse Performance." 24 February 1964
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17-64	Gerald M. Levine	"Comparison of Transearth Trajectories." 27 February 1964

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19-64		not published to date.
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21-64	William F. Marscher	"Characteristics of the Return to Earth After an Engine Shutdown During S-II and S-IV Burn Phases of the Launch Into Orbit." 22 May 1964
22-64	Gerald M. Levine	"Abort from Translunar Orbit." 2 June 1964
23-64	William F. Marscher	"Universal Conic Time of Flight Formulae." 3 June 1964
24-64	Raymond Morth	"Entry Guidance for Flight 202." 8 June 1964
25-64	Gerald M. Levine	"Midcourse Monte Carlo Simulation Model." 16 June 1964
26-64	B. G. Sokkappa	"Mechanization of Cross-Product Steering without Direct Computation of the b-Vector." 17 June 1964
27-64	Roger Scholten	"Velocity Corrections Required to Correct Deviations at the End of Translunar Injection." 19 June 1964
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29-64	Fred H. Martin	"Explicit Calculation of the Perturbation Matrix, C*". 26 June 1964
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31-64	Peter J. Philliou	"Position and Velocity Uncertainties for Lunar Mission" 1 July 1964
32-64	Robert W. Baker	"ROOTFINDER 3 - 20th Order Polynomial Factoring Program" 14 July 1964
33-64	Larry Berman	"Optimum LEM Landing Trajectories" 30 July 1964
34-64	Gerald M. Levine	"Orbital Navigation Using Unknown Landmarks" 20 August 1964
35-64	Bard S. Crawford	"Optimization of Reentry 'Up-Phase' Guidance" 8 September 1964
36-64	Peter J. Philliou	"Generating Measurement Schedules on Board" 17 September 1964
37-64	Donald Fraser	"Computer Program Description - Root Locus Technique" 25 September 1964
38-64	Peter J. Philliou	"Optimal Guidance Laws" 23 September 1964
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40-64	E. S. Muller	"Terminal Rendezvous G&N in CSM Back-Up Mode" 26 September 1964
41-64	Robert W. Baker	"Program AGCOCTAL-CONVERT" 30 September 1964
42-64	A. L. Kosmala	"Note on SPS Engine-Off Signal Determination" 5 October 1964
43-64	Robert Truitt	"Approximating Transearth Injection Velocity" 7 October 1964
44-64	Wayne Tempelman	"Return to Earth from Inside the Sphere of Influence" 23 October 1964
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48-64	William Marscher	"Collection of Conic Equations" 1 November 1964
49-64	Edward M. Copps Jr.	"Noise Through a Derived Rate Controller" 3 December 1964
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2	Roger A. Scholten	"A Quick Look at Possible Advantages of Using DSIF Range Rate Information" 22 June 1962
3	Richard H. Battin	"Universal Formulae for Conic Trajectory Calculations" 25 June 1962
4	Peter J. Philliou	"Position Uncertainty at Target Before and After Velocity Corrections as a Function of Magnitude and Orientation Errors in Applying Velocity Corrections" 27 June 1962
5	Peter J. Philliou	"Effect of Magnitude and Orientation Errors in Applying Velocity Correction on Earth to Moon Flight Navigation" 27 June 1962
6	Peter J. Philliou	"Effect of Minimum Time Between Observations on Circumlunar Navigation Date" 28 June 1962
7	Richard H. Battin	"Space Guidance Analysis Division Personnel Assignments" 25 June 1962
8	Thomas J. Lawton	"AGC Programming Comparison" 5 July 1962

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9	Richard H. Battin	"Precise Circumlunar Trajectory Calculations" 27 June 1962
10	James S. Miller	"A Method for Computing Midcourse Velocity Corrections" 6 July 1962
11	Richard H. Battin	"SGA Studies Presently Underway" 16 July 1962
12	James E. Potter	"Storing Position of Moon" 16 July 1962
13	John N. Brusseau	"Effects of Velocity Errors on Abort Trajectories" 17 July 1962
14	Raymond H. Morth	"Some Reentry Considerations for Abort Maneuvers" 27 July 1962
15	Raymond H. Morth Dan Lickly	"Preliminary Reentry Guidance Report" 31 July 1962
16	Gerald M. Levine	"Status of Earth Orbital Navigation Study" 6 August 1962
17	Daniel J. Lickly	"Maximum Reentry Range as a Function of L/D" 15 August 1962
18	Bard S. Crawford	"Required Maximum Roll-Rate During Re-entry" 17 August 1962

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20	Bard S. Crawford	"Optimum Use of Acceleration Measurements to Determine Altitude-Rate During Re-entry" 20 August 1962
21	Gerald M. Levine	"Use of Landmark Observations in Earth Orbital Navigation" 4 September 1962
22	James E. Potter	"Calculation of the Roots of u C (u) = A" 10 September 1962
23	Peter J. Philliou	"Effect of Sextant Error on Earth to Moon Flight Navigation Data" 22 September 1962
24	Daniel J. Lickly	"Nominal Re-entry Trajectories" 2 October 1962
25	Edward M. Copps	"Guidance Dynamic Requirements on SCS" 18 October 1962
26	Charles A. Muntz James E. Potter	"Investigation of Minimum Mid-Course Attitude Maneuvers" 23 October 1962
27	Peter J. Philliou	"Effect of Poor Steering and Measurements on Moon to Earth Flight Navigation Data" 5 November 1962
28	Beverly J. Young	"Orbital Descent Phase of Lunar Landing Operations" 14 November 1962

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29	James E. Potter	"Error Ellipsoids" 20 November 1962
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31	Peter J. Philliou Roger A. Scholten	"Effect of Sextant Error, DSIF and Time for Last Velocity Correction of Moon Flight Navigation Data" 25 February 1963
32	Michael Richter	"CDU Non-linearities" 27 December 1962
33	George W. Cherry	"Guidance of the 3rd Stage of the Saturn C-5 During a Sub-Orbital Start" 9 January 1963
34	Bard S. Crawford	"Midcourse Performance Requirements Imposed by Reentry Safety and Accuracy Requirements" 28 January 1963
35	Peter J. Philliou	"Effect of Grouping Observations on Midcourse Performance" 13 February 1963
36	Larry D. Brock	"The Effects of Various Velocity Corrections Schedules" 28 February 1963
37	Richard H. Battin	"A Unified Treatment of Powered Flight Guidance" 8 March 1963
38	Fred H. Martin	"Lunar Deboost Using a Correlated Velocity" 11 March 1963

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41	George M. Schuster	"Velocity Steering Loop Pulse Transfer Function" (Kollsman Resident) 1 May 1963
42	George M. Schuster	"Controller Design" (Kollsman Resident) 1 May 1963
43	Eugene S. Muller	"Summary of b-Vectors for Radar Measurements" (Raytheon Resident) 7 May 1963
44	Robert J. Fitzgerald	"Optimization of Midcourse Correction Time" 27 May 1963
45	George M. Schuster	"Controller Design II" (Kollsman Resident) 14 May 1963
46	George M. Schuster	"Limit Cycle Analysis" (Kollsman Resident) 1 May 1963
47	Robert Bairnsfather	"Navigation Algorithms for Non-Freefall Flight" 12 June 1963
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50	George M. Schuster	"Revised System Analysis" (Kollsman Resident) 11 July 1963
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53	William Marscher	"Abort from Midcourse to a Selected Landing Site" (Revised Aug. 6, 1963) 22 July 1963
54	George M. Schuster	"Linear Analysis II" 24 July 1963
55	Bard S. Crawford	"Investigation of an Unmanned Elliptical Mission with Re-entry at Escape Velocity" 1 August 1963
56	Richard D. Goss Eugene S. Muller	"Deriving Random Error Vectors from Covariance Matrix" 13 August 1963
57	Larry D. Brock	"Coordinate System Used in the Moon Position Subroutine" 16 September 1963
58	William F. Marscher	"Impulsive Characteristics of Insertion Into and Injection Out of Lunar Orbit" 17 September 1963

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62	Raymond Morth	"Steering Errors of Entry Guidance" 31 October 1963
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64	Peter J. Philliou	"A Fixed Measurement Schedule for Four Abort Cases" 13 November 1963
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