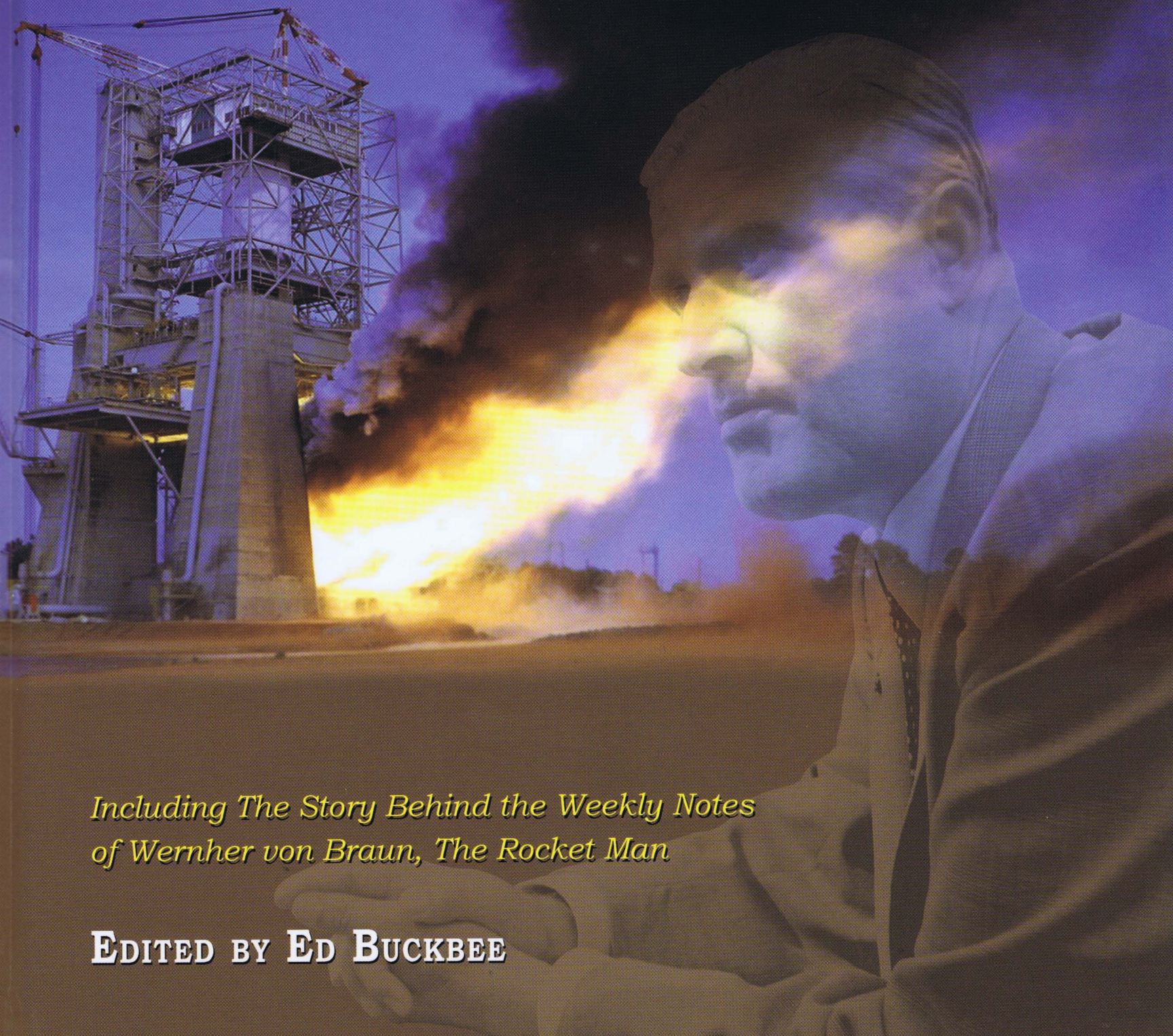


# 50<sup>YEARS</sup> of ROCKETS & SPACECRAFT

NASA MARSHALL SPACE FLIGHT CENTER



*Including The Story Behind the Weekly Notes  
of Wernher von Braun, The Rocket Man*

**EDITED BY ED BUCKBEE**





50  
YEARS of ROCKETS &  
SPACECRAFT

NASA MARSHALL SPACE FLIGHT CENTER

**AP**<sup>TM</sup>  
**Acclaim Press**  
— Your Next Great Book —

P.O. Box 238  
Morley, MO 63767  
(573) 472-9800  
www.acclaimpress.com

Designer: M. Frene Melton  
Cover Design: M. Frene Melton

Copyright © 2009  
The Marshall Retiree Association  
All Rights Reserved.

No part of this book shall be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or by an information or retrieval system, except in the case of brief quotations embodied in articles and reviews without the prior written consent of the publisher. The scanning, uploading, and distribution of this book via the Internet or via any other means without permission of the publisher is illegal and punishable by law.

Library of Congress Cataloging-in-Publication Data

Buckbee, Ed.  
50 years of rockets & spacecraft : NASA-Marshall Space Flight Center commemorative history / by Ed Buckbee.

p. cm.

Includes bibliographical references and index.

ISBN-10: 1-935001-17-5 (alk. paper)

ISBN-13: 978-1-935001-17-1 (alk. paper)

1. George C. Marshall Space Flight Center--History. 2. Astronautics--United States--History. I. Title. II. Title: Fifty years of rockets and spacecraft.

TL862.G4B83 2009

629.40973--dc22

2009027376

All photographs, unless otherwise noted, appear courtesy of NASA, U.S. Army, U.S. Space & Rocket Center, or the University of Alabama-Huntsville.

First Printing: 2009

Printed in the United States of America

10 9 8 7 6 5 4 3 2 1









# VON BRAUN'S WEEKLY NOTES

by Ed Buckbee

History has embraced few uncommonly gifted scientists—think in the caliber of Galileo and Thomas Edison, as well as few uncommonly gifted managers. So reasonably, history has rarely welcomed an individual who is equally gifted in both disciplines. Wernher von Braun, considered by many to be one of the most successful and effective managers of a U.S. peacetime technology program, was certainly such an individual.

During the height of the Saturn-Apollo program, von Braun implemented a particularly effective management tool: the Weekly Notes. The notes were his direct channel with his laboratory directors and project managers. The subjects covered in the notes can be categorized as programmatic, strategic, institutional, political or sometimes humorous.

Here is how it worked: Each person would turn in a one-page report—they were restricted to one page—on Friday or early Monday. The report, not a bureaucratic form, was to document what occurred in that laboratory or project office during the prior week. Input was collected from each of the subordinate organizations. The document dated October 25, 1961, authored by Jerry C. McCall, von Braun's special assistant, outlines the procedures to be followed and the persons responsible for preparing the notes. As the document was passed through Marshall's chain of command, additions or deletions were made based upon the importance of the issue. Bonnie Holmes, von Braun's secretary, collected the reports and prepared them for her boss to review. Once von Braun had read and made notations on each of the reports (in most cases within 24 hours) they were returned by courier to the directors and managers.

Von Braun's notations would always include his initial, a 'B', the date that he read the report and a check mark at the end of each paragraph to indicate he had read every word. His notations were addressed to the sender—mostly abbreviated—within the paragraph of the subject being discussed. Von Braun corrected misspellings and any other information submitted incorrectly. His handwritten notes were clear, concise and grammatically correct. Often, his notes were directed to someone else to take action or returned to the sender with specific instructions. The sender would respond with his personal notations and return the same report to von Braun.

Von Braun's comments included more than corrections. He also provided encouragement and suggestions regarding progress in his rocket factory. Sometimes, he requested briefings in order to be better informed on subjects new to him. He constantly advised his people of changing strategies and politics of the day and encouraged them to go directly to a higher level of management to expedite problem solving. He kept abreast of new and innovative technologies in the fields of rocketry and space flight. Especially, he loved to examine new equipment and operate man-in-the-loop simulators. It was common knowledge that if someone were peddling a new space-related prototype and it could be driven, flown or floated; they could bring it to Marshall. If von Braun gave it a test run, there was likely a sale.

Von Braun understood and valued the talents and skills of his people and often gave the same problem to more than one to solve, thus establishing more than one solution. He sought opinions and advice, always prefacing his requests with, "Please," and offered

apologies for being short, harsh or too abrupt with a colleague. His ire could be raised when people failed to report a problem in a timely manner or offered sloppy workmanship or "goofs" as he might have called them, but he took care not to "shoot the messenger." He readily offered guidance to improve procedures and prevent a re-occurrence and was quick to congratulate those organizations and individuals who succeeded and surpassed milestone events. He never failed to write letters of condolences to families who lost loved ones.

He often asked to be kept informed, "because I'm greatly interested," or "lay-on a one-hour briefing for me on that subject through Bonnie." Or, he might use the expression "presto-prompto" regarding the urgency of a matter. "How can I help you with this problem," was one of his favorites. He often offered to write letters to contractors who were falling behind schedule, reminding them they were on the "critical path" of the lunar landing program.

Some of the most interesting notes are between von Braun and Heinz H. Koelle, the head of future projects. During the early 60s, Koelle and von Braun discussed exciting new programs like Nova, space station, manned missions to Mars and electric and nuclear powered rocket stages. These were real projects being studied by the von Braun team at the same time the Saturn family of space vehicles was being developed.

One of von Braun's challenges during the early 60s was the transformation of the Marshall Center from an arsenal system to a research-development and industrial operations center. The von Braun team brought to the U.S. an in-house rocket design and fabrication capability that was accepted and expanded by the U.S. Army at Redstone Arsenal. Upon transfer of the team to NASA in 1960, von Braun began an effort to change his one-stop rocket factory to a more diversified organization.

With the growing interest by U.S. industry in building space hardware for the lunar landing program, von Braun found it necessary to add an industry management team. He opened assembly and test facilities in Mississippi and Louisiana, and began awarding contracts across the nation to the big aircraft and missile corporations. This required a major change in the way many of his laboratories functioned. As can be seen in the Weekly Notes, it was painful for many of his people to relinquish to contractors the fabrication of rocket components previously done in-house. Further, it required the labs to have "penetration people," Marshall engineers residing at the contractor plants, serving as the eyes and ears of Marshall. Von Braun was constantly reminding his lab directors to devote more time and effort to advancing the state of the art of rocket technology and developing new vehicles. Von Braun was successful in transforming his rocket factory into a premier space vehicle research and development organization with a strong industry management team.

What follows are reprints of the Weekly Notes collected from the National Archives by Mike Wright, Marshall's historian. We are indebted to Wright for his efforts in locating and collecting these valuable pieces of Marshall Center and von Braun history. My colleague Nancy Guire, who proudly served 39 years with Marshall, joined von Braun's office in 1965 as secretary to assistant directors J.T. Shepherd, Jay Foster and Ed Mohlere. She has read and



interpreted several years of the von Braun Weekly Notes and I wish to acknowledge her valuable contribution in making these documents available.

I was fortunate to have worked in the Marshall Center's public affairs office for nearly 10 years where I interacted with von Braun on many public affairs-related events. When he asked me to become the director of the new Space & Rocket Center, I was honored to accept. We spent a lot of time together working on the early science center concepts. He wanted a hands-on place, not a dusty museum. Upon the center's opening in 1970, I proposed to the von Braun family that his papers, honorary degrees and memorabilia be given to the center for scholars, students and historians to review and study. The family agreed and for the past four decades I have had the opportunity to investigate and study von Braun's papers and interview numerous members of his team. For me, it was like re-living the exciting 60s, the decade of the moon landings.

Von Braun continues to receive many accolades long after his death. Here's one I believe would have gotten his attention: In 2003, worldwide aerospace industry professionals sponsored by *Aviation Week & Space Technology*, named the *Top 100 Stars of Aerospace*. Wilbur and Orville Wright were at the top of the list. Wernher von Braun was named the second most important aerospace pioneer in history. Ten others on the listed were astronauts who flew on von Braun's rockets.

One shortcoming of this collection is the lack of responses from the managers to whom von Braun directed his personal remarks. Those documents have not been recovered as of this writing. Due to the quality of the copies, the editor has added interpretative information to clarify notations, titles and organizations. Von Braun is noted as "B."

After reading nearly 10,000 documents—eight years of von Braun's career—there is no question he was the leader of the Marshall Team, forever the mentor, mediator and decision-maker. His leadership was never questioned. Von Braun's superb management skills enabled him to keep abreast of the technical issues while directing and managing the institutional business of the Marshall Center. He was clearly attuned to the political climate within the NASA family, the U.S. Congress and the White House. He demonstrated confidence in his people and set bold and challenging goals. He was highly respected and revered. Today, I still marvel at his vision and sense of purpose. He didn't just dream and wonder if we could launch man into space and land on the moon, he knew we could do it.

Von Braun truly had uncommon abilities to visualize and organize a project to its completion—conceiving, designing, developing, fabricating, testing and launching—an entirely new rocket system within one organization. His superior judgment in all engineering questions, his brilliant leadership, his ability to instill enthusiasm in others to include government officials and the general public, his wisdom in keeping the rocket team together and focused, and simply his exuberant joy of life, made us, an incredible team of over 200,000 employees and contractors, realize that Wernher von Braun was a true crusader for space travel.

NASA Historian Eugene Emme said it well:

*"Cruel fate denied Wernher von Braun the chance to buy his ticket as a passenger bound for an excursion in space—his boyhood dream and lifetime goal. Because of Wernher von Braun, however, almost*

*everyone has been brought to the realization that we have been passengers on a spaceship all along—Spaceship Earth. Posterity will not forget Wernher von Braun."*

October 26, 1961

MEMORANDUM TO: See Distribution  
From: J. C. McCall  
Subject: Weekly "NOTES"

In a meeting today of the persons responsible for preparing the weekly NOTES, it was decided:

- a. The deadline for delivery of NOTES (original and two copies) to Office of Director will be 11:30 a.m. each Monday. It was emphasized that late NOTES will not be accepted.
- b. Attached is a list of names and phone numbers of all persons preparing NOTES.
- c. After Dr. von Braun has written his comments on the NOTES, a copy will be made for our files, a copy will be made for Mr. Rees and for Mr. Gorman, and the original will be returned to the author. In order to preserve the personal flavor, no other copies will be made. If some person other than the author is addressed in comments, the question will be phoned by us to the addressee. Coordination can then take place between addressee and author for answering the question.
- d. The NOTES will not be open for inspection. If information from one author is desired regarding another author's NOTES, the contact must be made direct, not through this office.
- e. If answering questions from Dr. von Braun, copies of the old NOTES must be attached. If this is done, state at the end of page on current NOTES: "Attachment 1, NOTES 6 - 2 - 61 MRAZEK".
- f. The NOTES are bound at the top. Please allow room for binding.
- g. It was emphasized that a "NEGATIVE" NOTE is required if no information is to be presented.

PERSON RESPONSIBLE FOR WEEKLY "NOTES"

M-AERO	Mr. Larsen	876-1301
M-COMP	Mr. Prince	876-3147
M-DEP-ADM	Mrs. King	876-1764
M-F&AE	Mr. Heim	876-1735
M-FPO	Mr. Huber	876-4714
M-G&C	Mr. Chase	876-4705
M-LOD	Mr. Heiser	876-4520
M-L&M	Mr. Stone	876-3829
MICHOUD	Mr. Wible	876-4125
M-QUAL	Mr. Buhmann	876-4731
M-RP	Mr. Bucher	876-4935
M-SAT	Mr. Lindstrom	876-3448
M-S&M	Mr. Rieger	876-4340
M-TPC	Mr. Smith	876-4119
M-TEST	Mr. Rivers	876-2696



# 1961

5. A meeting has been set for November 15 between Maintenance, Inc. (our janitorial contractor) and the steel workers union. This meeting is to discuss wage demands by the union. There is a possibility of a strike sometime in the future. Mr. Styles is keeping abreast of the situation. There is nothing we can do as far as we know.

11-13-61 (Gorman)

Get me a broom! I'll sweep my own office.  
B

11-20-61 (Grau)

CENTAUR: Heat transfer through the intermediate bulkhead separating the LO<sub>2</sub> and LH<sub>2</sub> tanks is intolerable. Mr. K. J. Bossart has been assigned to this problem for a solution. Who goofed here? I've seen tons of reports studying this problem.

4. P&W Aircraft coverage by Quality Division: Per your request for comments concerning NOTES 9-29-61 (copy attached), the reduction in the number of personnel stationed at P&W Aircraft was primarily a result of your decision to allow P&W development people as much freedom as they needed to deliver the first 6 or 8 engines. This decision re-

10-16-61 (Grau)

These notes will be left in suspense, when reply is ready, please send to Dr. McColl w/cy of these NOTES as reference.

Dieter Grau  
Do you think the time has come to tighten up again? P&W told us at that time they could keep the new schedule only if we'd "call off our dogs" for awhile. Please B10-17 prepare joint reply & recommendation with Lee Bekw.

### 3. NATIONAL TEST SITE:

a. T. E. Edwards and Dr. W. H. Sieber made final presentation in Washington, October 19, 1961, on National Test Site. Dr. Sieber made sound presentation. He was questioned quite thoroughly. One question was, "What Effect would the Flares have on Funeral Procession?"

guess a fellow can't be deader than dead!

10-23-61 (Helmburg)

A draft for the proposed NOVA study effort has been completed and I would like to discuss it as well as the initiation of the "NOVA definition effort" at your earliest convenience.

Let's first get the C-5 issue out of the way. "One emergency at a time". But why don't you draft something, meanwhile. B

12-18-61 (Koelle)

Mr. John Leshko, Space Task Group, visited this Division to become familiar with the facilities, mockups, and support equipment planned for use in the preliminary space maintenance and repair exercise scheduled for the latter part of this month. Construction of the airbearing chair/platform for this exercise has been completed.

Mr. Koelle: Good. Please keep me posted (write Jim Carter) how this program is shaping up. I am very interested in this whole thing. What can I do to expedite it? B

8. The meeting of November 1 with the people to be displaced at Pearl River went very smoothly; thanks to Senator Stennis, who strongly endorsed our project. About 1,000 people attended.

9. A GAO team will make an initial survey of our activities the week of November 20. The detailed audit will follow.

11-06-61 (Gorman)

been held in reserve for staffing for management of Pratt & Whitney Convair contracts, Pearl River and Michoud operations, additional positions for Centaur, etc.

2. Nothing new has developed in the Gurtler-Habert issue except an unfortunate article in the Huntsville Times which begins "MSFC Refutes Drew Pearson". As you know, we are trying to avoid any further involvement in this case.

3. Our personnel office has received word of my confirmation to the deputy's job.

4. A meeting has been scheduled for November 14 between Styles, myself, and a

Has discussed, but issue is still open. Meanwhile, suggest you discuss with Hausman, the new "Ludy Richard Concept" of ops. B

12-18-61 (Stuhlinger)


3. Saturn Launch Photos: Color films of the Saturn Launch are available showing many details of ignition, lift-off and tracking. Technically outstanding. Zeiler can arrange for showing at MSFC if you are interested. I am!! B
4. NASA Hqs. Organization: Copy of the new Headquarters organization was furnished me while in Washington. Snider tells me that there will be 5 individual Launch Operations segments

Kurt  
We discussed this with Brainerd Holmes and Al Linn that this was impossible. We agreed that there should be a special meeting on this entire organizational problem in the near future. Please lay it on the Holmes' office. (Coordinate schedule date 10/23/61) B

11-07-61 (Debus)

3. INTRODUCTION OF APOLLO SHAPE: A discussion was held with representatives of SIG and Langley Research Center concerning the payload of SA-5. There is evidence of a substantial amount of aerodynamic vibration produced by the escape tower and by the nose shape, which may at transonic speeds lead to structural damage. Further tests with a 2% scale model are expected in the near future simulating accelerated flight through Mach 1. If the results are encouraging, an effort will be made to introduce Apollo shape into SA-5 and schedules are presently being checked to see whether a test flight of this shape can be made on SA-4. It will also be necessary to increase the stiffness of the escape tower, especially in view of the possible use of an  $\alpha$ -meter on top of it.

Can't we put a cover over the tower? How much more could it really weigh? B



11-13-61 (Geissler)

3. M-1 (Y-1) ENGINE: Further action has been delayed by approximately 30 days. This information from Del Fishler on 10-19-61, appears to have something to do with reorganization, 11-1-61. Good!! We are not enough more urgent problems. B
4. J-2 AND F-1 FACILITIES: Funds have still not been released as of this date. Please keep me posted. I made a lot of steam on F-1 facilities with Dixon. B
5. J-2 ENGINE: Initiation of Engine Systems testing has been rescheduled for 2-5-62, a delay of six weeks. This is another admittance by Rocketdyne that the program is marginal and optimistic. ✓

10-23-61 (Mrazek)

11-06-61 (Geissler)

5. SPACE ENVIRONMENTAL CHAMBERS: Mr. Jim Carter, FPO, contacted AERO-E during this week for background information about space environmental chambers. He feels strongly that large chambers will be required for "Orbital Operations" R&D and full scale vehicle checkout. Mr. Carter was given copies of the Aeroballistics Division's proposal for formation of a Space Simulation Group plus the NASA-DOD survey on existing U. S. facilities and proposed facilities. Warning: Space simulators are too costly to be dealt with at the Divisional level, centerwide treatment required.

Hausman: Suggest you get in touch with Jim Carter to coordinate this program. He is making preparations in the area of 'main' outside repairs in orbit etc. B

1. NAA required funding was 36,000 million versus 23,000 million available. ✓
  2. To gain a more definitive scope of work by allowing MSFC and NAA engineers to work together for 90 days. Open areas include:
    - a. Diameter
    - b. Electrical networks
    - c. Control system

Also: they projected layout for Seal Beach looks very plush to me. (See model in FREE modeling shop and discuss matter with Kuers!) B
  3. NAA proposed schedule was 4 months ahead of our present C-3 or C-4 schedules. ✓
- II. C-133 AIR TRANSPORT FOR S-IV STAGE - On the basis of Langley investigation, Seaman has said no. How's the blimp plan coming along? ✓

10-23-61 (Lange)

III. PERT - The S-I personnel of this office have been meeting with TPC personnel in preparation of using the PERT programs developed by TPC for the S-I SA-5 as a firm management tool. This present network indicates the stage is 18 months off schedule; our first work will be to try to work this time out of the program.

10-23-61 (Lange)

WHAT?? B

Dr. von Braun: I remind you, we just lost our PERT man to Ground from C&D Div. If the PERT information is really useful, this loss is quite serious. (Request more info + soon! This delay should be a catastrophe!!)



# 1962

mainly of 2 huge bulge forming dies, and fabrication of 12 each segments of the apex and knuckle parts was \$209,205. After changing the tool design layout on our request twice, Boeing changed the price on October 17, 1962 to a total of \$609,805. This week we were informed that the last quotation was in error and that the price of this job would be \$2,700,000. We had a meeting with Mr. Coenen and his people where a break-down of the figures was discussed.

11-05-62 (Kuers)

Jim Braulick  
What's going on here??  
If Boeing keeps operating like this, we'll be broke in no time!  
B

\*1. HEADQUARTERS ADP MEETING: The Ad Hoc Group Meeting on administrative ADP procedures called by Mr. Seipert was held last week in Washington and the four members from MSFC indicated in last week's NOTES (copy attached) attended. A meeting instruction dealing with ADP was prepared by Headquarters and discussed. The critical point is, as always, how deeply Headquarters should become involved in center acquisitions and programs. MSFC representatives (as did other centers) made it clear that they felt NASA Headquarters should be kept informed as to the center ADP plans for NASA-wide dissemination. They strongly objected to Headquarters control over ADP equipment procurement and center applications placed on this equipment. Headquarters should approve ADP equipment procurement procedures in the center and the over-

The old creeping NASA disease again!  
B  
(The "headquarters" activities "stealing" all activity if not checked continuously)

10-15-62 (Hoelzer)

O.L. (Please take up with Shepard)  
→ There why in h... don't we get moving??  
B

09-04-62 (Lange)

MSFC requested from OMSF authority and C of F funds for re-roofing the Manufacturing Building (\$955,000) and the storm drainage construction (\$700,000). M-SAT understands that appropriate authorization and funds are available from FY-62 supplemental budget.

09-04-62 (Rudolph)

Heck, I don't know what the lesson is like! Never been there!  
B

Office of Systems is very interested to receive MSFC comments on Issue No. 1 of a statement titled: "Office of Manned Space Flight Requirements for Data in Support of Project Apollo".

3. QUALITY REQUIREMENTS FOR STANDARD SPACE LAUNCH VEHICLE: A meeting was held with Space Systems Division (Air Force) personnel and Mr. Howard Weiss, Office of Reliability and Quality Assurance, NASA Headquarters, at Aerospace Corporation, Los Angeles, California, to discuss Quality Requirements for the Standard Space Launch Vehicle. Air Force Specification DCAS 62-10 is to be included as a part of the contract. Since this document is not as comprehensive as NPC 200-2, there were certain provisions which were requested by NASA to be included. A list of these provisions is being prepared for distribution.

D.F.  
Is that Pentagon-Chinese for Taiwan III?  
B

08-06-62 (Grau)

6. Centaur: During the course of Centaur checkout this past week, it was disclosed that considerable harness wiring is not flight worthy. An overall inspection and replacement of wiring harness is in process. The schedule is being revised to reflect an overall checkout of one month from the present initial launch date.

02-12-62 (Debus)

Haus Hueber  
I'm about ready to blow up the whole damn project. How long is this kind of thing to continue??  
B 2-12

No report. H.H.  
Hope you are still alive.  
How is Slidell?  
Midland?  
B

10-22-62 (Hoelzer)

W.K.  
Request a briefing on this subject by the most knowledgeable people we have. Please arrange  
B w/20

within 10 seconds--tolerances of the die, uniformness of material properties, etc., were: "We have experience with this process and we are confident that we will solve these problems". The confidence is there, but the answer is generalized! Because of uncertainty of success with this method S&ID has been directed through Saturn Systems Office not to proceed with construction of 33 feet diameter dies of this type for the complete bulkhead, but to go ahead with application of this method for sizing of gore segments. The problem of sizing a complete bulkhead of 33 feet diameter to tolerances of  $\pm .020$ " all over the contour is still unsolved--at least no method with a reasonable confidence factor for success is known at this time. Therefore, we strongly recommend consideration and evaluation of the membrane-type bulkhead design or to bond upper gore segments in place and seal of gaps by the use of doublers.

10-29-62 (Kuers)





# 1963

LUNAR LANDING SIMULATION PROJECT: A breadboard flying spot scanner system is operating which permits simulation of a portion of the descent to the lunar surface. While the resolution is not as high as desired, the system is satisfactory for the time being.

03-02-63 (Hoelzer)

## 1. FUTURE OF THE SATURN FAMILY

You expressed some concern about the lack of activities on the "marketing" of the SATURN launch vehicles. Here is a summary of what we are doing and planning to do:

the "old reliable SATURN's." Thus a 10-year operational lifetime, and production numbers of at least 50 for SATURN IB and 100 for SATURN V, seem virtually to be assured. ✓

08-26-63 (Koelle)

H.H.K.  
You're an optimist, but then, so am I!  
B

H.H.  
Please call me when you'd like to give me a little demonstration  
\*2.  
B

01-07-63 (Mrazek)

L.M.

This report is a bit thin considering PAV's tremendous tasks!!  
B

(Hope next time it'll be more, and that this is just New Year's eve hangover)

H.M.

Please see to it that this doesn't bog down in bureaucratic difficulties.

I think we should use these first 4 tasks as "ice-breakers"

to get this cooperation with the AF established. It may be helpful and useful in 1000 ways in the future!!  
B

and a task submitted by Aeroballistics Division, for Aerodynamics Instrumentation Research, both to be performed by AEDC-Tullahoma. Two additional tasks, Self Sealants, submitted by Special Assignments Office, and Thermal Control in Space, submitted by Research Projects Division, are to be performed by Wright-Patterson Air Force Base. ✓

These four proposals have been referred to the laboratories/divisions concerned for technical review and approval. ✓

09-23-63 (Maus)

1. RIFT: The projected FY-64 funding level for RIFT was the reason for a Lockheed Nuclear Space Programs Division reorganization. We understand that cognizance over the manufacturing group will be returned to the central manufacturing group, and the directorates for Product Assurance and Test Operations will be combined. Official notification of this rearrangement has not been received from Lockheed.

## 1. Saturn V, S-IC Stage:

...ing a sufficient number of people in purchasing and follow-up activities, etc. Immediately affected is the schedule for hardware qualification testing and for components for single engine testing for Test Division needed by the end of this year. We had several meetings with the Vice President of Arrowhead and their key people and hope at least to avoid further slippage and possibly catch up some of the lost time. ✓

04-01-63 (Kuers)

1. ST-124 SLED TESTS: A total of 7 runs was made with the first ST-124 Stabilized Platform delivered from Eclipse-Pioneer on the high speed track at Holloman AFB between 11/27/62 and 2/21/63. The first three runs were

The reliability was conclusively demonstrated by the series of seven runs.

03-04-63 (Haeussermann)

H.H.

Very good program! At anyone involved!  
B

I understand this may cost me 2 to 3 months!!!  
(per Lange)  
am of Pressure Notes  
ere is a delay of 4-1-63)  
by a two con-  
providing for  
W.K.

this is the kind of thing we simply cannot tolerate!

Boeing Y-Ring I hope have initiated a the vacuum chamber of Y-Ring welding. head been quite however, have hit was found that really level for the been y. This fact gists. As a (1 Amp, thode and anode s have been made Shall ed a 80,000 volt I send n the gun at a him a vaporized metal fiery letter? If so, please draft 2. we will present one condensed form to 1 presentation  
B

6. S-IV STAGE PROBLEMS: Problems which this actuator-accumulator-reservoir design has encountered are (a) Servo valve body forgings rejected; (b) Markite potentiometers rejected; (c) Dirty servo valves; (d) Excessive leakage across bypass valve -- new bypass valves made; (e) High-pressure drop through filter cavity, caused by restriction--spacer and snap-ring employed as fix; (f) Piston rods scoring during velocity-load tests.

W.M.  
Anything  
good  
at  
all??  
B

02-04-63 (Rudolph)

02-25-63 (Mrazek)

Flight Mission Assignments

I will have a final review of those with Shea and Gautraud, etc. on 12 Feb 63 (before Shea's submission to Holmes for official approval and distribution). I will provide a set of slides for you.

1. USE OF GULFSTREAM AIRCRAFT: We understand from Mr. W. P. Morrow, M-SS-V, that the use of the Gulfstream is limited to yourself and your staff officers.

04-22-63 (Haeussermann)

Dr. Haeussermann,  
See Mr. Morrow, f officers. I do not think this is true. We've got this is a plan, investigated to offer of course.  
of course  
is the Gulfstream available for group travel?  
Reference Harry  
ation in German  
zation with whom we  
feedback, discussed  
age supply, this, pro-  
d electrical circuit as  
ne servo- but out  
ce the servo a paper  
1. Concurrent on  
improvements  
to be followed so  
use it.  
ne practically  
areas. B 422  
avoid  
here

heavy technical work loads and increased administrative

CUTATOR DEVELOPMENT FOR S-2: Reference

I was not able to make this announcement at the executive session.

02-04-63 (Mrazek)

copy  
in  
W.M.  
I'm  
sorry for  
my harshness.  
He just had  
ed to come to  
near grips with  
that LOC/  
LVO  
problem

01-28-63 (Constan)

2. ETS HOKIN & GALVAN VS IBW

The IBW Union Personnel returned to work on Thursday, January 24. They agreed to perform the work as before using the hydrolift in lieu of block and tackle. ✓

\* 3. STATUS OF S-I ASSEMBLY

12-09-63 (Gruene)

4. TV Coverage of SA-5: As you know, Headquarters tries to make a big TV splash out of the SA-5 launch. Due to the numerous difficulties encountered during our three loading test tries, my personal confidence in getting SA-5 off on the first try, is very low. Dr. Debus is trying, through Dr. Mueller, to discourage any commercial TV coverage. If a question should come to you, I would appreciate your backing us up.

H.F. This was  
Pres. Kennedy's  
personal suggestion.  
It'll be hard to  
iron down  
materials? Particular  
not, after the  
logic event.



# 1964

4. PARTICIPATION IN LOCAL POLITICAL CONTESTS: A legal opinion has been requested from the Chief Counsel's Office concerning candidacy of MSFC employees in local political contests. By the end of last week, four R&D Operations representatives had requested permission to enter local political races.

*I thought we had enough politics  
in the Carter B*

07-06-64 (McCartney)

E.S.  
that's  
a very  
good  
idea.  
I've  
always  
felt that  
the  
lack of  
visual  
display  
(photos,  
models,  
samples  
of past  
SRT achievement)  
has hampered  
our sales  
efforts.  
I've  
new  
program  
Let's  
discuss  
a  
hard-  
hitting  
plan B2/7

1. RESEARCH PROGRAM INFORMATION FOR MSF: Ed Gray from MSF requested that MSFC prepare a collection of narrative and exhibit material to demonstrate objectives and results of the MSFC supporting research and technology programs. Fiscal years 63, 64, and 65 should be covered. This material will be needed in forthcoming congressional committee hearings. Unfortunately (only a former for on a con

01-27-64 (Stuhlinger)

WASHINGTON VISIT BY UNIVERSITY OF ALABAMA/TUSCALOOSA BUSINESS PEOPLE: A group of Tuscaloosa business people and University of Alabama officials, including Dr. A. Pow (Dr. Rose joined later), visited with Mr. J. Webb and the Headquarters staff on January 10, 1964. Their intention: to invite NASA to place business in a Tuscaloosa Research Park area of some 700 acres. The proposal was apparently a strictly "Tuscaloosa local" backed by the University of Alabama. Mr. Webb appeared puzzled, first that the University of Alabama and the Tuscaloosa business people came to see him directly for such local interest, and second they had not seen the NASA "Rep." in their area, the MSFC (more details available to you). Dr. A. Pow called today to make arrangement for a MSFC-Tuscaloosa business-University of Alabama mutual briefing here at Huntsville.

*O.L.  
I'll be the  
coldest  
fish  
they've ever  
seen!  
B*

01-20-64 (Lange)

for implementation on various contractors. ✓

3. CONFIGURATION CONTROL BOARD ACTION: The material used to prevent galvanic corrosion between the GOX Diffuser and the bulkhead of the 105-inch LOX Tank has been determined to be incompatible with LOX. Correction of this problem on SA-7 is impossible without a schedule delay. A change of material on SA-9 may also cause a schedule delay. Investigation of the problem will continue.

4. F-1 FLIGHT RATING TEST (FRT) INJECTOR HA

*P.S. I'm not  
interested in name  
of culprit. I am  
interested in steps  
to prevent recurrence  
B*

*Fred C.  
Who, goofed?  
Please see  
to it that  
procedures  
are  
tightened  
B*

08-24-64 (Cline)

No submission this week.

W.H.  
I guess I haven't had any  
notes from Astionics for 3  
or 4 weeks. Have you stopped  
working, has your place burned down,  
or is it that you simply have  
no problems? B

11-30-64 (Haeussermann)

## 2. SA-6 Launch

I would like to make you aware of the fact that in SA-6 we carry, in addition to the SA-5 instrumentation systems, three more telemetry links on the spacecraft, two C-Band Beacons on the spacecraft, and ODOP (Offset Doppler) System in addition to the UDOP in the launch vehicle. The interference history of SA-5 scares us with this number of active RF systems. It might have to be decided, in coordination with Dr. Speer and Mr. Hoberg, that some of the systems have to be eliminated in case we run into serious problems.

H.F.  
Suggest  
the  
time if you get together on this at once.

B

02-03-64 (Gruene)

12-28-64 (Belew)

## F-1 ENGINE

F-1 production is now at a rate of two deliverable engines a month. The two "December" engines (F-2007 & F-2008) have been acceptance tested and have completed their final checkouts. Both engines will be air shipped via the "Pregnant Guppy" aircraft next week. ✓

a  
Karl  
Heimbürg  
Just to remind  
you that you  
are on the  
Critical Path  
B

## Saturn V, S-IC Stage:

The structural assembly of the T-Vehicle is not making good progress and is already falling behind schedule VI. There are three major reasons for this delay:

Karl Heimbürg

When can I get that promised status and problem briefing on SIC-T? B

02-03-64 (Kuers)

## 4. MARINE TRANSPORTATION:

The last barge trip (SA-6) under Test Laboratory's jurisdiction, from MSFC to the Cape, started at 4 p.m. on 2/7. From now on, operation of the barge will be under the jurisdiction of the Project Logistics Office. ✓

K.H.

Test deserves a big pat on the back for setting up and running a very efficient transportation system all these years! B (Please pass this on)

02-10-64 (Heimbürg)

## 1. MICHoud FATALITY

On December 21, 1964, Mr. Edward Williams, sheet metal worker employed by Erectors, Inc., subcontractor to Martin K. Eby, the construction contractor for the stage test facility for the Boeing Company, was fatally injured at Michoud Operations. Mr. Williams was hoisting steel siding when the hoisting device overbalanced, throwing a board down on top of Mr. Williams. Boeing is investigating the accident by means of a board of inquiry. ✓

Frank

Please prepare a condolence letter to widow or other relatives inform Constan & Boeing. B

12-28-64 (Constan)

01-20-64 (Fortune)

→ Again ??? Oh no! B

5. Visit Of NAS New Orleans Personnel: Captain Tracy and other personnel from the Naval Air Station visited MTO looking for space for a Navy bombing range. We pointed out



1965

2. CENTER SELECTION CRITERIA: Our second iteration on the development of suitable project selection criteria resulted in the following weighted priority list. This was obtained by polling the 45 members of the Executive Board and the Center Planning Working Group of which 20 elected to participate. We are very happy to have this high degree

04-26-65 (Koelle)

11. Does this project make us a "rich" Center

7.82

100.00%

I never heard we had so many idealists around here!

Or are we just snobs who take our having money for granted? B

1. delay Also The prac

2. IU-500-FS: IU-500-FS was transferred to R-QUAL on October 25, 1965. After analysis of the assembly status revealed that no systems were complete, representatives of QUAL, ME, and the Project Office, decided to return the unit to ME for incorporation of outstanding EO's and addition of available items that were missing. The IU is scheduled to return to QUAL on November 29, 1965.

11-15-65 (Grau)

01-25-65 (Stuhlinger)

1. WEEKLY NOTE SYSTEM: In response to your plea to reduce the number of problems brought to the attention of DIR by having more of these problems handled on the R-DIR level, may I suggest that Labs and Offices write two Weekly Note sheets, a short one for DIR, and a more detailed one for R-DIR? I believe that the "Weekly Note" system is

SATURN IB/CENTAUR TERMINATION: On November 4 we recommended that \$1.1 million be authorized for continued effort on fabrication and test of honeycomb panels, feasibility demonstration of a non-contaminating retro-rocket, and Saturn V-Voyager aeroballistic studies. We received a teletype from John Disher on November 18 which stated that Dr. Mueller had disapproved our request to spend the additional money. Action has been taken to terminate all Saturn IB/Centaur contracts. It is anti-termination charges

That's correct B

Shau R. ✓  
All Sat IB/Centaur funds reverted to Saturn IB, and some of them may find their way into AAP, i.e., to you! B

11-29-65 (Reinartz)

E.S.  
ber. Misunderstanding! I don't think mind having these problems brought to my Offices attention. I only feel that R-DIR should always be called to help resolve them, before they are brought into the act. No. Let's leave the Weekly Note system as it is. I like it. B

Ground Computer Program Problem at KSC: On Thursday, Dec. 2, 1965, a problem with the ground computer operating system programs occurred during checkout operations. This program error caused erroneous outputs to be issued to the vehicle electrical system. No known damage occurred as a result to these erroneous signals.

12-06-65 (Richard)

result of an error made in a previous change to correct a different situation. This shows again that very close coordination is required in making changes and/or corrections to these programs. MSFC (R-ASTR) and KSC are working with IBM to continually improve this coordination and to improve the procedures.

LR Please keep KSC constantly aware of this!! B

1. S-IC Manufacturing Problems: The intention of my reporting on manufacturing problems is to show with some examples that we are not engaged in a routine manufacturing task in building these stages and to give you a feeling of the degree of extension of the art in manufacturing that we and the Prime Contractors are involved in. At the same time these examples, I hope, might serve to further the understanding why some delays have occurred in our program.

12-06-65 (Heimbürg)

01-25-65 (Kuers)

S-IC-T: Test S-IC-14, approximately 145 seconds duration, is scheduled for December 9, 1965.

Shop  
If possible, I'd like Mr. George Bunker of Martin witness this test. He'll be in HSR for a visit. Bourde has details. B

W.K.  
Request a  
45-min  
briefing  
with  
samples,  
pictures  
and  
overall  
plan  
B  
(Please  
arrange  
this  
Bonne)

12-27-65 (Kuers)

**Superinsulation R&D:** The first large scale application of Linde's pre-evacuated multiple-layer insulation of Al-foil and glass fiber paper (70-inch tank) was unsuccessful because a flexible vacuum jacket could not be manufactured to the extremely low leakage requirement (pinholes and sealing of structural and plumbing penetrations). The structural solution for the integral tank wall, which does everything, still has to be invented.

Merry Christmas and Happy New Year! Same to you  
B

**AS-201 SOFTWARE:** As you are aware, the checkout tapes have been the MSFC pacing item for the SA-201 launch. As a result, elements of R-ASTR, CCSD and IBM have been on a "backbreaking" schedule. The breadboards are being utilized on a 24 hour-7 day week-schedule to meet the software delivery dates. We see no problems at this time to prevent us from delivering the remaining tapes to meet the KSC need dates. The personnel involved in this effort are certainly to be commended for a fine job under extremely difficult circumstances.

Lee: Let's wait until after 201 launch. Then please prepare personal letter to all personnel concerned for my signature  
B  
J-202

11-15-65 (James)

2. AAP: H. Gierow of RPL gave a presentation mission to Dr. Mueller's Science and Technology (STAC) Meeting held at NAA last week. John Disner sent us an appreciative letter for this presentation. ✓

We are presently preparing, as requested by MSF, a 15-20 minute introduction to the subject of MSFC's lunar roving vehicle program. This presentation, which will be on November 19th in

Mueller's questions  
Introductory remarks  
that a mobility aid  
need impose certain  
E.S. I know. But we still have to watch out that we are not pricing the whole scientific lunar surface program out of existence because of the high price tag on LSM.  
B

11-15-65 (Stuhlinger)

01-18-65 (Maus)

**MR. WEBB'S LETTER TO PRESIDENT JOHNSON** - Mr. Webb has requested your comments on the rewrite of the Future Program Task Group Report, and on a draft of his reply to the President's letter of January 30, 1964, which requested examination of future missions and technologies required to accomplish them. In his letter, Mr. Webb states two major

H.M.  
I hope you have received the copy with my comments and have incorporated them in your reply. If there are any questions, please contact Frank W. with whom I have discussed the draft.  
B

12-27-65 (Heimborg)

**S-II BATTLESHIP (SANTA SUSANA)**

Six unsuccessful attempts were made to get the first firing (15 seconds) on the re-built stage between December 18 through December 22, 1965. The fifth and only attempt resulting in engine

Still a lousy record!  
B

E.G.  
This worries me. How about AS-201?  
B

11-01-65 (Geissler)

1. Saturn IB and V Panel Flutter: Ref: Notes 10/11/65 Geissler, item 4, copy attached. Flutter tests were conducted at Langley on panels similar to S-IVB forward skirt panels at Mach 1.9 using existing test equipment. Flutter did start at dynamic pressures as low as about 25% of expected flight values at critical buckling loads and zero differential pressure on the panels. Raising the differential pressure above 0.40 psi increased the minimum dynamic pressure

→ Fred C.  
Please give me an interim briefing on this. I think this is utterly undesirable and should be avoided by all means, even at the price of payload capability or mission flexibility. It may indeed kill the entire Saturn V/Voyager idea if we don't succeed in using our standard Saturn V launch vehicle.  
THIS IS URGENT.  
B

12-06-65 (Haeussermann)

2. **SATURN V/VOYAGER STUDY PROGRAM:** In response to the JPL request to perform a parametric study of Voyager payload variations, a study program plan has been prepared. A cursory analysis and assessment of available data were made using intended Voyager payload and shroud data as provided by JPL. It appears that the Voyager payload concept and mission requirements will require modifications to the Saturn V stages. To fully evaluate this, a 5-month study with MSFC and Saturn V contractors participating is planned. Cost is estimated at approximately \$250,000. The technical study effort will be managed by Mr. A. G. Orillion from P&VE Advanced Studies Office. The Advanced Systems Offices' laboratory organizations and IO will be required to support this effort.

5. I will be on annual leave for the next 10 days. In my absence Dr. Ruppe, and in his absence Bill Huber, will act in my behalf. ✓ Same to all of you.  
Merry Christmas and Happy New Year\*  
(\*It's going to be a busy one - heading up MSFC's Bright Future.) ✓

12-20-65 (Williams)



# 1966

KSC RESIDENT OFFICE: I think you are aware that General Shinkle, in a letter concerning Field Engineering Changes (FEC's), has questioned the role of our resident office in the configuration control that we exercise at KSC.

09-19-66 (James)

announced his resident office at KSC under the leadership of a Mr. Kapryhan. It is interesting that each of the design centers strongly see the need for resident offices at KSC and are able to make them work but KSC has continued to resist them. ✓ *Let's hold the line: B*

4. Key Personnel Losses: Mr. John Winch, Chief of our Applied Guidance & Flight Mechanics Branch, has resigned effective the end of March. He accepted a position with T.R.W. (Houston), performing the same function for T.R.W. (MSC) as he performed here. His stated reason for leaving is "no future at MSFC." His Branch is responsible for Guidance work, Mission planning and Flight Mechanics for mainstream Apollo and AAP. His talents will be very difficult to replace. ✓ Another extremely valuable key employee in our Unsteady Aerodynamics Branch, has indicated he will most likely leave MSFC to accept a teaching job; he has made extensive contributions in the difficult field of unsteady aerodynamics on IB and V. He is a PhD, GS-13, without hope of getting a promotion under present personnel policy. He will make more money teaching than in his present position.

03-07-66 (Geissler)

*E.F. After our discussion today (Mr. Dahms's presentation) I'd like to have another private talk with you on this personnel morale problem. Please arrange thru Bonnie. (I'm going on a trip, so our talk after 3-27) B*

*Hans Maus*

*Do we get reimbursed for this work?*

*Houston misses his opportunity to put his hand into our pocket. I think we should reciprocate. B*

4. Gondola Tests for Human Centrifuge at Houston: Agreements have been reached for performance of pressure tests for this Gondola, which is 12 feet in diameter, in our big Autoclave. Tooling for this task has been designed by us and will be fabricated by Hayes. Tests will be started at the end of July. ✓

05-09-66 (Kuers)

09-26-66 (Constan)

#### VISIT OF INTERIM COMMUNICATIONS SATELLITE COMMITTEE

A group of fifteen international members of the Interim Communications Satellite Committee, accompanied by Mr. Richard Colino, Director of International Arrangements for the Communications Satellite Corporation, were given a briefing and tour of the Michoud Assembly Facility on Friday, September 23, 1966. ✓

*Good. Sold 'em a Sat. V? B*

*Herm. Weidner and F.W.*

04-04-66 (Williams)

2. Impressions from Gray and Mueller Visits to MSFC: In several instances over the past few months, and again during the Gray and Mueller visits last week, a "message" seems to weave its way through the discussions and meetings. That message is:

- (1) We don't have much money to go out for new activities.
- (2) With no (or very little) money, we (Headquarters) can't make decisions to start or approve new activities.
- (3) New activities must be started - but don't ask us for approval because we can't say yes in this climate. Just go ahead and do things. ✓

*I couldn't agree!! more!! This is precisely the situation where can I help more? B*

AS-201 POSTFLIGHT EVALUATION: Analysis of the AS-201 flight data has revealed only two minor problems: (1) At about 79 and 81 seconds of

The high noise levels on these signals are of concern because the EDS vehicle angular velocity abort limits are  $\pm 5 \frac{1}{2}$  deg/s in pitch and yaw and  $\pm 20$  deg/s in roll. Both of these conditions are currently under investigation and are expected to be corrected prior to the next flight test. The overall performance of all other Astrionics systems was satisfactory. ✓

03-07-66 (Haeussermann)

*W.H. Congratulations! A splendid record. B*

SUBJECT : S-II Battleship

In this same attempt the gas generator for engine no. 3 indicated an over temperature condition as well as a very low turbine speed. The pump was entered on Saturday, July 23, 1966, and found the first stage turbine wheel was installed backward by the Rocketdyne field crew. This pump is currently being replaced by Rocketdyne.

The next attempt is scheduled for Friday, July 29, 1966.

I.O. Suggest you prepare a personal letter to Sam Hoffman for my signature. cool - See Page 2

Samuel Yarchin

"How can we ever hope to go to the moon if something like this is still possible??"

07-25-66 (Rudolph)

S-IC-4 - very little testing accomplished during the week with "change outs" in progress and scheduled to continue thru September 29. Two deep scratches were found in the lower bulkhead of the fuel tank. They are approximately one half inch apart, and it appears as though a tool had been dropped in the tank. Further investigation is in progress and an engineering evaluation is forthcoming.

09-19-66 (Constan)

George C.

Let's find out why the man who dropped it did not report it! If people start hiding goofs like this, we'll find ourselves in endless trouble! B

Incidents  
So we  
will  
discover  
surprises  
during  
static  
testing  
of SIB  
stages!!!  
B

H-1 ENGINE During the first static test of S-IB-208 on 11-16-66, Engine H-4078 (position #6) ran significantly lower in thrust than expected. (19,000 lbs. less than the other seven). A quick look at the data pointed to the turbine as the suspect component. Disassembly of the turbine showed that approximately 20% of the first stage blades were missing, second stage blades were dented and scored, and there were dents in the heat exchanger coils. The cause of the failure cannot be determined until the engine is disassembled for further investigation. An apparently

11-21-66 (Brown)

utilizes about 5 Service Propulsion Burns and phasing via elliptical orbits to achieve rendezvous and the MSFC proposal consists of putting the CSM into an elliptical orbit and the LEM into a circular orbit utilizing ground phasing and the iterative guidance capability in the yaw plane. (2) MSC apparently is having rather severe weight growth problems, particularly in the CSM at this time. It is anticipated that MSC may have to request a payload commitment increase for Saturn V. MSFC position was that we would support analysis of the S/C requirements and L/V capabilities; however, any commitment change is a Program Office (Dr. Shea & Dr. Rudolph) function to initiate. We are also initiating studies to determine a

04-25-66 (Geissler)

1. S-II Welding Meeting: You might get tired hearing so often about welding problems. But all of the welding techniques are compromises for the many overlapping aspects in the areas of metallurgy, weld equipment, tooling, quality control, and last but not least, management. If

04-04-66 (Kuers)

W.K.

No, I'm not. A lifetime in rocketry has convinced me that welding is one of the most critical aspects of our whole job!!  
B

10-03-66 (Maus)

ECONOMIC IMPACT STUDY - The first phase of our on-going economic impact study has been completed and reviewed by Mr. Koenig of NASA Headquarters. As was generally expected, the phase-down in MSFC's operation as Apollo is completed will have an extensive effect upon the Huntsville work force and area economy. A similar effect will be felt by MTF and its surrounding area while New Orleans, on the other hand, with its extensive metropolitan area and diversified economy, will feel little effect as the Michoud Operation phases down. The New Orleans area is singularly different from Huntsville and MTF in that it was experiencing a decided boom in its economy before the activation of Michoud.

H.M.  
When  
quoted  
out of  
context  
this  
text can  
be  
damaging  
Please put it under wraps, Stuchow  
B



# 1967

11-13-67 (Rudolph)

## AS-501 Launch Vehicle:

- o Gone --- but never, never to be forgotten. ✓✓
- o Launched on time. ✓✓
- o All primary and secondary objectives achieved. ✓✓
- o Flight Evaluation Working Group is reviewing launch and flight data, and the preliminary report will be sent to MSF later today (Monday, 13 Nov 67).

*Congrats to the Sat. V Program office and the entire Saturn V team. B*

*F.W. I think we should go all-out on these studies. Voyager should have a multiple capability: while near-optimum for Mars mission, modular changes should permit Venus, Jupiter, Jupiter-Sun (Thomae profile) and Grand Tour Missions. B*

03-06-67 (Williams)

4. Unmanned Planetary Spacecraft: We have been requested by OSSA, (Mr. Pitt Thome of Mr. Oran Nicks' office), to manage system studies of unmanned planetary spacecraft. Specifically, OSSA is desirous of investigating requirements for Voyager-type space-

*Can't we also help local educational organizations such as*

- U of Fla
- Research Institute
- A-M + Oakland Colleges
- Schools
- Nat space museum? B

04-17-67 (Fellows)

Reduction of Supplies Inventory: A number of steps have been taken within the Center, with R&DO participation, to implement the President's September 16, 1966, direction that we reduce cost in procurement, supply, and property management. A "walk-through"

Offices. The overriding principle within which this committee functions (as with all other excess property evaluations) is that property which can be used by on-coming programs must be identified and retained. Only items truly excess to our present and immediate-future programs are to be disposed of through established government procedures.

11-20-67 (Haeussermann)

- a. The ingress/egress through the docking port as well as through the LM front hatch in a suited condition and with the life support back pack. The exit from the front hatch is necessary for the CSM/LM-ATM docked mode.
- b. The removal of the docking probes without cramping the astronauts working volume. *also*

*Lee Behaw Are we preparing a neutral buoyancy workshop to verify feasibility? Think we should!! B*

*F.S. Does this mean that astronaut-initiated abort in case of pad fallback is not possible during first 25 sec?? What's the rationale? B*

09-11-67 (Speer)

1. APOLLO 4 FLIGHT MISSION RULES REVIEW: Gen. Phillips and Mission Director W. Schneider conducted the second part of their AS-501 mission rules review on 9/7 at Headquarters (the first part covered the Launch Rules and was held on 8/22 at KSC). We had (1) Pad fallback and tower collision will not result in S/C abort; the earliest abort capability will be at 25 sec flight time; (2) Gen. Phillips stated a requirement for a crew-initiated L/S out-off capability on all

5. Mr. Ishmail Akbay, Configuration Management Engineer in the Saturn V, S-IC Stage Office, served as interpreter for the First Lady of Turkey during the President of Turkey's visit to KSC on Wednesday, 5 April 67. ✓

*I'm sure they talked Turkey. B.*

04-10-67 (Rudolph)

1. KRAFT VISIT: Chris Kraft, some time ago, has asked me to arrange for a meeting here to give him an opportunity to explain his activities and responsibilities to MSFC and, in turn to improve his personal knowledge of MSFC personnel and facilities (In all these years he hasn't seen much of MSFC yet). We had agreed to wait until after launch of Apollo 4. The two-day meeting is now scheduled for Dec. 12 and 13. The discussions

11-20-67 (Speer)

Thru  
Herm  
Weldner  
to  
B.L.

10-23-67 (Lucas)

While  
we  
should  
not  
commit  
ourselves  
we  
should  
definitely  
keep the  
door  
open.  
We may  
need  
SART's

protection in  
case of more  
cutback threats.  
B

3. OART INQUIRIES FOR RESEARCH ASSISTANCE: We have received inquiries from OART in Washington as to our capability to assist in aeronautics research.

Shap  
Let's  
have  
a nice  
buffet  
luncheon  
on 10th  
Floor with  
some of  
our other  
key people  
present.  
I think it's  
very  
important  
that we  
improve our  
relations w/  
Chris,  
("Red",  
carpet)  
B

08-14-67 (Lucas)

Thanks. I'm relieved!!  
B  
8/22

1. S-IVB Forward Skirt Temperatures

As per George Hopson, P&VE-P, there is no problem as of today. No insulation is required.

F.S.  
Could  
have a

hr  
briefing on  
this subject, at Mr. Casey's  
convenience? B

3. STAC MEETING: The second in a series of three operations reviews of the lunar mission by the Science and Technology Advisory Committee (STAC) was held on 8/11 at Santa Cruz. C. Casey of our Flight Control Office at MSC presented the L/V orbital checkout portion. Some discussion developed on S-IVB/IU lifetime limitations. No action items resulted for MSFC.

08-14-67 (Speer)

10-16-67 (Haeussermann)

5. Last week, I learned from Dr. Rees that you had desired to meet Dr. Letov. I regret very much that such a meeting did not take place; it was strongly opposed by Mr. Slattery with whom I had discussed this before I met Dr. Letov. I asked at that time that Mr. Slattery inform you on the matter.

W.H. → NASA Hq Public Relations (Julian Scher)  
Opposed the idea, since State Dept. had  
not liked Letov's visit here B

3. S-IVB PROGRAM: S-IVB-208 completed post-static checkout March 21, 1967, and is being removed from the checkout tower. There are large amounts of rework and modification scheduled to be performed during storage, which will invalidate approximately 75% of post-static checkout.

D.F.

he should  
put our foot  
down and  
declare this  
as unacceptable.  
If you run into any difficulty,  
just let me know and I'll  
raise case. B

• A new safety policy at DAC requires checkout at Huntington Beach to be run at reduced pressures. Should static firing be discontinued, the new DAC policy would contribute to shipment of stages to KSC which had never been pressurized to full operating pressures.

03-27-67 (Gru)

08-21-67 (Richard)

a. The operations people stated that the launch vehicle guidance system would be prime to go out of orbit, and J. McDivitt described the onboard methods that would be used to monitor its operation. He

L.B.  
I'm glad  
to see MSC  
is going on  
record  
on this matter  
B

# 1968

05-13-68 (Williams)

2. Chrysler "National Space Booster Study": On 4/30/68, Dan Schnyer (MSF Manager of the Chrysler study contract) met the "Study Team" at MSFC, including representatives from MSFC (IO and R&DO), KSC, MSC, OSSA, OART, and MSF. Study Team participation was discussed, and an orientation meeting with Chrysler was planned. We were later informed by Mr. Schnyer that plans have been changed, based on a 5/3/68 meeting of Messrs. Webb, Mathews, Schnyer, and Lowery (CCSD).

Frank H.

I'd like to have a personal appraisal from you on merits and objectives of this Chrysler study. No formal briefing, just a chat between the two of us. B

Harry S.  
I hope we are taking adequate steps to protect privacy of medical information. B

1. AUTOMATED MEDICAL ANALYSIS SUPPORT: As a first step in the automation of medical records at MSFC, the scheduling and notification of NASA employees for periodic physical examinations is now being accomplished mechanically. Additional support areas have been identified. They have a keen desire to mechanically massage the medical data of MSFC personnel in an effort to determine the incidence of various diseases and, hopefully, to attain the ability to detect at an earlier time the onset of disease or its symptoms. They feel that the statistics and data accumulated will not

04-08-68 (Hoelzer)

05-13-68 (Balch)

A very nice & constructive memo! B

Mr. Richard Lewis, a well-known aerospace writer of the Chicago Sun Times, will visit MTF on 5/27/68. ✓

ATM PRELIMINARY REQUIREMENTS REVIEW (PRR): The ATM PRR was successfully conducted last week. A large number of Review Item Discrepancies were written of which the majority are meaningful comments which deserve serious consideration. However, the incorporation of some could have a significant impact on the ATM design, such as additional redundancy, automation of astronaut functions, redesign of control and displays, etc. The most significant impact could be in the control and display area wherein use of the digital address system has been seriously questioned by MSC. Since the comments in the control

L.B.  
Looks like this display business (ATM) is growing into a major problem area between MSC and NASA. I'd better get up in a recent meeting with REM and myself. B

10-07-68 (Lucas)

01-29-68 (Belew)

probability of losing most of the J-2 engine data is high again. General Phillips has disapproved these changes for AS-503 and is holding up the incorporation of the changes into AS-504 and 505 until after the AS-503 flight. Unless every effort is made to immediately implement these changes for AS-504 and 505, time limitations will probably again prevent their implementation.

RUSH

B.L.

Here it is again: waiting for some failure history. I'm ready to buck the decision for 504/05.

If you concur, please draft a suitable letter to Phillips polite but strong for my signature (refer to my previous notes in this matter) B 10-11

ME Laboratory Internal Information Program: In November, 1967, we initiated this program in ME Laboratory as a result of the studies of Dr. Tompkins and Mr. Richetto from Purdue University which revealed a need for improvement of communications mainly from Division level down to the first line supervisors. The objective of the program is to improve the team spirit in the organization, to enhance the feeling of participation of all supervisory personnel in our challenging programs and to improve the awareness of responsibilities for building flight hardware. ✓

Sheep  
Suggest we follow this example in all labs and offices. B

05-06-68 (Kuers)

AS-502 Flight Performance: Once the shock of having significant failures on AS-502 is over and those failures have been identified and fixed, we intend to make a compilation of all the things we have learned from this flight. We demonstrated significant characteristics and capabilities that might never have been demonstrated on a totally successful shot. ✓ Such areas as EDS, flight control, separation dynamics, guidance, performance reserves, etc., really were exercised. ✓

04-08-68 (Richard)

Ludie

But don't feel encouraged to have a "repeat performance" of 502!! B

National Launch Vehicle Stable Study: We have recently received some unofficial information on the way NASA/DOD plans to implement some closer planning in the review of the National Launch Vehicle Stable. It is expected that the Aeronautics and Astronautics Coordinating Board (AACB) will again be requested to conduct such a study.

H.M.

Please this will offer us a new opportunity to promote the SIB/SIB/SM configuration. Please discuss with Frank Williams. B

02-12-68 (Maus)



OFFICE OF DIRECTOR - MSFC				
CODE	NAME	INIT.	<input type="checkbox"/> A	<input type="checkbox"/> I
	Dr. von Braun			
	Capt. L. Lucas + Bill	11-13		
	W. Lucas + M. Lucas	11-14		

REMARKS

Lee Belew and Bill Lucas would like to get your opinion on how they should pursue this matter of different specifications. We can do one of the following:

a. Accept the Headquarters-issued Houston specification (this is considered unsatisfactory). Shep Please tell them.

b. Hold out strongly for our spec. Yes, but

It would appear that we should take course b. above and try to get Headquarters to negotiate a position between our spec and Houston's spec which would permit the utilization of our specification on the Workshop and not disturb the Houston spec on the Apollo program.

I suggest the following approach: In our disagreement with the MSFC spec, let us avoid any language which questions the safety of the Apollo hardware. But take the position that OLC is second generation hardware, and a new start that permits superior solutions all the way thru. ("You don't use DC-3 specs in the jet age") This position doesn't question the

CODE	NAME	DATE
DIR	J. T. Shepherd	11-8-68

MSFC - Form 495 (Rev August 1963)

11-08-68 (Shepherd)

B.L.

Not it way to be a good lot for the final full-mission profile. Apollo-10 - the moon flights. B

5. LOX PURITY INCREASE: The Linde Company has proposed to supply LOX of increased purity. Studies to determine the performance improvement realizable on the Saturn V vehicle by changing from 99.7% to 99.9% pure LOX indicated that payload increase for a 100 n.m. circular earth orbit would be approximately 600 lbs. From a cost effectiveness viewpoint, this change would not be advantageous.

6. ATM POINTING SYSTEM: The 56-day vacuum test on the ATM Inertial Guidance Gimbal System has been completed successfully. Disassembly and inspection by Bendix and Astrionics personnel will begin this week; the system appears to be operating satisfactorily.

06-10-68 (Lucas)

110.

S-IVB LOX FILL AND DRAIN TESTS

P&VE has identified a potential problem area in the S-IVB fill and drain system should an inadvertent loss of electrical or pneumatic power occur during lox transfer at KSC. A test program was established to investigate the above problem by simulating the S-IVB lox transfer system. To date, 13 tests have been conducted which appear to verify the existence of the problem. The S-IVB fill and drain valve exhibits abnormal closing characteristics causing unacceptable pressure spikes during closing, which may exceed the design limits of the fill and drain system. The problem is being investigated by personnel from Test Lab, P&VE Lab, and Douglas.

Such a failure could cost us a flight!!

02-12-68 (Heimburg)

Meeting with Research Institute - On February 28, Mr. Miles, members of his staff, and I met with Dr. Thompson of the Research Institute on several occasions with company technical reps. If the university will now follow through with some individual contacts, they should be able to develop a program of research that is highly beneficial to us and to them. But they will have to sell individual tasks and individual researchers.

03-04-68 (Johnson)

## 2. AS-502 Data Problems:

AS-502 is adequately supported by raw and processed data deliveries. A few shortcomings of the types mentioned above probably cannot be completely avoided. However, action is being taken to avoid repetition of these specific failures, and I would like to endorse the continued need for a strong MSFC in-house data reduction capability.

I'm all for it. This is one of our most important functions in the forthcoming Apollo flight series! B

06-24-68 (Speer)

1. Stratoscope II. Stratoscope II was launched at 8:55 P.M. on May 18, 1968 for its 6th flight. The balloon system and the mechanical and electronic equipment of the telescope functioned perfectly. The photographic image of

first. Our review committee has essentially contributed in establishing the flight worthiness of Stratoscope II. Mr. Boehm, who chaired the review team, several other team members and I were in Palestine, Texas for the launch event.

06-03-68 (Haeussermann)

04-08-68 (Heimburg)

S-11-5 (MTF)

S-11-5 is presently installed in the A-1 Test Stand at MTF undergoing systems hook-up and checkout. A cryogenic proof pressure test is scheduled for April 16, 1968, to be followed by the acceptance static firing test.

110.

Can we conduct the static firing during Dr. Paine's visit to MTF, 22 April, afternoon? B

Effects of Sub-Orbital Trajectories of S-IVB-IU on Passenger Experiments- Decisions appear to have been reached to fly the AS-206 (AAP-I) in a mode such that the S-IVB-IU does not attain orbit. The plan was to fly a P&VE

orbital trajectory of the IU is being planned. Prof. Kraushaar and the University of Wisconsin Group now have four years invested in the experiment -- which is OSSA sponsored. We will try to work out with the AAP Office alternatives which will permit flying the experiment, but there are

Lee Belew

Has this commitment to Bill Krawlers (indeed a faithful supporter) overlooked when the mission profile was changed? But do you propose to do? I think we shouldn't simply pull the rug from under him! B

10-07-68 (Johnson)

# 1969

2. **FUTURE MSF FILM:** A pre-production meeting was held on May 28, 1969, with Capt. Freitag on a new MSF movie. This film will cover space station, space shuttle, lunar exploration, and space science and applications. It will be produced by the AV Corporation in Houston, a contractor to MSC. Presently planned MSFC contributions are: simulated space station operations in a full size mockup, animated space station and space base model operations, astronomy module animations, and lunar surface mobility operations. The film is planned to be available after the lunar landing mission in July.

*Shes*  
I think we should recruit someone to see that MSFC's inputs are properly used and that things don't come out as a completely MSFC-slanted pitch. *B*

06-02-69 (Huber)

**EXECUTIVE LEADERSHIP CONFERENCE ON PUBLIC AFFAIRS FOR SCIENCE EXECUTIVES:** For six days last week, I attended this conference at Williamsburg, arranged by the Brookings Institution. Ten

11-24-69 (Stuhlinger)

*E.S.*  
*Amidst all this*  
*is wrong?*  
*B*  
It became painfully clear to us that our government is more complex, decision making is more involved, pressure groups are more influential, opinions are more divided, passing a law is more difficult, expediency is more absent, parochialism is more present, committees are more sterile, the dangers of pollution and poisoning are more imminent, and the fact that "it still works" is more surprising than all of us had thought before. The Kennedy way ("get American astronauts to the moon and back in this decade") seems to be the only way in which significant progress in important fields can be achieved.

*Bill B.*  
Could this still become a show-stopper for Apollo 9? *B*

**J-2 ENGINE** - As you heard at the Center Staff and Board Meeting last Friday, the J-2 engine oscillations on S-II 503 have not been fully explained and detailed studies by Science and Engineering Directorate, NAR/Space Division and Rocketdyne are continuing.

01-20-69 (Brown)

**F-1 ENGINE** - Based on our experience to date, it is highly probable that the temperature under the thermal insulation would drop below the launch redline value were the weather to be cold and windy (as was experienced at KSC a few days before the launch of AS-503). In an effort to preclude a delay in CDDT or launch under

01-06-69 (Brown)

*B.B.*  
Florida weather extremes have been known for centuries. Has come? *B*

4. **EVALUATION OF MSC SPACE SHUTTLE CONCEPT:** Attached is an artist's conception, picked up at the Flight Research Center illustrating the probable evolution of the MSC Space Shuttle Concept.

This shuttlecraft will do everything according to our Paper Study.

Preliminary wind tunnel studies indicate this shuttlecraft may do everything.

More detailed studies indicate this shuttlecraft can do most of the Mission.

After exhaustive studies we have found the shuttlecraft to perform the mission.

03-10-69 (Newby)

**MSFC'S PROGRAM HISTORY OF PROJECT SATURN:**

Dr. Barton C. Hacker of the University of Houston, Senior Contract Historian for NASA's Manned Spacecraft Center, has orally accepted an offer from the University of Alabama at Huntsville to serve as Chief Historian for MSFC's Program History of Project Saturn, under Contract NAS8-21321. Formal confirmation of the immediate future.

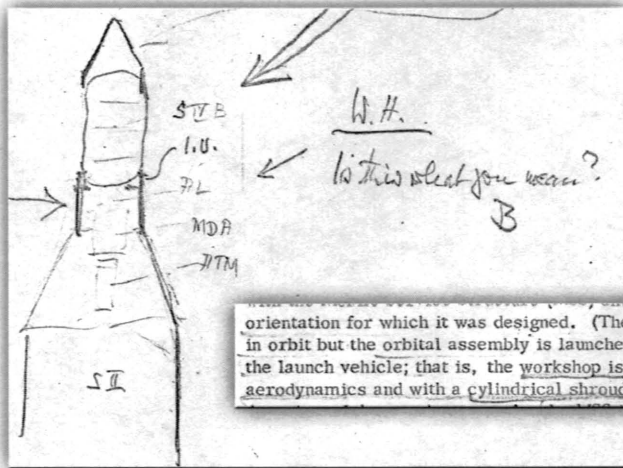
*Dave N.*  
I hope Hacker is not a completely brainwashed MSC historian who views the spacecraft as a lady Godiva and the launch vehicle as her horse! *B*

01-06-69 (James)

**Apollo 8:** From time to time, we have naturally worried as to whether critical technical personnel have drifted away from their specialties on Saturn V. During 503 preparation, we had occasion to examine many random, critical subsystems. We always found right people hard at work on any concerns we had. I would like to take this occasion to thank all who made 503 such a fine success.

*That's good to know. Surely reassuring*  
*B*

09-29-69 (Geissler)



08-19-69 (Haeussermann)

1. **WEST COAST QUALITY & RELIABILITY OPERATIONS:** We have evaluated our West Coast Quality and Reliability MSFC manpower resources (approximately 97 including S-II Program Management Inspectors) with respect to current planned workload. Although some minor reductions can presently be made, significant reductions can begin in the August time period under the assumption that the program progresses according to present schedules. We are making plans for the relocation of some of these people into other areas where the need develops.

02-17-69 (Grau)

*Sheep*  
I think these guys ought to get an opportunity of new placement MSFC - inside. It's not just a small or even E2S. B

orientation for which it was designed. (The alternate configuration is the same in orbit but the orbital assembly is launched in an inverted position relative to the launch vehicle; that is, the workshop is forward with a nose cone added for aerodynamics and with a cylindrical shroud covering the MDA, AM and ATM).

While it is too early to arrive at a detailed definition of the split of assignments, the atmosphere seems conducive to further pursuit of the arrangement. With your concurrence, I would like to continue these discussions with Bob Gardiner to further develop a definition of avionics responsibilities for your consideration.

10-13-69 (Moore)

*B.M.*  
I'm glad to hear this. Good luck with your further talks with Bob Gardiner. Please keep Bill Lucas posted at the time. B

4. **AS-506/S-IC Entry:** Reference notes Speer 8/11/69. Col. Schulherr, Mission Operations, Headquarters, has informed us that he received the S-IC piece from Apollo 11 which struck the German ship *Vegeack*. The piece is about 30 cm and is T-shaped. Schulherr is bringing the piece to MSFC on Wednesday. He has prepared a letter to the ship Captain (to be signed by you) and has coordinated it with the State Department. On future launches, ETR will broadcast on maritime frequencies the time of impending launch starting at T-3 days instead of the previous 90 minutes.

08-25-69 (Speer)

*I didn't, in order to avoid unwanted publicity about "having hit a ship" B*

01-20-69 (Maus)

*H.M.* → *Realizes that means, I'm afraid these findings spell doom for the IB* B 1/21

Chrysler is to submit a draft report of the Saturn/Titan analysis on February 15. This report will not be a volume of the NSBS report but an addendum with very limited distribution. The report will not be a "comparison" between Saturn IB/Titan but rather a report of the costing methods.

We understand from Headquarters contacts that Senator Proxmire plans to propose a \$1.0 billion reduction to the NASA authorization.

09-15-69 (Bethay)

2. **NEW DIAGNOSTICS CAPABILITY IN MATERIALS DIVISION:** After several months of trying to obtain an electron paramagnetic and cyclotron resonance spectra of aluminum, we have finally found a technique by which to accomplish both. This accomplishment now gives us the ability.

10-13-69 (Heimburg)

*J.B.*  
Sounds like a broken record by now. B

*12/2/69*  
*K.H.*  
Can someone explain to me in 15 min how this works? In basic elementary terms. B

*Sheep*  
I didn't know we had one here at MSFC. If it fits me, I'd like to try it. B

02-10-69 (Haeussermann)

During our visit to P&VE relative to the EVA simulation activities, Phil Culbertson suited-up in the new Litton EVA pressure suit. Both Culbertson and Forsythe expressed their satisfaction with this visit.