

December 9, 1963

MADE FREE  
BOSTON

FREE



*Bannon*

NOTES TO MUELLER 12-10-63 DEBUS

1. SA-5:

a. Status. A cryogenic loading test on the S-IV stage was performed again on 8 December. Results of these tests indicated that the tests were acceptable despite the difficulties that were encountered, on which I reported verbally to you.

b. Damaged H2 Vent Lines. A probable cause for the vent line leak was believed due to water in the expansion bellows which was trapped between the inner liner and the outer shell: The water very probably was caused by condensation over long periods of time. Purging cannot remove the water because of the presence of the inner liner. Each time H2 was vented, this water froze and small cracks appeared. Since they were at the lowest point of the lines, it could not be detected. The newly installed vent line has no expansion bellows.

Further study indicated: Gaseous hydrogen has the specific weight of air not many degrees over the liquification point. The hydrogen in the trench in the affected area must have been considerably warmer, therefore, much lighter than air, and would have escaped through the slots of the cover plates had it not been for the honeycomb grid structure underneath the cover plate. Consequently, the escaping hydrogen was trapped in the honeycomb structure and was probably ignited by the fire in the "burn" pond. The explosion was propagated up-stream of the trench in the small area directly under the cover plates, which blew the covers vertically up and pressed the pipes and their supports to the bottom of the trench.

Engineering design studies for construction criteria for all similar lines for 34, 37, and 39 have been initiated. Open-grid trench covers in all areas where overland lines would interfere with traffic and operations will probably be perfectly safe and acceptable, and the experience with inner-liner equipped expansion bellows brought to bear in our modifications and new designs.

2. Base Services Contract:

a. Several continuing meetings of the Technical Committee were held during the past week, resulting in a 71-page Technical Evaluation Report for the Base Services Contract.



b. Bids were due December 9, 1963. This has been officially extended to December 16, 1963.

3. Utilities on MILA: None of these utilities have been released to LOC for operation. Some Beneficial Occupancy may occur within the next week or two but contractor is in difficulty achieving acceptance tests.

4. Formal Reply to GAO Report on LOC Activities: This report should clear all deficiencies now entered against LOC and MSC at AMR.

5. VAB Foundations: Approximately 635,000 l. f. of 674,000 l. f. of piling driven; approximately 16,000 c. y. of concrete of 37,500 c. y. of concrete placed. Total progress approximately 15% ahead of schedule.

6. Color TV: Equipment is being installed on the umbilical tower for the SA-5 launch. Monitors in the blockhouse will be observed during launch by one or more astronauts to determine color TV effectiveness for evaluating liftoff abort conditions in the event the vehicle drifts into the tower.

7. Arming Tower: Further evaluation of spacecraft requirements indicate it will be impractical to provide the required access from the LUT. With the present plans to install ordnance in the VAB the launch vehicle requirements can be met by one or two movable platforms that can be repositioned conveniently, rapidly, and with a high degree of reliability. Arming tower design will be continued in line with these needs.

8. Altitude Chambers, Contract NAS10-732: The Stokes protest has been denied by GAO in a decision rendered November 22, 1963. GAO further recommended the reprocurement of Phase II and III. Stokes proprietary data contained in Phase I will be reviewed by Marshall Counsel this week.

9. Notice of MSI Appeal to NASA Board of Contract Appeals: Notice of the appeal of Management Services, Inc. from the decision of the Contracting Officer under NAS10-105 was received on November 27, 1963, and will be forwarded to the NASA Board of Contract Appeals in accordance with applicable regulations. The appeal was on the question of whether under Article XXI (and other clauses) the Government has a residual interest in the disposal value of vehicles removed from the contract. It is noted (1) that the decision appealed from had the prior

concurrence of the NASA Office of General Counsel, and (2) that, in the opinion of the LOC Legal Staff, it is probable that the matter will be disposed of by a motion to dismiss subject appeal.

10. Operation and Maintenance of MILA Communications System: A wire authorization was issued to RCA establishing December 2 as the date of incurrence of costs for this contract. The definitive contract date is programmed for the week of December 30.

11. Lightning Protection Activities: Since the G. E. contract forbids them to furnish hardware, equipment for the G. E. Lightning Study is being purchased by LOC. To date, two lightning warning systems, measuring and stroke counting equipment (totaling approximately \$27,000) has been ordered.

12. NOVA Launch Facilities Study: A Procurement Request and Statement of Work for an extension of the basic contract (NAS8-5159) on "NOVA Launch Facilities Study" have been drafted. It is planned that this 10-month extension (February 21, 1964 to December 15, 1964) will be a non-competitive award to Martin-Marietta Corporation, Denver, Colorado to continue the complementary work necessary to parallel and support the "NOVA Vehicle Study" by Future Projects Office, MSFC. Estimated cost will be \$300,000.

13. Frank Lehan Visit to LOC: Total instrumentation program briefing was given to him on SA-5 at LOC on Saturday, 7 December, by Karl Sandler, combined with a tour of launch facilities and actual hardware.

14. Redesign of Deflector: I have initiated studies for Pad #39 to use mobile steel deflectors with refractory concrete sidings and fused silica (MASROCK) protection instead of the plan to use uncoated steel or fixed concrete deflectors. Many advantages are claimed and seem to be possible from initial discussions.

NOTES 12-9-63 BELEW

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\*fw H-1 ENGINE PROGRAM

Official contractor authorization was given on November 8. The contractor is proceeding with design development and testing of 200K engine hardware. Approximately 15,000 seconds of engine testing (185 tests) have now been accumulated at the 200K thrust level. Engine qualification is scheduled for completion November 30, 1964.

The first 200K engines will be delivered in March 1964. A firm S-1B launch schedule is needed so that a new rate of delivery can be established for the continued production of H-1 engines. ✓

\*fw J-2 ENGINE PROGRAM

↓ The first production J-2 engine S/N 2001 was delivered November 26, to Douglas for use in cold-flow tests on their battleship test stand.

The side load restraining arm failure problem, mentioned in the November 25 notes, has been solved.

Two successful engine systems tests exceeding 500-seconds duration have been conducted since the November 25 notes. ✓

RL10 ENGINE PROGRAM

Current engine testing on E-5 test stand at Pratt & Whitney is demonstrating that normal engine operation can be expected under the environmental and inlet conditions expected in the flight of the SA-5 vehicle. These tests give added assurance of a successful two-stage SA-5 flight. Normal engine operation has been proven despite introduction of contaminants into the engine. ✓

F-1 ENGINE PROGRAM

Tentative agreement has been reached with Rocketdyne to conduct a Flight Rating Test Series (FRT) utilizing the flight type engine (Block II) instead of conducting a formal PFRT with a Block I engine as previously planned. Completion of FRT by November 15, 1964, will be in advance of a five-engine cluster firing under the proposed OMSF November 1, 1963, Saturn V schedule.

The first F-1 engine test at MSFC was conducted on December 3, 1963. ✓

### 1. VISITS

Dr. Edward B. Doll, a vice-president with S.T.L. on special assignment studying manned space program management, as consultant to the Office of Manned Space Flight, visited Michoud Operations on December 3, 1963. Dr. Doll was given a general orientation and briefing and visited management of both Chrysler and Boeing Companies.

Senior executives of major Apollo contractors, Dr. Mueller, Office of Manned Space Flight, and Drs. von Braun, Gilruth and Debus visited Michoud Operations on December 4, 1963. Chrysler and Boeing made presentations on what their contribution is to the Apollo Program and the group was given a general tour. ✓

### 2. QUARTERLY REVIEW

A quarterly review of S-I/IB was held at Michoud Operations on December 5-6, 1963. ✓

### 3. HOUSE COMMITTEE ON SCIENCE AND ASTRONAUTICS

Messrs James Wilson and Peter Gerardi, staff members House Committee on Science and Astronautics will visit Michoud Operations on December 10, 1963. They will be accompanied by Mr. Edward Lievens, Office of Manned Space Flight, NASA Headquarters. Both Mr. Wilson and Mr. Gerardi are engineers and are primarily interested in the technical aspects of the Saturn Vehicle Program and the work being performed at Michoud Operations. It is my understanding that they plan to visit MTO on either December 10 or 11. ✓

NOTES 12-9-63 DANNENBERG

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1. "All-Up" - We are undertaking a detailed technical analysis of the "All-Up" concept including precise definition of "fall back" position. You will be briefed on outcome before end of January. ✓
2. Panel Review Board - At last PRB meeting, two new panels were proposed: Flight Evaluation Panel, and Flight Mission Planning Panel. Dr. Mueller had asked his staff members, John Disher (Director, Apollo Tests), and Thompson, Bellcomm (Apollo Systems Engineering Office) to review our proposals. Disher, whom we know well (formerly in charge of spacecraft under Low) will discuss matter with us tomorrow, while Thompson has visited us, MSC, and LOC. Decision by Mueller expected late this week. ✓
- \*fw 3. Re-Entry Mission for Saturn V - Re Notes 11-26-63 Dannenberg, (Attach. 1) Item 4 - Flight Mechanics Panel meeting of 12-4-63 agreed that trajectory types 3 and 4 for 501 are acceptable to both Centers. Background material will be given to you for Management Council Meeting. ✓
4. Apollo - MSC considers manual jettison of LES tower on Saturn V.

Engineering data were requested from MSC to determine if an Apollo spacecraft adapter can be made at MSFC for static load tests. ✓

5. Re Notes 11-26-63 Dannenberg (Attach. 1) Item 2 - Biological Payload - Full briefing on SA-10 mission to be given to you today. SA-9 mission time has run out. SA-8 presently under study.

Item 3 - Bellcomm - Quarterly Progress Reports (2) were furnished on 12-6-63. ✓

↓  
K.D.

I'd like to see these reports

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(Bowie: See next page)

NOTES 12/9/63 FORTUNE

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1. More Visits: Dr. Ed Doll, Special Consultant to Dr. Seamans, visited MTO Monday. After discussions with Dr. Mueller and Mr. Webb about his Huntsville trip, he apparently felt he should come to MTO and Michoud. He stated that he was not concerned with the facilities so much as how we were planning on using them. However, he did want to see them, before talking to Bob Young on this subject. ✓

"Business Week" reporters were in Tuesday. ✓

Paul Styles was down to see local contractor and union personnel. ✓

Heimburg sponsored a ground, aerial and boat tour Wednesday for an eminent group from Marshall, which followed a discussion on how to avoid at MTO certain problems encountered in building test facilities at MSFC. General Hayes and other Corps of Engineers participated. ✓

We were also visited by Staff and Students from Bogalusa Trade School, Louisiana, and Perkinson, Mississippi, Junior College, other days. ✓

2. Communities Facilities Assistance Log Jam Broken: Senator Stennis, by critical comment and questioning during Hearings on HHFA Appropriations, was able to achieve an understanding that Mississippi would receive community facilities assistance in the way of 701 Planning Grants, sanitation loans and other aid. Local newspapers have announced some small grants along this line. ✓

NOTES 12/9/63 GEISSLER

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1. Research Advisory Committee for Space Vehicle Aerodynamics: I attended a meeting of the Research Advisory Committee for Space Vehicle Aerodynamics at Edwards Air Force Base. A strong concern was expressed by members of this committee about the fact that (a) full scale Apollo lunar reentry tests were scheduled so late with respect to manned flight, and (b) presently no unmanned flight with both realistic (long time) space exposure and subsequent full speed reentry are planned prior to manned lunar flight. There was also quite some criticism about the way MSC has handled the evaluation of the Gemini program so far. No detailed experimental data have been reported concerning the aerodynamics and aerodynamic heating of the capsule. The next meeting will be held (probably in April) at MSC and will be devoted primarily to an examination of the Apollo reentry program. ✓
2. Vehicle Dynamics and Control Working Group: Action items resulting from subject meeting held November 20, 1963 at MSFC are attached as enclosure 1. ✓
3. The Seventh Flight Mechanics, Dynamics, Guidance and Control Coordination Panel Meeting: The panel agreed on the acceptability of flying either profile 3 or 4 for the reentry test flights on Saturn V. Further studies are needed, however, before a final selection is made. ✓
4. Mission Control Operations Panel: An MCOP meeting was held in Huntsville on December 3, 4. The new joint LOC-MSFC proposal was presented. It is in general agreement with Dr. Williams' letter. Official acceptance may be expected soon. ✓
5. Method 5 Solution to Saturn V Reentry Mission: (Reference Notes 11/18/63 Geissler, paragraph 5, copy attached as enclosure 2) Overriding reasons for not accepting Method 5 reentry profile are P&VE objections presented in November 25 meeting: (1) thermal environment for the S-IVB stage are more severe in the elliptical orbit because of greater exposure to direct sun rays, and (2) the altered drag conditions (zero drag) in the ellipse as compared to the low drag condition in the circular orbit. These conditions affect the expected propellant seating environment and venting requirements. Other undesirable features are (1) first stage separation is more difficult for Method 5 because of low orbit insertion altitude. Higher orbit insertion altitude requires additional offloading up to 7,000 lb and increased propellant consumption in the first burn of the S-IVB; (2) tracking of the vehicle to its orbit insertion point is not prohibitive, but is much worse for Method 5; and (3) it is more difficult to find an acceptable landing site for Method 5 than for Methods 3 or 4. ✓ Consideration for impact of S-IVB debris is an important aspect of this problem. Offloading of the Saturn V payload of 20,000 to 30,000 lb is not considered to be critical as to loads and dynamic behavior of the vehicle. The degree of offloading can be diminished by the addition of pressurization bottles in the S-IVB stage. Details of Method 5 reentry are attached as enclosure 3. ✓

B 12/14

1. S-IU-6 FINAL CHECKOUT: Thirteen (13) umbilical connectors are being replaced on the S-IU-6 Instrument Unit in that the force required to effect a disconnect was considerably more than the disconnect device was designed to deliver. A schedule has been arranged with Manufacturing Engineering Laboratory whereby the necessary changes can be accomplished and verified without effecting the December 22 shipping date. ✓
2. S-IV-6 POST-STATIC AT DAC, SACRAMENTO: Post-static checkout of the S-IV-6 stage is being conducted on the stand at DAC, Sacramento. Records taken during Electro-Magnetic Compatibility Test are not presently available for detail analysis, but excessive values were observed during testing and cables are being rerouted in an attempt to eliminate interfering signals. ✓
3. S-IV-7 CHECKOUT AT DAC, SANTA MONICA: All procedures for factory checkout of the S-IV-7 stage have been reviewed and approved or comments forwarded to DAC. Certification of the GSE recording system is complete and checkout of the propulsion, telemetry and instrumentation systems are in progress. Estimated completion date of the Simulated Flight Test is January 10, 1964, and estimated shipment to Sacramento is January 25, 1964. ✓
4. S-I-8 PRE-STATIC CHECKOUT AT CSD, MICHLOUD: The S-I-8 vehicle pre-static Measurement Calibration and Radio Frequency Systems Tests continue on schedule at CSD, Michoud. ✓
5. S-I-9 PRE-STATIC CHECKOUT: Electrical pre-static checkout of the S-I-9 vehicle will be completed today. The vehicle will then be transferred to building 4705 for completion of pressure testing and clean up. ✓
6. NAA/S&ID DOWNEY, CALIFORNIA QUALITY PROGRAM SURVEY: The NASA-O inspection agency for both the Apollo and S-II Stage programs completed contractor quality program surveys at NAA/S&ID on November 22, 1963. Two members of the survey team were provided by this Laboratory. Preliminary findings indicate considerable inadequacies in the quality programs. Upon completion of the survey report, corrective action will be initiated by this Laboratory. ✓

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SA-5 Status

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1. Damaged H<sub>2</sub> Vent Lines: The H<sub>2</sub> lines you saw during your last visit were repaired and went through a successful leakage and H<sub>2</sub> vent test. Some union problems delayed the readiness for wet test by one day. The wet test was run on December 8, with approximately 95% success. As of this moment, it is not known if repetition will be required, because record evaluation is still going on. ✓

2. Bulkhead Leak: As I told you, DAC detected an oxygen leak into the bulkhead. In discussions with DAC and P&VE, it was decided that the bulkhead is flight worthy. Because the bonding material of the honeycomb in the bulkhead is lox impact sensitive, our loading procedures were modified and special safety precautions taken in accordance with the advice from Dr. Lucas. ✓

3. <u>SA-5 Measurement Calibration Summary</u>	<u>S-I</u>	<u>IU</u>
Total number of measurements	671	210
Measurements requiring adjustment to optimum value	356	68
Measurements requiring adjustment to meet ± 1% tolerance	184	42
Signal conditioners replaced	44	12
Transducers replaced	24	2 ✓

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.

Dr Lucas P&VE

In view of the general importance of this problem for SIV, SIVB and SIV:  
Are we conducting (or funding) any research to find non-lox impact sensitive bonding materials?  
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H.F. This was Pres. Kennedy's personal suggestion.

It will be hard to work down, particular was, after the tragic event.

NOTES 12/9/63 HAEUSSERMANN

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1. INSTRUMENTATION TASK FORCE: Mr. Hoberg, MSFC's member of the "Instrumentation Task Force" set up recently by Dr. Mueller, attended the first meeting in Washington, D. C. on 11/20/63. The objectives of the Task Force, as defined in Dr. Mueller's memo of 11/13/63, minutes of the first meeting, dated 11/21/63, and the agenda for the second meeting scheduled for 12/9/63, in Houston are attached for your information. ✓

The chairman, Mr. Frank Lehan, not at all familiar about the Apollo program, is on one year's leave from his company to help Dr. Mueller. He expressed a reasonable attitude in discussing the objectives of the Task Force, was, however, not sure about Dr. Mueller's intentions and about possible consequences of such a review activity. Travel, participation in meetings, and preparation of data for the required presentations will be time consuming. ✓

2. FUEL CELL PRESENTATION TO DR. MUELLER: I have been unable to reach Dr. Mueller concerning Dr. Rees's proposal for a presentation. I will notify Mrs. Holmes as soon as I have discussed it with Dr. Mueller. ✓

3 Enc:

1. Objectives of Task Force
2. Minutes of First Meeting
3. Agenda for Second Meeting

Note: Copies of attachments provided M-DIR and R-DIR only.

NOTES 12/9/63 HEIMBURG

B 12/14

\*fw 1. F-1 TESTING (STATIC TEST TOWER WEST): The initial static firing was conducted on 12/3. Programmed for 6 seconds duration, the engine was prematurely cutoff by a faulty rough combustion cutoff indication. The difficulty was traced to an amplifier unit, which vibrated loose during the run. A total of 1.5 seconds of mainstage operation was achieved. The countdown proceeded smoothly, except for the thrust chamber pre-fill valve, which could not be remotely actuated. Problem was traced to dirt in the solenoid vent valve port. A successful 10-second mainstage firing was performed on 12/5 with no hitches. Next static firing is tentatively scheduled for 12/12 or 12/13. ✓

\*fw 2. S-IV-6: Reference NOTES 11/26/63 HEIMBURG (copy attached). Hydraulic oil supply for one engine was lost due to rupture of a pressure transducer. It will not be necessary to re-fire this stage due to this malfunction. ✓ The problem in the hydraulic system involved a manifold port which had not been drilled, thereby causing the main pump to "dead head" against the transducer. Since this pump is a positive displacement type, pressure was relieved by rupture of the transducer. The error in manifold fabrication was not caught during checkout, due to the fact that an auxiliary pump is used for engine gimbaling, and the main pump is not functionally checked until during the engine hot firing. During checkout, the lack of a signal from the transducer was attributed to the transducer itself and not to the hydraulic system. Steps will be taken in the future to prevent a re-occurrence of this problem. ✓

\*fw 3. H-1 SOUND SUPPRESSION TESTS: This test program was completed on 12/7, and the facility will be modified to accommodate the S-1C model cluster of five GE 30K engines. ↓ The Huntsville and Tullahoma chapters of the AIAA were invited to witness the H-1 engine operating with sound suppression and without suppression (on the Power Plant Test Stand). Approximately 100 persons attended the firings. ✓

4. MTF WORKING GROUP: Office Chief of Engineers has advised Mobile District Engineers (MDE) that bid opening for the Navigation Lock must be held in abeyance pending signing into law of the NASA FY 1964 Appropriation Act. ✓

Advice received 11/29 from NASA Headquarters indicates that the procurement plan for MTF Phase II and III Technical Systems has been rewritten and the source justification is in the process of coordination.

A meeting was held on 12/4 with the MDE Corps of Engineers to discuss some of the problems encountered in the design and construction of the test facilities at MSFC, and to determine a plan of action, aimed primarily at improved design review and inspection, to prevent similar occurrences at MTF. Seventy personnel attended, including Gen. Hayes and Col. Bennett, Office Chief of Engineers; Col. Casper, NASA Headquarters; Col. Raymond and Roberts, MDE; and Dr. Rees, Messers. Gorman, Hueter, Young, and members of the Test Laboratory and the MTF Working Group. ✓

ATTACHMENT : NOTES 11/26/63 HEIMBURG

NOTES 12-9-63 HOELZER

B 12/14

INTER-CENTER COMMITTEE ON ADP: Dr. Seamans has directed that an inter-center committee on ADP be formed to essentially formulate the NASA position relative to the use of computers and the interpretation and compliance with Bureau of the Budget, GAO, and other agency directives. Each center is to name a member and alternate and will furnish inputs so that the policies established can represent a NASA-wide feeling. The committee reports to the Office of Tracking and Data Acquisition, and Paul Fuhrmeister, Langley, has been named first chairman. The first meeting was held in New Orleans on December 5th, and satisfactory progress toward organization and the full cooperation of all centers was obtained. Essentially, if this committee is successful, this will prevent a computing Czar being established in Headquarters. ✓  
We have continually argued against such a Czar being established. ✓

B 12/14

NOTES 12-9-63 JAMES

SATURN I: - The CCSD Quarterly Review was conducted at Michoud December 5 and 6, 1963. S-I Stage activity is proceeding satisfactorily with S-I-8 in pre-static checkout and S-I-10 in final assembly. CCSD is in the process of impacting the program re-orientation (new loads criteria for 200K engines and new schedule). CCSD has been directed to submit a Budget and Planning estimate based on this programs direction by December 10, 1963. This contractor contribution for B&P is considered vital to the present budget exercise underway. ✓

\*fw

S-IV - During a cursory inspection of the S-IV-6 LH<sub>2</sub> insulation by a man in a boatswain chair, a crease was observed in the forward dome of the common bulkhead. Further investigation has revealed the extent of the crease or wrinkle. (The attached diagram depicts the affected areas.) No determination has been made yet as to what action will be taken. ✓

omit from text

SA-10 Payload Study - SA-10 Payload Study Presentation is to be held in the Director's Conference Room on December 9, 1963. I will present a summary of the shroud and payload configurations and will be followed by a presentation on the possible payloads. These payloads include the Advanced Meteoroid Detection Satellite to be given by Mr. Heller of Research Projects Laboratory; the RIO Medical Payload by Dr. Farish of the Saturn Apollo Office; and, the Nuclear Engine Payload by Mr. Keller of the RIFT Office. ✓

\*fw

SA-6 - The following dates have been established for SA-6 subject to current schedule for SA-5 being met: S-I-6 and I.U.-6 - Ship via barge the morning of December 23 and arrive at AMR approximately January 3; S-IV-6 - Ship via Pregnant Guppy and arrive at AMR no later than January 8. ✓

L.J.  
What are the new dates, was that SA-6 has been postponed?  
B

What is that? B

SATURN IB: S-IVB - In a review with Contracts Office personnel, it was decided to make a last ditch effort to obtain Headquarters approval of Mod 66 prior to issuing a letter contract. Contact was made by phone with Headquarters personnel on December 5 and agreement was made for Mod 66 to be re-examined with further consideration for approval. At Headquarters request, personnel from our Contracts Office went to Washington on 8 December to further discuss Mod 66 in an effort to obtain Headquarters approval of this contract. In the event our Contracts people are not successful in getting an approval of Mod 66, I will call Dr. Mueller personally prior to agreeing to a letter contract.

\*fw

S-IVB - The S-IVB quarterly review has been scheduled for 18-19 December. ✓

B 12/14

1. HYDROGEN TECHNOLOGY: GE, Valley Forge, has a \$650,000 contract with Edwards AFB to test, in a simulated environment, various sizes of tanks to determine the boil-off rates of cryogenics over extended periods of time. The tests will include different simulation techniques and materials. You expressed an interest last week in what is going on. Suggest P&VE should follow this program very closely. ✓

Silly  
Musazek  
I agree  
B

2. K. A. EHRICKE: He has decided not to accept Ed Gray's offer to take the position of Director, Manned Planetary Mission Studies at this time. His problem is a personal one. He has now nine years with GD/A and he will receive a quantum jump in his retirement benefits after 10 years. He would have accepted if this offer had come one year later. ✓

(MMM implications)

3. MANNED ORBITAL LABORATORY: Dr. Mueller has requested Langley to study the problems connected with launching the MOL on SATURN V (instead by SATURN IB). ✓

4. MSFC MISSION: There is an attempt being made at Dr. Seamans' staff level to exclude us from further mission type studies for advanced projects. Of course, some people at MSC drive in the same direction. The question being raised is the one of MSFC's charter and basic responsibilities. We have to watch out here, or we may lose our shirt. Agree

5. BUDGET CUTS: There are indications that further budget cuts for advanced mission studies and SRT are in the mill. Ed Gray expects a 25 percent cut in his area; OART also has been notified that they will have reduced funding available. We will be lucky to get 10 million dollars from OMSF and one million from OART. We somewhat expected that, and we can live with it. Our problem is not necessarily money, but the approval of each study by Dr. Seamans. This is the real bottleneck. ✓

→ Agree

HHK  
Once the dust has settled after the AF switch from Dynasoar to MORL, please brief me on your appraisal of NASA work in this area. Also: what is "Gemini-X", and what is NASA/AF relationship in it?  
B

HHK  
Request briefing, who's behind this?  
Urgent. B

B 12/14

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12/14

1. Saturn V, S-IC Stage:

a. The Fuel Test Container is now nearing its completion prior to hydrostatic test. The last operation, the installation of one lox tunnel, was delayed because of some missing tooling, but will start this week. ✓

b. The lower bulkhead plus Y-ring for S-IC-T is practically complete. Installation of the fuel exclusion riser (polyurethane foam) can start soon. The upper bulkhead is on the Meridian Welder. Work on the first lox bulkhead will be started this week. ✓

c. Work on the thrust structure assembly for S-IC-T has come to a complete stop because of missing major components (thrust posts and hold down posts) from Boeing. According to best promises from Wichita we can only continue this assembly in the first week of January. It is now recognized that the major delays in deliveries from Boeing is caused by a heavy over load of the whole Wichita plant resulting from the combined load of commercial work, AF work, and Saturn work. Since the B-52 will rapidly phase out in February or March next year there has been a tendency at Wichita to accumulate a heavy backlog of Saturn work affecting the deliveries to us. Boeing management is now in a process of unloading the Wichita plant by sub-contracting and shifting more work to Seattle. The fins and fairings for example, are planned for transfer to Seattle, subject to approval by the contracting officer. ✓

d. Present status of S-IC-T vehicle with reference to the Plan V schedule: Fuel Container 17 weeks behind; Intertank Section (Boeing), 14 weeks behind; Lox Container, 14 weeks behind; Forward Skirt (Boeing), 15 weeks behind; Thrust Structure ( Sub-assemblies Boeing, final assembly MSFC), 27 weeks behind.

2. Zero Leak Tube Connection Development: As a part of the joint program with P&VE Laboratory and Quality Assurance and Reliability Laboratory for development of zero leak tube connections we developed an orbital tube flaring tool which can be attached to a standard Leonard tubemaster machine. First try-out resulted in excellent quality flares. Evaluation of miniaturized tube welding equipment, developed by NAA, and tube brazing equipment from Aeroquip Corporation is also underway. ✓

Kare  
Heimburg  
f.x.i.  
B  
↓  
let's discuss impact of this on our latest program schedule  
↳  
(with Kuers, Redolph, Urlaub)

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NOTES 12-9-63 MAUS

- 1. DECEMBER MANAGEMENT COUNCIL - We have been informed by Dr. Mueller's Executive Assistant that no formal procedure has been established as yet for setting up the agenda for the Management Council Meetings. Consequently, no official agenda will be issued for the December meeting. Center Directors are suggested to present any items they might desire during the meeting. ✓

A package is being prepared by Mr. Dannenberg on the Flight Failure Board for your use at the December meeting. ✓

- 2. MANPOWER - After several weeks of little or no gain, some progress was made in getting people on board during the week ending November 30, 1963; the regular permanents rose from 6957 to 6985. Over half this increase, however, was the belated transfer of Dr. Rudolph's people from OMSF. Status as of November 30 was as follows:

	<u>Ceiling</u>	<u>On-Board</u>
Permanent (excludes Co-ops)	7094	6985
Co-ops	169	132
Temporary and Consultants	25	61
Total	<u>7288</u>	<u>7178</u> ✓

- 3. NASA PERT AND COMPANION COST COORDINATION MEETING - This meeting had to be postponed in November, and is now scheduled to be held at MSFC January 15 and 16. We have arranged with Mrs. Holmes for you to make the brief introductory remarks to the 40 - 50 people from NASA Hqs. and other field centers. ✓
- 4. DECEMBER MSF PROGRAM REVIEW - Official guidelines have been received from MSF resulting from the anticipated FY64 Budget appropriation. There has been no change in the amount planned for FY65.

A supplemental appropriation for FY64 is currently under consideration, however, if enacted, it is unlikely that funds would be available prior to June 64. ✓ Amounts being considered are:

Apollo	\$ 51.9 Million
Saturn IB Dev.	28.6
Saturn V Dev.	1 03.1
Integ. Check & Rel. (PACE)	<u>10.0 (MSC)</u>
Total	<u>\$ 193.6</u> ✓

Project Offices are assessing program and schedule impact from new guidelines, and the extent this supplemental FY64 appropriation could reduce the impact on the Nov. 1, MSF Target schedule. Results of this assessment are to be presented as a part of the Program Review at the December 17, 1963, Management Council Meeting. ✓

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NOTES 12-9-63 McCartney

FOR WARDNER & MCCALL  
fw

Negative report submitted for this week.

NOTES 12-9-63 MRAZEK

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12/19

- \*fw 1. FIRST SUCCESSFUL J-2 FULL-DURATION RUN: Engine J002-2 was fired for 508 seconds on Test Stand 2B. This was followed, in five days, by another successful 510-second run. ✓
2. UNSUCCESSFUL S-IVB APS 150-POUND THRUST ATTITUDE CONTROL ENGINE FIRING: TAPCO fired this engine for 200 seconds accumulated burntime. A temperature of the back side of the injector ran 125° to 150°F, the coolest run to date. Gas flow at the interface of the throat insert and chamber ablative liner caused the material in the back of the throat to char completely with a corresponding 1,100°F outer wall temperature. It was found that an "O-ring" used to seal the joint in the ablative material at the throat insert interface had been rolled out of position during manufacture and contributed to the failure. ✓
3. SA-10 PAYLOAD: The ROVER Flight Safety Panel, in its Pittsburgh meeting on 12-4-63, indicated substantial support for an intact engine reentry test combined with NERVA hardware component and subsystem flight dynamic tests. An additional test involving the space destruct of the NERVA was questioned, primarily due to the lack of sufficient lead time on design and test of destruct hardware. (Such tests are being considered as candidates for an SA-10 payload.) ✓
- \*fw 4. LEAK IN S-IV-5 BULKHEAD: Analysis of gases in the common bulkhead of the S-IV-5 has shown that a leak exists on the LOX side. This has been corroborated by pressure rises within the bulkhead on pressurization of the LOX tank. Previous tests by the Materials Division have shown that both the core material and adhesive in the common bulkhead are extremely sensitive to impact in LOX (or even only 30% LOX/70%LN<sub>2</sub>); thus, a serious hazard exists in this stage. ✓
- \*fw 5. NO SERIOUS CONTAMINATION FOUND IN LOX DOMES OF S-I-7: Analysis of contamination in two LOX domes indicated no problem exists for S-I-5 engines as previously suspected. It was decided to leave S-I-5 engines "as is." ✓
6. SUCCESSFUL RUN COMPLETED ON RL10 ENGINE CHILLDOWN TEST SERIES: A successful run was made on the E-5 test stand at Pratt and Whitney Aircraft. This run used the S-IV flight LOX pressure profile and helium bubbling. This is the first of a series of runs which will be made to evaluate the present S-IV chilldown sequence. Preliminary analysis indicates a successful start was made using LOX inlet temperatures in excess of present limits. ✓
- \*fw 7. MICROMETEOROID MEASURING CAPSULE (MMC): Vibration testing of the Block II MMC was completed. The testing included sinusoidal sweep tests at low level and high level, and dwell tests at the major resonant frequencies. No failures were noted but modifications were made to the supporting brackets of the solar panel to reduce the vibration amplification factors. ✓

NOTES 12/9/63 RUDOLPH

B 12/14

1. S-IC STAGE: Arrangements have been made for a presentation on the General Test Plan for the S-IC Stage during the week of December 16-20. The principle presentation will be made by Mr. James L. Stamy, Michoud Operations, to directors of MSFC Laboratories on the 17th from 10:00 until 12:00. This will be preceded by a briefing to Saturn V Project personnel on the 16th and followed by similar briefings to the Laboratory staffs on the 18, 19, and 20th.

2. S-II STAGE: The contractor has been re-apprised of MSFC's concern in the continued growth of S-II Stage dry weight. The contractor has been requested to submit a list of weight reduction items categorized as follows: (1) definite items, (2) probable items, (3) possible items. ✓

3. S-IVB STAGE: The S-IVB quarterly review is scheduled for December 18-19.

Dr. Mueller sent a TWX to MSFC on November 29, 1963, directing that DAC not proceed further with the negotiations with Rocketdyne for the ullage motors for the S-IVB/Saturn V. Although negotiations have not actually started, the component is critical in the development cycle. DAC plans were to start negotiations around December 12. So far the specific cause for the "Stop Action" TWX cannot be identified. Unless this can be resolved by December 12, this item will be included in our Management Council Program Review dry run to you. ✓

4. IU: Negotiations will resume again on the IBM Systems Integration and Checkout Contract (NAS8-5469) on December 10, 1963. Target fee and incentive features are the remaining items to be negotiated. ✓

Bonnie

That's  
More  
Council  
Date!

When can  
I hear  
that story?

B

A.R.

That's  
the latest?  
I understand

that GEM

is attempting to standardize  
the many different "small  
thrusters" in his total

Jeniusi - Apollo - Saturn program

B

NOTES-12-9-63-SHEPHERD

B 12/14

tu  
13/4

1. FY-64 CofF BUDGET: The Congress has reduced the NASA CofF Budget by \$33M. MSF believes they will absorb the total cut and have reviewed the budget to determine those items which, in their opinion, would be deferred with minimum program impact. The following are their findings: At MTO- The Interstate Highway 10 Bridge - \$4.5M; the F-I Engine Stand - \$6.541M; and the relocation of Highway 43 - \$2M; At Michoud - The Vehicle Components Supply Building - \$2.633M. At Huntsville - The Project Engineer Office Building - \$2.650M. The first three items at MTO are tolerable provided we receive the necessary design and Highway 43 right-of-way acquisition money from the FY-64 budget. The projects at Huntsville and Michoud are considered necessary to the program. Headquarters has been advised of this position. A final decision will be made by MSF after the FY-64 appropriations. It is entirely possible that the entire amount may be taken from Complex 39. If we receive a cut it is expected that the FY-65 budget will be correspondingly increased.

2. STATUS OF FY-65 CofF BUDGET: The Bureau of Budget has deleted \$27.493M from the total Marshall budget request. The deletions are as follows: (a) MTO - \$2M from roads and parking; (b) The RIFT projects were deleted entirely - \$10.7; (c) Huntsville - \$.5M, the Propellant Storage for the S-I Stand, \$2.417M for the Expansion of Computation Facilities. \$2.307M for the Extension of P&VE Building, \$1.475 for the Extension of Rideout Road to Highway 72 and \$6.848 for the Sound Suppressor on the S-IC Stand; (d) Michoud - \$1.247 for the Slidell Computer Facility. These cuts were made against our program of \$133.878M. Captain Freitag states that Headquarters will reclaim all of the items except the Rideout Road Extension. BOB cut the over-all FY-65 budget by 42.1%, our cut amount is 13.6% of our total.

3. CORRECTION OF PARAGRAPH 5 in NOTES-11-26-63-SHEPHERD:  
(Copy attached)

5. During conversation with Mr. Poppel, Col. Dyer expressed the opinion that he found it difficult to understand why Mr. Poppel's function was a part of LOC rather than Marshall. This was based upon a comparison of work assignments for the ground support equipment design in the Saturn and Centaur programs.

Attachment

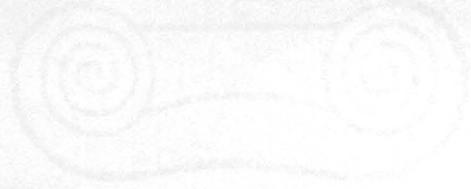
fw  
12/9

B 12/14

NOTES 12-9-63 Stuhlinger

1. VISIT BY E. Z. GRAY: During his visit at MSFC, E. Z. Gray from OMSF received a briefing on our Supporting Research Program. He suggested that our present working relations with OART should be retained without change, although in all other respects MSFC reports to OMSF. We gladly accepted this suggestion. ✓

2. VISIT BY DR. ROTH: On December 6 Dr. Sidney Roth, a consultant to the Office of Grants and Research Contracts, NASA Headquarters, visited RPL. He is performing a broad study of the conduct of the NASA research program emphasizing NASA-University relations. We explained the MSFC attitude toward support of Universities, and discussed at some length our dealings with the Alabama Research Institute. He appeared pleasantly surprised at the amount of MSFC in-house research and the number of MSFC contracts with universities. It is felt that he generally sympathizes with our views concerning Center-Headquarters channels, and policies affecting support of non-profit organizations. ✓



WVGE

December 12, 1963

WVGE  
BRANDY

ET AL



*Memorandum*

TO NOTES Writers

DATE December 20, 1963

FROM *Office of the Director*

SUBJECT NOTES Requirements during Holiday Season

Due to the Christmas holidays and the fact that many MSFC employees will be on an annual leave status, the requirement for submission of Weekly NOTES to Dr. von Braun on December 23 and December 30, 1963, is waived. The next Weekly NOTES will be required on January 6, 1964.

Orig. Sgd by **F. L. Williams**

F. L. Williams  
Assistant to the Director

F-1 ENGINE PROGRAM

\*7w Flame deflector expansion joints on the new F-1 Test Stands (1-C, 1-D & 1-E) at Edwards Air Force Base will be redesigned to take advantage of the latest experience on the R&D test stands. Stand joints had been completed but required removal due to faulty welds. The stands will be delayed about one month (without program impact) and the change will require an estimated additional \$150,000. ✓

J-2 ENGINE PROGRAM

\*7w Due to unavailability of engines, the Preliminary Flight Test Program has been rescheduled for initiation in early February. Also, engine deliveries to the stage contractors (S-II and S-IVB) will not be initiated until mid-February. Engine fabrication is behind schedule because of manufacturing problems and, if the current freeze on manpower continues, only eight engines will be delivered by June 30, instead of the scheduled June 11. The third operational simulator engine (No. J203) was delivered to North American Aviation, Inc., Space and Information Systems Division on December 10, 1963. ✓

RL10 ENGINE PROGRAM

Substantial testing is continuing at Pratt & Whitney Aircraft in support of the forthcoming SA-5 launch. These tests are being run to: (1) Confirm that the propellant inlet conditions, which can be expected in the flight, will allow normal engine operation. (2) Further investigate the feasibility of the elimination of helium bubbling. (3) Furnish assurance that engine operation will not be affected by contamination. ✓

B 12/18

\* 1. CIVIL SERVICE COMMISSION REVIEW

On December 9-10, 1963, the Dallas Regional Office, US Civil Service Commission, conducted the Michoud Operations portion of the New Orleans, Louisiana, community review for the equal employment opportunity program. The Commission Representative reported during his exit interview with the General Manager, that Michoud Operations had an active affirmative program. Further, that liaison with local universities and the Urban League was very good. Mr. Kent, MSC Director's Office and Dr. Albert, MSC Personnel Office, were present during the review. ✓

2. CONTRACTOR PERSONNEL FREEZE

In accordance with NASA Headquarters' direction, the Boeing Company, and Chrysler Corporation Space Division, have been directed to freeze manpower ceiling as of the current level. Loss of personnel through normal attrition will not be replaced unless they are absolutely essential to the programs. ✓

3. BOEING OVERHEAD

Since the DOD has announced the cancellation of the Dinosaur Program, it will affect the overhead rate of the Saturn program. The Boeing Company has been requested to develop information as to cost impact and make a presentation as soon as possible. It is expected that this presentation will be made in approximately 10 days. ✓

K  
7w

NOTES 12-16-63 DANNENBERG

B 12/18

1. Re-entry - MSC again has confirmed that from a guidance standpoint methods 3 and 4 are acceptable. Their only reservation is that methods 3 & 4 are assuming an 8-hour time to S/M propulsion re-entry ignition. (MSFC estimating approx. 12 hrs.) MSC Flight Mechanics Co-Chairman is to brief Dr. Gilruth on MSC's panel agreement on methods 3 and 4. ✓

2. "All-Up" - Purpose of the meeting on 12-11-63 was to request the Working Group chairmen to undertake in consort with each other, a detailed technical analysis of the concept utilizing SA-501 as a focal point. R-SA will provide I.O. a complete and coordinated assessment of the technical ramifications of the "All-Up" approach on which to base realistic programming. ✓

3. SA-10 Payload - MSFC will support MSC for an Apollo mission for SA-10. In the Flight Mechanics Panel meeting of 12-3-63, Mr. R. Ward, MSC, informed that MSC basically wishes to assure that the Apollo Airframe C/M-S/M which is presently on SA-201 does indeed fly in that specific time frame. A cutoff date is the beginning date of SA-10 dynamic testing, 7-2-64.

4. An MSFC technical team visited Lewis Research Center on 12-13-63 to discuss Centaur flight test results that might be pertinent to our SA-5 launch. Cooperation was excellent, ✓ although only limited amounts of information had been reduced and analyzed. A second meeting is proposed for January, 1964, when more information will be available.

A Centaur film and preliminary test data report furnished by General Dynamics were reviewed by the technical team prior to their visit. ✓

5. The Saturn IB brochure, publishers format, is being prepared for a presentation to you during first 2 weeks in January. At present, the data being used in the brochure is based upon 32,500 lbs. into a 100 n.m. orbit since studies have not been completed on the uprated performance based on the 200,000 lb. thrust engines. ✓

6. In a new letter (not yet available), from Assist. Secretary of Air Force Flox to Adm. Boone, the AF objects to the cost, reliability, and performance comparisons between Saturn I/IB and Titan III A/III C in the OMSF MORL Report dated 10-16-63. MSFC can easily defend its position if called upon to do so by OMSF.

KD  
I hope you know the letter re SA-10 I sent to Dispinghoff. If not, please get it through Lee James  
B

K.D.

It would be fine if it could be updated. After all, we'll have 200K from SA 201 on B

K.D.  
Please call Harvey Hall and ask him for guidance  
B

NOTES 12/16/63 FORTUNE

B 12/18

1. Traffic Control: A coordinated effort is underway with Mississippi State Highway Department to provide adequate traffic signs on Highway 43, because of the many construction trucks crossing. Plans are also being made to provide traffic and control signs to restrict reckless or unauthorized use of other roads throughout the MTF area. Gates can now be placed across all but the three main roads leading in or out of the Fee Area. ✓
2. Employment of Minority Group: B. U. Jones and R. A. Allen, of General Electric, met with the Principal of the G. W. Carver High School in Picayune to determine the names of colored people who would be available and qualified for employment when opportunity avails. ✓
3. 701 Planning Grants: Worked with officials of HHFA and Mississippi Agricultural Industrial Board to develop plans to secure 701 funds for our Regional Council. As a part of this, plans are being developed for a three-way attack on mosquitoes. ✓ This involves elimination of breeding places through drainage, chemical treatment of marshlands and fogging for control of adult mosquitoes. The latter is the best effective method of control and also the most expensive. A budget for this purpose has been set at \$120,000 for a three county area, under control of a Mosquito Control Commission. An MSFC mosquito committee has been set up to work with the Commission. ✓
4. Boy Scout Visit: Bruce Favallora, the youngster from New Orleans who was struck by the descending radiosonde transmitter, was a guest of MTF for a tour and briefing Saturday, with other members of his boy scout troop. ✓
5. Walk-Out at MTO: Warrior Construction Co., building the Bascule Bridge and our Lab and Engineering Building, apparently did not fulfill their Union Contractor responsibilities to give electrical workers a raise due December 1. Workers have not reported the last three days; a Federal Mediator has met with labor and management representatives; Paul Styles is keeping contact. ✓
6. Staff Visits:
  - a. Mr. Jim Wilson and Peter Gerardi, Engineering Staff, House Committee on Space and Science, were in Tuesday for orientation and tour of facilities. ✓
  - b. Mr. D'anofrio and Mr. Garrison, Capt. Freitag's office, did the same Thursday. ✓

~~CONFIDENTIAL~~

NOTES 12/16/63 GEISSLER

B 12/18

1. Flight Mechanics, Dynamics, Guidance and Control Coordination Panel: The seventh meeting of this panel was held at MSFC on Dec. 3, 1963. A copy of the Agenda, Action Items, and Agreements are enclosed for your information. ✓

E.F.

I concur  
10/90  
with your  
reasoning  
on Encl. 2

I understand  
that MSC  
has raised  
the question

again,  
maybe  
since they  
are trying  
to avoid  
having  
to furnish  
Escape  
Towers.

Suggest we  
dig in and  
insist.

Suggest  
you so  
notify  
Lee James.  
Maybe he  
can  
break  
MSC  
reluctance

to our  
new MSC  
liaison

man,  
Mr.  
Davidson  
B

2. Requirements for Q-Ball on SA-8, 9, and 10: Enclosure 2, a memorandum to Dr. Mrazek, subject as above, was prepared to clarify the need for the Q-Ball on SA-8, 9, and 10, and as a response to your question to me on Notes 11/12/63 Mrazek: "Isn't that (the MSFC Q-Ball) needed for  $\alpha$ -control?"

3. Aerodynamic Pressure Distributions on F-1 Engine: Preliminary F-1 engine aerodynamic pressure distributions were given to Rocketdyne early this month in response to their urgent November 1963 request. In September 1962 we asked Rocketdyne when the F-1 loads data would be required, since Langley was then ready to start testing. Rocketdyne did not indicate a need for the data, consequently low priority tests were run from Dec. 1962 to Feb. 1963. Langley reduced the data during the period of March 1963 to August 1963. MSFC analysis took place thereafter. Now, in response to Rocketdyne's urgent request, by applying the highest priority, we can furnish final loads data in late Jan. 1964. If current ??! shroud design is changed, however, the cycle must be repeated, with a resultant final loads data availability of August 1964. ✓

4. SA-5 Orbital Debris: Your office was contacted by Headquarters Dec. 6, 1963 concerning the orbital debris problem on SA-5. The primary concern was to obtain from MSFC a rough estimate of weight, time and cost for equipping the orbital payload with a deorbiting device that would land the payload in a non-hazardous area. It was stated that this information was needed for briefing to the State Department - thus generating quite a bit of excitement. A meeting was held in Mr. Reinartz's office (I-I/IB) on December 7, 1963. Since studies pertaining to the Saturn I vehicle had been dropped, and concentration was now on the Saturn IB and Saturn V program, no conclusive information was available for the SA-5 question. Some engineering judgment figures were passed on to your office for transmittal. No additional work is planned in the Saturn I area and it is assumed that the pressure is relieved. ✓ But let's continue work on Sat IB and Sat V B

5. Aero Lab Participation in Rhode Design Criteria Handbook Effort: In view of mounting pressure by Mr. Rhode for our participation in establishing a "Design Criteria Handbook" volume on guidance and control, I have appointed Mr. Clyde Baker to study the problem and we have sent a letter to Mr. Rhode offering our help under the condition that we will be furnished sufficient OART funds so that we can do the bulk of the work through a few selected contractors. We will appoint about three or four key people to direct and evaluate contractor contributions. This would be the utmost we could afford to do with the stringent restrictions on manpower. ✓ Mr. Rhode responded favorably and Mr. Baker will go to Washington next week for further discussions. ✓

~~CONFIDENTIAL~~

WHEN ENCLOSURES ARE WITHDRAWN, THE  
CLASSIFICATION OF THIS DOCUMENT IS  
DOWNGRADED TO UNCLASSIFIED.

B 12/18

1. S-IU-6 FINAL CHECKOUT: The S-IU-6 Instrument Unit was returned to this Laboratory December 14, 1963, and is now undergoing reverification of all umbilical lines due to installation of an Engineering Order. ✓
2. S-IV-6 POST-STATIC CHECKOUT AT DAC, SACRAMENTO: Post-static electrical sub-system testing of the S-IV-6 stage has been delayed pending resolution of hydraulic system contamination problems. ✓
3. S-IV-7 CHECKOUT AT DAC, SANTA MONICA: The vertical checkout area, which represents a substantial improvement over the previous horizontal checkout facility, is being utilized for pre-static checkout of the S-IV-7 stage at DAC, Santa Monica. Manufacturing and electrical checkout is in progress and approximately on schedule. ✓
4. S-I-8 PRE-STATIC CHECKOUT AT CSD, MICHLOUD: Pre-static checkout of the S-I-8 stage is approximately 45% complete. CSD has reduced checkout effort from two nine hour shifts per day to two eight hour shifts per day with no Saturday work. ✓
5. S-I-9 PRE-STATIC CHECKOUT: Vehicle S-I-9 was transferred to Manufacturing Engineering Laboratory on December 12, 1963, for rework prior to completion of pre-static pressure test. Electrical pre-static checkout was satisfactory; however, the majority of the telemetry system components were "working dummies" rather than flight hardware. It is anticipated that flight hardware will be available and tested on the stand prior to the short duration static firing. ✓
6. VEHICLE ALIGNMENT: Combined Manufacturing Engineering Laboratory and Quality and Reliability Assurance Laboratory equipment was used in post-static alignment of vehicles S-I-6 and S-I-7. This Laboratory's WAA-MAC (weight and alignment-mass and center) equipment was shipped to CSD, Michoud by barge on December 7, 1963, after completion of pre-static weight and alignment of S-I-9, for further use by Michoud. ✓
7. PROCUREMENT REQUEST AND CONTRACT RELIABILITY PROVISIONS: The agreement between Quality and Reliability Assurance Laboratory and Purchasing Office on working level procedures and policies has been revised to ensure inclusion of reliability requirements in the appropriate procurement actions. ✓
- \*8. SOLDERING SCHOOLS: As of this date, 124 soldering schools have been established in the United States which are capable of training operators and inspectors to MSFC-PROC-15CB (High Reliability Soldering of Electrical Connections). The following breakdown is by regional areas.

NORTH EASTERN - 57 schools, FLORIDA - 22 schools, WESTERN - 45 schools.

NASA operates only three schools: MSFC, Huntsville, Alabama, WOO, Santa Monica, California, and NEO, Cambridge, Massachusetts. ✓✓

SA-5 Status

\* 721  
1. Simulated Flight Test was completed on December 13, 1963 with satisfactory results. Only minor, mainly procedural difficulties were encountered. Detailed record evaluation is still progressing. This Simulated Flight Test has to be considered now as a dry run for a repetition approximately one week before a new launch date. ✓

2. Propellant Loading, S-IB: A minor controversy can be expected between LOC and MSFC in the use of the Propellant Utilization System for loading purposes (as is being done now with the S-IV stage). M-SAT informed LOC that the first two S-IB stages will not contain Capacitance Probes of the PU System. Previous informal information seemed to indicate that inclusion in the vehicles would be possible. I expect that LOC might bring up this point in the next Program Review Meeting.

Lee James

I understand that LOC has based their sequential loading system on availability of these capacitance probes! We can't let them down by simply telling them now that those gauges will come only after SA-203!!

B

B<sub>12/18</sub>

W.H.  
I brought back some new info re FEM's desires in this area. Please discuss with Weidner and/or McCall  
B

1. FUEL CELL PROGRAM PLAN STATUS: Mr. Weir of Mr. Duerr's office is in Washington today and will distribute copies of the procurement plan to appropriate people in NASA Headquarters. I am checking the possibility of the Bell Labs. findings being presented to Dr. Mueller with our participation being scheduled this week.

2. INSTRUMENTATION TASK FORCE: Mr. Hoberg attended the Second Meeting of Dr. Mueller's Instrumentation Task Force held at MSC, Houston on 12/9/63.

The unified S-Band System, weight, cost figures of the space vehicle instrumentation, hard wire test philosophy (presented by Mr. Driscoll, Test Lab) were discussed. The chairman, F. Lehan, stated (after being questioned several times) that the main purpose of these meetings is to determine "if the Saturn Space Vehicle and Spacecraft is over, under or just right instrumented".

There is, however, no system available to measure such parameters. It should be sufficient to become convinced of the seriousness of the requirements and the level of effort MSFC together with the stage contractors devotes to the establishment of coordinated instrumentation programs. Time to do this is not available. Dr. Mueller is pressing for Mr. Lehan's report by 1/1/64.

Mr. Lehan plans to visit MSFC before that time but will not call for an additional meeting. *W.H. I'd like to see him. Please arrange* B

Bob Young  
An exemption such as promised by FEM in special case might be in order  
B

3. EFFECTS OF PERSONNEL FREEZE ON IBM-IU CONTRACT: These effects are quite serious since the freeze comes at the time of the maximum buildup rate. The start of this effort was delayed. At the present time, we are operating on a letter contract basis; negotiations are almost complete for the final contract. It will be very difficult for IBM to meet their commitments if this contract is not excepted from the freeze within a very short time. The commitments include IBM providing plans and documentation to assure responsibilities for Saturn IB, 205 IU hardware.

4. IO/ASTRONICS RELATIONSHIPS REGARDING IU: Messrs. Duerr and Weber review pressing matters on a daily basis. Mr. Duerr has not moved to Astrionics for a number of weeks as agreed in the meeting of 10/4. I believe this arrangement is essential in establishing operational familiarity and effective working relationships. ✓

Why not? B

B 12/18

\*rw

1. F-1 TESTING (STATIC TEST TOWER WEST): The firings planned for last week were cancelled, due to unfavorable sound focus prediction. The estimated noise level at the Parkway Shopping Center would have been 118 db (Wed., 12/11). The attached chart shows the condition at 1 p.m. Similar acoustic conditions existed throughout the remainder of last week. Good use has been made of this delay in the fact that 30 dynamic measurements have been added to the stand, and 44 strain measurements have been added to the flame deflector during this interim period. Next scheduled F-1 engine test is a 40-second-duration firing today, 12/16, at 4:15 p.m. ✓

*KA*  
*This acoustic plotting system really has graduated into a reliable tool. My compliments to all those who helped setting it up.*  
*LB*

2. MTF WORKING GROUP: Informal advice received 12/11 from OMSF indicates that the Procurement plan for Phase II and Phase III MTF Technical Systems has been revised to include justification for non-competitive procurement. OMSF delivered this revised plan with justification to Dr. Seamans, 12/5. ✓

Submittal to NASA Headquarters of Linde Company and Air Products and Chemical Company proposals for the liquid hydrogen plant has been rescheduled for early January 1964. ✓

MSFC received a copy of a letter dated 11/29 from the Bureau of Public Roads to the Government Accounting Office (GAO) wherein questions previously raised by GAO regarding the MTF Bascule Bridge were answered adequately. We have no reason to believe that GAO will raise further questions. ✓

*KA*  
*I hope you can realize that availability of MTF's S-II stand begins to clearly emerge as the critical path item for the S-OI launch. What special actions do you recommend?*  
*B*

Difficulty has been experienced in obtaining a satisfactory S-II Test Stand Pile Test on the lower level. It was thought that the problem was resolved on 12/11 when a test pile driven to -90 feet elevation met the specifications. However, a second pile driven under the same conditions has failed to meet the specifications for the dead load test. The Corps of Engineers is conducting further tests to determine the required pile depth. This difficulty has already resulted in a 3-week delay in the start of pile driving for the remaining half of the test stand.

As a result of the meeting held on 12/4 with the Mobile District Corps of Engineers to discuss problems encountered during the buildup of facilities in the MSFC West Area, a follow-up meeting will be held at MSFC today, 12/16, in which Corps personnel (including General Hayes) will participate. During this meeting, a concerted effort will again be made to establish policies and procedures to prevent at MTF the mistakes which have occurred at MSFC. ✓

3. MARINE TRANSPORTATION: A 100% review of the construction plans for the Seal Beach Facility Pier was held during the week of 12/9 at the Bureau of Yards and Docks, San Diego. Construction on the pier is scheduled to commence in January 1964, and the completion date is 5/15/64. ✓

ATTACHMENT: Calculated Acoustic Ray Paths for Huntsville, Ala., 12/11, 1 p.m.

NOTE: Attachment to Dr. von Braun's copy only.

NOTES 12/16/63 HOELZER

B 12/18

PRESENTATION TO DR. REES AND MR. WEIDNER: A presentation to the Director and Deputy Director of R&D, and attended by Dr. Rees, indicated the management problems presently being faced by the Computation Laboratory due to changing conditions in the computer field and changing philosophy of MSFC operations. Essentially, the presentation pointed out the difficulties presently encountered or anticipated, and recommended a new management philosophy in the Computation Laboratory. This will involve moving Civil Service personnel to more project management type roles and will involve giving more of the detailed work of the Laboratory to contractors. Dr. Rees and Mr. Weidner agreed with the recommendations made, and mechanics are being set up to accomplish the goals established. More on request.

→ HH

Why don't you drop in occasionally and tell me a bit more about this. Suggest you call Bourse for an appointment. Let's do it on a small scale, e.g., just you and me. B

B 12/18

NOTES 12-16-63 JAMES

\*7u SATURN I: SA-5 - Based on the delay of the SA-5, the shipment of S-I-6, S-IV-6 and I.U.-6 have been delayed and will be rescheduled as soon as a firm launch date has been established. ✓

\*7u S-IV Stage: S-IV-6 - As reported last week, an inspection of the common bulkhead revealed a large wrinkle on one segment of the common bulkhead. The DAC structures people have investigated this wrinkle and report that the stage is acceptable for flight. ✓

Contract: - Funding on the S-IV Contract continues to be almost at the contract value level. Present funds will cover DAC expenditures (not including commitments and fee) through about December 26. MSFC has proposed incremental funding without fee pending realignment, but DAC has not agreed to this. However, MSFC can, and probably will, take unilateral action to fund the contract to relieve the situation. ✓

SA-5 Orbital Debris - MSFC was contacted by NASA Headquarters on December 6, 1963 concerning the Orbital Debris problem on SA-5. A meeting was held in the SATURN I/IB Project Office on Saturday morning, December 7, to initiate a quick look at possible solutions and the impact on SATURN schedules. The immediate question was answered to Mr. Low of Headquarters during phone conversation with your office. The requirement for this exercise was cancelled on Tuesday, December 10. ✓

A review of events on this problem reveals that a briefing was made to the Director in June, 1963 by the Orbital Debris Committee and it was agreed that efforts to obtain solutions for the SATURN IB and V would continue but that lack of time prevented solutions for SATURN I. This subject was also discussed in the June Management Council Meeting and although the minutes of this meeting do not properly reflect the outcome, MSFC was informed by Headquarters' personnel that it was agreed that no actions would be taken on SATURN I Vehicles. Based on the above information, this office does not plan any further action on solutions for SATURN I Vehicles. ✓

*Lid.  
Suggest  
we forget Sat I  
but continue  
on Sat IB and  
Sat IB*

SATURN IB: S-IVB - The DAC contract, Mod 66, was released by Headquarters on December 11.

A meeting between IO and R&DO personnel was held December 9 for further discussion and clarification of bending moment data. A statement of agreement is to be prepared and concurred in by P&VE and AERO Divisions prior to release of load figures. DAC is predicting a schedule impact and a phase-in approach may have to be investigated. ✓

NOTES 12-16-63 Koelle

B 12/18 ✓

1. NUCLEAR PULSE VEHICLE: We have heard that the Joint Congressional Committee on Atomic Energy (Subcommittee for R&D, Chairman, Congressman Price ) intends to have a hearing early February on the above subject. You probably will be called as a witness. We are in the process of completing our mission-oriented study on this concept with GD/A at this time. Their final presentation here at MSFC is planned for January 14, 9:00 to 12:00 a.m. Would you want to attend this presentation, have a special presentation for you, or do you want to have it rescheduled so that it fits your schedule?

*yes*  
2. SATURN V PRODUCT IMPROVEMENT: *if necessary, yes* We hope to obtain study funds in the amount of \$500,000 to \$900,000 for studies on improvements leading to performance increases or cost effectiveness improvements on SATURN V. I have reached an agreement with Dr. Geissler and Dr. Mrazek as to how to coordinate this effort and how to distribute the funding. Mr. DeFries will be the Technical Coordinator and Mr. Orillion (P&VE) will be his deputy on this project. ✓

B 12/19

1. Saturn V, S-IC Stage: (a) The lox tunnel has not been welded yet into the Fuel Test Container because of fitting problems of tunnel to bulkhead. The container has already been moved to hydrostatic test station in the tower building in order to make room for the S-IV stage on which P&VE will make load test on the helium sphere supports. (b) The lower fuel bulkhead for S-IC-T has been moved to 4707 for installation of the fuel exclusion riser. The meridian welding on the upper fuel bulkhead has been completed. No progress on the Thrust Structure has been accomplished because of missing components. (c) It is very difficult to obtain a clear and objective picture of the Wichita overload situation since internal Boeing Company policies which are not known by MSFC have some effect on the trend to transfer work to Seattle. It seems that the cancellation of the Dyna Soar Project has some influence on the desire to place Saturn work at Seattle. Transfer of the fins and fairings has not been authorized by Industrial Operations and the contracting officer because Boeing is asking for an additional \$250,000 for this transfer because of higher wages and overhead cost at Seattle. ✓

2. Saturn V, S-II Stage: The fifth Manufacturing Engineering Working Group Meeting with S&ID took place at Los Angeles last week. Besides a general review of the progress in manufacturing in all NAA shops by our key personnel the following topics and problem areas were discussed: Proposed S-II Stage structural alignment methods and techniques by S&ID including S-IC and S-IVB interface assurance; The problem encountered and corrective action taken as results of horizontal welding development at S&ID and the tooling required for welding the tank cylinders to bulkheads and "J" sections; Cryogenic insulation development program. This was a joint session with P&VE. Dr. Stuckey from P&VE presented the latest design ideas of MSFC. The MSFC manufacturing plan to be used in developing the techniques were discussed; A review of the latest thinking on the common bulkhead fabrication and honeycomb fit-up problems were held. A new concept of "Composite Common Bulkhead Assembly Technology" was proposed by NAA, called "Inflation Assembly Technique". Briefly, the technique is to inflate, at low pressures, the forward and aft skin assemblies of the bulkhead into smoothly faired contours, cut both faces of the honeycomb core from recorded dimensional traces of the actual pressurized skin contours, control the core thickness and profile concentricity by calculations derived from the contour traces and bond the skins to the core in a condition of preload. This is now the fifth concept undergoing analytical, down scaled, and partially full scaled process evaluation. Our comments and recommendations will be furnished to NAA by end of January. Pertinent Douglas representatives participated in the discussions. ✓

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with  
McCartney's  
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12-16-63  
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1. MANPOWER - We were advised at noon Thursday, Dec. 12, of reductions in "anticipated" FY64 and FY65 civil service personnel ceilings. Comparative reductions are as follows:

	<u>FY64</u>	<u>FY65</u>
MSFC	- 100	- 42
MSC	- 75	- 300
LOC	- 25	- 208

As now expected, our ceiling will be 7658 for both FY64 and FY65. Inasmuch as our interim FY64 ceiling is 7288, this is a cut in anticipated/guideline ceilings only. Indications are that additional reductions may be made in order to fully comply with the President's policy of no increases. ✓

To prepare for a meeting that Dr. Seamans was holding on Dec. 13, Bill Lilly, MSF, requested us to furnish a statement indicating the strongest possible, but brief, justifications for the increases projected beyond current on-board strength. We furnished the statement by phone on December 13; a transcript is on file in this office. ✓

Within our currently authorized ceiling (7288), there were 103 unfilled permanent spaces as of December 6. Of these, 55 were temporarily occupied by non-permanent employees. Net gain in permanent employees over the previous week was minus four. Our accession rate has a tendency to dispute any justification we use for ceiling increases. ✓

2. MSF APOLLO PLANNING NETWORK - An Apollo Top Level Planning Network developed by MSF which includes schedule information from all centers was received by MSFC Dec. 9, 1963. MSF has requested MSFC to validate the logic and time estimates for MSFC-managed activities. This is being accomplished in conjunction with the project offices. The subject network will be proposed by MSF as the source for updating, on a monthly basis, level 1 & 2 schedule milestones. A preliminary presentation on this is scheduled to be made to Dr. Mueller tomorrow. MSFC position on this proposal has not yet been determined. ✓
3. MILESTONE INVENTORY - A milestone inventory, to determine the compatibility of SARP and PERT Milestones, is underway in conjunction with I. O. with completion of study expected by December 18th. The objective of this study is to evaluate the number of changes and the associated workload required to obtain total milestone compatibility. ✓

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1. FY-64 R&D MANPOWER: NASA Headquarters has tentatively programmed a small increase in FY-64 R&D manpower, from the present allotment of 4748 to 4877. (That increase still represents 100 fewer spaces than requested for R&D in the Executive Staff's December 9 uncoordinated submittal.) Definitive R&D allocations will be determined after the impending visit of the MSF Manpower Survey Group to MSFC. ✓

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2. R&D OPERATIONS BUDGET EXECUTION: Mr. W. C. Bush, Chief of our Programs and Contracts group, has developed a streamlined method for executing the R&D Operations budget. The method has been presented to Messrs. Gorman and Maus and will be presented to Industrial Operations as soon as Mr. Young is available. Reactions, so far, have been most favorable. ✓

3. FY-66 Coff REQUIREMENTS: Messrs. Read and Corbett of our Facilities group have requested the laboratories to submit preliminary FY-66 Coff requirements this week. A consolidated listing, with proposed priorities, will be presented to R&D management for decision on December 20. Detailed justification will then be prepared for those facilities established as R&D Operations requirements. ✓

4. PERSONNEL CONDITION RESULTING FROM REORGANIZATION: Last week, Mr. J. R. Ellis, Chief of our Administrative group, met with Messrs. Kroeger (Astrionics), Sorensen (Management Services), Boyd (Personnel), and others to discuss an administrative and management problem resulting from the recent reorganization. Reassignments within laboratories and absorption of personnel from other organizations have created conditions in which experienced people cannot always be placed most effectively. In addition, some people, whose advancement was reasonably assured, now find themselves in positions where their advancement opportunities are not so clear. The condition exists in relatively few situations. However, it must be resolved quickly to the best advantage of management and the individual. ✓

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NOTES 12-16-63 MRAZEK

1. S-IV DYNAMICS/FACILITY STAGE: This stage is expected to arrive at MSFC 12-17-63. The Propulsion and Vehicle Engineering Laboratory S-IV Project Engineer has been charged with control of the stage during its stay at MSFC. Initial testing on the cold helium spheres will be conducted on the stage while it is housed in the Saturn V Assembly Tower. Manufacturing Engineering Laboratory has requested that the S-IV stage be removed from the tower by 1-1-64. Additional testing past this date is planned to be performed either adjacent to Building 4619 or in front of the Dynamics Tower. ✓ SIC
2. HELIUM BUBBLING REQUIREMENT RETAINED ON S-IV-5: The propellant loading test at AMR revealed that helium bubbling in the S-IV suction lines caused LOX in the oxidizer tank to geyser and force liquid out through the vent line. Because of this, the suggestion was made to eliminate the helium bubbling requirement. MSFC and Pratt and Whitney Aircraft Company personnel reviewed this problem and it was concluded that, from a propulsion system viewpoint, helium bubbling is required to cool LOX to the proper temperature to avoid cavitation of the LOX pump. Alternate solutions are being investigated. ✓
3. S-IV-5 PROPELLANT LOADING TEST AT AMR ABORTED BECAUSE OF SHORT IN LOX PROPELLANT UTILIZATION (PU) PROBE: A piece of 150-mesh screen was shorting out the PU probe and a bare wire was found in the PU at the feed-through. The probe was repaired. ✓
4. F-1 ENGINE NUMBER 1001 TESTED AT MSFC: Two tests were conducted. The first test for 4.6 seconds was terminated prematurely by a faulty rough combustion cutoff signal. Post-test inspection revealed no hardware damage. The second test was a programmed cutoff of 14 seconds. ✓
5. INJECTOR X019 DAMAGED BEYOND REPAIR DURING TEST: The bomb-induced combustion instability did not damp until well into chamber pressure decay. Severe erosion of the injector face occurred and the injector is not repairable. The test was conducted slightly above rated thrust and mixture ratio. This injector had reversed 5U pattern with offset fans, reduced spacing between orifices in each cluster, protected streams, and no baffle. ✓
6. TEST OF S-IC PREVALVE SPRING ACTUATORS UNSUCCESSFUL: A high flow test damaged the LOX prevalve and suction duct because of pressure surges caused by rapid valve closure. Subsequent testing and computer analysis demonstrated that the spring-actuated normally-open and normally-closed actuator should be dropped in favor of the double pneumatic actuator so closing time can be controlled to eliminate excessive surge pressure. ✓

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NOTES 12/16/63 RUDOLPH

1. S-II: The first full scale separation test has been successfully accomplished at NAA/S&ID. The test model is a ring 33 feet in diameter and is representative of the aft interstage at the second plane of separation (Sta. 196). Separation was inaugurated by an explosive charge. ✓

The first two LH<sub>2</sub> tank skin panels for the S-II Stage static test vehicle have been accepted. These panels were fabricated by the Los Angeles Division of NAA. ✓

The recent NASA Headquarters directive relative to contractor manpower levels, restricts manpower allocations to meet program requirements. This restriction in addition to funding limitations will cause an additional slippage in the inauguration date of the Battleship Test Program. ✓

2. IU: Information received from NASA Headquarters indicates that considerable exception is being taken to the Procurement Plan for the ST-124M Stabilized Platform. Detailed comments have been received concerning the proposed period of performance, the lack of a detailed work statement for implementation of quality and reliability programs, documentation requirements, and the method of contracting for the initial platforms and design of platform sub-assemblies.

The Procurement Plan for the Allis-Chalmers Fuel Cell Development was handcarried to Washington on Sunday, December 15, 1963, by Mr. Weir of the Instrument Unit Stage Office. Allis-Chalmers must be under contract by January 20, 1964, to meet the S-IU-201 delivery. ✓

The technical proposals for continued development and prototype production of the Guidance Computer and Data Adapter have been received from IBM. The cost proposals are expected December 17, 1963. These efforts are currently under letter contract. ✓

3. GSE: RCA has been given a release to proceed with performance on the 110-A contract (#5423). However, the manpower freeze will prevent the build-up of production personnel. If a release is given within two to three weeks, there will be no problem. ✓

The design of the Bldg. 4708 modification for the breadboard facility has begun. Funds for this effort will be transferred from Vehicle GSE account when requested by Facilities Project Office. ✓

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GEM sold  
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a waiver  
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area.  
Please prepare  
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*A.R.*  
What  
actions  
do you  
suggest?  
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NOTES - 12-16-63- SHEPHERD

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No Notes

NOTES 12-16-63 Stuhlinger

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1. FIRING-INDUCED TREMORS: Seismographic measurements taken by Dr. Dalins, RPL, on four occasions in recent weeks indicated that no immediate danger exists to the foundations of adjacent Army buildings as a result of seismic effects from Saturn and F-1 engine firings. ✓

2. SUPPORTING RESEARCH PROGRAM: Mr. Merle Waugh, Chief, Advanced Manned Missions Control Office, which is under the direction of Mr. Ed Gray of Manned Missions Programs, visited RPL on December 12. He feels that technology requirements are more appropriate for his Office than research requirements. He indicated that our LVT Program would probably be reduced by \$1,000,000 when the budget cut is reflected at our level. ✓

Mr. Waugh expressed confidence that the present hold order on all SRT fund obligations will be of short duration only. ✓