

NOVEMBER 5, 1962



*Mr. Johnson*  
*X*

NOTES TO HOLMES 11-5-62 DEBUS

1. Problem: Crawler Transporter Procurement: Marion Power Shovel Company has protested officially concerning the sole-source crawler procurement action with Bucyrus-Erie. Additional protests may be expected according to Holcomb. Therefore, any statement or explanation from NASA must be from an official source. Questions at LOC will be referred to Michaud; contacts made at Washington level will be referred to Brewer (in Brackett's office); both Brewer and Michaud will keep in touch with each other concerning discussions, questions and answers. LOC personnel have been advised of this arrangement.
2. Publications by General Electric: The multi-volume set of publications, "Systems Description for Saturn/Apollo," prepared by General Electric have generated an extremely heavy workload to comply with Sloan's request for our review and comment. I contacted Sloan and he has consented to a meeting 8 November at LOC to discuss the requirement for such documentation as well as the value to be obtained inasmuch as most information is available and updated by publications from the Centers with prime responsibility in the areas. Will keep you posted of the outcome, but in the meantime, I have suspended work on our review.
3. Orsino Causeway Fill: Award of contract not made to date due to lack of FY '63 funds. None the less, Gahagan Dredging Company has already placed almost 400,000 cubic yards of total 1.6 million cubic yards.
4. Channel and Fill for VAB and 39-C: Gahagan Dredging Company low bidder for \$3,619,500. Award not made due to lack of funds. Work on clearing in VAB area already begun. Gahagan plans to begin initial fill in VAB area week of November 5. These are two of the items discussed at Management Council under Coff allotment.
5. Emergency War Plan for NASA: Preliminary work has been started by NASA Headquarters and LOC is working up details for our plan. Will keep you posted.
6. Diluzio: Diluzio has advised me that it is impossible for him to accept appointment with LOC because of family medical problems. As a result, I have taken another look at an organizational possibility for LOC which I will discuss with you and, in the meantime, I will not actively pursue recruitment to fill the position.



7. News-Center Auditorium at Cocoa Beach: Bid proposals have been furnished to NASA Headquarters. We are waiting for their determination before proceeding.
8. Additional Off-Cape Facilities for LOC: Space layout and specifications for 30,500 square feet of office building space are being prepared for bid invitation. Location; probably Cocoa Beach area.
9. Propellant Procurement: Requirements for MLLP propellants have been furnished from NASA Headquarters to Air Force Materiel Command and thence to AMR. Inasmuch as this is a normal function of LOC, we are attempting to clear up this matter. (No action required at this time.)
10. Aircraft for LOC: We are currently pursuing a study to determine which aircraft types and contract services could be made available to LOC for the remainder of FY '63.
11. OSS Senior Council meeting for January 3, 4, 1963 will be held at CCMTA. LOC will be host.
12. Silverstein's Visit: On November 7 Silverstein will visit LOC for a briefing and discussion in our joint effort to define launch responsibilities for the Centaur program.
13. Visitors to AMR: The restrictions on visitors to AMR will continue in effect as long as we remain in Defense Condition 3. Davis has cancelled several scheduled visits. We have also. Davis commended NASA in a letter to me for cooperating.

B#15

NOTES 11/5/62 CONSTAN

Negative Report Submitted

1. Saturn SA-3: (a) Cracked sleeves on the flared-fitting connection of the lox-line from the main lox-valve to the heat-exchanger were found on Engines No. 2 and No. 4. These sleeves were replaced. Rocketdyne people worked with LOC in accomplishing the job over this weekend. ✓

(b) Because of the cracked sleeves (above), a revision of the daily work schedule for the remainder of the preparations has been issued to meet the launch schedule. i. e., the Plug Drop Overall Test was rescheduled for Tuesday, with Simulated Flight Test the following Tuesday. ✓

(c) The launch forecast date has been submitted to Range Scheduling where it was determined that a Minuteman launch was also forecast for the same date and time. It was noted that SA-3 was being scheduled by the Range pending flight safety approval which must be available this Thursday when a firm launch schedule is made up. I discussed the trajectory problem at the Management Council and what course of action I planned to take with the Range on this. Will keep you current on any problem if it should emerge. ✓

2. Test of Umbilical Swing Arm at LC 34: Functional, retraction tests of the umbilical swing arm were conducted at LC 34 with SA-3. Tests were satisfactory with the exception that movies showed that the lower portion of the quick-disconnect housing bumped the vehicle after the housing was released just prior to retraction. This will be corrected by adding two rubber cords with 50 pounds preload tension. Further tests are scheduled. ✓

3. CTL Project: Gantry repairs on Complex 26 have been completed sufficiently to permit de-erecting the damaged Jupiter Missile. The next CTL missile is due to arrive at AMR this week. The damaged missile will be returned to Detroit on the same courier. ✓

4. Mothballing of Launch Complex 5/6 was stopped because of possibility of Lewis Laboratory requirement for two Redstone shots. Don't know more at this time. ✓

What's that?  
B

5. Briefing on Complex 39: Our briefing for you has been rescheduled to November 14th. ✓

1. URGENT ACTION: Last week I reported that Brainerd Holmes was not satisfied with the answer his staff had prepared on our request for additional funds to accelerate the Hydrostatic Test Facility. It is our understanding that this problem has since gone to Seamans since it involves the use of R&D funds for construction purposes. You will recall that this was Milt Rosen's idea based on MSFC's estimate that the construction period can be cut by two months if additional funds were made available immediately to expedite material deliveries, increased manpower, supervision, and overtime. A ruling is expected this week. I am not optimistic about this one. ✓
2. MICHOUD: Funds for design and construction have been received, with the exception of the \$9.5 million for activation of the S-1C area. \$150,000 of this amount has been received for design; the balance is expected by November 23. Roof replacement - as of November 2, the contractor had 70 men working on the roof at Michoud. ✓
3. MISSISSIPPI TEST FACILITY: Nine sets of criteria were received from Sverdrup and Parcel this week for preliminary review. Construction has been started on the Temporary Acoustical Test Facility. Bids were opened on contracts to drive test piles for the S-1C test stand and to construct potable water wells. \$12.5 million was received from Headquarters to complete the real estate acquisition program. ✓
4. S-IVB The Sacramento District Engineer was given permission to advertise for the facilities at Sacramento prior to receipt of funds. The Corps advertised on October 30. A TWX was received from OMSF stating that they will make every effort to obtain release of funds to meet Marshall requirements of November 8 for design funds and November 16 for construction funds. As a result of this message, the urgent action message was not sent. ✓
5. UNITED AIRLINES SERVICE TO HUNTSVILLE: The CAB Hearing on United Airlines service into Huntsville is coming up sometime during the month of January. It is our understanding that NASA Headquarters has agreed to intervene in the case, much in the same way as they did in the Delta Hearings. The documentation is to be filed no later than November 10. ✓
6. M-1 ENGINE: Procurement files were forwarded to Lewis Research Center on October 26. ✓
7. BROWN AND ROOT: At your request, Newby has prepared a record of the Brown and Root visit to be forwarded to Seamans through Holmes. I believe this may not be such a good idea under the circumstances. I would like to discuss it with you before we send the letter out.

Alright, let's  
do that. B

- \* 1. Special Saturn C-1 Mission: Lifetime studies for the proposed <sup>from</sup> Goodyear inflatable space station on SA-8 have been completed. Guaranteed lifetime is a strong function of vehicle configuration and desired orbital altitude and varies between 15 days and more than a year for extreme conditions. ✓
2. Micrometeorite Experiment: Preliminary results of the optimization study for the micrometeorite experiment point to the following likely situation: apogee 1,700 km, perigee 480 km, total experiment area 450 m<sup>2</sup> and a weight of 3,400 kp (7,400 lb.) Experiment is optimized for a 1 year orbital lifetime. ✓
3. LLS Spacecraft Bus Study: Representatives from Aero. Div. attended this mid point review Oct. 26, 1962, at STL. Attendees felt results to date were favorably received by headquarters (OMSF - Dr. Lee). Trade-off studies are continuing, but at this point firm trends cannot be given. ✓
4. EDS and Abort Trajectory Studies: C-1, Block II static stability wind tunnel tests in support of EDS and abort trajectory studies were conducted at Cornell Aeronautical Laboratories the week of October 22. Test conditions included a Mach range of 0.2 to 1.3 at angles of attack up to 25 degrees. Pre-capsule abort and post-capsule abort configurations were studied on a 1.75% scale model complete with latest protuberances. These data, together with MSC-NAA data up to Mach 3.5, will be available immediately for trajectory and control studies. ✓
- \* 5. JPL Contributes to Vehicle Technology: A joint research project between JPL and MSFC is presently underway in the JPL Hypersonic Wind Tunnel. The purpose of the research is to determine the degree of validity of scale model test results applied to full scale vehicles (M=5.00 - 10.00). During the first phase of this program, an attempt was made to determine the boundary layer characteristics and general flow fields which the full scale vehicle is expected to encounter by simulating trajectory Reynolds number and wall to free stream total temperature ratio. A 0.0227 scale liquid-nitrogen cooled copper model of the Saturn C-1, Block II vehicle upper stages was utilized for this investigation. Extensive photographic documentation and pressure measurements were made and these data are presently being analyzed. Results look promising. ✓
6. Research Program on Wind Shear Determination in Lower Atmosphere: Enclosed is a copy of a paper, to be given to Agard soon, which summarizes our efforts in this critical area. If you would like to get a more detailed briefing, I will be glad to arrange this. Funds for a special FPS-16 (Meteorological Radar Facility) have just been released by Mr. Rosen; it will take one year before it gets operative (we lost 1/2 year due to delay in funding). ✓  
*See left side of folder.*
7. Centaur Transfer: Lewis is still calling for more visits and for furnish-ing of decks and other data. They have very little knowledge in the area of wind effects and Aeroballistics, and it represents considerable burden on us, to educate them. Even more so, since they are trying desperately to question our data and assumptions by calling in other people from Langley which makes the education process more drawn out. ✓

- \*1. PERSONNEL UTILIZATION: Contractor personnel (SPACO) have taken over all duties in the electrical receiving inspection area, except the Radiflo leak testing of relays and semiconductor testing. Three civil service personnel formerly occupied with these tasks are being retrained for other duties. ✓
- \*2. QUALITY ASSURANCE COVERAGE ON S-IV AT DAC: On October 29, 1962, seven (7) NASA-O personnel were on-board at Douglas Aircraft Company to supplement the Air Force inspection effort. One additional inspector is expected on November 5, 1962. A memo of agreement on this subject was signed on October 24, 1962 by the Air Force Quality Control Manager and the Quality Assurance Division Representative at DAC. NASA-O has agreed to furnish twelve (12) more in January 1963. These twenty (20) people will be assigned for approximately six months. We will request the Air Force Western Contracts Management Region by letter to inform us on the future plans of the Air Force for S-IV manpower. ✓
3. SA-4 POST STATIC CHECKOUT: The S-I stage is in its second week of pressure-functional testing and eleven systems have been accepted to date. The Packard-Bell Satellite Test Station has been used successfully in the valve timing, heater monitoring and event recording programs. ✓
4. NASA QUALITY ASSURANCE SCHOOL: Mr. Howard Weiss, Office of Reliability and Quality Assurance, NASA Headquarters has suggested the establishment of a NASA Quality Assurance School at this Center financed by NASA Headquarters. ✓ O.K.  
with me  
B
5. M-1 ENGINE QUALITY CONTROL PLAN: Personnel of this Division last week participated in the final review of the Aerojet-General Corporation M-1 Engine Quality Program Plan at Aerojet, Sacramento, California, with Lewis Research Center personnel. It was agreed that the plan was satisfactory and could be formally submitted to Lewis Research Center. Mr. Godman, Director, Office of Reliability and Quality Assurance, Lewis Research Center, indicated that this completed the major quality engineering support that his office would require on this program from the Quality Assurance Division; however, some further assistance may be requested, if deemed necessary. ✓
6. FIELD QUALITY ASSURANCE BY CONTRACTOR: "Ground rules" for utilization of contractor Quality Assurance personnel to perform NASA Quality Assurance functions at other contractor facilities were furnished to Mr. Koppenhaver, Director, Office of Reliability and Quality Assurance, NASA Headquarters at his request. This is an alternate solution to the field quality assurance coverage problem since we have been informed that the Bureau of Budget rejected the Department of Defense request for support of the additional effort required by NASA contracts. ✓

B 11/7

NOTES - HAEUSSERMANN, 11/5/62

1. VISIT TO MINNEAPOLIS-HONEYWELL AT MINNEAPOLIS ON 10/31. I participated in a presentation at M-H given to members of OART, JPL, OMSF, Holloman AFB, etc. Good results and hardware were shown concerning the electrostatic gyro development. Even if I omitted the optimism of M-H's salesmanship this new two degree of freedom gyro gives hope for 1-2 orders drift reduction compared to good floatation gyros. Compensation methods are not applied. The electronic gear is comparatively simple. Classified report is available if you are interested. No contractual support necessary from NASA since sufficiently financed by AF. I will receive further test results from Holloman AFB.

W.H.  
 ↓  
 → yes,  
 I am  
 B

M-H's cryogenic work is at least two years behind GE's. They have not yet found the basic problems.

M-H's R&D effort is very impressive. As a result of our contract we received three AB gyro cans with ceramic gas spin bearings. Preliminary tests at M-H look good. ✓

\* 2. HYDRAULIC ACTUATORS FOR S-II. Detailed analysis has been made by Astrionics and DAC personnel to further investigate the practicality of using the S-II hydraulic actuator on S-IVB. The results indicate the desirability of a separate system. The S-IVB torque requirements are lower (11 in.<sup>2</sup> piston versus 14 in.<sup>2</sup> piston on S-II) and the environmental problem is different due to the orbital coast requirements on S-IVB. Since utilization of the S-II actuators on S-IVB would result in a system weight increase of 80 pounds, DAC is being directed to proceed with a system design tailored to the specific S-IVB requirements. ✓

even if expansion ratio of nozzle is higher in SIV B??  
 B

3. STATUS REPORT - C-1 VEHICLE INSTRUMENTATION WORKING GROUP: Meeting was held at MSFC on 10/30 with DAC on the S-IV stage. The status of the all systems vehicle and SA-5 (S-IV) was presented by DAC with no major problems existing. ✓

4. STATUS REPORT - C-5 VEHICLE INSTRUMENTATION WORKING GROUP: A joint meeting was held at MSFC on 10/31. This was the first joint C-5 instrumentation meeting and the status of the instrumentation for each stage was presented to familiarize all groups represented. No significant problems exist at this time. ✓

NOTES 11/5/62 Heimburg

B 11/7

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1. SAT-4.5 TESTING: A 65-second test was successfully completed, Friday 11/2/62. Some minor burning of the deflector was sustained under engine positions No. 1 and 2. Cooling-water hole pattern will be modified for the next firing, tentatively planned for Friday, 11/9/62. ✓
- \*2. S-IV BATTLESHIP TESTING, DAC SACTO: Good News! A successful 460-second, depletion test was completed, Saturday, 11/3/62. Quick-look indicates all systems OK. DAC plans to make one additional duration firing, Wednesday, 11/7/62, before changing from the A-1 to the A-3 engine cluster. ✓✓
3. RL10A1 ENGINE TESTING, MSFC: An intended 30-second duration test with the engine "can" closed was cut off at 3 seconds by the fire detection system. Indications are that this was caused by engine flashback from diffuser into "can". Next test tentatively scheduled, 11/14/62. Will notify you, if you are in town. (See Attached Sketch.) ✓
4. MARINE ACTIVITIES: Barge PROMISE sailed from Cape Canaveral, 11/1/62, and is scheduled to arrive at New Orleans for loading the S-IVD vehicle, 11/7/62. Estimated time of arrival, Huntsville, 11/13/62. Routing on this return voyage has been changed from Southwest Pass on the Mississippi River to the Ship Island Channel and the Gulf Intracoastal Route, which passes by Pearl River and Michoud Plant. Should any benefits be apparent from this change of route, we intend to traverse the Ship Island Channel on Voyage No. 5 (South). ✓

Documentation of U.S. and foreign vessel availability for space vehicle transport and an operating costs study has been completed. This investigation was made at the request of NASA Headquarters Legislative Liaison and Legal Branch for the procurement of the late S/S NEW GRAND HAVEN. ✓

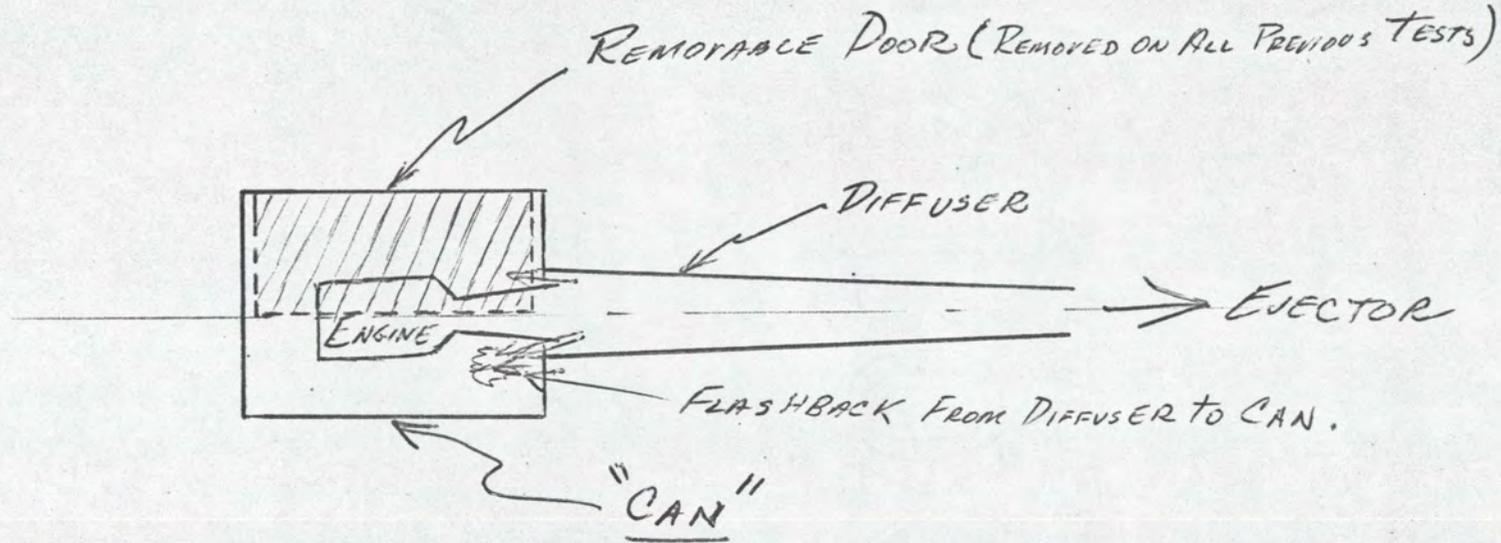
H. gem request explanation in next  
\*5. F-1 ENGINE TEST STAND, MSFC: Reprogramming request for additional funds is in Washington; they state that approximately \$400,000 of FY-62 funds may be provided by them, which will allow Mobile to immediately advertise for bids. Approximately \$1,200,000 FY-63 funds must be found locally. Project delay has been day-for-day since October 1.

NOTES  
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6. MTF: The MTF railroad situation should be finalized by negotiations at P&C with L&N Railroad scheduled 11/6/62. ✓

It is anticipated that criteria for the MTF lock, dredging of East Pearl River, and the test pile program will be forwarded to the Mobile Corps of Engineers by 11/9/62. However, the Corps is proceeding on the latter two items on preliminary information already submitted. ✓

1 Attachment:  
RL10 Engine Sketch

RL10 ENGINE SKETCH



All previous tests have been conducted with exterior of engine at atmospheric pressure and chamber only evacuated by ejector. To more closely simulate flight conditions, the "can" around complete engine is subjected to vacuum.

\* 1. *gen* CENTRAL COMPUTER FACILITY SLIDELL: Phase I (basement) of the modification to the Slidell Facility is to be completed today. The digital computers are being moved in this week and are to be operational by November 15, 1962. These digital computers are an IBM 7090, an IBM 1401, a GE 225, a Minneapolis-Honeywell 800, and two Minneapolis-Honeywell 400's. Phase II of the modification which includes the double decking in the large display room on the first floor is, at the present time, out for bids. The schedule now calls for this being complete by March 1, 1963. We are about 30 days late, according to an ambitious schedule made last March. To our knowledge, there has been no difficulty within the Boeing Company due to the slippage except that in a few instances computing has been shipped from New Orleans to Huntsville and they have been serviced on an overnight basis. ✓

\* 2. *gen* MSFC DATA CENTER: The ADPS Branch installed an IBM 1410 computer last week as a first step in implementing the Marshall Data Center. The 1410 is a 2nd generation business computer and will replace the 705, after a necessary overlap period of a few months. The 1410 will be equipped with a mass random access disk file in March. Integration stations or input-output devices in some 30 locations at MSFC will be hooked to the 1410 around July of next year.

H.H.  
Whatever that is!  
B

3. COST ESTIMATE OF AIR-CONDITIONING FAILURE: The following is a cost estimate, over and above normal operating expenses, from August 23, 1962 to September 4, 1962, as a result of air-conditioning failure:

Total Hours available	488	Estimated Usage by Marshall	377 hours
Army Usage -	257 hours	against the scheduled	100 hours
		giving	157
extra hours plus Outside Usage	85 hours	=	242 hours
\$273.00 (60% of \$455.00 reg. rental) x 242 hours		=	\$66,066.00
Total of 80 programmers and 20 operators working at half efficiency for 8 days = 400 man days at average of \$50.00 per day.			\$20,000.00
100 sponsors at 75% efficiency			\$10,000.00
		Digital -	\$96,000.00
Simulation -1676 m/hrs at \$6.50 per hour		-	\$10,894.00
Travel Costs		-	\$ 1,500.00
Total Estimated Cost		-	108,460.00

H.H.  
Looks like a second standby - unit would be a sound investment!  
(Suggest you take it up w/ Nesby) B

B 11/7

1. CENTAUR:

Transfer: Twenty-seven personnel have returned to MSFC as of today. Personnel remaining at Lewis Research Center are eight. For Reassignment: Atlas Management - 16; C-1/Agena Study - 4; Agena Office - 4. ✓

2. AGENA:

\* a. Gemini: The uncertainty with the Gemini target (the pending discussions between Messrs. Gilruth and Shea on the subject) causes us to further "drag our feet." If we are to participate effectively, this cannot go on much longer. I recommend we put pressure on this matter again by the end of this coming week.

H.H. gm  
Will do!

b. C-1 Agena: A management proposal has been worked out by us with detailed assignments of responsibilities both as to MSFC and JPL, and internally as to the Divisions. A JPL/MSFC meeting will take place on Wed., 11-7, at 1:30 PM in the Director's Conference Room. I hope you will participate. I have not invited Hq. I thought assignment of responsibilities should be worked out between our two Centers. Al Nelson, Hq. - OSS, told me that the money is not yet assigned - they would like to see the management proposal in order to decide whether the money should be split or assigned to JPL only. ✓

I did.

We need enough for LMSD contract! B

c. Topside Sounder S-27: A representative of Mr. Forsythe's office, NASA Hq, attended a meeting of the S-27 Topside Sounder Working Group at Ottawa, Canada on 10-18 and 19, 1962. Purpose of the meeting was to evaluate data obtained to date. It was determined that the spin axis of the S-27 is slightly off the perpendicular to the ecliptic. This is considered favorable because the spacecraft batteries are receiving a full charge prematurely from the solar cells. The Canadians report the spacecraft is continuing to send back good data. NASA Hq. has cancelled the S-27 back-up mission due to the success of the S-27. The S-27 back-up mission will be diverted to another use. It is anticipated the decision regarding the use of the S-27 back-up may be made prior to 11-16-62. ✓✓

d. Ranger 5: Signals from Ranger 5 were last received by the Deep Space Instrumentation Facility No. 2 on 10-29-62. When received, signal strength was at threshold level. Another search was unsuccessfully conducted for Ranger 5 signals on 10-30-62. The mission was officially ended as a result of this search. ✓

3. GENERAL:

OSS Management Review: The meeting was very helpful to me in that it reveals more details about difficulties JPL and Goddard have with their spacecraft which will help me in the future in better assessing the situation.

One item which might be of special interest to you - a joint working group between OSS and OMSF has been established. The Centers are being approached as to assigning participants.

→

H.H. Please keep me posted, B

B 11/7

1. SPACE STATION PROJECT

\*  
gen { We had a very successful coordination meeting with Mr. Emanuel Schnitzer (Dr. Shea's office), Project Officer for Space Station Projects. We are essentially in agreement on the evaluation of the present situation, the approach to be taken, and MSFC's role in this area. ] There will be another coordination meeting (NASA-wide) on this subject in Washington early in December, primarily to discuss what each center can do to develop plans for the implementation of NASA space station projects. Mr. Schnitzer welcomes and encourages our effort in the area of conceptual design studies of minimum space stations and reusable launch vehicles for logistics support of space stations. The following actions are presently in preparation:

- a. Response to Dr. Shea's request on potential use of space stations,
- b. A six-month design study of a small space station using C-1B and APOLLO-type hardware,
- c. A contractor study on priority problem areas of orbital operations in the light of the reorientation of the APOLLO program. The emphasis is on post APOLLO missions,
- d. Continuation of contractor studies of passenger-carrying (12 men), reusable earth-launch vehicles. We have requested approval of funds from Milt Rosen. (We might have a potential problem area here. Rosen seems to be against almost anything.)

Mr. Schnitzer seems to be a very good man to work with. He is very open minded and willing to listen. He was formerly at Langley.

2. ORION PROJECT

There was a report in "Missiles and Rockets" last week on this subject, indicating that this "launch vehicle study project" might be transferred from the AF to NASA or AEC. We have followed this study in the past years very closely and are in favor of continuing this study project. If this is offered to NASA, you might want to consider asking Mr. Finger whether he wants our support in this area. We do have a section in P&VE (Will Jordan) which worries only about advanced nuclear propulsion concepts. They are available and eager to handle this project jointly with us. I feel we cannot afford not to get interested, because "ORION" is the only high thrust, high specific impulse concept we know of which has any chance to materialize. Admittedly, it might be 1980 before it is operational (if ever), nevertheless, it is one of the best bets to get a substantial improvement.

In summary, I propose that MSFC offers Harry Finger our services in case the ORION Project should be assigned to AEC/NASA. If you agree, I will draft a letter to Harry Finger for your signature. (We will not require any additional spaces, it is a low level effort and within our present capabilities.)

HHK  
Request details (next NOTES)  
B

HHK  
Before I make any move, I want to be convinced that Orion is a good bet. So far, I accept he is quoted, but have my doubts as to its soundness as an engineering concept. For example, if Orion people have developed small scale tests, you have to build the monster as your first step!!?

Maybe you want to lay on a good brick for me.

For example, if Orion people have developed small scale tests, you have to build the monster as your first step!!?

B 11/7

\* Jim  
 1. S-IC Forming of Gore Segment by Boeing at Wichita: Present schedule--though very tight and requiring 3 shift work, 7 days a week--is now compatible with Program Plan Number V. There is however, a budget problem. The original estimate submitted by Boeing for the design and fabrication of the tooling, consisting 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. We think it to be excessive by a factor of 2 to 3! The job is now 30% complete; all the material has been bought and consequently more than 30% of the total cost already expended. I have asked for a written justification and breakdown of the price and a written explanation why the last quotation was in error. In several other task assignments Boeing completed jobs within the estimated cost. Besides the gore segment case there is one more substantial overrun occurring. The cost of the Y-Ring fabrication consisting of welding equipment and fixtures plus fabrication of 2 Y-Rings went up from \$337,627 on 6/14/62 to \$693,902 on 9/26/62.

Jim Braulet

Matt Vrlaub

What's

going on here??

If Boeing keeps operating like this, we'll be broke in no time!  
B

\* Jim  
 2. New Equipment: Last week we received our first tape controlled milling machine. It is the Giddings and Lewis DiMil, a three axis continuous path numerically controlled milling machine. Motions under command are, table longitudinal (X axis, 120") head saddle on column (Y axis, 48") and depth (Z axis, 18"). The machine has a 20 horsepower spindle drive providing the ability to remove up to 35 cubic inches per minute of aluminum. A programming group has been established and already well trained in ME Division with the help of Computation Division. The APT language, developed by Aerospace Industries Association will be used. The machine will be operational in about two weeks. A work program for approximately 8 weeks has been established mainly in support of our multicell development program. ✓

B 11/7

\* 1. C-1: S-IV - Battleship - static firing was conducted on 10-30-62. Due to high temperature, the Helium heater was cut off at 40 sec. and the test was terminated at 70 seconds. The P&W recommended, and M-SAT agreed to, new measurement for the LOX pump seal, consisting of a capillary tube inserted in the LOX seal cavity with redline pressure of 2.5 psig, worked satisfactorily. During the firing the pressure did not exceed 1 psig.

Next static firing was conducted on Saturday, 11-3-62. Test was run 330 sec. with Helium heater operating satisfactorily. When Helium heater temperature became too low, it was cut off and test continued for another 100 sec. No further information is available yet. ✓

2. C-5: S-IC - Long term contract. The 60-day extension to Contract NASS-2577 has not yet been approved by Headquarters; however, pending final approval, P&C has authorized Boeing to continue.

The S-IC schedules are being revised to reflect a five month slip in the launch schedule and a two month slip in the ground test schedule.

S-II - Santa Susana. Tests to determine explosive potential in engine area will begin 11-10-62 with final report due by end of November.

Tulsa. NAA/S&ID asked through their contracting officer that the policy of limiting the design effort at Tulsa should be modified. They have been told that this will not be done. ✓

AMR. SSO made arrangements with AFMTC, Patrick AFB, on 11-2-62 to provide MISTRAM transponders and test sets for the S-II. ✓

S-IVB - A Quarterly Program Review is scheduled for 12-12-62 at MSFC.

In advance of funding authorization, approval has been granted Corps of Engineers to advertise bids for site development and foundation work for Complex Beta. ✓

3. Guidance System - Revised Instrument Units Schedules, reflecting the OMSF 10-16-62 approved launch schedule changes, have been distributed within MSFC.

Boeing presented on 11-2-62 to P&VE, ASTR and SSO the results of their preliminary design efforts (conducted "at no expense to the Government") on their "SATURN Instr. Unit Technical Plan." P&VE will review plan for possible funded tasks to be performed and, in addition will present to M-DIR for decision a plan summary with recommendations if Boeing should continue with their design efforts.

4. APOLLO: Astronauts indicated considerable interest in SATURN static firing for their visit 11-28/29-62, if this can be arranged by Test Division. *It cannot.*

Emergency Detection and Crew Safety Panel met 11-2-62. Titan-GEMINI emergency simulation movie showed astronauts manual abort control.

Slayton emphasized preference of manual control and disinterest in emergency displays which do not offer clear astronauts options. ✓

Panel Review Board Meeting tentatively planned for 12-6-62.

Here we go!

O.C. Yes, request briefing

I told Heimburg "No". He will tell Knutson. 9/20/11-5

Agree B

→ Stry. I'll be on West Coast that day (as Bonnie has known for several weeks) B

B 11/7

NOTES, 11-5-62, MAUS

- 1. OMSF SCHEDULING & REPORTING PROCEDURES - OMSF postponed the first meeting of the Working Group which was established to develop uniform scheduling, reporting, and program review procedures and to determine the appropriate level of detail to which OMSF should regularly direct attention in schedules and status reports submitted by the centers. The meeting will be held sometime after a November 10 status review meeting between Mr. Holmes and his Directors. ✓
- 2. PERT PROGRAM - We have completed arrangements with NASA headquarters for local presentation of the Management Orientation Seminar in NASA PERT and Companion Cost System. This course was prepared by Management Systems, Inc. under contract with headquarters, and is designed for technical and management personnel GS-14 and above. The course is well organized and brief, and will be completed in only two four-hour sessions. It will be given to three groups of MSFC people, the first is scheduled for November 13 and 14. ✓

H.M.  
 Request a  
 copy for  
 me.  
 B

PERT AND COMPANION COST SYSTEM HANDBOOK - NASA's new publication on PERT and Companion Cost System is being printed in handbook form and is to be released this week. We have requested sufficient copies for distribution internally within MSFC, and to the MSFC contractors. ✓

- \*3. LIQUID HYDROGEN SUPPLY - After a shortage last week which delayed testing at Rocketdyne, the liquid hydrogen supply situation looks some brighter today. The two West Coast plants are back in production today. In West Palm Beach, the liquid hydrogen storage tanks are filled to about 90% of capacity and two of four available tank cars are also filled. The West Palm Beach plant is scheduled for a 15 day shutdown for repairs beginning November 11. ✓

gem

B11/7

21

W.M.,  
Unknowns  
to me!  
Who told  
you that?  
B

1. INSTRUMENT UNIT: Boeing has explained to us that they studied (on your suggestion during your visit to Seattle) the design, manufacture and management approach to the Instrument Unit for C-1B and C-5. We now have a 4" thick document from Boeing for our evaluation. Who is going to tell Boeing that we have firmed up other plans in the meantime?

2. PERT: NASA-PERT appears to still be non-existent from an official implementation standpoint within Marshall Space Flight Center. This Division questions the validity of PERT to the operating Divisions since it has apparently met with very little success during the past two-year "practice session". Training on PERT and the Companion Cost Systems is considered uneconomical since PERT itself has not functioned independently to date. Major emphasis of PERT seems to be towards a direct contractor-Center level relationship with division participation on an after-the-fact basis. I suggest rapid clarification of intended internal Marshall Space Flight Center use of NASA-PERT or cancellation of any further PERT effort altogether by the divisions.

H. Mauer  
request  
your  
comment  
B

\*3. SA-5 STRUCTURAL TESTS: The first phase of structural testing of SA-5 Thrust Structure Assembly was completed with satisfactory results. The test simulated captive firing conditions involving hold-down and gimbaling. The next phase will simulate rebound conditions. ✓

\*4. MODEL TANK TEST: A series of three model tank tests (reported in earlier notes) for S-I stage propellant dispersion system (destruct system) to be used in Block II vehicles has been completed. The test results show that the Flexible Linear-Shaped Charge installation on the container cluster as documented for SA-5 and subsequent give the desired controlled burning of the propellants. A short movie and still photos of tests performed will be available for showing in about a week. ✓

W.M.  
Please  
see  
me  
on this  
B

5. INDEPENDENT CONTRACTOR EFFORT: The situation relative to engineering support has become extremely critical due to delays in the decision relative to an independent contractor support effort for this Division. Since the beginning of this fiscal year, the decision to move Boeing personnel out and replace them with independent effort has been hanging on threads. As of 11-1-62 this Division released all Boeing personnel (324 in 8-62) and has not been able to build up supporting effort elsewhere. The critical shortage of money in the Chrysler effort and the inability to use Chrysler on C-5 has also taken its toll. Brown Engineering Company has been given a limited increase without showing our hand too openly and so has Hayes, but the overall problem still lies in the basic decision to go one way or the other on the independent supporting effort. The depth of penetration in the technical areas not only of S-I and S-IC but also S-II, S-IV, S-IVB and NOVA are in jeopardy. This decision is long overdue for us now and further delays will significantly affect all technical programs.

I thought  
? You  
had  
2. the  
decision  
What exactly  
are  
you  
waiting  
for??  
B

\*5  
9cm  
6. AUXILIARY PROPULSION: Reference paragraph 3, NOTES 10-29-62 MRAZEK (attached). S-IVB control requirements cannot be met by APOLLO-GEMINI motor. For example:

	Thrust	Duration	Min. Impulse Bit	Pulse Width (min)
APOLLO- GEMINI Motors	100#	540 sec.	25# sec.	.25 sec.
S-IVB Requirements	150#	1800 sec.	7.5# sec.	.03 - .05 sec.

\*6  
9cm  
APOLLO-GEMINI motor also uses an ablative-cooled nozzle which we doubt will last for 1800 seconds unless made much heavier. ✓

Attachment #1: Notes 10-29-62 MRAZEK

B 11/7

1. Coordination Panels:

On 30 Oct. Mr. Howard Burns of my office briefed Mr. Gautraud on agreements reached with you and your people on 25 Oct. regarding Systems Coordination Board (Coordination Panels). Mr. Gautraud supports our proposal for such a Board and is anxious to get the matter resolved. He is awaiting decision of Dr. Shea and Mr. Holmes.

My best speculation is that a Systems Coordination Board will evolve to the following:

- (a) Membership similar to that proposed
- (b) No formal relation to Coordination Panels or Review Board
- (c) Purpose - Review and synthesize Systems Requirements,  
Identify problems,  
Review solutions ✓

2. Mr. Gautraud's Visit to MSFC:

Although Mr. Gautraud is anxious to visit with you and your people and get a first hand view of MSFC's capabilities, he prefers to postpone his visit until he gets further guidelines on Systems Coordination Board from Dr. Shea. ✓

B 11/7

\*1. SPACE RESEARCH ACTIVITIES AT INDUSTRY: On a visit to West Coast industries during the past week, I learned that on the average the space research activities of industrial and university laboratories are funded in the following way: 50 to 60% by the Air Force; 15 to 20% by NASA; and the balance by ARPA, DOD, etc. Besides contracted research, a considerable amount of self-funded research is underway at each company. ✓

2. OART RESEARCH PROGRAM: A recent letter from OART to the Directors of Field Installations (October 31) established the research task approval system to be followed from now on. Mr. G. Miles from this division received additional information during his visit at Headquarters the week before last. In essence, the system gives Field Center Directors full freedom to propose research tasks. However, approval of proposed tasks is the sole authority of research managers in OART. Minute details of each task must be submitted to OART, and the funding level of each task area will then be established in accordance with the task selection by OART. After task approval has been obtained from OART, all the details of each task contract must go to OART again at least three weeks prior to contract award in order that "duplicate funding of a single piece of work" can be avoided.

Tasks which MSFC desires to submit to OMSF for funding must also go through this OART approval system. This is even true for the tasks which we plan to fund out of the famous \$10 M reprogramming fund which you suggested to Mr. Holmes.

In all fairness to OART, it must be said that the present OART charter does not allow much deviation from this course of action.

E.S.

In view of the short time which is left now in FY 1963 for submitting contract requests, I would suggest that we try to live with this system, hoping that we can obtain authorization for at least a modest part of our research programs. However, it becomes more and more obvious that a new system of research program implementation must be introduced. Other Centers share this opinion fully. My associates and I will be glad to work out a plan for a new system, if you so desire.

o.k.

Yes, I do.

agree

B 11/7

19

1. SA-3 ENGINE TUBING: A flared tube fitting sleeve on the heat exchanger LOX supply line was found to be cracked on engine positions No. 2 and 4 of the SA-3 vehicle at AMR. The sleeves were replaced 11-2-62 and involved the breaking of many high pressure LOX joints due to the inaccessibility of the joint. ✓
2. S-I BLOCK II LOX GEYSERING: The Block II, S-I Stage, LOX suction line was tested to determine whether geysering existed. The test revealed the existence of geysering. These tests are not necessarily indicative of vehicle conditions since the component test tank contained only approximately 15-20 ft. LOX. Further tests, more nearly simulating vehicle conditions, are planned. Too, helium bubbling for geysering elimination will be evaluated for flow rate requirements should the necessity for geysering elimination be established. ✓
- \*3. J-2 PROGRAM: Two engine tests run on 10-25-62 were successful  
5-second mainstage runs. Due to liquid hydrogen shortage:
  - a. Rocketdyne is reduced to 25% effectivity on engine system testing.
  - b. No component testing.
  - c. Holding up the assembly of next engines because of lack of green runs on components. ✓
- \*4. RL10 PROGRAM: Several engine components failed during vibration testing at Pratt and Whitney Aircraft (P&WA). Vibration tests are being conducted to the levels required in the Model Specification. P&WA is preparing corrective modifications on a first priority basis. It is too early to tell whether this can be solved within the present SA-5 schedule time. ✓
5. GENERAL: Mr. John Moore of the Engine Management Office was in the Headquarters Propulsion Office for 3 days during the week of 10-28-62. A complete review of the FY-64 engine project requirements was accomplished. The Headquarters Propulsion Office had not seen the FY-64 budget nor had a hand in the Headquarters input. ✓
6. S-IV BATTLESHIP TEST: A 70-second hot firing of the S-IV Battleship vehicle was made on 10-30-62. The helium heater was cut off at 25 seconds due to an indicated excessively high combustion temperature. The planned test duration was then shortened from 420 to 100 seconds, but was inadvertently manually terminated at 70 seconds because of a misunderstood time signal. ✓

NOVEMBER 13, 1962

B 11/13

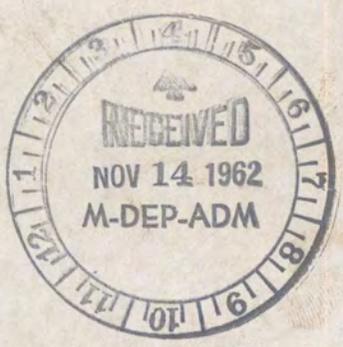
NOTES 11-13-62 GORMAN

1. COST REPORTING: During the quarterly review there was much discussion about the level of detail being reported to Washington on OMSF programs. You may recall that Ted Hardeman was given the job of looking into this problem and coming up with a level of detail which would satisfy the Washington office requirements. Hardeman has been working with the project offices on this problem. He will have a recommended solution by December 1.

While Eberhard was on the West Coast, he picked up a cost report prepared by the Douglas Company on the S-IV, which did not reflect a true picture. In checking this out further, I find that Douglas has been reluctant to abide by the NASA financial reporting system. It is possible that they may have received some encouragement in this attitude by our own Marshall people. The primary purpose of our cost reporting system is to: (1) serve the project management at MSFC; (2) to serve overall management at MSFC and at NASA Headquarters. It has no other purpose. The idea of a company such as Douglas deliberately preparing misleading information on an official basis is serious. Hardeman is to look into this more deeply with the Saturn System Office. We may have to go to "top-side" Douglas to get the situation straightened out.

H.F.

I'll see them first week of December, please keep me posted B



1. COMPUTER FACILITY SLIDELL

Landscaping of the Computer Facility in Slidell is now in progress and the estimated completion date is November 20. ✓

\* 2. CERTIFYING AUTHORITY

*fm*

Financial Management Office is establishing certifying authority with Michoud Operations in New Orleans. This authority will permit Michoud to certify contractor reimbursement vouchers directly to Birmingham for payment resulting in a significant decrease in the reimbursement cycle for contractor vouchers. ✓

B 11/13

1. Jupiter CTL Program: The damaged Jupiter Missile was de-erected last week for shipment back to Detroit. The Nose Cone was in satisfactory condition and will remain at AMR for use on the next Jupiter CTL Missile. ✓

Jupiter CTL Missile 106 arrived at AMR Thursday, November 8. Hopefully, erection of this missile will take place the week of 28 November, depending on pad rehabilitation. At the present time the service structure is the pacing item. ✓

\* 2. SA-3 Schedule: Saturn SA-3 has been firmly scheduled for Simulated Flight Test and Launch with AMR Range Scheduling. No problems exist. Simulated Flight Test T-0 time Tuesday at 10:30 EST. Launch T-0 time on Friday, November 16 at 12 noon. (NASA launch dates become unclassified 10 days before firing schedule launch date.) ✓

4. Reference last week's item on two Redstone shots for LeRC from Launch Complex 56. OSS has continued to furnish us with requirements for maintaining launch complex 56. As of last week Jack Rosenberry had advised that LeRC would try to use Redstone boosters for LH<sub>2</sub>/zero gravity tests. This was then cancelled and substituted the possibility of Tiros Satellites for the Weather Bureau. We are still delaying the "mothballing" of Complex 56.

K.D.

Don't understand  
that you mean by that

B

1. Centaur Transfer: Since the Working Groups formed by LeRC have accomplished their stated purposes, Aeroballistics participation will be minimized. However, in keeping with Dr. Seaman's directive of October 24, 1962, the Division personnel will be available for support and consultation as required. ✓

2. Northrop Support for Aeroballistics Division: A few technical key people from Northrop visited last week for further discussions of support to our Division. It looks as if starting 1963, we can expect some 15 people of good experience which will work closely with us in Flight Mechanics, Celestial Mechanics, and Structural Dynamics. The limitation is dictated by available funds, but a gradual build up is preferable anyway. ✓

\*  
Jan ✓  
3. Angle of Attack Measurements on Fins of Saturn Vehicles SA-7 - SA-10: Angle of attack measurements have been requested to be made on the fins of Saturn vehicles SA-7 - SA-10. Several considerations lead one to request these measurements. It is becoming increasingly difficult to put angle of attack devices on the nose of a vehicle, which is the most desirable position. Other locations have to be considered. Fin locations have been suggested several times but the difficulties involved in an experimental wind tunnel test to check this location would be tremendous, due to model size, altitude requirements, rocket exhaust spreading characteristics, upwash flow fields, etc. A close analysis of the SA-1 flight by Aeroballistics Division has indicated that no great problems exist, due to boundary layer or separated flow regions, for meters mounted on the end of the fins of the above vehicles over the range of altitude being considered at this time (0 - 75 km). However, parameters such as fin vibration or meter vibration are not known. If measurements are made on a vehicle which has a good angle of attack measuring system on board, such as Q-Ball on vehicles SA-7 - SA-10, the potentials of an installation on the fins can be explored with very little expense compared to the cost of development of models and equipment for a large and expensive wind tunnel program. ✓✓

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H.G.

I'll see them first  
week of December, Please  
keep me posted B

NOTES 11-13-62 GRAU

B 11/13

19

- \* 1. SA-4 POST-STATIC CHECKOUT: Final mechanical pressure and functional testing was completed on November 5, 1962 and the vehicle was moved into the performance/electrical test area. No major problems were encountered during this phase of testing. ✓
2. SA-5 PRE-STATIC CHECKOUT: The vehicle was received for pre-static checkout on November 6, 1962. Status determination and continuity checks are being made this week. ✓
3. TRAINING: As of October 24, 1962 a total of 1234 personnel hold certificates on soldering from our schools on "Reliable Electrical Connections". ✓✓
- \* 4. DOUGLAS AIRCRAFT DEVIATIONS: Review and evaluation of 1216 items of SATURN S-IV stage electrical ground support equipment, which deviates from XDOD-STD-0002A, has been completed on Douglas Aircraft Deviation Request No. 163. This review was conducted by representatives of Astrionics Division, Quality Assurance Division, and Propulsion and Vehicle Engineering Division. The memo and approval or disapproval of each individual item is now being typed in Astrionics Division, and will be concurred in by the representatives from the other divisions. ✓
5. CAPTAIN FORTUNE'S VISIT: Capt. William C. Fortune, Director of the Mississippi Test Facility, was given a tour of our facilities and briefed on the efforts of this Division in support of the Center's projects. ✓

Mr. Grant,  
Note 7/11-13

B 11/13

NOTES - HAEUSSERMANN, 11/13/62

1. HYDRAULIC ACTUATORS FOR S-II AND S-IVB (reference your comments to Item 2 of 11/5 Notes, copy attached). A higher expansion ratio of the nozzle for S-IVB increases the torque requirements negligibly; the aerodynamic load might be more important. Investigations are being carried out. ✓

2. FLIGHT SIMULATION FACILITY - SECOND PHASE: CELESTIAL BODY MOTION SIMULATOR. Contract for design engineering and manufacture with R. E. Aickison, Inc., Azusa, California, was effective 11/7. Delivery of simulator to MSFC is to be within 14 weeks. Due to extreme alignment accuracy requirements, it is presently estimated that after receipt MSFC personnel will require an additional 90 days for installation, alignment and acceptance testing of the contracted items. ✓

\*3. PHASE-OUT OF CHRYSLER SUPPORT. The proposed plan of phasing local Chrysler support out of the C-1 electrical vehicle and GSE program will cause delays in equipment delivery which will result in delaying checkout and launching of SA-5 by three months and SA-6 by 2 1/2 months. This matter is being reviewed by our Program Coordination Office and Saturn Systems Office. A meeting is scheduled today with Bob Lindstrom to examine total requirements and modify the present phase-out plan to provide necessary continued Chrysler support.

W.H.

Not acceptable.

Please keep me posted

B

1. SA-T4.5: The last firing of this series (SAT-31) was successfully conducted for 115 sec. intended duration, Friday, 11/9/62. Quick-look indicates that deflector is OK. Some minor, unexplained instability in the LOX pump inlet pressures on 7 of the 8 engines is still under investigation. ✓
- \* 2. S-IV BATTLESHIP TESTING, DAC SACTO: DAC is presently changing from A-1 engines to A-3 engines. This and other modifications and maintenance will take an estimated one month's time to complete. First turbine spin-up test with modified system is presently scheduled for 12/19/62. ✓
3. SA-D5: Installation of the Block II Dynamics Vehicle on the Dynamic Stand was started. S-IVD stage from DAC is due to arrive at MSFC, 11/16/62. First testing scheduled about 12/6/62. ✓
4. RL10A1 ENGINE TESTING, MSFC: Next firing scheduled, Friday, 11/16/62, with engine "can" closed. A nitrogen purge system has been installed, which, it is hoped, will minimize "flash-back" at ignition. Intended duration is 40 seconds. ✓
- \* 5. SA-5 GSE: There are still no satisfactory propellant connectors for swing arm No. 2 for SA-5. Both the LOC- and DAC-modified Parker couplings either leak or fail to disconnect satisfactorily. LOC is preparing a completely new coupling design and release housing. ✓
6. F-1 ENGINE TEST STAND, MSFC: Explanation requested in last week's NOTES (Attachment No. 1) enclosed as Attachment No. 2. ✓

ATTACHMENT NO. 1: F-1 Engine Test Stand  
ATTACHMENT NO. 2: NOTES 11/5/62 Heimburg

F-1 ENGINE TEST STAND

At meetings with the A-E (AETRON) in Covina, California, first week of June 62, design approaches were modified so that the estimated cost of the project was within the approved budget of \$6,000,000.00. Test Division requested immediate notification if future estimates indicated an overrun. On 7/25/62, estimates prepared by A-E and sent to Facilities Engineering Office, showed an overrun of approximately \$400,000.00. Due to communication difficulties, it was 8/31/62, before Test Division received a copy of estimates and overrun. At meetings in Covina, 9/4/62, the indicated shortage had risen to approximately \$600,000.00. Attempts were made to lower the cost, but the design had gone so far (90% complete) that this was impossible without virtually starting over. AETRON was instructed to recheck their estimates immediately in order to have something firm on which we could reprogram money. On 9/14/62, a new total overrun figure of \$900,000.00 was received. Before any final action could be taken, word was received, on 10/1/62, that further checking showed that the estimated overrun was now approximately \$1,300,000.00. A meeting was held in Test Division on 10/4/62, which was attended by Test, Facilities Engineering Office, Mobile, and AETRON representatives. Possible ways of relieving the situation were explored without success. The validity of the last estimate was verified by the Corps of Engineers and there has been no further change.

22  
The matter was submitted to the Facilities Review Board on 10/5/62, and they approved a request for additional funds for this project in the amount of \$1,622,000.00, which contains a contingency factor over the actual overrun. This request was submitted to OMSF, 10/23/62, and they agreed to provide \$428,300.00 in the FY-62 part of this project, and instructed MSFC to provide the additional \$1,193,700 from other FY-63 C of F projects. MSFC has requested permission to advertise for bids on a part of the work up to the limit (\$6,000,000.00) of available funds. This request has not been approved. Adherence to the schedule required that bids be solicited on 10/1/62. There has been a slippage, day-for-day, since then. Facilities Engineering Office is attempting to find some FY-63 project which may be deferred or reduced.

K.H.

Is that "two-key" concept the stumbling block? Suggest you ask Bourne for copy of my letter to Brainerd Holmes re "two-key" problem. It would appear that some of that C of F overrun could be taken out of R&D.

ATTACHMENT NO. 1:

We can't go on slipping. Please suggest what approach we should take. K.H.

NOTES 11-13-62 HOELZER

B 11/13

No Report.

\* 1. CENTAUR:

Three additional Centaur Project Office personnel were released by Lewis at the end of last week. During the week of Nov. 11, four Project Office personnel remain at Lewis. None of the seven Project Office personnel interviewed by Lewis for permanent assignment have accepted the Lewis offer. ✓

2. ATLAS:

The Office of Space Sciences made their presentation to Dr. Seamans on Nov. 6 relative to management of the NASA Agena Program. No decision was reached. This office prepared a letter for your signature to Dr. Newell, expressing the Marshall position relative to this matter. In the meantime, Mr. Evans and a substantial portion of the Centaur Office are in the process of familiarizing themselves with the Atlas system and establishing status and relations with the Air Force. ✓

3. C-1/AGENA:

\* General agreements relative to the MSFC/JPL/LOC participation in the C-1/Agena preliminary design study were established in a Nov. 7 meeting. JPL will prepare a summary development plan for submission to NASA Hq. by Nov. 15. Marshall inputs to this summary development plan were furnished by TWX Nov. 9. Appropriate LMSC personnel will be at Marshall on Thursday, Nov. 15, to discuss their participation in the program. From this discussion, it is planned that LMSC will generate a statement of work for review. It is planned that an LMSC contract will be in effect by January 1, 1963. ✓

4. AGENA:

a. Mariner 2: On Nov. 8, the spacecraft power system began operating normally again. The apparent short in the solar panel causing voltage degradation apparently burned itself out. As a result, the cruise science has been turned back on and data are being received with scientific measurements being essentially the same as before cruise science turnoff on Oct. 31. As of 2400 GMT, Nov. 8, the spacecraft was 14.7 million statute miles from the Earth and 12.8 million statute miles from Venus. The Earth referenced velocity at that time was 15,952 miles per hour. ✓ ✓

b. Gemini: Reprogramming is continuing with decisions reached by MSFC, SSD and LMSC for the effort necessary. The LMSC ROM for the program is \$44.5 million. The funding limitation of \$36 million established by MSC is inadequate. FY-63 budget of \$10.3 million as limited by MSC will have to be increased. The exact amount will be known by November 20. ✓

B 11/13

1. ADVANCED LAUNCH VEHICLE FOR PASSENGER TRANSPORT

I mentioned in my last notes that we might have a potential problem area with M. Rosen on the approval of additional study funds on this project. You asked for additional information. May I postpone this until I am back from my trip (reviewing this effort). Maybe Rosen will have signed off by then. ✓

2. NOVA

Several MSFC personnel involved in the NOVA Study, plus representatives from Headquarters (Rosen's and Shea's office), the AF (Edwards AFB), and Lewis (M-1 office) visited Martin and GD/A to review the progress and coordinate in-house activities with those of the contractors. Progress to-date is satisfactory. GD/A has done a very good job during the past two months. They have a good understanding of the problem and are well organized. We expect to get an outstanding job from them. This feeling is shared by all division people who were in attendance. ✓✓

Due to recent budget exercises (FY 1964), the study schedule has been changed as follows:

a. Completion of Conceptual Phase on April 1, 1962. <sup>32 B</sup> (At this time we should be in a position to narrow the number of configurations down to one (1) and initiate the preliminary design phase. However, we have the choice of keeping the two (2) most desirable configurations and putting them through a parallel preliminary design phase and make the "one" vehicle selection in August 1963, then start the detailed preliminary design phase. -- At this time the latter seems to be the best choice. We can wait until April to make this decision. ✓

b. Complete preliminary design and system definition phase by August 1963 OR, if we take the alternate plan mentioned above, select one vehicle and initiate a detailed preliminary design in August 1963. It would be completed along with systems definition by March 1964. This would give several months for hardware RFQ, evaluation, and contractor selection for program initiation in early FY 1965. ✓

This study modification is in line with our discussions of early October. ✓

Martin and GD/A will be at MSFC for a working meeting on December 11, 12, and 13, 1962. Would you like for them to give you a summary briefing of their activities? No basic decisions will be required during the meetings.

For the configuration selection (1 or 2 vehicles) in April, we recommend that the status of the study and the recommended vehicles be presented to the OMSF Management Council for concurrence or approval. Do you think that this is proper, desirable, and timely?

H.H.K.

Only day I'd be available.

Yes, please lay out w/ Bonnie B

yan

19  
B 11/13

*B* \* 1. C-1 Program: Assembly of S-I Stage for SA-5 has been completed on schedule. The stage was officially transferred on November 6, 1962 to Quality Division for check-out prior to static firing. The first Block II Stage, as you know, required complete retooling for the Thrust Structure and the Second Stage Adapter. In order to transfer this stage on schedule, a magnitude of teamwork and cooperative effort between design engineering, tool engineering, fabrication and quality control was absolutely essential. ✓✓

*Mac*  
*How about*  
*that*  
*asterisk?*  
*B*  
The Structural Assembly of the first Payload Adapter (replacing the Apollo capsule) for SA-D5 has been completed. ✓

\* 2. S-IC Stage: An agreement has been reached with Boeing as to *you* responsibility for procurement of vehicle components ("Specialty Hardware") for our in-house program whereby according to an established list approximately 50% of the items would be procured by Boeing through task assignment and the remaining items by ME Division directly from industry. The agreement provides for complete coordination among all parties involved for selection of sources, quality control, technical evaluation and control of design qualification, etc. But the technical supervision and direction of the subcontractor would be done only through one channel--either Boeing or MSFC-ME. ✓

B 11/13

Notes 11-13-62 Lange

1. C-1: S-I Michoud - Out of 150 items from Nat. Industrial Equipment Reserve CCSD selected cards for 82 of the most promising items with an estimated value of approx. \$1.1 Mill. Survey of equipment will start 11-12-62. ✓

Modification of contract 4016 for Documentation Maintenance is in negotiation. Negotiation of Technical Work Statement is expected to be complete by 11-16-62. The documentation modification will include transfer of 40 - 45 people from P&VE under Item II. ✓

Preliminary information from CCSD indicates that they can live within the \$46 Mill limitation for FY-63 (excluding Direct Support) ✓

Information from OMSF-ML indicates that the acceptance test facility at MTF has been dropped from the FY-64 C of F program. Staff paper is being prepared to have the project reinstated. ✓

S-IV Battleship - Static firing on 11-8-62 was aborted at 41 seconds when small fire developed at engine #3. Helium heater worked satisfactorily. Next firing, scheduled for 11-10-62, was cancelled due to leaking thrust chamber tubes. Removal of A-1 engines is being started. ✓

2. C-5: S-IC - Headquarters informed by phone on 11-10-62 that Plan V (to include SA-501 final assembly at Huntsville) is officially approved. It was also mentioned that the \$175,000 for MSFC Vertical Assembly Tower acceleration was approved by Dr. Seaman's Office, and will be taken to Congress for emergency funding. ✓ ✓

Technical evaluation of Boeing cost proposal was completed and pre-negotiations started on 11-9-62. ✓

The 60-day extension of long term contract is still being reviewed at HQ's. ✓

S-II - Quarterly review is scheduled for 1-15-63 at MSFC.

NAA is in process of realigning the program to Plan V schedule. ✓

3. Guidance System - With M-SAT memo of 11-7-62 to M-DIR recommendation was made that Boeing cease all further Instrument Unit efforts unless directed by MSFC to conduct "funded" task in the future. M-ASTR and P&VE concurred in memo. ✓

M-SAT requested all pertinent MSFC elements to initiate a PERT network for C-5 Instrument Units for SA-501 and C-5 test units. ✓

Comments, additions and/or deletion pertaining to the 12-11-62 Instrument Unit Project Review were requested from all potential contributors. ✓

So do 11/13 B

\* Mr. Dannenberg said this 60-day extension was approved today by HQ (phone call from them)

✓ B Bhs 11/13/62

O.L.

Did we make any headway with respect to better machine tools out of Industrial Reserve? (Reference my recent letter to Brainerd Holmes)

B

B 11/13

NOTES, 11-13-62, MAUS

- 1. SEMI-ANNUAL INSTITUTIONAL REVIEW - Tom Jenkins from D. Wyatt's office will visit MSFC 9:00 a.m., November 15, to discuss (a) Institutional Reviews; (b) Institutional Reporting; and (c) Manpower Requirements. Mr. Holmes has responsibility for this now and Mr. Jenkins is handling it for him. Mr. Jenkins stated that your attendance will not be necessary, but Mr. Jenkins did ask that Dr. Rees and Mr. Gorman attend the meeting.
- 2. 3RD QUARTER PROGRAM REVIEW MEETING - OMSF has indicated that next Program Review is tentatively scheduled for Dec 13-14. This will necessitate submitting an Operating Plan to OMSF by Nov 20; we feel we can comply with deadline since most of the data are readily available. ✓
- 3. PERT PROGRAM - Tom Smith will attend the Nov 15 & 16 meeting in Houston, which is being arranged by NASA headquarters. Primary topic for discussion will be field center organization for implementation of NASA PERT and Companion Cost System. ✓

APPLICATION OF NASA PERT BY MSFC - A complete review of status of application will be presented to you within two weeks. ✓

Suggest you include some of the underlying principles and methods  
B

- 4. OMS LONG RANGE PLAN - OMSF sent us copies of the Long Range Planning material submitted to Office of Plans and Program Evaluation, NASA hdqs, on Launch Vehicles, Propulsion, and Facilities. They requested comments for revision of this first submission, as they want their submissions to "reflect the consolidated judgements, and technical competence of all centers and directorates responsible for implementation of the program." We will consolidate the MSFC comments and are requesting an extension of the November 19 deadline date. ✓

H.M.

RUSTH

Short notice! Both Rees and I plan to be at Casanoveral. Suggest you postpone that visit.

B

B 11/13

NOTES 11-13-62 MRAZEK

\*1. S-II STAGE DESIGN: Recent technical discussions with Space and Information Systems Division in the areas of heat transfer in the common bulkhead; guidance and control equipment environment control system; propellant tank pressurization; and tank sidewall insulation heat transfer revealed technical problems for which satisfactory technical solutions were nonexistent. An all-out Marshall Space Flight Center effort is in progress to assist the contractor in solving these problems. ✓

W.M.

I think this is indeed one of our most pressing problems  
B

\*2. BIAXIAL LOADING FACTOR: At the insistence of The Boeing Company the use of a biaxial loading factor, separate and apart from the standard design safety factor, was authorized for sizing weldment thicknesses in the booster. This will result in a weight increase of approximately 800 pounds in the S-IC (equal to loss of 50 pounds of payload reserve). ✓

3. RESULTS OF S-IV BATTLESHIP TEST 11-8-62: Two attempts were made to complete a LOX depletion test. On the first attempt the diffuser was blown prior to ignition. The second attempt was terminated after 41 seconds duration by a manual "observer cutoff." A fire on engine #3, not confirmed, was observed at 25 seconds and cutoff was given 16 seconds later. The helium heater performed as expected; however, the test did not reach the step pressurization time. The LOX seal cavity pressure did not exceed 1.5 psi on all engines. The fuel inlet valve on engine #5 had to be recycled several times.

Plans were to attempt another test firing 11-10-62, but if unsuccessful, the A-1 engines will be replaced by the A-3 engines. No information available yet. ✓

NOTES 11-13-62 Rudolph

B 11/13

Negative

B 11/13

NOTES 11-13-62 Stuhlinger

1. SPACE RADIATION PROGRAM: The management of this program in OMSF appears to be shifting from Dr. Roadman of Aerospace Medicine to Mr. Low of Spacecraft and Flight Missions, where the cooperation with OART (Mr. Keller) is expected to be vastly improved. ✓

\* 2. DEGREE OFFERINGS AT HUNTSVILLE CENTER: The University of Alabama is expecting to complete soon a poll of deans, department heads, and faculty members on this subject. A meeting will be held November 12 to summarize the state of affairs, and individuals from the Army and NASA will be invited to discuss the new University position. After this meeting, the University will contact NASA Headquarters in the hope that the new position may justify a grant. ✓

3. SUPPORTING RESEARCH: (FOR INTERNAL MSFC INFORMATION ONLY) RPD has now received 1.4 M from Dr. Lange as a first installment on the funding to be applied to filling the "dry lake". At the present time, MSFC has a free hand in spending this funding. We should be extremely careful not to let this money fall under the direct managership of OMSF (Mr. Trueblood) if we desire that its maximum usefulness to MSFC be retained.

4. OFFICE OF SPACE SCIENCES SUPPORTING TECHNOLOGIES: (FOR INTERNAL MSFC INFORMATION ONLY) We have been advised by the Office of Space Sciences that 400K has been set aside for an OSS-MSFC Supporting Technology Program in FY-63. Seven MSFC tasks involving various aspects of spacecraft (and launch vehicle) technology have been tentatively approved by OSS. At the present time, the task descriptions are being rewritten by OSS in order that OART will not be able to attack OSS for sponsoring the proposed work. (The same Seamans' approval procedure crops up again here.) ✓

5. MICROMETEOROID PROJECT: Mr. Milton Ames from OART, and other representatives from OART, OMSF, Lewis, and Langley will meet with us at MSFC on November 20 for a joint discussion of the micrometeoroid project. Mr. Ames expects that final Headquarters authorization of the project will be obtained soon after this meeting. ✓

6. OMSF RESEARCH PROGRAM: (FOR INTERNAL MSFC INFORMATION ONLY) Mr. Miles (RPD) and Mr. Dunlap (CPO) handcarried your letter and the newest version of the FY-63 MSFC Launch Vehicle Program to Milton Rosen. Although our submission contained more details than previously requested by Mr. Holmes and Mr. Rosen, it was unacceptable to Milton. Against his promises during the 2nd Quarterly Review Meeting, he demanded minute task-by-task details for the funding amounts approved in the Review Meeting, i.e., \$2.2 M for Propulsion Technology (Weidner); 1.8 M for Advanced Studies (Koelle); and 6.05 for Vehicle Supporting Technology (RPD), for his "personal review". Although the required details are rather difficult to develop we will do our best to comply with Milton's demand. ✓

No action is requested on your part at the present time. ✓

E.S.

→ Suggestious? I think this will work only as long as tasks are reasonably "Saturn-related" B

B 11/13

\* 1. F-1 PROGRAM: F-1 engine testing is continuing at a relatively slow pace due to technical difficulties.

The nozzle extension damaged on a previous run of engine 006 appears to be beyond repair. A six-inch wide section was burned through both walls. ✓

The contract for the construction of the three additional F-1 Engine Test Stands at Edwards Rocket Base was signed recently. ✓

\* 2. J-2 PROGRAM: The Ontario, California, liquid hydrogen (LH<sub>2</sub>) plant was back in operation on 11-3-62. Rocketdyne is presently receiving all the LH<sub>2</sub> requested. ✓

Rocketdyne indicates that propellant shortage for the period 9-22-62 through 10-27-62 has caused a two and one-half week overall slip. ✓

\* 3. RL10 PROGRAM: We discussed the recent failures of an RL10A-3 engine during vibration testing at levels specified in the model specification. It was determined that the results of these first tests were probably invalid due to poor choice of location of the instrumentation used to monitor input, and the absence of instrumentation on the engine. It was decided that the test should be re-run with adequate instrumentation to determine the thresholds of failure. The acceptability of the present RL10A-3 engines for use on the SATURN SA-5 vehicle will be based on the results of these tests. ✓

Also, we discussed instant start for the RL10A-3 engine. A LOX-side instant start configuration was agreed upon. It was also agreed that a recirculation system would be the first priority for the fuel side instant start configuration. Backup effort will continue on other fuel side instant start schemes with early December as the date to decide which fuel side instant start system will be qualified. ✓

Discussions between our Bill Brown and Lewis Research Center personnel on the RL10A-3 Engine Program and the Engine Throttling Program were held 11-7-62. Working level agreements were reached as to the character and function of panels to represent the two Centers for coordination of RL10 engine matters. Agreements were also reached as to the immediate requirements for modifications of the existing Engineering Change Procedure. ✓

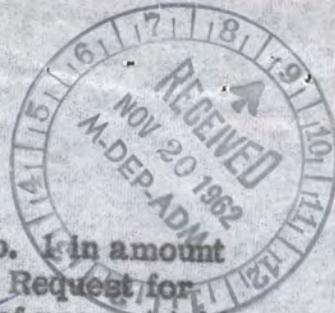
4. DEPARTMENT OF DEFENSE LARGE SOLID MOTOR PROGRAM: The Department of Defense large solid motor program will (1) finalize a contract with United Technology Corporation during November for the development of the TITAN III motor and delivery of 24 flight motors, (2) load and fire existing steel metal parts of a 156" diameter motor and probably initiate a full-scale 156" motor development program for an as yet unstated requirement (TITAN IV ???); (3) will fund \$20 million for the demonstration firing of two one-half length 260" diameter class motors and (4) fund \$12 million for advanced technology studies of large solid motors. Item 3 may be increased to one or two full-length 260" motors if NASA evidences interest at the Headquarters level. What is our interest?

H.W.  
 → Suggest we have a discussion on this subject following a more detailed briefing on that DOD program.

B

NOVEMBER 19, 1962

NOTES TO HOLMES 11-20-62 DEBUS



1. Land Acquisition. Real Estate Directive No. 1 in amount of \$27,750,000 has been issued covering NASA Purchase Request for acquisition of 14,800 acres, comprising Area IV, North of present taking.
2. Orsino Causeway Fill. Contract awarded to Gahagan Dredging Company on 9 November 1962 for \$895,000.
3. Channel and Fill for VAB and LC 39C. Contract awarded to Gahagan Dredging Company on 9 November 1962 for \$3,618,500.
4. VAB Design. \$3,322,000 has been negotiated for design of VAB. Pre-Design Conference scheduled at Jacksonville for 27 and 28 November 1962.
5. Atlas Agena. On 15 November a meeting of the Ranger Inquiry Board was held at LOC. LOC, 6555th Test Wing, and JPL presentations were made to the Board in connection with past history and problems with this program at AMR. Board is fact finding only at this time. A report is to be published later.
6. Budget. The FY 64 Launch Operations Development Budget was revised, reprinted and resubmitted to NASA Headquarters.
7. Crawler Procurement. Following our discussion on Friday, November 16, and a further telecon with Al Siepert on Monday, November 19, we are preparing a procurement plan based on CPFF and incentive clause so as to be prepared if decision should be made in this direction.
8. Jetstar. P&C is moving on the contract coordinated with Brackett as per your guidelines. Will keep you posted.
9. SA-3. Preliminary evaluation of the flight records indicates all systems performed normally and high quality records were obtained for detailed analyses.
10. GD/A Visit. In view of decision to retain Atlas Agena activity, I plan to accept invitation of GD/A to attend an orientation and detailed briefing of the Atlas booster at San Diego plant December 3-4-5. Several LOC and MSFC members will attend at the same time.
11. PIO Auditorium. Lynn of OMSF is at the Cape this week to look into this problem with our P&C people. Will discuss with you later.

*Mr. Garrison*

NOTES 11/19/62 CONSTAN

*B 11/20*

\* I. COMPUTER FACILITY

*Jan*

Phase I of the modification to the Computer Facility (basement area) has been completed. It is expected all computers will be operational at the facility by November 26, 1962. ✓

NOTES 11/19/62 DEBUS

B 11/20

No NOTES received from Dr. Debus this date.

B 11/22

1. NASA Environmental Sub-Committee: A second meeting of the NASA Environmental Sub-Committee of the Design Criteria Steering Committee was attended in Washington, November 14 & 15, 1962, by an Aeroballistics representative. Mr. Rhode, NASA Headquarters, is Steering Committee chairman. The desired end product of the sub-committee's work is still unclear. It appears that it will be a compilation of state-of-the-art environmental data, rather than design criteria as such. This is in general agreement with the conclusions expressed in the September Management Council discussions on this subject. The Design Criteria Steering Committee has met only one time, and is planning a December meeting. ✓

o.k.!  
B

2. C-5 Launch Deflector: A cold air facility in support of C-5 launch complex design has been in operation since late summer at Aeroballistics Division's wind tunnel (see attached photograph). The model consists of a 1/50 scale S-IC booster with model F-1 engines scaled to exit Mach number and exit to ambient pressure ratio. Launch complex parameters investigated include: deflector wedge angle; height; turning radius; width; ridge separation from engines. Additional parameters will include: transporter hole size; channel length, width and depth; vehicle height on transporter. Static pressure measurements and flow pictures were used for evaluation. Test results indicate that a wedge angle of 60°, a turning radius of 280 inches and a width of 448 inches, with the ridge radius located 3-engine diameters below F-1 engine exit, give minimum interference at the base of vehicle. Data have been transmitted to Test Division to guide their efforts on the hot model test program. Aeroballistics is working directly with Test Division. All coordination with LOC is through Test Division. A final report of model studies will be prepared by Test for concurrence by Aeroballistics. ✓✓

\*  
3. Air Load Manual and Wind Tunnel News Letter: Two communication media have recently been adopted by Aeroballistics Division to submit current aerodynamic data to all MSFC divisions, stage contractors, NASA centers, and NASA Headquarters. One of these is the Air Load Manual which condenses into a single volume all current aerodynamic information and supporting wind tunnel data for each vehicle. Manuals for C-1, block II and C-5 have already been distributed. These manuals are continuously up dated as revised information becomes available. ✓

The Wind Tunnel News Letter is an informal publication issued monthly and distributed to holders of the Air Load Manuals plus others. Included in the news letter are items of interest concerning wind tunnel programs test data, recent documentation releases, problem areas, and other news items of interest. ✓

4. Research Program on Wind Shear Determination in Lower Atmosphere: Re: item 6, Notes 11-5-62 Geissler, (copy attached). Mr. Vaughan's presentation on the "Role of Wind, Wind Shear and Turbulence in the Development of Space Vehicles and Missiles" was well received by the Structures and Materials Panel of AGARD as evidenced by the attached letter. ✓

November 13, 1962

RVA

Dr. Ernst D. Geissler  
Director, Aeroballistics Division  
George C. Marshall Space Flight Center  
Huntsville, Alabama.

Dear Dr. Geissler:

I know that you will be pleased but not surprised to learn that Bill Vaughn made an excellent presentation on the "Role of Wind, Wind Shear and Turbulence in the Development of Space Vehicles and Missiles" to the Structures and Materials Panel of AGARD in Washington on November 6, 1962. This paper was exceptionally well designed to serve its purpose, as was evident not only from comments of the Panel members but also from the fact that the Panel took action which may result in an inter-NATO program for the measurement of wind shear and turbulence at several European stations.

Please accept our thanks for your permission to have Bill present this paper for us, and please convey our appreciation to him and to his co-author, Mr. Scoggins, for the really excellent job they did.

Sincerely yours,

Richard V. Rhode  
Chairman  
Structures and Materials Panel, AGARD

PERO

Congrats for a job well done  
to Mrs. Vaughn and Scoggins!

(Isn't it  
Vaughan rather  
than Vaughn?)

B 11/22

NOTES 11-19-62 GORMAN

B 11/20

\* 1. TRANSFER OF CONTRACTS: The schedule for transferring Saturn contracts from WOO to MSFC is as follows:

S-II December 15, 1962

S-IV January 20, 1963

S-IVB January 20, 1963 ✓

2. MICHOU VERTICAL ASSEMBLY FACILITY AND HYDROSTATIC TEST AND CLEANING FACILITY (HIGH BAY FACILITY): Bids for this facility were opened on November 15, 1962. Apparent low bidder is Ross Corporation with a cost of \$2,664,433. Foundations and pilings for this structure are presently under construction. Project is currently on schedule. ✓

B 11/20

1. SA-4 POST-STATIC CHECKOUT: Final electrical checkout of the SA-4 vehicle is in progress. Networks and Radio Frequency tests are complete. Instrumentation tests are in progress with 482 of the 692 measurements completed. System tests are being hampered because of shortage of the Measuring Voltage Power Supply, Control Computer, Q-Ball Angle of Attack Meter, Control Accelerometers and the ST-124P. Delivery of the ST-124P is expected on November 19, 1962. ✓
2. SA-5 PRE-STATIC CHECKOUT: Status determination, continuity tests and engine clearance checks were completed this week with mass characteristics determination being initiated on November 14, 1962. ✓
3. RIFT PROGRAM: Quality Assurance support for the RIFT Program at Lockheed was discussed with the Nuclear Vehicle Project Office and the Air Force at Lockheed. The Nuclear Vehicle Project Office prefers Quality Assurance coverage by MSFC, not the Air Force. This program could be supported with a minimum number of people for the next 12 to 18 months. Advantages of MSFC support are greater control, shorter response time to problems and firmer direction to the contractor. ✓
4. QUALITY SURVEY OF GENERAL ELECTRIC FACILITIES: Personnel of this Division recently participated in a Quality Survey with the Air Force of the General Electric Co. facilities at Syracuse and Utica, New York. This was in connection with the Mistram Transponder. ✓
- \* 5. MEETING AT MANNED SPACECRAFT CENTER ON QUALITY ASSURANCE: A meeting was held at Manned Spacecraft Center on November 2, 1962 to discuss working level Quality Assurance problems at NAA/S&ID concerning S-II Stage and Apollo contracts. Interest was extremely high and a valuable exchange of information concerning a single NASA Quality Assurance approach to NAA/S&ID should be forthcoming. Regular monthly meetings will be held to discuss Quality Assurance problem areas and Center interpretations of the NASA Quality Assurance documents NPC's 200-1, -2, and -3. Great benefits are expected from these meetings. ✓✓
- \* 6. CENTAUR: Extensive changes in checkout philosophy, sequence, methods, and procedures were to be implemented by GD/A on Vehicle F-2. Quality Assurance Division had planned to send an experienced checkout team (6 or 7 people) to San Diego to closely monitor and control final acceptance testing of this vehicle. Cancelling of F-2 as a flight vehicle enhanced this idea by affording an excellent practice and training opportunity. When the project was transferred to the Lewis Research Center this Division felt obligated to offer to continue this effort as planned for Vehicle F-2 since the Lewis Research Center does not as yet have a capability in this area. However, this offer was declined by the Lewis Research Center (telephone conversation with Mr. Robert Godman, Chief of Reliability and Quality Assurance, on Nov. 7, 1962). In a subsequent telecon on November 14, 1962, Mr. Godman requested that two people from MSFC participate during the checkout as advisors. ✓

\*  
Jan 1. QUICK LOOK AT SA-3: Our Green Mountain Propagation Test Facility and the microwave link to Computation Division and our telemetry lab were operational for the launch. VHF and UHF telemetry signals as well as UDOP were received. UHF telemetry signals were received at T +128 seconds and UDOP was received at T +132 seconds. Received telemetry information was recorded on magnetic tape as well as retransmitted via microwave to Computation Division and our telemetry lab. Data handling and processing scheme provided records for review and evaluation in real time. I was reviewing the first strip chart just 15 minutes after launch.

Quality of signals was good during period of reception with signal strength from telemetry link 1 as high as -62 dbm. The UDOP signal strength got as high as -82 dbm. All signals were lost at T +292 seconds. However, the signal strength record indicated that the UDOP signals reappeared several times after T +292. At the present time, there is no explanation for this.

For SA-4, improvements in timing, count down clocks, and additional telemetry relay links will be added to this facility. So far the Green Mountain station has proven to be an excellent facility for experimental testing of several low noise receiving systems in conjunction with laboratory studies and serving as a receiving station for vehicle launchings.

\*  
Jan Quick-look analysis of the SA-3 "Green Mountain" records indicate the following points of interest: (a) The time period covered indicated no noticeable vehicle control motions prior to in-board engine cutoff. Starting at that point a motion of the pitch and yaw actuators at a frequency of  $\approx 1$  cps indicates that some sloshing existed. (b) At out-board engine cutoff a lowly damped oscillation at 2.8 cps in the control accelerometer and rate gyro channels indicates a "ringing" of the first bending mode. This is not unexpected since the control loop which damps the bending is essentially opened at cutoff. The information will be useful in establishing free-free structural frequency and damping. (c) When the retro-rockets were fired a noticeable roll torque was introduced. Since no control torque was available to compensate, the roll error reached 15 degrees within 5 seconds of the retro initiation. ✓

2. C-1, S-1, BLOCK II ACTUATORS: Problems have been encountered in the development of the servo valve which require modifying the production techniques and retro-fitting existing units. Prototype servo valves received (20) performed satisfactorily but first production units have failed to meet specifications. Astrionics and Moog personnel have conducted an extensive joint investigation of the problem. A review of their findings disclosed that the basic cause of the failure was the dynamic pressure feedback (DPF) design. A DPF nozzle spacing of .0005 inches made the valve highly susceptible to contamination. To resolve the problem, production cleaning techniques will be improved to minimize built-in contamination possibilities and the spacing will be increased to .0012 inches. While the units are being reworked other features will be incorporated (with negligible influence in the availability of flight hardware) which will improve the overall reliability and performance of the actuator package, eliminate auxiliary pump pick-up problems, etc. ✓

B11/20

1. SA-T4.5: The stage was removed from the test stand, Thursday, 11/15/62. Modifications to the test stand for S-1-5 acceptance testing have been started. ✓
- \* 2. SA-D5: The S-I stage has been placed in the Dynamic Stand and attachment of suspension system is in progress. The S-IV stage arrived from DAC and should be installed either Tuesday or Wednesday of this week. ✓
3. RL10A1 ENGINE FIRING, MSFC: A static firing of 25 seconds duration (40 seconds planned) was conducted, Friday, 11/16/62, with the engine "can" closed. The GN<sub>2</sub> purge was not completely effective in eliminating "can" heatup. A program was started to get more knowledge about the LOX pump seal leakage during firing. This keys back into problem on S-IV regarding allowable leakage, behavior of helium purge, etc. ✓
4. F-1 ENGINE TEST STAND (Ref Comments on ATT. NO. 1 to last week's NOTES): NASA-Washington has refused to honor our request for using the available \$6,000,000.00 until we have an approved source for making up the deficit. A proposal to transfer FY 1963 C of F funds from the Advanced Dynamic Test Stand and from MTF to cover the deficit is being presented (hand carried) to the Facilities Review Board for local approval and transmission to OMSF. This transfer of funds can be made without detrimentally affecting completion dates of either project. This proposal will include a new request for authority to use available funds, pending processing of paper work. R&D funds cannot be legally used for this purpose. This difficulty is in line with your "turn-key" letter in that it was not possible to do advanced planning and estimating to the detailed accuracy required. Adoption of your proposal that all funding of this type be in the R&D budget will eliminate similar problems in the future. We know of no further action that can be taken at this time to ~~achieve~~ <sup>relience</sup> this condition. ✓
5. MTF: Criteria for navigation lock at MTF has been approved and forwarded to Mobile Corps of Engineers. In addition, criteria for 12 items of support facilities, together with brick and mortar portion of the S-1C test stands, have been approved and released for final printing. It is anticipated that these data will be available for transmittal to Mobile by 11/23/62, contingent on receipt of FY 1963 funds. ✓

ATTACHMENT:  
ATTACHMENT NO. 1 TO (NOTES 11/13/62 Heimburg)

F-1 ENGINE TEST STAND

At meetings with the A-E (AETRON) in Covina, California, first week of June 62, design approaches were modified so that the estimated cost of the project was within the approved budget of \$6,000,000.00. Test Division requested immediate notification if future estimates indicated an overrun. On 7/25/62, estimates prepared by A-E and sent to Facilities Engineering Office, showed an overrun of approximately \$400,000.00. Due to communication difficulties, it was 8/31/62, before Test Division received a copy of estimates and overrun. At meetings in Covina, 9/4/62, the indicated shortage had risen to approximately \$600,000.00. Attempts were made to lower the cost, but the design had gone so far (90% complete) that this was impossible without virtually starting over. AETRON was instructed to recheck their estimates immediately in order to have something firm on which we could reprogram money. On 9/14/62, a new total overrun figure of \$900,000.00 was received. Before any final action could be taken, word was received, on 10/1/62, that further checking showed that the estimated overrun was now approximately \$1,300,000.00. A meeting was held in Test Division on 10/4/62, which was attended by Test, Facilities Engineering Office, Mobile, and AETRON representatives. Possible ways of relieving the situation were explored without success. The validity of the last estimate was verified by the Corps of Engineers and there has been no further change.

22  
The matter was submitted to the Facilities Review Board on 10/5/62, and they approved a request for additional funds for this project in the amount of \$1,622,000.00, which contains a contingency factor over the actual overrun. This request was submitted to OMSF, 10/23/62, and they agreed to provide \$428,300.00 in the FY-62 part of this project, and instructed MSFC to provide the additional \$1,193,700 from other FY-63 C of F projects. MSFC has requested permission to advertise for bids on a part of the work up to the limit (\$6,000,000.00) of available funds. This request has not been approved. Adherence to the schedule required that bids be solicited on 10/1/62. There has been a slippage, day-for-day, since then. Facilities Engineering Office is attempting to find some FY-63 project which may be deferred or reduced.

K.H.

Is that "turn-key" concept the stumbling block? Suggest you ask Bourne for copy of my letter to Brainerd Holmes re "turn-key" problem. It would appear that some of that C of F overrun could be taken out of R&D.

ATTACHMENT NO. 1:

We can't go on slipping. Please suggest what approach we should take to

NOTES 11-19-62 HOELZER

B11/20

1. PERSONNEL ASSIGNMENT: Mr. Robert W. Stafford will be transferred to the Manned Spacecraft Center, Houston, Texas, effective December 2, 1962. Mr. Robert L. Wesson, formerly with the Automatic Data Processing Systems Branch, will replace Mr. Stafford as Chief, Program Coordination and Administration Office, for this division. ✓

gan

B 11/20

1. CENTAUR:

There are four (4) Project Office personnel at Lewis this week. Current plans call for the MSFC personnel to return on Wed., Nov. 21, and this will conclude our regularly scheduled efforts at Lewis. ✓

\* 2. C-1/AGENA:

you The LMSC role and participation in the C-1/Agena preliminary design study were discussed with LMSC personnel on Thurs., Nov. 15. Based upon these and similar discussions with JPL during the week of Nov. 18, LMSC will prepare a definitive work statement and a ROM cost estimate. This work statement will be reviewed by MSFC, LOC and JPL during the first week of Dec. It is planned that contract coverage be effected by Jan. 2, 1963. ✓

3. AGENA:

a. Gemini: The first management meeting took place on 11-13 with Mr. Williams chairing it. There was no doubt in anybody's mind that the Agena target has to be continued even under the considerable budget cut. In a private discussion with Mr. Gilruth, he informed me that no meeting between him and Dr. Shea has taken place in the meantime. He, of course, was not interested anyway to raise the issue. Mr. Chamberlain indicated that the Air Force is very interested in supporting the Agena target for their own purposes. The Air Force is considering to support the Agena target with their own funds (\$26 M ?). ✓

b. Atlas: I had several discussions on the Atlas improvement program with Messrs. Donovan and Hohmann from Aerospace, and Col. Brandeberry and Col. Marcus of the Air Force. The main point of discussion was the Aerospace support. Donovan has doubts about a direct support contract with MSFC but felt that an indirect contract with the Air Force to support NASA vehicles would be essential for the success of NASA programs. Interesting was that Donovan feels we should go right away for Titan II rather than standardization of the Atlas with the Mercury philosophy for Atlas vehicles until Titan is available. It is interesting, in this connection, that Roger Lewis, General Dynamics, after his recent visit to Huntsville, did not do anything to improve the Atlas status or organization with GD/A in spite of his agreement here that radical changes should be made.

c. Atlas/Agena Management: After your meeting with Cortright and Morrison on 11-13, the comments to the proposed new DOD/NASA agreement were forwarded to Hq. on 11-16 by telephone and are going out in written form today. ✓

d. Ranger Spacecraft Review Board:

(1) This board was formed to review the history of the Ranger spacecraft and its present status, and recommend to OSS steps deemed necessary to achieve successful Ranger operation. In addition to JPL and its subcontractors, discussions were held with LMSC, AFSSD, WOO, LOC, 6555th Test Wing. ✓

(2) Agena Office personnel were present for the discussions at LMSC on 11-5 and LOC on 11-15. The key question asked was, "What can be done to improve the reliability of the Ranger program?" We outlined the management recommendation we have forwarded to NASA Hq. (OSS). This appeared to be favorably received by the board. ✓

(3) At the Cape, both the Test Wing and LOC agreed only one should remain in the program with each stating it should be them. JPL (Burke) expressed concern that should LOC assume sole responsibility, the program might suffer later with the heavy workload in the manned effort. ✓

(4) The board is to submit a final report on 11-30. This, presumably, permits time to reschedule Ranger 6 if deemed necessary. The most disturbing question asked was, "Should Ranger 6 be fired on the present schedule if the life of the program depends on its success?" ✓

vos  
are  
talking!

very  
interesting

H.

genas,  
too??  
B

NOTES 11-19-62 Koelle

B 11/22

No NOTES this week.

\* 1. C-1 Program: S-IV Dummy modification work for SA-4 to simulate shroud configuration of Block II vehicles is well under way. Without the use of expensive tooling this job could only be done in a vertical position. Since no facilities high enough for this work were available we improvised and do the modification in the open air under a tent. Though working conditions are not ideal we will accomplish the job in time. This case illustrates again the need for more high bay facilities in the future. ✓

\* 2. S-IC Stage: (a) An agreement with Boeing personnel on implementation of Plan V with respect to Boeing support for our in-house program has been reached. Boeing will do the following work for us at Michoud:

- (1) Build all Skirt Sections ✓
- (2) Pre-assemble all Intertank Stations to be shipped in sections and reassembled at ME Division ✓
- (3) Build some bulkheads, after tooling try-out has been completed at ME Division ✓
- (4) Build all sub-assemblies for Thrust Structure for assembly at ME Division ✓

(b) Installation of the turntable for assembly for bulkheads and of the tilt platform for gore assembly welding is complete. Gore segment vacuum chucks, weld and trim tracks, and the welding boom for bulkhead welding have been delivered and are being installed. ✓

(c) Our Technical Liaison Office has participated in evaluation of cost proposal for the definitive Boeing contract. Though tooling costs for component fabrication is presently being absorbed in Item 2 of the contract, Boeing is asking for additional 3 million manhours for the same task in contract Item 1. We are now participating in the contract negotiation. ✓

(d) Reference my Notes 11/5/62, high cost of Gore Segment tooling. Boeing has now established, on our request, a procedure of price control for our task order assignments whereby we will receive accurate cost estimates for our work prior to release of the task order. They will also currently record accrued costs for each job for control to avoid overruns. We hope that we will not have such surprises in the future. ✓

So do 1 B

\* 1. S-IC Forming of Gore Segment by Boeing at Wichita: Present schedule--though very tight and requiring 3 shift work, 7 days a week--is now compatible with Program Plan Number V. There is however, a budget problem. The original estimate submitted by Boeing for the design and fabrication of the tooling, consisting 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. We think it to be excessive by a factor of 2 to 3! The job is now 30% complete; all the material has been bought and consequently more than 30% of the total cost already expended. I have asked for a written justification and breakdown of the price and a written explanation why the last quotation was in error. In several other task assignments Boeing completed jobs within the estimated cost. Besides the gore segment case there is one more substantial overrun occurring. The cost of the Y-Ring fabrication consisting of welding equipment and fixtures plus fabrication of 2 Y-Rings went up from \$337,627 on 6/14/62 to \$693,902 on 9/26/62.

\* 2. New Equipment: Last week we received our first tape controlled milling machine. It is the Giddings and Lewis DIM11, a three axis continuous path numerically controlled milling machine. Motions under command are, table longitudinal (X axis, 120") head saddle on column (Y axis, 48") and depth (Z axis, 18"). The machine has a 20 horsepower spindle drive providing the ability to remove up to 35 cubic inches per minute of aluminum. A programming group has been established and already well trained in ME Division with the help of Computation Division. The APT language, developed by Aerospace Industries Association will be used. The machine will be operational in about two weeks. A work program for approximately 8 weeks has been established mainly in support of our multicell development program. ✓

Lin  
Broulet  
at  
V-laub.  
That's  
going on  
here??  
If Boeing  
keeps opera-  
ting like  
this, we'll  
be broke  
in no  
time!  
B

B 11/20

- \* 1. C-1: Funding - It is indicated that the C-1 Program is in a funding shortage of approx. \$7 Mill due to additional costs at Douglas and LOC; shortages in Direct Support from CCSD; extra funds required at Astrionics for an RCA overrun; and insufficient guidance hardware money. An analysis of the C-1 funds is being made to see what shortages can be funded within available resources (i.e., eliminate the reliability program at CCSD.)
2. C-5: S-IC - The 60-day extension to contract NAS8-2577 was approved officially by Headquarters on 11-13-62. ✓
- \* Negotiations on cost proposal for long term Contract NAS8-5608 commenced on 11-15-62. ✓
- \* FY-63 C of F Project for Michoud general plant modifications is still being reviewed by the Bureau of Budget. !!
- Boeing, upon M-SAT's request, will present on 11-28-62, the impact on schedules and funds on two P&VE approved weight saving approaches resulting from their weight saving exercise recently presented. ✓
- S-II - Mr. B. Holmes visited S&ID on 11-14 for a review of the S-II Program status and plant tour. ✓
- Contractual action was inaugurated to delete requirements for the vertical checkout building and two sets of GSE at MTE. ✓
- The test program to evaluate the explosive hazard of trapped fuel in J-2 engine lines was inaugurated at Santa Susana on 11-10-62. ✓
- S-IVB - Since J-2 engine testing at SACTO 2A-Stand has been dropped due to potential hazard to All system testing on 2B-Stand, DAC will present to MSFC their S-IVB static test plans for discussion on 11-21-62. ✓
- Marquardt has been selected by DAC for development of the 1750 lb. thrust motor for S-IVB ullage control. ✓
3. Guidance System: Instrument Unit Project Review, scheduled for 12-11-62, will include discussion of proposed location of the I. U. test facility and discussions of procedures and facilities required in handling the I. U. at AMR. ✓
- \* 4. APOLLO: Astronauts Visit to MSFC on 11-28/29-62 is firm. ✓  
Panel Review Board will meet at MSFC on 12-17-62. Dr. Gilruth will be present. ✓

O.L.  
112  
B

B 11/20

NOTES, 11-19-62, MAUS

1. VISIT OF TOM JENKINS - On my 11-12-62 NOTES, you commented that we should postpone the visit of Mr. Thomas Jenkins, Director of Management Reports in Mr. Wyatt's Office of Programs, since neither you nor Dr. Rees would be here. However, Mr. Jenkins was already en route touring various centers and we were unable to rearrange his visit. Mr. Jenkins regrets that he could not meet you and Dr. Rees and stated that he would be glad to visit MSFC again at your convenience if you desire. ✓

*H.M. necessary and advisable? B*

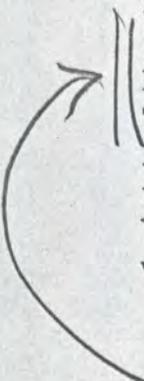
During his visit Thursday, we arranged a meeting with Messrs Neubert, Newby, Maus, Andressen, and Hardeman. Acting for Brainerd Holmes, he discussed headquarters' plans and format for holding reviews of Institutional matters at field centers. This will include a formal analysis and presentation on non-program oriented matters, resources, organization, and problem areas. Mr. Jenkins indicated that the first MSFC review is tentatively planned for mid-December.

*Hope we get early warning on this. B*

We also discussed status of PERT application. Mr. Jenkins stated that experience to date with PERT and Companion Costs is favorable and that Dr. Seamans has reaffirmed his intentions to further implement this management system. ✓

2. FY-64 PERSONNEL AND OPERATION OF INSTALLATION ESTIMATES- We received notice Friday (Nov 16) that members of Office of Resources Programming (under Dee Wyatt) will visit MSFC, MSC and LOC, this week. Messrs Malaga, Miller and Cushman arrived in Huntsville last night. Their purpose is to review with Center Staffs the personnel and operation of installation cost estimates for the President's FY 1964 Budget. ✓

3. THIRD QUARTER OMSF PROGRAM REVIEW - The OMSF Third Quarter (FY-63) Program Review is now scheduled to be held in Washington, December 12, 1962. Our submission (Financial Operating Plan and Technical Operating Plan) is due November 28, 1962. It is to be based on the OMSF control funding ceiling of \$739.657 Million, and the flight schedules approved by Mr. Holmes on October 15, 1962. We are planning to have an internal review of the presentation material with Dr. Rees on December 6, 1962, at 2:00 p.m.



Bonnie  
✓ I have it listed 13/14 Dec in Huntsville. 12 Dec collides w/ STB review which I must attend. Please eliminate conflict by moving 1 of the 2 meetings. B Jim

B 11/20

1. SA-5: Manufacturing Engineering Division has installed seven stub fins (one with hydrogen vent), one large fin for aerodynamic load, and all outriggers on the SA-5 thrust structure in preparation of the second phase of structural testing. No assembly difficulty was experienced except a small increase in length of attachment bolts. ✓

The vibration trailer has been instrumented at Experimental Structures Section and is ready to be moved to the Dynamic Test Stand where SA-5D is being installed in the tower. The S-IV stage, received at Marshall Space Flight Center on 11-16-62, will be installed immediately. ✓

\* 2. S-IV: A firing of the S-IV Battleship vehicle on 11-8-62, as reported earlier, was terminated at 41 seconds because of a fire at the number 3 engine. Investigation indicates thrust chamber tube leaks (similar to the recent tube failures at Pratt and Whitney Aircraft) caused the problem. The RL10A-1 engines are being removed from the Battleship vehicle and RL10A-3 engines are being installed. ✓

Bonnie  
 ✓ i'd like to visit these lists. Please set up w/ Mrazek + Thayer  
 B P&VE

NOTES 11-19-62 Rudolph

B 11/20

Negative

*[Handwritten signature]*

B 11/20

NOTES 11-19-62 Stuhlinger

\* 1. PROJECT HIGHWATER: As far as we can judge at present, observations of the cloud during the SA-3 launching was very good from most stations. Scientific returns from the experiment are expected to be substantial. ✓

\* 2. OMSF SUPPORTING TECHNOLOGY: As mentioned in last week's NOTES, Mr. Rosen has advised us that the MSFC FY-63 Launch Vehicle Supporting Technology Program transmitted to OMSF with your cover letter of November 6 was not acceptable. He directed that the proposed program should be presented to OMSF on an individual task-by-task basis. We have now prepared an updated "big book" for submission to OMSF. As desired, individual task titles, funding, and task descriptions covering a total of 6.05 M dollars are included. (The 6.05 M is the funding guideline figure established at the 2nd Quarter Review. It does not include the Propulsion Supporting Technology Requirements or Mr. Koelle's requirements.) ✓

The 6.05 M program will be managed by Mr. Trueblood. This package should not be confused with the 4.8 M program which Saturn Systems Office has indicated will be furnished to RPD for MSFC Supporting Technologies, and which we hopefully can keep within MSFC. ✓

3. NEW PLAN FOR RESEARCH PROGRAMS: In my efforts to devise a better plan for the implementation of MSFC research programs, I intend to meet with Mr. Dixon and with Dr. Bisplinghoff early next week, and subsequently with the Division Directors at MSFC. After this, I would like to ask you for a joint meeting with Mr. Holmes, and possibly with Dr. Seamans, at your convenience. O.K. B

4. MICROMETEOROID PROJECT: Mr. Milton Ames and other members of OART, OMSF, Langley, and Lewis will meet with us on Tuesday, November 20, for a discussion of the micrometeoroid project. Dr. Rees will participate in the meeting at the beginning and for the summary. ✓

\* 5. RESEARCH INSTITUTE: Groundbreaking ceremonies for the first building are planned for December 20. A University position on degree opportunities in Huntsville is expected to be declared before November 23. The Graduate Study Steering Committee has been asked to recommend what areas would be of most interest to the Redstone complex if a limited degree opportunity were available for the University of Alabama. ✓

B 11/20

1. RL10 PROGRAM: Vibration testing of the RL10A-3 engine is continuing. The engine has now completed the model specification vibration test series at one-half the required levels and about 70% of the tests required at full specification levels. (Quick fixes to some of the component brackets have enhanced the possibility for the engine to also pass the remainder. These fixes are of a kind easy to apply in the field.) ✓

2. SOLID PROPULSION: The Air Force last week received a go-ahead from the Department of Defense and the approval from Mr. Webb to revise the 260-inch solid motor Request for Quotations in accordance with the following program:

- a. Two contractors will produce and test three one-half length 260-inch motors.
- b. One contractor will later be chosen for follow-on to build and test two full-length 260-inch motors.
- c. First firing to be in eighteen months; total program completed in forty-eight months.

Marshall Space Flight Center is expected to provide inputs and to participate in the preparation of the Request for Quotations, and in the selection of the contractors expected to be no later than 1-63. ✓

\* 3. F-1 PROGRAM: The F-1 engine testing in the past month has been plagued by a series of small test stand and engine development problems. There have been 13 short tests. Two facility failures (fuel tank diaphragm, upstream LOX boot strap line bellow), one human error (quick disconnect on Ignition Monitor Valve Sensor was left open), three engine problems (gas generator 1/4" drain line loose, nozzle extension, and gas generator to turbine inlet gasket) caused six engine runs to be terminated prematurely.

The first of a series of F-1 Engine/S-IC Stage Interface Meetings was held 11-15-62. The Boeing Company is participating fully. ✓

\* 4. J-2 PROGRAM: The Revised Program Plan on the increased expansion ratio nozzle program is expected from Rocketdyne late in November. Analysis is being conducted to determine optimum expansion ratio for both the S-II and S-IVB stages. It is anticipated that the nozzle design change can be incorporated into the development program no later than early December.

A satisfactory scheduled 50-second run was accomplished on 11-8-62. ✓

5. Dr. HOLMES VISIT TO ROCKETDYNE: (Dr.) Brainerd Holmes visit to Rocketdyne went over smoothly. Technical presentation in general-sober. F-1 and H-1 firings went well. J-2 failed due to frozen valve. ✓

H. Kaelle  
for  
Information  
B

\*  
Gen

\*  
Gen

H.W.

Any reaction to my letter to OMSF  
re our "Tischler" problem? B

NOVEMBER 26, 1962



1. COMPUTER FACILITY

The IBM 7090 Computer has been delivered to the Central Computer Facility at Slidell and is presently being installed. ✓

*gm* \* 2. COMPUTER OPERATION CONTRACTOR

A bidders conference will be held at the Central Computer Facility on November 27, 1962. The purpose of this conference is to brief prospective bidders on the operation of the computer facility. Items to be covered on the agenda are:

1. The procurement procedures.
2. The equipment.
3. The physical facilities at Slidell.
4. Answer questions of attendees. ✓

*gm* \* 3. CHRYSLER REVISED SCHEDULE

Chrysler has submitted the budget and planning estimates for the revised schedule which includes the C-1B. Copies of this estimate have been forwarded to Saturn Systems Office for review. ✓

4. MATERIAL FOR AIRCRAFT HANGAR

Four individuals from Redstone Arsenal Post Engineer's Office visited Michoud Operations last week to determine if some of the structural steel and other materials being removed from the plant could be used in the construction of an aircraft hangar at Redstone Arsenal airstrip. If useable surplus materials should be found and made available to Post Engineer, the actual cost of the hangar could be significantly reduced. They did not indicate to us the results of their visit. ✓

1. Jupiter CTL. Jupiter CTL Missile 106 is now scheduled for erection on 26 November. Launch by NATO troops in the latter portion of January 1963. ✓

2. 37B Launcher. During the launcher load tests on 37B, the deflection was approximately 3 times that estimated by design people. An investigation brought to light a high percentage of bad welds used in launcher fabrication. LO-D, Buchanan, is making an investigation of this now along with LVOD people. We plan a thorough check of nearly all welds with Magna-Flux or X-ray. ✓



gen

1. Booster and Orbital Fragment Studies: Studies, concerning the return to earth of orbital trash and booster fragments, have been discussed by Aeroballistics personnel. (Mr. McNair is coordinator of these studies). Saturn Systems Office will make money available for contract studies to supplement our in-house efforts. Extent of studies will, of course, define amount of money needed. Committee for these studies will state recommended approach shortly. It appears now that Lockheed Aircraft Company (locally) would be a desirable contractor for such a job. ✓

\* 2. S-2 Dual Plane Separation Problem: The dual plane separation scheme, to be incorporated into the design of the S-2 stage of C-5, has created the problem of how to remove the inter-stage section at the second phase of the dual plane separation. Under asymmetric loading conditions (engine or actuator malfunction), the interstage would experience displacements which could result in a collision of the separating inter-stage with the J-2 engines.

NAA has suggested that testing be performed in two phases. Preliminary investigations (Phase 1) will be conducted in one of NAA's facilities to provide data which will supplement analytical studies and define the major test program. The major test program (phase 2) will likely be conducted in one of the AEDC high altitude test cells or in some NASA research center facility, depending on test parameters required. Both possibilities are being explored. The decision will somewhat depend on results of the phase 1 studies. Estimated cost of phase 1 is \$10,000, while phase 2 could conceivably cost \$300,000, if AEDC is selected as the most suitable facility, and providing phase 1 indicates that phase 2 is necessary. ✓

3. Proposed New Building for Research Projects Division: Dr. Stuhlinger has recently solicited comments to a proposed new building and research facility for Research Projects Division. The proposal so far suffers from lack of mission definition and implies a potentially very substantial drain on manpower and funds. I am attaching my comments to Dr. Stuhlinger. ✓

Eberhard R.

This is "turns-down No. 2"

B 11/30

Dr. Stuhlinger, M-RP-DIR

November 23, 1962

Director, Aeroballistics Division  
M-AERO-DIR

Comments Concerning Proposed New Building for Research  
Projects ~~DIVISION~~

Reference: Memo dated October 16, 1962, same subject

1. The referenced memorandum has been studied very carefully. It appears that what is being requested is vastly more than a new building: An extensive research facility is being proposed. Perhaps this is not a bad idea; but before a research facility, under the cognizance of your division is approved, the mission of each division, especially Research Projects, should be considered.

2. It is recognized that there is a need for basic and applied research to be conducted at MSFC and that, unless we begin such research immediately, we will not have the necessary knowledge and tools to solve our space problems. Unfortunately, in the past, research has been subordinated in favor of project oriented tasks. This situation can be remedied by each division expending a specified portion of its manpower in a coordinated research program. Also the University of Alabama Research Institute can fulfill a portion of our research requirements for the next few years.

3. The following facts should be considered when making a decision concerning Research Projects Division's request for a new building:

a. It is essential that we establish or expand divisional research capabilities.

b. An MSFC research facility should not be started simultaneously with the University of Alabama Research Institute. From the outset, the two facilities would be in competition financially as well as in their search for qualified personnel.

c. Several urgently needed buildings and facilities have been postponed for many years. For example, the Aeroballistics office building and the Aeroballistics Fluid Mechanics Laboratory should be given priority.

M-AERO-DIR, File Copy

SUBJECT: Comments Concerning Proposed New Building  
for Research Projects Division

November 23, 1962

d. The scope of work listed in the referenced memorandum is much too wide and too ambitious. If this program were attempted, even a cursory analysis reveals that a strong buildup in manpower would be required. There is, of course, the danger of such an unrestricted research group proselyting personnel who are tied to more routine tasks.

e. It is probable that there would be a conflict of interest between the University of Alabama Research Institute and RPD Research Facility versus MSFC as agent for total research programs. I do not believe that a well organized laboratory can be conceived out of the "leftovers" or voids in capability that now exist at MSFC. Rather than dabbling in a lot of areas, a Research Projects Division facility should be established exclusively for conducting basic research and acting as consultants to other MSFC divisions.

f. An increase in the staff of RPD to formulate, present, and select the MSFC research programs to headquarters offices is not desirable. Rather, this selecting job should be handled by the people who will benefit most from the research, that is, division personnel. It is also desirable for the research programs to be presented by the various divisions. The present mode of operation is actually carried out this way. Personnel from one of the program offices quite frequently visit MSFC. In some cases, RPD personnel act as liaison contacts and the divisions still have to present, and some times defend, their specific projects.

E. D. Geissler

B 11/30

NOTES 11-26-62 GORMAN

1. CIVIL DEFENSE: Modification of four igloos for use as an alternate MSFC Headquarters is 75% complete. Food has been ordered for 200 people to survive for 30 days. ✓

2. C of F BUDGETS: Believe you may be interested in a summary picture of the working C of F budgets. In 1961 we received \$53 million, made up of 18 projects, which are now approximately 85% complete. In 1962, we received \$133 million for 45 projects, which are now approximately 38% complete. Our budget for the current FY 63 totals \$193 million, comprising 23 projects. Since receipt of authority and funds are still in the process of release by Washington, less than 1% has been accomplished towards the completion of the 1963 projects. Six projects are under design. This is an area where we have to speed things up. We have to find competent, experienced people and we have to find ways to do things differently than in the past. Hans Maus' office has just completed a study of our internal procedures here at Marshall. I think we can use this as a basis to make some improvements. When we have progressed a little further in the next week or so, you may want to take a half hour out for a briefing on this subject.

3. CHRYSLER CONTRACT MODIFICATION: Negotiations were successfully concluded with Chrysler Corporation Space Division for the incorporation of eighteen months of "Engineering Documentation Services", for S-I Program, Contract NAS8-4016, valued at \$2,380,056 costs and \$145,000 fixed fee. Procurement package will be forwarded to NASA Headquarters for necessary review/approval action on or about November 26, 1962. ✓

H.G. ↓  
Preferably prior to  
Baird Bremer's visit  
or at least prior to  
the next Management Council.  
B

Ken

B11/30

- 1. SA-4 POST STATIC CHECKOUT: The SA-4 vehicle is presently undergoing Instrumentation Calibration with approximately 580 measurements completed to date. Due to missing components required for continuation of Performance Testing, tentative plans are to discontinue Performance Testing on November 27, 1962. The SA-4 vehicle will be transferred to the Alignment area and alignment, weight, center of gravity and moment of inertia determinations will be made. Performance Testing will tentatively resume on December 14, 1962.
- \*2. SA-5 PRE-STATIC CHECKOUT: The SA-5 vehicle is in the mechanical area of Bldg. 4708 and is presently undergoing optical alignment which is expected to be completed on November 27, 1962. Status determination, continuity, clearance checks and mass characteristics (weight, center of gravity and mass moment of inertia) have been completed.
- 3. SCHOOL FOR RELIABLE ELECTRICAL CONNECTIONS: The Quality Assurance Division soldering school has been relocated off the limits of Redstone Arsenal at 3024 University Avenue, N. W., Huntsville, Alabama.
- \*4. NOVA: Representatives from the Martin Company, Baltimore, were guests of the Quality Assurance Division for a two day orientation in connection with the Nova Design Study. Present were six representatives from Design, Quality, Test and Launch, Manufacturing and Nova Management.

5. MATERIAL REVIEW BOARD PROCEDURE: Since July of this year the Quality Assurance Division has attempted to write a Material Review Board Procedure satisfactory to the Saturn Systems Office. To date this Division has been unable to accomplish this. When negotiations were again deadlocked early in October I took the problem up myself, made a careful analysis of the interests of the Quality Assurance Division and of the Saturn Systems Office in support of the MSFC projects, and together with Dr. Shratter I worked up a new version of the procedure (dated October 9, 1962) based on this. I was in complete agreement with Dr. Shratter and the people who assisted him. On October 29, 1962 I received a memorandum signed by Dr. Lange with a statement of disagreement. I replied immediately (October 31, 1962) in writing with detailed explanations how his points of objections have already been taken care of in the new procedure which I drafted with Dr. Shratter. therefore, I recommended reconsideration of his letter and acceptance of this procedure. To date the Saturn Systems Office has not furnished an answer although it has been contacted verbally several times.

I can guarantee you that with this type of support and slowness of action from a Project Management Office your series of successes in the Saturn program will not extend into the upper stages. I redline this paragraph because I feel that dissemination of this information will not contribute to the peace in this Center for I know I am not the only one who is dissatisfied with the actions and attitudes of certain people in the Saturn Systems Office. I have no objection that this paragraph be made available to Dr. Lange verbatim because it states only facts.

Eberhard  
Please  
look  
into  
this  
B

B W/30

\*  
 gm  
 1. ESTABLISHMENT OF GUIDANCE IMPLEMENTATION SUB PANEL: A Guidance Implementation Sub Panel with MSC-MSFC membership has been established as an element of the Flight Dynamics and Control Working Group. The first meeting was held Wednesday, 11/21. General descriptions of both hardware systems were given. Both centers agreed to exchange further technical information on how each system operates. This interchange will also include technical considerations associated with the different possible ways of tying the two systems together. The next meeting will be in mid January.

Three things are apparent from the meeting:

- a. If MSC guides from earth orbit, they do not intend to use Path Adaptive Guidance.
- b. MSC does not look at guidance redundancy the way MSFC does. That is, MSC looks to have either system be able to guide from orbit, but once the decision is made and the flight started, switch-over in the event of malfunction is not considered. (They may have slightly altered their opinion after the meeting.)
- c. It is fairly apparent that the decision of who would guide from earth orbit (if only one or two orbits are involved) must be based on something other than expected performance of either system.

2. AUTOMATION BREADBOARD: RCA-110 Computer has been installed and accepted. This is the first GSE computer built to MSFC standards. Testing started 11/17 and is proceeding better than expected. ✓

W.H.  
 please  
 keep me  
 posted  
 on  
 develop  
 ments  
 B

B 11/30

\*1. SA-D5:

The S-IV stage will be installed in the Dynamic Test Stand, on top of the S-I stage, today. ✓

2. RL10A1 ENGINE FIRING, MSFC:

Next firing planned Thursday this week, 1:30 p.m., for 40 seconds duration. Purpose is to achieve successful operation with complete engine in vacuum (engine "can" closed and connected to ejector). You will be kept posted on progress. ✓

3. MTF:

Criteria for 12 support facilities were received and will be forwarded to the Corps of Engineers; however, money for the design of these facilities has not been received from NASA Headquarters; therefore, the Corps of Engineers will be unable to proceed with the design. Appendix E to the S&P contract, which provides an additional \$100,000.00 to permit design criteria on S-II test stand to continue until 12/10/62, is to be negotiated today. Preparation of Appendix F, for another "spoonful" of funds, has been initiated.



Bill Fortune

Has about a visit well armed with material at Ullmer, - maybe jointly with Shepard. I guess Holmes has talked to him in the meantime. B  
(Maybe you'll want to drop in on him first)

NOTES 11-26-62 HOELZER

B u/30

No Report.

gam

\*1. CENTAUR:

- gm a. All Light & Medium Vehicles Office personnel have been released by Lewis; however, one Hayes PERT specialist is at Lewis from L&M and will remain approximately 3 weeks. The only future activity expected in this area is consultation for special problems or attendance at certain meetings at the request of Lewis. ✓
- b. A meeting is planned at Lewis on Nov. 27 to discuss launch facilities (36A and 36B). I will attend, along with representative from Astrionics. ✓

\*2. C-1/AGENA:

gm The Preliminary Project Development Plan for the Saturn C-1/Agena Integration Design (SAID) has been submitted by JPL to NASA Headquarters. A meeting with JPL and Lockheed has been tentatively scheduled for Nov. 28 to discuss and finalize the LMSC Statement of Work for C-1/Agena Phase I study. ✓

3. AGENA:

- a. Mariner R-2: As of Nov. 21, the spacecraft was 20 million statute miles from earth at an earth referenced speed of 21,843 statute miles per hour. The closest approach to Venus will be approximately 21,000 statute miles on Dec. 14, 1962, 2000 GMT. The gas supply is presently 2.49 pounds with an average consumption of .017 pounds per day. The hinge angle is 27 degrees, reference angle is 33 degrees. JPL reports cyclic pulses 115 through 124 have occurred on schedule. The solar panel problem still exists as indicated by fluctuation of voltage and current measurements but the indicated power distribution is essentially constant. The science experiments are in general operating normally with good data being received. ✓
- b. Gemini: A meeting was held at Manned Spacecraft Center on Nov. 20 to discuss the status of Gemini reprogramming. AFSSD, MSC, MSFC and LMSC participated in the meeting. The major technical developments as associated with vehicle configuration have been defined for the new program. Costs and schedules are in the process of being firmed up. Generally speaking, the total effect of Gemini reprogramming will be to lengthen the schedule time and conform to budget limitations. ✓
- c. S-27 Back-up Vehicle: NASA Headquarters has assigned the S-27 Back-up vehicle (Agena 6102) as a back-up for Comsat (A-12). In the event of a successful Comsat mission, consideration is being given to use 6102 for the S-6/Tiros mission. ✓
- d. Atlas: In reference to my Notes of 11-19-62 relative to Roger Lewis' response to GD/A Atlas problems, Mr. Heineman, a General Dynamics vice president, called me on Nov. 19 and asked that we get together to further discuss the problems. I suggested that we postpone such discussion until after the DOD/NASA agreement has been resolved. I recommended that in the meantime he should contact Aerospace and discuss their experience in the Mercury program. ✓

✓ → Yes, by all means  
B 11/30

\*1. ADVANCED NOVA STUDIES

B 11/30

I have just returned from the midterm reviews of our studies with GD/A, Douglas and RAND. Krafft Ehrlicke's concept of a large reusable NOVA still looks very promising because of its basic simplicity. It does require a new engine of the Aerojet (Beichel) type and probably solid RATO's as insurance for adequate performance. Douglas has done a very good systematic comparison of various concepts and is now concentrating on reusable concepts called ROOST and RHOMBUS. The sea-launched concept (Truax) is still being evaluated and considered, but it is not the front runner. At this time Ehrlicke's concept looks most promising. The RAND Corporation performance is very disappointing up to now. If they do not do any better in the next few months, we will probably not recommend future vehicle concept studies by RAND. They are quite good, however, in cost estimating and we have very good working relationships with them in this area. ✓

2. ROCKET AIRPLANE STUDIES

I also attended the midterm reviews on reusable vehicles in the C-1 and C-5 performance class. The 10-passenger rocket airplane is being studied for us by NAA/SID and Lockheed/Burbank Division. Both companies concluded that horizontal takeoff has advantages over vertical takeoff under the ground rules established. We talked about two-stage winged vehicles with accelerations and decelerations limited to about 3 g. Takeoff weight will be slightly above one million pounds if high-pressure engines are used in the second stage. Studies indicate that this approach will reduce round-trip cost from about 5 million dollars/person in 1968 (C-1B plus 5-man APOLLO) to about 50,000 dollars/person by 1978 for earth-to-orbit transportation. Lockheed is doing an outstanding job on this project; NAA is satisfactory. This project is gaining momentum all over the country (also within the Air Force) because of the increasing interest in orbiting manned laboratories. The final presentations are scheduled for mid January and we will arrange the time so that you can attend. ✓

Interesting!

\*1. S-IC Tooling: Some weeks ago Boeing initiated action to start manufacturing bulkhead tooling for Michoud. We discussed the "pros and cons" of this action with Boeing and they agreed to stop this work and not to start tooling manufacture for Michoud until the identical tools are jointly de-bugged here. ✓

\*2. 70" & 105" Tanks - S-I: The container program with Ling Tempco Vought, previously beset by many delays, is now progressing excellently. Containers for SA-7 will be here ahead of schedule. Indications are that containers for SA-8, 9, 10 will also be delivered ahead of schedule. ✓

3. Portable Clean Room: We have received and are setting up a portable (air inflatable, 10' X 10' X 8', vinyl coated nylon) clean room. This piece of equipment will be used in entering assemblies that have been previously cleaned, such as 70", 105" and S-IC tankage. Experience has shown us that it is always necessary to re-enter these assemblies at various locations in order to perform modifications, changes, inspections etc. and re-contamination of the assembly is always a problem. This piece of equipment (presently in the assembly shop) will undoubtedly improve reliability by more closely controlling the environment and personnel that must enter these assemblies. ✓

4. Explosive Forming: Work is beginning in this area in a small way. We are beginning by detonating blasting caps to verify their safety features and expect to begin test forming parts this week on the 54" center piece for the S-IC fuel tank bulkhead. A program is under way to improve this facility - larger blasting tank and cranes. ✓

5. Cafeteria: A contract has been signed to build a much needed cafeteria in our area. It will be centrally located (in building 4705), it will be completed in April and will have a seating capacity of about 120.

→ "Minor <sup>W.K.</sup> Construction"  
pressure, B

Notes 11-26-62, Lange

- \* 1. C-1: Funding - The financial operating plan prepared for the 3rd Quarter Review at ONSP outlines additional requirements in the C-1 program of \$13.3 Mill for additional CCSD Direct Support, a CCSD Reliability Program, S-IV, Guidance Hardware and GSE for LOC. ✓

A budget and planning proposal for FY-63 received from CCSD on 11-23-62 is being analyzed. ✓

- \* Industrial Reserve Equipment - The Michoud-CCSD Team is surveying the choice equipment in the various storage areas. Inspection results are expected to be available within two weeks. ✓

- 2. C-5: S-IC - Follow-on Contract negotiations have been in progress all week. No estimate is available as to completion of this task. ✓

S-II - Funding action was accomplished to support conduct of the MSFC spill test program. Test will be inaugurated and be completed on 12-15-~~62~~<sub>63</sub>. ✓ 12/15/62

Representatives from MSC, NAA and M-COMP are discussing the feasibility of using one common data reduction center for the Apollo and S-II programs at Downey. ✓

Contractual action to delete requirements for the vertical checkout building and two sets of GSE at MTF was accomplished by CGN #5 dated 11-8-62. ✓

- \* S-IVB - Quarterly Program Review at MSFC scheduled for 12-12-62 has been changed to 12-14-62. ✓

DAC study of static test plans for S-IVB is being reviewed by MSFC. ✓

*Dr. Lange,  
I still offer the same  
suggestion for improvement:  
more on fewer items*

*Agree B*

B/W/ao

NOTES 11-26-62 MAUS

1. FY 63 SUPPLEMENTAL BUDGET POSSIBILITY-On November 20, we were informed by OMSF through Mr. Gorman who was visiting in Mr. Holmes' office, of the possibility of an additional 175 to 200 million dollars for the Lunar Program in FY 63. We were requested to investigate the effect on project schedules and contracts. Essentially, the increase would raise the funding levels from the 739.657 plan (11 month basis) to 940.357 (965.246 minus M-1 funding) funding plan (12 month basis), and would approximate the schedules contained in the MSFC Oct 5, 1962 submission. We phoned the information to OMSF on same date. ✓

2. WASHINGTON INQUIRY-MSFC INSTITUTIONAL SUPPORT ESTIMATES-On Nov 16 we received notice that representatives of Office of Programs would visit on FY 64 Personnel and Operation of Installation Estimates. During their visit here last week, Messrs. Cushman, Malaga, and Miller from D. Wyatt's office raised the question: "On what did Marshall base its FY 63, FY 64 manpower estimates?" With only three calendar days notice, all the answers were not immediately available, so they left a questionnaire concerning our estimating factors in the institutional support area. Mr. Malaga will return this week for answers. All offices and divisions involved have been notified as to the information desired. ✓

3. REORGANIZATION STUDIES-We have received a complete reorganization proposal from Dr. Geissler; including a name change for the Aeroballistics Division title. Our Management Analysis Office is studying this proposal. Other major re-organizations also under study are Astrionics Div, Quality Assurance Div, and Facilities Engineering Office. ✓

4. VISIT OF TOM JENKINS-In follow-up of Mr. Jenkins' visit from last week, the 1st MSFC Institutional review will not be before February 15, 1963. ✓

\* 5. PERT REVIEW AND STATUS-Per your request, we have arranged two meetings as follows:

Dec 4, 9:00-1:00, PERT Training Course for top executives only; to be conducted by Management Systems Corporation. ✓

Dec 5, MSFC PERT Status Review. ✓

gan

B 11/30

NOTES 11-26-62 MRAZEK

1. RIFT: Hangar #1 at Moffett Naval Air Station was officially designated by Office of Nuclear Systems, OART, on 11-21-62 as the manufacturing site for RIFT stages. ✓

The Atomic Energy Commission has agreed to take over ownership of the Lockheed-operated Georgia Nuclear Laboratory at Dawsonville where RIFT radiation testing is in progress. ✓

Lockheed was the winner (point-score evaluations) over ten other firms bidding on a RIFT Safety Study for one year at a \$200,000 level. There may be repercussions, however, because of the Headquarters participants' bias against selecting a contractor already in the ROVER program. In our opinion, the selection was made on a sound basis. It has additional merit because of the recent Lockheed funding reduction in the prime RIFT contract. ✓

\* 2. C-I, BLOCK II: Analytical design analyses of the C-I (Block II) Instrument Unit Redesign have been completed. The studies show the feasibility of the redesign as a means of effecting vehicle weight reduction. Bulk transient thermal analyses of the individual electronic components showed no thermal conditioning requirement during ascent flight. Ground conditioning of the instrument unit will be accomplished with presently available facilities and will result in increased accessibility to individual components for pre-launch servicing. ✓

3. S-IC: The first structural test on S-IC components has been completed. The parts tested were the fittings attaching the corrugated intertank shell to the LOX and fuel tank "Y" rings. ✓

4. GENERAL: Correlation studies are being accomplished for the acoustic and vibration data taken during SATURN static tests. Separate calculations of acoustical and mechanical power will provide for determination of an efficiency factor of conversion for the induced vibratory response. This technique has not heretofore been utilized in vibration prediction. ✓

NOTES 11-26-62 Rudolph

Bulso

Negative

Ken

BWCo

NOTES 11-26-62 Stuhlinger

1. MICROMETEOROID PROJECT: In the meeting here on November 20, it was agreed that Marshall, with assistance from Langley and Lewis on certain technical aspects of the capsule, would provide to NASA Headquarters on December 8 a Project Development Plan. Mr. Ames will attempt to schedule a meeting with Mr. Holmes, Dr. Bisplinghoff, and yourself (and Marshall representation as required) early in the week of December 10 through 14. Assuming agreement on the program at this level, Mr. Holmes and Dr. Bisplinghoff will then take the project to Dr. Seamans for final approval. Target date for this is December 15. ✓

2. IN-HOUSE STUDY OF ELECTRIC LUNAR FERRY: Encouraged by Mr. Dixon and Dr. Bisplinghoff, we would like to make an RPD in-house study (2 1/2 man-years) of an electric lunar ferry. It would emphasize the technical aspects, complementing similar studies by Future Projects Office which emphasize aspects of scheduling, transport volume, cost figures, and comparisons between chemical, nuclear, and electric ferries. Your approval is requested. ACTION REQUIRED.

E.S.  
 Orbit -  
 Dr. - orbit,  
 O.K. with  
 → me.  
 B

3. OART RESEARCH PROGRAM: Mr. Dixon told me that in the future Mr. Holmes will be responsible for MSFC, MSC, and LOC, while he will be responsible for the other centers. I will discuss the effect of this change upon the OART-MSFC research program with Dr. Bisplinghoff and Mr. Dixon today in Washington. ✓

BH/30

NOTES 11-26-62 WEIDNER

1. YOUR QUESTION, NOTES 11-19-62: No response yet at this end to your letter to the Office of Manned Space Flight regarding the engine management problem. (Reference NOTES 11-19-62 WEIDNER, attached.) ✓

2. ADMINISTRATOR'S REVIEW: The 11-17-62 presentation on Chemical Propulsion Research and Development was well worth our attendance. Here are two points you might want to know:

a. The F-1 engine, from the day of initiation to its first manned flight, will take approximately eight and one-half years. A large "post-Saturn" vehicle applying new engine concepts might take ten years; therefore, in order to fly something of that class in 1972 one must start now.

In answer to this argument, Mr. Webb stated that he believes this country is presently expending, overall, more effort in the area of manned space flight than the Soviet Union and will, therefore, attain a strong relative capability. With one Saturn round costing approximately \$100 million, the taxpayer might not see the need for forging further ahead so fast. It requires some continuous judgement process to keep appraised of the state-of-the-art and of our needs, and to formulate our decisions for the future. (He stressed repeatedly that Bellcomm was to help NASA do that.) He did not leave me with the impression that "post-Saturn" was foremost on his mind.

b. During the F-1 engine presentation, Dr. Seamans (assisted by Mr. Manganiello in the background) doubted whether enough is being done to bring all available talent to bear on our instability problem. Upon inquiry, he had no specific suggestion. We are preparing a letter for your signature to Dr. Seamans outlining the present situation. Mr. Rosen, in answer, was radiating full confidence that the F-1 engine will come through in time; however, with the engines being on the critical path, it would appear desirable for us to find some method to involve you more regularly in some of our more serious problems.

\*3. J-2 PROGRAM: On 11-29-62 we will discuss the nozzle design change with representatives from Rocketdyne, Douglas Aircraft Company, and Space and Information Systems Division. Many pros and cons have to be considered and the outcome is not yet quite clear. ✓

\*4. RL10 PROGRAM: A modified engine has completed the vibration test with no apparent failures. It was agreed that the modifications, which are very minor and can be performed in the field, should be incorporated on all RL10A-3 engines. ✓

\*5. F-1 PROGRAM: Engine #006 on Test Stand 1A successfully completed a 150-second test at 1500K. This run was the first completely successful full duration test in the last seven attempts. ✓

Attachment #1: Notes 11-19-62 Weidner

AA Koelle  
for your info.  
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W/30

Good! →  
B

attend  
F-1  
briefing  
on  
12/4  
B