

September 7, 1965



THE
MUSEUM
OF
ART

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1. Consent to use of the Logtown School in the MTF Buffer Zone for another school year was given last week, subject to execution of a legal agreement between the school board and the Corps of Engineers. Agreement requires evacuation of building on NASA notice. Similarly, a waiver of our easement rights in the Buffer Zone for a weighing station by Mississippi on I-10 was consented to, subject to execution of the legal documents by the Corps and the State. ✓

2. Court trial of Clay Calhoun Tract (Buffer Zone) condemnation begins this morning in Biloxi. Mr. Lee Nybo has been subpoenaed as witness regarding acoustic hazards. Werner Sieber is advising Nybo on Huntsville results thus far. ✓

3. MTF "open house" was held on Labor Day. Although primary purpose was to permit employees' families to see the test complexes, the response from the general public who were also invited far exceeded our expectations. Approximately 2900 persons attended nine formal briefings and space movies, and 1580 automobiles (approximately 7900 persons) made the motor tour of the test area. ✓

4. Negotiations with GE/MTSO began Wednesday, September 1, for the FY-66 Plant and Test Support. Their proposal of \$57,425 million far exceeds our evaluation and will be greatly reduced to meet our budget guidelines. ✓

5. Youth Opportunity Campaign (YOC) personnel have dropped from a high of 353 to present level of 46 due to return to school. Project has been relatively free of incidents and has produced positive results in several areas. A letter to the President, originated by the students, is being forwarded through regular channels. ✓

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J-2 ENGINE

NAA Rocketdyne signed and returned to MSFC the production incentive contract conversion (NAS 8-5603). ✓

The next J-2 Engine Quarterly Review will be held at Rocketdyne on September 13 and 14, 1965. The Defense Purchase Request for J-2 engine testing at AEDC has been forwarded to AEDC. Production engine J-2032 was accepted and delivered to Rocketdyne for Qualification I testing. ✓

South Western Industries' calips switch production has been shutdown for quality control deficiencies. During a move to their new facility, records of vendor components traceability were lost. Switches are available for engines through engine J-2042. Total impact is unknown; however, it appears production engines will be delivered without calips switches. ✓

C-1 ENGINE

Negotiations with both Thompson Ramo Wooldridge and Reaction Motors Division are planned for the weeks of September 7 and 13 respectively. ✓

RL10 ENGINE

The YRL10A3-3 engine satisfactorily completed an informal in-house PFRT. The engine was assembled to the prototype bill of material with production procedures. The engine was acceptance trimmed, and the test series completed after 25 runs and 4,401 seconds. The average impulse for all runs was 439.9 seconds, teardown of the engine following the test series showed the turbo machinery chamber and injector to be in good condition. ✓

NOTES 9-7-65 CLINE

NEGATIVE REPORT

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The Boeing Company, Contract NAS8-5608, submitted their firm Cost Proposal for conversion from CFFF to CFIIF on September 1, 1965, on schedule. ✓

Qualification Testing - During qualification test of the stage main power distributor, one of the relays in the distributor failed vibration tests. There are 20 relays of this type in the stage of which only one failed during the latter part of the test. The relays are used only for ground checkout prior to power transfer to the stage. One of the welded joints in the relay came apart resulting in an open circuit. It is believed that this is a result of a manufacturing deficiency and action has been taken to more closely scrutinize the vendor's manufacturing operation. ✓

Qualification Testing/Propulsion Distributor - A failure occurred in one of the relays during qualification testing of the propulsion distributor. This relay, S&GH-2-1, made by Electra Tech is on the Qualified Product List (QPL) furnished to Boeing in MSFC-SPEC-339. The failure occurred during vibration testing. At this time the cause of the failure has not been determined; however, if it is ascertained to be a design deficiency, a serious problem may exist since this relay is common in the timing and sequencing distributor and the propulsion distributor. ✓

NOTES 9/7/65 COOK

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1. PERSONNEL ASSIGNMENT: Colonel Scott Fellows has been appointed as the Director, Operations Management Office (R-OM), effective September 3. ✓

2. SATURN IB PROJECT SUPPORT AGREEMENT: By mutual agreement between IO and R&D Operations, the first Project Support Agreement (PSA) system is being activated for the Saturn IB Program. The target completion date for the Saturn IB PSA is November 5. ✓

3. SINGLE SUPPORT CONTRACTOR MEETING: On September 1 the last of a series of meetings on the AO & R&DO Single Support Contracts was held with Research Projects Laboratory and its contractor, Brown Engineering Company. Overall, the transition from multiple to single support contracts has been accomplished without major difficulty. ✓ Most of the contractors did, however, have more internal problems of staffing and recruiting than they had anticipated. ✓

4. PERSONNEL SPACES: The transfer of 24 personnel spaces to IO on September 1 completed R&D Operations obligations to IO for 250 spaces. Five additional spaces were also transferred to IO on September 1 for the Mission Operations Office. Although vouchers have not been issued for 38 of the spaces, the spaces for 38 R&D Operations people at MTF are considered transferred. The official transfer will occur as personnel actions are accomplished. ✓

NOTES 9-7-65 DANNENBERG

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NEGATIVE REPORT

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1. S-IVB PROGRAM: The S-IVB-203 stage is scheduled for a three-week period of modification which will consist, for the most part, of installation of baffles in the propellant tank. After modification DAC had planned to ship the stage to SACTO without completing post manufacturing checkout. However, recent meetings with DAC and discussions with the S-IVB Stage Manager have changed the plans somewhat. It is now expected that S-IVB-203 will receive post manufacturing checkout at Huntington Beach at least equivalent to the S-IVB-201 checkout. ✓
2. S-IC SERVO ACTUATORS: Due to recent failures at MSFC, both in final acceptance test and static firing, thirty-three servo actuators have been returned to Moog Servocontrols, Incorporated for disassembly, incorporation of design changes, cleaning, and retest. The first servo actuator on Contract NAS8-11960 from Hydraulic Research, Incorporated was delivered to MSFC five days ahead of schedule. Performance of Hydraulic Research, Incorporated actuators continues to be good. ✓
3. NASA TRAINING AGREEMENT: The NASA-wide letter of agreement for training in Non-Destructive Testing, Soldering and Quality Management was signed off by NASA Headquarters, Codes KR and BP, August 20, 1965. This does not materially change the mode of operation. It does assure Headquarters support for existing classes in these areas and for any additional requirements that may result from this agreement. No changes were made in the original copy signed at MSFC by Mr. Neubert for Dr. Rees before forwarding to Headquarters for concurrence. ✓

NOTES 9/7/65 GEISSLER

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- ✓ 1. SA-10 Flight Evaluation: The early evaluation of the SA-10 flight has been completed on schedule. The analysis has indicated a nearly perfect flight. ✓ The payload was inserted with a total velocity 0.7 m/s less than predicted and with essentially no altitude dispersion. Apogee altitude was as predicted and perigee was 2.8 km below predicted, yielding an expected lifetime only 5 days less than nominal. The special instrumentation installed on SA-10 to detect panel debonding of the S-I/S-IV interstage again, as on SA-8, did not indicate any debonding as had been observed on the SA-5 and SA-7 flights. ✓
2. AES Polar Orbit Mission: No notification has been received from Headquarters as to whether the Polar Orbit Mission has a vehicle assigned to it. However, we are proceeding to assemble the mission package while Houston puts together the spacecraft package. ✓ We shall have the total package available for quick response, should Headquarters suddenly indicate a desire for such a mission in the AES mission plans. Incidentally, the AES Mission Planning Task Force Meeting in Houston has been changed from September 8, 1965 to September 14, 1965. ✓
3. Centaur Guidance for Voyager Mission: Representatives of Aero-Astroynamics Laboratory and Astrionics Laboratory met recently to discuss a T. R. W. proposal to compose and evaluate three guidance schemes which might be used in the Centaur stage for the Voyager mission. The schemes to be considered are (1) the present Centaur scheme revised as required for the Voyager mission; (2) an advanced explicit Centaur guidance scheme under analysis by T. R. W. ; and (3) the MSFC iterative guidance scheme. The study would take approximately 6 months and cost \$168,000 including \$45,000 for computer time. Certain studies of the present and possible advanced Centaur hardware would be performed also. Astrionics Laboratory is very interested in having the study made with strong participation from Aero-Astroynamics Laboratory. T. R. W. is eminently qualified to perform the study because of present participation in the Centaur program under contract to L. R. C. The adaptation of the MSFC guidance to the Voyager mission is, of course, being carried out in-house. GDC is under 6 months contract to Lewis to adapt the current Centaur guidance scheme to the new mission in a parallel study. This study and the accompanying work statement will be discussed by Aero-Astroynamics Laboratory personnel and Astrionics Laboratory personnel again next week before contractual action is initiated. ✓
4. Structural Dynamics and Aeroelasticity Symposium: Two papers were presented by members of Aero-Astroynamics Laboratory at the AIAA Symposium on Structural Dynamics and Aeroelasticity held at M. I. T. during the week of August 30, 1965. Mr. Rheinfurth's paper was "A New Approach to the Explanation of the Flutter Mechanism." Mr. Lavender's paper was "On Touchdown Dynamics Analysis for Lunar Landing." Both papers resulted in subsequent questions and discussion indicating lively audience interest. ✓

1. STATUS REPORT - SUSPENSION SYSTEM FOR SAT V DYNAMIC TEST STAND:

a. Hydraulic Support Units: All five units plus required hydraulic components are undergoing functional and loading tests at Martin-Baltimore. Generally, the tests are successful. Loads up to 1.8×10^6 lb per unit were exercised which is equivalent to the weight of advanced Saturn space vehicles (7.2×10^6). Sink rates of the support points are as slow as 3 in/min which is important for a safe sit-down operation for emergency conditions. ✓

Vertical damping as found presently in the head-to-head test on units 1 and 2 is above contract specs. Measuring methods were poorly applied and the company is now in the process of improving its technique. The higher damping values were unexpected and the company is making efforts to understand this discrepancy by carefully inspecting units 1 and 2 and by utilizing simple test methods (i.e., spinning the piston and ring out) at very low piston loads. The results of the latter are very close to expected and specified values. The present results on damping would still qualify the support for dynamic testing of the Saturn V. ✓

During assembly and testing, minor difficulties were experienced in some components and in system integration. A significant on-site installation problem was encountered requiring reinforcing bars spacing in the support pedestal to be changed to conform to the construction code. The rework will probably result in an additional cost to expedite the construction to meet the facility availability date for the installation to support cylinders. Once all data is established, the matter will be coordinated with Dr. Rudolph's office. Acceptance tests are scheduled for completion 11/15/65 which is specified in the contract. ✓

b. Data Acquisition Facility: ASTR supported by P&VE, Test, and various contractors is providing this facility for Saturn V Dynamics Test program use. The facility is housed in a trailer which is in place at the test site. Boeing is installing various electrical and electronic hardware (systems integration) and anticipates completion during 1/66. The analogue recording system to be used in conjunction with the digital data acquisition system is installed in the trailer and functional tests have been completed. Accelerometers, rate gyros, pressure and strain gauges acquisition for instrumentation of the Saturn V Dynamics Vehicle are on schedule and delivery should be complete during 2/66. Installation and acceptance testing of the digital data acquisition system is to be completed during 11/65. These dates blend appropriately with the testing schedule of the Dynamics vehicle and no delays are anticipated on this facility. ✓

NOTES 9/7/65 HEIMBURG

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1. S-IC: S-IC-T firing for 10/5 still looks good. Decision has been made to use AiResearch prevalues as is, on firings of S-IC-T with promise that fix will be available for S-IC-1. Whittaker valve (alternate source to AiResearch) passed all tests at Test Laboratory. These valves are slated for S-IC-2, while S-IC-T and S-IC-1 have AiResearch installed. ✓

2. S-IVB STAGE (SACTO): Our last notes may have been misunderstood (copy attached). Knowledge of time constants has to do with difference between times of valves under cryogenic conditions as compared to warm. ✓ This is a separate reason for loading test and has nothing to do with gimbaling during hot firing. Stage 201 was shipped from Sacramento 9/3. ✓

3. F-1 ENGINE: Complete dye checking of high strength (gold plated) injector revealed no cracks after 669 seconds of mainstage in 8 starts. Engine with this injector will be reinstalled for further testing. ✓

A "fix" to solve decaying bearing, lube jet, pressure problem encountered on Block IV (flight engine) pumps was verified on F-1 engine F-3TI (501 configuration) by a 93-second successful firing on 9/2. Potentially, all flight engines have this problem. ✓

4. S-IVB TEST STAND (MSFC): Test S-IVB-004 was scheduled for 9/1 for 80 seconds, however, trouble developed on the engine (J-2013) oxygen turbine bypass valve and the test had to be cancelled. Test S-IVB-004 is scheduled for 9/8. ✓

JWS 9/9

1. F-1 ENGINE

Four F-1 Engine tests were conducted this week. Engine F-2009 at the West Area Test Stand was tested for approximately 154 seconds for a total mainstage time of 669 seconds in 8 starts on the high strength gold plated injector. Engine F-2009 will be removed and the main injector will be dye-checked at this time to determine if cracking has occurred. Three tests were conducted on Engine F-3T1 to calibrate this engine.

2. S-1C

The S-1C-T firing is scheduled for 10/5. Steps are being taken by ME to assure delivery of stage distributors on time. Results of LOX pre valve (Air Research) tests conducted on the F-1 turbopump test stand indicate that this valve cannot meet the closing time specifications.

3. S-1VB TEST STAND (MSFC)

The next test is scheduled for 9/2.

4. S-1VB STAGE (SACTO)

Preparations are being made to ship Stage 201 from Sacramento on 9/3. Stage 202 will be installed on Beta III within two days after shipment of Stage 201. We are opposed to DAC proposal to delete propellant loading and hot gimbal requirement on 202 stage since gimbaling is a critical stage requirement and the successful use of automated equipment pre-supposes a definite knowledge of time constants.

5. S-11 BATTLESHIP

S&ID is moving ahead with changes i.e., the J-2 engines have been removed; the LH₂ feed line bellows are being replaced; the water spray heat shield has been removed, disassembled, and is being sent to a warehouse for storage; the LH₂ loading sled is being removed and the spare sled from Coca 4 will be installed; the crane on Battleship stand has been inoperative and has delayed LH₂ tank entrance.

6. COMMON BULKHEAD TESTING SANTA SUSANA S-11

Growler tests are being made on the common bulkhead test article to check effect of LN₂ tanking during the weekend of 8/22. The LH₂ tanking test will get underway in September.

7. RANDOM MOTION SIMULATORS

During acceptance checkouts of two simulators (Command Module and S-11 Combination positions) the connecting linkages between the drive cylinders and the moving carriages failed. Failure traced to marginal design of bearing housings coupled with "over-rated" bearings supplied by AMF subcontractor which not only effects failed positions but all eight positions. An AMF redesigned housing will be fabricated in-house, however, supply of bearing inserts for all simulators appears pacing item. Checkouts continuing at reduced amplitudes and frequencies with acceptance of all simulators slipping to mid-October.

NOTES 9-7-65 HOELZER

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1. THIRD GENERATION COMPUTER SYSTEM: The procurement plan for third generation computers has been approved locally and was forwarded to Headquarters on August 30, 1965. We are hoping to get Headquarters approval within three weeks. ✓

2. REPLACEMENT OF GE-235 COMPUTER: September 1 began a 30-day acceptance test on the CDC 3200 computer (Building 4200) replacing the GE-235 computer. At approximately the same cost, turn-around time has improved, second shift and overtime has been eliminated, and there exists capability to handle the increased demands of Aero-Astrodynamic Laboratory. ✓

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I. U. -201: Difficulty was encountered early in the week when a polarity reversal in the cable system resulted in damage to measuring racks. The cause was corrected, the damage repaired and checkout was resumed. Current schedules indicate that the coolant pump, the 56 volt power supply and the Mod II switch selector may not be qualified by AS-201 launch date. We need maximum effort to improve the schedules. We are planning to launch with the Mod I switch selector but prefer to use the Mod II. ✓

I understand the Qual people are on a minimum of a 70 hour week during these checks. If there is down time they have to take Annual Leave to cut down overtime. I recommend the Qual people be put on a 40 hour week during I. U. checkout. ✓

SYSTEM DEVELOPMENT FACILITY: All SDF Launch Control Center (Blockhouse) ESE has been installed and functionally checked out. ✓ The Saturn IB Ground Equipment Test Set test, which includes LCC ESE computer, data link, and Automatic Ground Control Station ESE is now under way. The S-IVB and I. U. GETS tests are next followed by stage system tests. ✓

VLF-34: All GSE necessary for GETS has been delivered to VLF-34 Mod kits and E. O. 's, to update the hardware following an MSFC/KSC/G. E. drawing review in August, are not yet available and are necessary prior to GETS. G. E. has promised to get the E. O. 's out 8 September and is shipping bulk material to KSC to permit installation of fixes, completing in about one week. The Mod kits will be installed later as retrofits. ✓

AS-201 LAUNCH: General Phillips has called a conference at KSC on 8 September to be attended by Dr. Shea, Col. Petrone and Col. James to assess our capability to meet the accelerated launch date. ✓

NOTES 9-7-65 KUERS

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Negative reply.

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1. MANPOWER - In our September 1 meeting on redistribution of manpower resources, agreement was reached to transfer 24 spaces from R&DO to IO effective September 1. Except for the 38 spaces from Test Laboratory, which will be transferred as soon as the personnel transfers can be effected, this completes the 250 space transfer agreement from R&DO to IO. Agreement was also reached to transfer 5 spaces from R-AERO to IO in the functional relocation of Dr. Speer and the Missions Operations Office. ✓
2. ADP SURVEY - Tom Smith's office has completed the (initial phase of) the Survey of ADP Resources Management at MSFC; a briefing on findings and recommendations was given to Mr. Newby on September 2. At Mr. Newby's request, we are now preparing for Phase II, a plan for implementing the recommendations. ✓
3. BOB VISIT - The dates for the BOB visit to MSFC have been firmly established for September 27 through October 1. Mr. Don Crabill, who heads the BOB team has requested a tour of MTF and Michoud on Friday, October 1. These arrangements are being worked out with IO, and other preparations are underway. ✓
4. GENERAL WILLIAM F. CASSIDY VISIT - General William F. Cassidy, new Army Chief of Engineers, and party of nine are scheduled to visit MSFC today September 7, from 10:30 to 1:00 p.m. for general orientation. ✓
5. APOLLO EMBLEM - Dr. Mueller has adopted an official Apollo Emblem and has authorized its use by all participating organizations in government and industry. Attached is a color photo which shows the emblem.
Suggested uses for the emblem include: wearing apparel, machinery ground handling equipment used in the Apollo Program, pamphlets, hand-books, bulletins, post signs, decals, on personal automobiles, and for personal items such as jewelry, tie clasps, and ear-rings (!). We have passed this on to Public Affairs Office to handle internal dissemination and coordinate the use of the emblems at MSFC. ✓
6. MOL PROGRAM - General Schriever has been appointed Director of the Air Force MOL Program; he will also retain his duties as Commander of the Air Force Systems Command and will report directly to Dr. Harold Brown, Secretary of the Air Force. Brigadier General Harry L. Evans is Vice-Director of the MOL Program and is in charge of the MOL Program Office being established in the Pentagon. Brigadier General Russel A. Berg will manage the MOL Systems Office in Los Angeles. Brigadier General Bleymaier is now the Commander of the Western Test Range, which will eventually handle most of the Titan III/MOL launches. ✓
7. BUDGET CUTS IN MSF POP 65-3 - Attached is internal note prepared by Don Messer on the budget reduction being shown in MSF POP 65-3. We are working with Industrial Operations to determine impact. ✓

NOTES 9/7/65 REINARTZ

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SEPTEMBER MANAGEMENT COUNCIL ACTION ITEMS: I have been requested to give an approximately 15 minute presentation at the September Program Review on the impact of the JPL requirement on spacecraft encapsulation and contamination. In addition, Colonel Russell requested that I present a brief summary on the impact of lengthening the 260 inch shroud by a minimum of 82 inches. The lengthened shroud requirement is based on a request from Don Hearsh, Voyager Program Manager to Colonel Russell, dated August 27, in which he stated that a longer shroud, non-contamination separation and spacecraft encapsulation should be considered by MSFC as soon as possible. During the time remaining prior to the Program Review the amount of study effort which can be performed will not permit a complete analysis of the above mentioned requirements. We will, however, attempt to determine major impacts of these requirements on the current design and on the schedule for SA 210. ✓

NOTES 9/7/65 RUDOLPH

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1. Presidential Scientific Advisory Committee (PSAC) - The final PSAC meeting in the current series is scheduled at MSC on 14, 15 & 16 October 1965. Mr. Jewel Moody, Chief, Saturn V Reliability and Quality Office, in keeping with his previous assignment for PSAC coordination at MSFC, will do the necessary coordination within IO and R&DO to provide answers to the recent questions raised by the Panel. ✓
2. S-IC Stage Incentive Contract Conversion - Firm cost proposal for conversion to CPIF received Thursday, September 2, 1965. Copies are being distributed to pertinent MSFC organizations for review and comments. Copies were delivered to NASA Headquarters (Mr. Linn) on Friday, September 3, 1965. ✓
3. S-II Stage Common Bulkhead Test Tank (CBTT) - Initial evaluation of data from LN₂ fill and drain test look good. Temperature drop across common bulkhead was 160° F and across sidewall insulation was 170° F. Ultrasonic inspection of common bulkhead is 50% complete and results show no detectable voids. ✓ Completed visual inspection indicates no damage to common bulkhead. ✓ One small crack appeared in the insulation at a field installed point, however, no cracks are visible in factory installed insulation. ✓
4. S-IVB Incentive Contract Conversion - The pre-negotiation position for incentive contract conversion was handcarried to Headquarters on Tuesday, August 31, 1965. We plan to review our position with Headquarters personnel this week. ✓
5. SA-500F Test Requirements - Agreement has been reached between MSFC and KSC on the SA-500F Test Requirements. KSC plans to distribute the approved document by Friday, October 1, 1965. ✓

NOTES SPEER 9/7/65

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1. OSRO: The basic disagreement between KSC and GSFC on implementation responsibility for tracking, data acquisition, and command for MSF from liftoff through insertion apparently has been resolved. Mr. Christensen is now proposing that KSC act as responsible management interface to the Eastern Test Range (ETR) and that GSFC assign personnel to KSC (Bertram's office). Even in the orbital phase, ETR's contact will be KSC. By virtue of this agreement KSC will be involved in all mission phases. Acceptance of this proposal would be a major success for KSC. ✓

2. LIEF Facility Status: Most of the display equipment for the Huntsville Operations Support Center (HOSC) is now scheduled for delivery around 10/1. The converters from digital data to TV display are checked out; 3 TV large screen projectors (Eidophor) are being installed. Complete system checkout is scheduled for early November. The HOSC voice communication system will be activated on 10/1 allowing us to participate in the MSC flight operations simulations for AS-201. Voice and data circuits to KSC will remain essentially unchanged. MSC circuits are expected to be operational by 11/1. ✓

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1. PEGASUS: All Pegasus III Subsystems continue to work well. Total meteoroid hit counts are at present as follows: 19 on 0.4 mm (16 mil) panels; 13 on 0.2 mm (8 mil) panels; and 41 on 0.04 (1.5 mil) panels. Three 0.4 mm detectors, and three 0.2 mm detectors were lost due to shorting; three 0.4 mm groups were switched off because of spurious pulses. The precession cone half-angle has increased to 20° ; spin rate is $5.3^{\circ} \text{ sec}^{-1}$. ✓

Pegasus II continues to operate properly. Fluxes remain approximately the same. The precession cone half-angle has increased to 20° ; spin rate is $2.5^{\circ} \text{ sec}^{-1}$. ✓

2. AAP: Mr. Conrad Swanson will be transferred from P&VE to Mr. Downey's Branch in RPL where he will assume responsibility for astronomy-related AAP tasks. ✓

We have completed work statements for the AAP tasks "Continual Surface Measurement Instrumentation" and "Lunar Surface Surveying Staff (Jacob's Staff)". The statements will be reviewed with members of Headquarters and of the United States Geological Survey (Dr. Shoemaker) before finalization. The first of these tasks is particularly significant because it is equally applicable to lunar surface exploration, lunar orbites, and earth orbites. ✓

We have been working closely with ASO in the definition of the assignments, functions, and responsibilities of Integration Centers, Lead Centers, Contributing Organizations, and Integration Contractors.

3. SUPPORTING RESEARCH AND TECHNOLOGY: Members of MSF (Beckwith, Waugh, Peil) visited MSFC to discuss a new approach to the "Advanced Manned Missions" (908) Program which has not met with MSF approval in its present form (FY 66). We will prepare a new program and discuss it with R-DIR before submitting it to MSF. ✓

Members of OART (Rosche, Gilstad) visited MSFC to discuss progress in the Launch Vehicle Loads and Structures Program. Representatives of P&VE and Aero presented the status of their work. It is our impression that MSF members were satisfied, and that we can count on continuing support in this area. ✓

NOTES 9/7/65 WILLIAMS

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1. Martin/Baltimore Trip Report. Mr. George Detko visited the Martin/Baltimore plant on September 2, 1965, to examine the Titan-II booster that was recovered after the Gemini Titan-5 launch. Discussions were held with the Martin Company, Air Force, MSC and NASA Headquarters representatives to ascertain the best course of action for analyzing and evaluating the recovered booster. A list of reusability data desired from the recovered booster was formulated and submitted to the MSC representative for consideration in the overall evaluation program. It is felt that useful and convincing reusability data can be obtained from this evaluation. ✓
2. MSFC Proposal to Headquarters on AES. This Office, in conjunction with Dr. Stuhlinger and E-DIR, is attempting to pull together a MSFC proposal to Headquarters on AES in response to Dr. Mueller's request to Dr. Rees. A review/dry run of this material is planned for September 17, exact time and place not yet firmed up. ✓
3. Visit of Martin/Denver General Manager. Mr. George Smith, General Manager of the Denver Division, Martin Company, will visit MSFC on Wednesday, September 8, to give us a rundown on how they are accomplishing the Titan III payload/experiment qualification, test, integration and operation for the Air Force. The meeting will be in Room 815 from 9:00 - 11:00. ✓

SEPTEMBER 13, 1965

NOTES 9/13/65 BALCH

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A special report will be made on hurricane damage as soon as
an assessment has been completed. ✓

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F-1 ENGINE

Final analysis is being made of high-strength braze FRT configuration injector tests which were run at NASA/RETS and MSFC. These analyses are expected to confirm a previous retrofit decision for S-IC-1 and S-IC-2 engines at MSFC. The first retrofit injector is expected to be delivered about September 21, and the second about one week later.

Engine F-4019 (third flight engine for S-IC-2) has been delivered to MSFC. ✓

J-2 ENGINE

The complete production incentive contract package is in Mr. Gorman's office for signature. ✓

Engines J-2020 and J-2036 have been delivered to S&ID as the first two engines of the second set of battleship engines. ✓

South Western Industries calips switch production has been resumed. The quality control deficiencies have been resolved with the Air Force. No impact on J-2 engine production is anticipated. ✓

Two full duration tests were conducted on the new 230K/5.5 MR engine, J018. The primary objective is to accumulate 3,750 seconds of run duration to demonstrate engine system integrity at the high thrust levels for extended durations. ✓

RL10 ENGINE

The first two RL10A-3-3 (uprated Isp) engines will be mounted on the Centaur battleship propulsion test vehicle at Sycamore Canyon on completion of a final firing this week using RL10A3-1 engines. The new test series will start shortly in support of the AC-8 and AC-10 (1966 flights) using the uprated engines. The first Atlas/Centaur vehicle to land a Surveyor spacecraft on the moon (AC-7) will be erected on its launch pad this week. ✓

C-1 ENGINE

Authority to negotiate Phase II contracts with both Reaction Motors Division and TRW Systems Group, TRW INC. (STL) was received from Dr. Mueller September 11. ✓

SIB 9/13

1. S-IB STAGE 201: During pressurization of the S-IB-1 fuel tank No. 1 instrument unit for leak checking purposes, a personnel error resulted in sufficient overpressure in the instrument unit to completely reverse the upper fuel tank bulkhead. On-site review of the damaged bulkhead by personnel of this Laboratory, Manufacturing Engineering Laboratory, and Industrial Operations representation resulted in a recommendation that dual approaches to correct the situation be made concurrently. These approaches are (1) attempt to modify the flight pressures so as to make the damaged upper fuel tank No. 1 bulkhead a membrane with the primary structure becoming the upper instrument cannister bulkhead, and (2) decluster S-IB-1 No. 1 fuel tank and replace this tank with a new, light-weight S-IB configuration tank. Schedule impact is being studied. ✓

NOTES 9/13/65 CONSTAN

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A special report will be made on hurricane damage as soon as an assessment has been completed.

NOTES 9-13-65 DANNENBERG

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1. Data Management - A study to determine the need for the original Redstone, Jupiter, Juno II, and Pershing flight records at KSC has been completed. A letter has been prepared for Dr. Rees' signature informing KSC that no need exists. Formal contact with the U.S. Army is suggested before disposal action is taken.

Suggest we keep a few samples for the MSFC Historical Section. Please

K.I.D.

2. ICD Management

Phase I of the Boeing effort to identify all Interface Control Documents (ICD) for the Facility Vehicle 500-F is almost completed. Meetings with laboratory people are being arranged for purpose of validating the matrices developed.

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Scope of Work for Saturn IB ICD identification was discussed with the Saturn I/IB System Engineering Office. It was agreed that Chrysler will prepare a matrix similar to the Saturn V matrix for necessary identification of Vehicle and Ground Support Equipment interfaces.

3. Experiments Coordination - An attempt is being made, through contacts in Headquarters, to find out the status of FY 66 funds for experiments. R&D has received no FY 66 funds for in-flight experiments as of today.

Ref. Notes 8-30-65 Dannenberg, Item I (Attachment 1) - Dave Lord will head the Experiments Division instead of Ted George.

NOTES 8-30-65 DANNENBERG

9/13

1. Experiment Coordination - MSF has established an Experiments Division, headed by Mr. Ted George, as an element of Mr. Gray's organization. The office is responsible for experiment generation, program control, funding, etc. The division will serve as an interface with the Program Offices and Field Centers. It will provide staff continuity, contact within and outside MSF, to assure sufficient experiment payloads.
2. PRB Meeting - The status of ICDs was reviewed and accepted by the PRB. The concept of preliminary ICDs has been deleted; a draft on "criteria for ICDs" was adopted and is being distributed for application to ICDs to be generated in the future.
3. Saturn V ICDs - A matrix for individual stages and their relationships with other stages (including spacecraft modules), test and launch facilities, and with transportation and checkout equipment is being prepared by Boeing to give Program Management the needed visibility. The implementation of all ICDs will be assured by incorporating these ICDs into the proper Contract End Items (CEI) specifications.
4. Configuration Management - has determined that all ICDs in contractual effect as of 4-8-65, have established the CEI baseline. Incorporation of new ICDs will require change board action; also, major changes to existing ICDs will require formal change procedures.

Attachment 1

NOTES 9/13/65 FELLOWS

BW/3

9/13/65

1. PROJECT SUPPORT AGREEMENT (PSA): An R&D Operations PSA Activation Committee is being formed so that all facets of the growing formal working arrangements will be properly covered and responsibilities clearly matched with R&D Operations support of IO objectives. ✓

2. LOCAL LOX STORAGE: The Congress deleted the 225,000 gallon LOX storage tank for the West Test Area from the FY 66 CoF Program. Test Laboratory is requesting reprogramming of the project within NASA; that would require Mr. Webb's approval under his special delegated authorities. This CoF project will be discussed thoroughly with IO before recommending a Center position on petitioning Mr. Webb to grant project approval. ✓

3. FY 66 BUDGET REDUCTION: NASA Headquarters has imposed a sizeable reduction in Saturn IB and Saturn V FY 66 funding. The R&D Operations portions of that reduction have not yet been fully determined, but we will work very closely with IO and the laboratories to assure that only the lowest priority work is affected by this change in the planned program. ✓

1. Touchdown Dynamics: An Aero-Astrodynamics in-house study was completed on the touchdown dynamics stability of spacecraft designed for lunar landing. Both three and four-legged generalized type vehicles were considered with various landing gear diameters. A Monte Carlo approach was used to determine initial conditions. Results show that for a given probability of stable landing, a three-legged vehicle requires a landing gear only slightly larger than diameter required for four-legged vehicle. Therefore, three-legged landing gear would weigh less, and be more attractive. ✓
2. Saturn IB Dynamic Test: Personnel of MSC and NAA visited MSFC Aug. 30 through Sept. 2, for observation of upper-stage Saturn IB dynamic test and for discussion of existing and potential problems in CM-SM interface. Two things showed up in test: (1) torsional behavior of interface (during roll testing) has worsened, (2) noise during lateral testing, attributed by us to separation of command module from support pads, has stopped. As a result, the MSC representative has stated that MSC will consider a redesign to eliminate torsion problem (this is an extremely simple redesign) ✓ On the basis of absence of noise in interface, MSC and NAA observers have decided that there is no longer a separation taking place; however, strain gage records (which have not been analyzed fully because of urgency of other test efforts) indicate that unloading of some of the support pads is occurring. It is certain, at least, that forces in the tension ties are much lower than specified by MSC. Because of this the MSC representative has agreed to recommend changes in assembly procedures to insure adequate tension. ✓
3. Little Joe - Saturn V Scale Model Program: A meeting was held Sept. 7 between Messrs J. Rainey from Langley, Coe from Ames, Modlin from MSC and members of Aero-Astrodynamics Laboratory concerning the validity of aerodynamic noise design criteria and the merits of the proposed Little Joe/Saturn V scale flight test program vs wind tunnel measurements. The intensities arrived at in the design criteria formulated by Aero-Astrodynamics Lab. were essentially confirmed with only a few relatively minor modifications ✓ It was also agreed that there is no straightforward approach for establishing information about cross-correlation of fluctuating pressures from theory or wind-tunnel tests. Mr. Rainey stated that a large scale wind tunnel program of a total vehicle model might establish sufficient data if structure is not very marginal. Mr. Coe was more skeptical as to adequacy of wind tunnel testing of total configuration but hoped that sufficient information could be obtained from wind tunnel component testing plus airplane testing. He admitted, however, that this approach would probably not give desired data in near future. He expressed interest in data from a free flight program, but was somewhat skeptical as to realism of scope and schedule of our program. He further suggested including elastic panels in Saturn V scale model or Little Joe. Mr. Modlin stated that their previous concern about excitation of SM fuselage vibrations which led to certain structural modifications was not borne out by in-flight response measurements. In summary, it was agreed that the case for the Little Joe program would strongly depend on structural marginality of configuration. Messrs Rainey and Coe stated they would prefer alternate approaches, if the concern was primarily about local panel response. ✓

9/13

B10/3

1. SATURN IB FIRST ARTICLE CONFIGURATION INSPECTION (FACI): During a recent meeting it was decided a somewhat limited FACI would be made and completed by December 1, 1965 on S-IB-2. A much more complete FACI will be made on S-IB-3; however, in consideration of the similar activities by I-MICH-Q personnel throughout stage assembly and checkout, this FACI is not planned to be of the detail required by NPC 500-1. ✓
2. S-IVB PROGRAM: An evaluation of the S-IVB-201 stage checkout history has been made to determine if any weak systems or components are on the stage. The evaluation has been submitted to the S-IVB Stage Manager's Office and points out areas which should be monitored closely at KSC during stage and vehicle testing. ✓
3. IU 201 CHECKOUT: General Networks tests have been completed on the S-IB-IU-201 Instrument Unit. I&T Systems tests have been started but not completed due to numerous problems. Tests are presently continuing on a non-interference basis with G&C system testing. Power supply failure in both RCA-110A computer display consoles and problems associated with the water methanol cooling system have caused approximately one day of schedule loss. The ST-124M inverter/power supply failed after 14 hours operation in the instrument unit because of a shorted capacitor. A non-flight test inverter is being used presently. Problems associated with the ST-124M mounting frame, i.e., canted mounting surfaces, are yet unresolved. ✓
4. S-IC COMPONENTS: All of the prevalves, five LOX and ten fuel valves, have been removed from S-IC-T to be changed from double pneumatic to normally open valves. Three of the modified fuel valves have been accepted for reinstallation. No problems are anticipated with the fuel valves and it is expected that they can be completed by the September 15 schedule date. LOX valves P/N20M32010-3C have given considerable problems with shaft seal and external leakage and position switches. None of these valves have been accepted to date. Plans are being made to establish two shift operations to try to meet schedule. Lox pre valve P/N20M32010-13C serial number 12 was accepted with no deviation for installation on S-IC-502. This was the first LOX pre valve accepted with no waiver required, which indicates the quality of this particular valve is improving. ✓

9/8 9/13

Boys

1. F-1 ENGINE

Engine F-1002-3 was installed in the Static Test Tower West on 9/8. Initial test is to be conducted on 9/13. The primary purposes of these tests are to check out inboard Flexonics ducts before they will be installed on the S-IC-T. Engine F-2009 was installed in the F-1 Test Stand on 9/8, with the initial test to be conducted on 9/13. Primary purpose of this test will be to continue verification of the high strength injector. ✓

2. S-IC

The work involved in the areas of the pre valves, PVC's, and engines is proceeding on schedule for the 10/5 static test date. However, any slip in the pre valve schedule will impact the next static firing date. The distributors for the ESE are to be completed today. However, only 12 of the 85 printed circuit boards for the distributors have been received from Boeing. The others are either in inspection or in the state of fabrication at Michoud. These distributors must be on hand by 9/20, or the test schedule will be affected. Also, Boeing may go on strike 9/15. ✓

3. S-IVB TEST STAND (MSFC)

Test S-IVB-004, conducted on 9/8 (scheduled for 80 seconds duration) was erroneously cut off by a redline observer at 10 seconds. Review of records and observation of the above test revealed no problems. Test S-IVB-005 (scheduled for 80 seconds duration) was successfully conducted on 9/10. Post test investigation revealed that the main lox valve was leaking, probably caused by a failure of the main lox valve lip seal. Valve will be replaced. The next test is scheduled for Wednesday, 9/15, for 400 seconds duration. ✓

4. RANDOM MOTION SIMULATOR, AMF

Acceptance testing of Command Module RMS was accomplished Friday and Saturday. ✓

5. HURRICANE DAMAGE REPORT, MARINE EQUIPMENT

No damage to: Tugs Clermont and Bonus H at Slidell; propellant barges, deck barges, and stage barge Pearl River at MTF; S-IC barge at Harvey, Louisiana, and to barge Little Lake at Michoud. Barge Promise at Michoud is aground. Extent of damage, if any, is not known at this time. ✓

NOTES 9-13-65 HOELZER

958 9/13

B 10/13

Negative report.

B 10/13

NOTES 9/13/65 JAMES

958 9/13

S-IVB AS-201: I met Wednesday with General Phillips, Colonel Petrone, and Dr. Shea at KSC to review the status of AS-201 hardware and to participate in a schedule assessment. It is quite apparent that the full pressure is still on us for a launch as currently scheduled even though substantial spacecraft problems are evident. There are indications that some rather drastic steps may receive serious consideration at a later date to permit meeting the schedule. These might include such things as deleting portions of the spacecraft checkout and possibly mission modifications. One of the things mentioned was the possibility of deleting the planned spacecraft propulsion system static firing at KSC. We must continue here at MSFC to work toward our current delivery commitments to support the planned launch date. ✓

S-IB-1: During leak checks of the F-1 tank instrument compartment of the S-IB-1 Stage at KSC late Friday, CCSD inadvertently over-pressurized the compartment and major structural damage occurred. The fuel tank upper bulkhead inverted, the pressurization standpipe was torn from the bulkhead and the manhole cover was severely warped. The F-2 instrument compartment is manifolded to the F-1. A quick-look indicates no damage but this is being investigated further. Fred Cline, Jack Franklin, and Art Thompson joined KSC and CCSD personnel in an on-the-spot inspection Saturday. Preliminary investigations indicate several possible alternatives: 1. Repair the bulkhead at KSC; 2. Remove and repair the tank at Michoud or Chance-Vought; 3. Replace the tank with a spare at KSC; 4. Replace the tank with a spare at Michoud; or, 5. Accelerate S-IB-2 and ship to KSC for the first flight stage. Alternative #1 appears highly questionable. Alternative #3, if it can be done, has obviously the least impact on the schedule. All alternatives are being investigated in detail. Dr. Debus has notified NASA Headquarters of this incident and I have also talked to General Phillips regarding it today. Dr. Debus has requested an official Board of Inquiry to investigate the cause of this incident and recommend corrective actions as required. Art Thompson and Ed Mathews (KSC) will co-chair this Board. Jack Furman, R-P&VE, George Hardy, I-I/IB-MGR, and a Michoud contracts representative will also serve on this Board along with appropriate KSC and CCSD people. ✓

Enclosure to Dr. von Braun: Picture of F-1 Tank Bulkhead

NOTES 9-13-65 KUERS

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9/13 9/13

S-IC-501 Progress Report: The assembly progress in our hard struggle to meet the September 27, 1965 delivery date to check-out is still satisfactory. The five engines have been installed and the cable installation is making very good progress. We have now 35 people doing actual installation work on the stage during the day shift and 6 to 8 people during the night shift in addition to supporting fabrication activities such as tube forming and cleaning, electrical distributor work, work in the valve clinic, etc. The total remaining installation work load is estimated at approximately 5,000 manhours. Shortage of parts from The Boeing Company, which are scheduled for installation prior to September 27, is 112 line items. The flow of parts from Michoud was cut off Friday afternoon because of the hurricane. When delivery will be resumed is not known today. These shortages comprise a great variety of components such as printed circuit panels, cables, boots, flex ducts, temperature gages, antenna hardware, brackets, etc. The assembly status at delivery will, as usual, be accurately assessed in our transfer document (which is now called Manufacturing Milestone Completion Certificate). We know that a certain work load will be carried over into the check-out period such as replacement of two dummy actuators, replacement of injector plates of the engines (new injector plates will become available only in October), replacement of some dummy and/or unqualified valves, installation of some missing measuring components, etc. However, this spill-over work to the check-out period is being coordinated with R-QUAL; it is not considered to be excessive and is well under control. ✓✓

9/13

1. NEW EXPERIMENTS DIVISION IN MSF - Dr. Mueller has approved the immediate establishment within E. Z. Gray's office of an Experiments Division which will be responsible for:

- coordination of the MSF Experiments Program
- providing Executive Secretariat services to the MSF Experiments Board and
- definition of experiments up to the point where feasibility is demonstrated and the experiments can be transferred to a program office for implementation.

Douglas A. Lord is acting Director of the division; his Senior Assistant will be Theodore A. George, and Bert Denicke will continue in his present role with the MSF Experiments Board. ✓

2. PROCUREMENT MANAGEMENT MEETING - A meeting is to be held in the MSF Apollo Program Control Office September 15, to discuss the development of an OMSF-Wide Procurement Tracking System. MSC has developed and will make a presentation on their Procurement Management System for the consideration of Headquarters and Center representatives. Messrs. Jackson and Webster will attend this meeting, along with representatives of the procurement offices. ✓

3. APOLLO EXECUTIVES MEETING - The Apollo Executives Meeting is scheduled to be held in New Orleans September 30 - October 2. We do not yet know whether the storm damage from Hurricane Betsy will cause a postponement. ✓

The purpose of this meeting is to review progress toward completion of MTF, and to review recent significant developments in the Apollo Program. Hal Benner, in Ray Kline's absence, is coordinating necessary arrangements for MSFC-Huntsville. ✓

4. BUDGET DATA FOR PROGRAM OPERATING PLAN (POP) 65-4 - The call for budget data for Program Operating Plan 65-4 was distributed within MSFC on September 10, 1965. This call includes program guidelines for all work being performed at MSFC and puts into motion the collection cycle for R&D, AO, and C of F data for the next POP submission at Headquarters, which will be done during the first week in November. ✓

NOTES 9/13/65 REINARTZ

9/13/65

B 10/13

JPL SPACECRAFT CAPSULE REQUIREMENTS: I received a datafax from JPL on September 10, requesting that MSFC undertake a brief look at nose fairing variations to the Saturn IB/Centaur in order to accommodate a larger capsule diameter. The request for this data is based on JPL's current studies of the latest interpretation of the Mars atmospheric data. There are three cases that JPL has asked MSFC to look at prior to 9/28/65 when they are to report to OSSA. Case 1: Lengthen the shroud to provide a 260 inch payload fairing diameter, 170 inches above the present vehicle/spacecraft interface. Case 2: Lengthen the vehicle and increase the diameter to provide a payload fairing diameter of 302 inches at a point 202 inches above the vehicle/spacecraft interface. Case 3: Increase the vehicle length and nose fairing diameter to provide a diameter of 392 inches at a point 247 inches above the vehicle/spacecraft interface. After a brief discussion with R&DO personnel, set up to investigate these problems, it was concluded that a minimum of four weeks instead of two is required to arrive at a realistic first order estimate of the effect of these changes on the vehicle. Since Case 3 is such an extreme, we plan to only investigate Case 1 and Case 2 at this time. JPL is also investigating what it means if they cannot get an increase above the 260 inch diameter. JPL will be at MSFC on September 14 to go over their requirements with the MSFC team. I am forwarding a TWX to Dr. Burcham, JPL Voyager Project Manager, stating that MSFC cannot complete a meaningful study within the two week time period and will need about four weeks. ✓

B 11/3

NOTES 9/13/65 RUDOLPH

9/13 9/13

1. S-IC Stage:

S-IC-T Stage Status - First automatic firing still predicted for Tuesday, October 5, 1965. ✓

S-IC-1 Stage Status - Configuration at time of transfer to R-QUAL has been defined. Some electrical distributors, liquid level probes, and isolated telemetry items are among missing components. Shortages are not expected to delay Test and Checkout operations. Transfer to R-QUAL expected on Friday, September 27, 1965, on schedule. ✓

S-IC-2 Stage Status - Fuel tank exclusion riser has been repaired. Fuel tank and Thrust Structure are being joined, one week behind schedule. No impact expected on stage completion schedule. ✓

2. S-II Stage:

Incentive Contract Conversion - Contractor's proposal for incentive conversion of S-II Stage Contract (NAS7-200) will be submitted to MSFC on Thursday, September 30, 1965. ✓

Common Bulkhead Test Tank (CBTT) - Leaks found during the last test were repaired and the LH₂ fill and drain test was attempted again over the past weekend (September 11-12, 1965). The test was terminated at approximately 1/2 of propellant capacity because of leaks. Repairs will be made and test rescheduled again for this weekend (September 18-19, 1965). ✓

S-II-T Stage Status - S-II-T Stage moved into Station 7 on Wednesday, September 8, 1965, (previously scheduled for Friday, September 3, 1965). Manufacturing completion and ship date still remains Friday, September 24, 1965. ✓

S-II-S Structural Failure - The limit test on the max. Q Alpha condition was conducted on Friday, September 10, 1965, with both external loads and internal pressures with a goal of 140% of limit design. At 130% of limit design load, local wrinkling occurred in the forward skirt at station 945 and approximately 4 1/2 feet on either side of fin A. First evaluation indicates the failure is repairable. The schedule and design analysis is currently underway and results will be transmitted as soon as available. ✓

3. S-IVB Stage:

Incentive Contract Conversion - NASA Headquarters personnel will be given a final briefing on our pre-negotiation position today, September 13, 1965, at MSFC, and it is tentatively planned that they will brief Dr. Mueller on Friday, September 17, 1965. Barring complications, negotiations with DAC can commence on Tuesday, September 21, 1965. ✓

NOTES 9/13/65 SPEER

B 10/3

9/18 9/13

1. LIEF PRESENTATION: Capt. Holcomb advised that Gen. Phillips and Mr. Christensen request a tour and presentation on our LIEF facility. Their visit has been tentatively set for early October. I will keep you informed on final date and arrangements. ✓
2. MSF MISSION OPERATIONS BUDGET: A meeting between Gen. Phillips and Mr. Christensen is scheduled for 9/16 to discuss budget division between Program and Mission Operations. I understand that the latter will include Launch Operations; Space Operations; Launch Instrumentation; and Mission Control Facilities. ✓
3. AS 203 FLIGHT OPERATIONS PLANNING: MSFC input to the AS-203 Flight Operations Plan (FOP), which will be published by MSC, has been forwarded to MSC. A meeting was held at MSC with MSFC participation on September 8 to review all flight operations aspects of this mission. MSC essentially agreed with our proposed sequence of LH₂ experiment and orbital checkout tests and with our proposed concept for flight control. A complete draft of the FOP is expected for MSFC review in two weeks. All other operations planning activities for this mission are on schedule. ✓

NOTES 9-13-65 Stuhlinger

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9/8 9/13

1. PROJECT PEGASUS: Pegasus II and III continue to operate properly and to return good data. ✓

2. AAP-LUNAR SURFACE EXPERIMENTS: Members of RPL attended meetings at MSC in which potential Apollo experimenters discussed the status of their experiments. The final selection of Apollo experiments has not yet been made. The presentations provided valuable information for our AAP lunar surface experiment studies. ✓

Our proposed work statement for the AAP Lunar Ground Truth Package (lunar surface measurements which can be compared with orbital observations of the same lunar features) was fully endorsed by OSSA. This study will prove very valuable for us because of its close relation to earth observations from earth-orbiting satellites. ✓

3. POSSIBLE MSFC CONTRIBUTIONS TO THE DEVELOPMENT OF THE SUPERSONIC TRANSPORT(SST): Mr. J. W. Howell of the Federal Aviation Agency visited RPL on September 9 for the purpose of reviewing this Center's supporting research and technology program for possible application to the design and development of the nation's SST. Mr. Howell was provided with a complete set of work units representing this Center's Research and Technology Program, as well as a copy of the latest Semi-Annual Progress Report. He was greatly interested in our work on materials, thermal design, quality assurance, reliability, manufacturing methods, checkout and test methods, and the like. ✓

9/13

1. NASA Lunar Experiments Summer Conference. In response to your question on my 8/16/65 Notes (copy attached), the following is submitted. The scientific committees that took part in the NASA Lunar Experiments Summer Conference were set up to advise the Director of the Manned Space Division of OSSA, Dr. Willis Foster, on the needs and recommendations of the "scientific community" for the Apollo, AES, and follow-on programs. The subject recommendations were excerpts from the final committee recommendations after extensive discussions and weighing of the scientific needs were completed. In particular, the following committees, in their submitted recommendations to Dr. Foster, contained the subject recommendations:

- a. The Geophysics Committee
Chairman: Dr. Frank Press
- b. The Geology Committee
Chairman: Dr. Eugene Shoemaker
- c. The Geochemistry Committee
Chairman: Dr. James Arnold ✓

✓ 2. AES (AAP) Integration. It seems fairly certain that MSFC will be assigned the task of AES (or AAP) integration for all Phase II flights, with MSC handling the flight operations. One of our first major tasks will be the finalizing of a RFQ and Procurement Plan for this work. A 'near final' draft of the RFQ has been prepared and will be coordinated within the Center starting early this week (9/13). A first draft of the Procurement Plan will be completed by 9/15/65 and its coordination will be initiated. There is an urgent need to get these items staffed through the Center and to Headquarters as soon as possible in order to get the RFQ out by early October. Dr. Mueller is pressing to get the contractors on board by January 1966, thus necessitating an RFQ release by the early October date. ✓

September 20, 1965

(Put Dr Haussermann's notes
in Mr C's urgent box because
Dr von Braun had directed
a question to Mr Corman)

9/20

1. T-Bird. The "buy-off" meeting for the T-Bird will begin in Downey on Sunday, September 19, 1965. The T-Bird is still scheduled to arrive at MTF on October 11. GSE-S&ID plans for GSE delivery, installation and checkout continue to support the January firing. However, there is growing MTF concern that the integrated GSE checkout will reveal substantial problems and require more time than the plan has allocated. The auxiliary crane which failed in load tests has been replaced by the Corps contractor. There is a problem in that the Corps is not at all satisfied with certain replaced components, therefore, it may be some time before this replacement is acceptable. In the meantime, loading the T-Bird will be by the barge-mounted crane previously reported. ✓

Hope you don't bump it like the SII roadtest dummy! B

2. Development of S-IC presentation for September 28 is progressing. Phase II Technical Systems costs against new Corps of Engineers Joint Occupancy Dates are due in September 22. Corps of Engineers representatives meet with Koppers Company on September 23 for negotiations on new dates. Study on utilization of S-IC-T will be completed and presented on September 28. Meanwhile, contractor has assured responsibility for working two eight-hour shifts, six days per week. ✓

3. Negotiations with GE are continuing on FY 66 Plant and Technical Support. Satisfactory work scope and man loading has been resolved. Expect to complete overhead and fee negotiations by the end of week. Aetron contract NAS8-5576 negotiations completed for overrun and scope changes amounting to \$3,128,717 including fee of \$33,547. Overrun negotiations on contract NAS8-14014 estimated at approximately \$500,000 scheduled for Wednesday, September 23. Negotiations with S&ID became deadlocked on Friday resulting from disagreement of manpower loadings for the S-II program. ✓

4. Forthcoming visits to MTF of Apollo President's Club on September 30 and // !!!
the Bureau of the Budget on October 1 are two major events for next week. Full participation of MTF contractor management is being requested for the former. ✓

5. MTF Land Management requirements were discussed with personnel of Mobile District on September 15 with intent of finalizing the Corps' responsibility in this area. ✓

6. Impact of "Betsy" on APCI LH₂ Plant and the resultant effect on barge activation is being investigated. MTF Government and contractor personnel suffered tremendous personal losses as a result of Hurricane Betsy. It is still too early to make a valid estimate of losses, but we know that some families lost everything, including their homes, furnishings, and personal effects. Additionally, coastal communities have been hard hit with respect to streets, utilities, and other public facilities. During the disaster, there was a large turnout of MTF personnel to ehlp the hurricane victims, some of whom are still in the process of "digging out" and trying to salvage possessions. The personal tragedy and financial impact (most losses not being covered by insurance) on personnel, resulting in less effective use of time and direct-time loss, will be significant to MTF. When a full assessment has been made, copies or summaries will be furnished you.

Harry G. What do you think of a concerted MSFC (and Michael?) action to pass the hat around for the most affected Government families at MTF? B

9/28 9/20

B1013

C-1 ENGINE Last week negotiations were completed with both Reaction Motors Division and TRW Systems Group, TRW INC. for a 21-month development program through Qualification. During the week of September 27, the Source Evaluation Board will perform the final evaluation of the two contractors. ✓

L.B.

F-1 ENGINE After 79 seconds into a water pumping test, the LOX impeller on turbopump E034 failed. The front shroud and all blades were lost. This pump had a total of 3,000 seconds of operating time, 1,800 seconds pumping LOX and 1,200 seconds pumping water. Fatigue is the suspected failure mode. The failure is being investigated. No program impact is foreseen.

Are we keeping book on total impeller time, so we would know when to replace an impeller? In helicopter operations retiring parts as they approach fatigue time limits is customary

Engine F-4022 (first engine for S-IC-3 at Michoud) showed abnormal dynamic pressure oscillations in the number one fuel outlet in acceptance testing. Replacement impeller and inducer are being installed in the turbopump as a fix. It will repeat hot-firing with a probable slip of three weeks in delivery. ✓

J-2 ENGINE R&D engine J018, a 230K/5.5 MR engine, has completed six full duration tests in succession for an accumulated run duration of 3,638 seconds. An additional 112 seconds will meet the service life requirement.

Engine J-2031 for S-IVB 205 was delivered Friday, September 17. This is the first of the four oil contaminated engines to be cleaned and prepared for delivery.

The production program incentive conversion contract package has been approved by MSFC and forwarded to NASA Headquarters for final approval.

A successful 400 second test was conducted September 15, with engine J-2013 at the Marshall Test Laboratory.

A Procurement Plan for negotiating the conversion of J-2 R&D contract NAS 8-19 from CPFF to CPIF plus the addition thereto of 54 J-2 Production Engines and Sustaining Engineering, to support the Apollo Program thru Saturn V (515), is being staffed for Center approval for subsequent submission to NASA Headquarters. ✓

RL10 ENGINE The negotiated two-year incentive contract for follow-on RL10 engine research and development was sent to NASA Headquarters last week for approval. The contract, which covers qualification of the RL10A-3-3 (uprated Isp version) and continued flight support, is effective on October 1.

A representative of the Engine Program Office attended the Centaur Project Management Meeting last week in San Diego. A brief summary of pertinent points brought out in that meeting are attached (attachment to Dr. von Braun's copy only). ✓

H-1 ENGINE As previously reported, an agreement could not be reached between Rocketdyne and MSFC negotiators for the procurement of 22 additional H-1 engines for support of Vehicles SA-210 through SA-212. On Monday, September 13, an MSFC team presented the government's position to Rocketdyne and asked that proposed costs be reviewed with consideration for a downward adjustment. The contractor has been requested to return on September 27 to resume negotiations. ✓

NOTES 9-20-65 CLINE

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NEGATIVE REPORT

9/28 9/20

B 10/3

1. HURRICANE BETSY

As a result of visit by Dr. Rees, Mr. Gorman, General O'Connor and others on Monday, September 13, 1965; immediate contractual action has been initiated with the Tri-State Roofing Company, Knoxville, Tennessee, and J. A. Jones Construction Company to repair damage. Both of these contractors have moved to the job site and are proceeding with damage repair. As an interim measure, maintenance personnel of Mason-Rust, Chrysler, and Boeing have closed the majority of roof damage. Primary concern is repair to S-IC Stage Checkout Building and Vertical Assembly Building. Work crews and material are on these jobs with repair work proceeding satisfactorily. Total dollar damage to the facility is currently being assessed by the MSFC Facility Office. ✓

2. BOEING STRIKE

The IAM (International Association of Machinists) went on strike against Boeing at 12:01 a.m., September 16, 1965. Approximately 220 employees of 1,250 reported for work first shift Thursday and first shift Friday. Michoud management is coordinating with Mr. Paul Styles, Boeing management, and Mr. Vernon McKimmey, Grand Lodge Representative, IAM and AW (International Association of Machinists and Aerospace Workers). No schedule impact is expected providing the strike is settled within a week or 10 days. Daily report is being received from Boeing and transmitted to IO. ✓

3. CONTRACTS

Mason-Rust, Contract NAS8-14017 - The Performance Evaluation Board forwarded comments and recommendations regarding award fee to Mason-Rust for the first period's performance to the Fee Determination Official on September 16, 1965. ✓

Source Evaluation Board - The Source Evaluation Board will convene Monday, September 20, 1965, to begin evaluation of proposals received for continuation of computer services at Computation Office at Slidell, Louisiana. ✓

NOTES 9-20-65 DANNENBERG

B10/3

9/28 9/20

1. Experiment Coordination - The responsibilities of Dr. Kuettner in the Experiments Coordination Function will continue to be handled by R-S, Mr. Dannenberg. ✓ A study by Mr. Magliato is under way to study for R-DIR other alternate proposals to handle the Experiments Coordination. ✓

The Experiments Review Board (ERB) has approved the following R-ASTR experiment proposals for presentation to the MSF Experiments Board (MSFEB):

MSFC #11	Hydrostatic Gas Bearings	Mr. Green
MSFC #13	Antenna Patterning	Dr. Decher
MSFC #14	Navigation and Tracking (AROD)	Dr. Decher
MSFC #15	Optical Tracking System	Mr. Wyman
MSFC #16	Precision Optical Track.	Mr. Wyman ✓

2. Data Management - A campaign --Operation Paper Mill-- to reduce excessive amount of documentation within R&D Operations has been initiated, and will be conducted jointly with M-S (Mr. Sorenson) and IO (Mr. Goldston). ✓

3. Configuration Management - KSC/MSFC Configuration Management sub-agreement has been signed by General O'Connor. ✓ Both centers have now concurred in the document. ✓ A flow chart for ICD changes in relationship with the KSC-MSFC sub-agreement on Configuration Management was modified, coordinated and furnished to IO. Further revisions to this chart will be considered at a later date. ✓

4. ICD Management - IO has requested R&DO to prepare a matrix depicting the total interface involvement. ✓ Such matrix has been established for the 500-F facilities vehicle and is being reviewed by R-ASTR and R-P&VE. It has become apparent that a central location must be established to maintain all Contract End Item Specifications (CEIs) as well as all Interface Control Documents (ICDs), and not only those Level A (center-to-center) interfaces which had been organized under the Panel structure and have been reported to the PRB in the past. ✓

On the basis of the information above this Repository will maintain parallel to the Apollo Log also a Saturn Intra-Center Interface Control Log, that is established to provide visibility for all planned or released Saturn ICDs. The content of the Saturn Log is derived from inputs furnished by the cognizant design activities. ✓

JTB 9/20

B W/3

1. Visit by GE Personnel: Dr. Hillary Paige, General Manager of GE's Missile and Space Department, and approximately fifteen key members of his staff, including Dr. Roy Beaton, have requested a visit to MSFC and a presentation on MSFC's philosophy and procedures in Quality and Reliability Control. Arrangements have been made for the GE people to get together with Dr. Farish and Mr. Grau and other Quality Lab people on October 6. ✓

2. S-II Incentive Contract Conversion: Plans for converting the S-II contract to CPIF by Jan. 31, 1966, have resulted in a request for a large amount of R&D Operations support during October and November. R-DIR office and I-V-SII have discussed this at length resulting in the agreement that R&D Operations will do everything possible to support the conversion effort within the limits of availability of manpower. Additional definition is needed before the workload can be properly estimated. ✓

3. Saturn IB/Centaur: The charter for the Saturn IB/Centaur office was sent to the Executive Staff for final approval and publication. Memoranda were sent to the laboratory directors outlining the staffing plan on an as-needed basis, and a letter of agreement was furnished the Director, P&VE, defining his relationship to the Saturn IB/Centaur office. ✓

4. Project Support Agreement (PSA): The R&DO Saturn IB PSA Activation Committee has been established and is scheduled to meet with the IO members next week to commence implementation of the joint IO/R&DO agreement. ✓

5. FY 67 CofF Program: The MSF Facilities Review Board has tentatively recommended actions on projects as follows:

Approval: (1) RP: Space Vehicle Research Lab; (2) ME: Modification of Building 4711; (3) TEST: LOX Storage Facilities; (4) ASTR: Hazardous Operations Lab Addition. ✓

Deletion: (1) ME: Refurbishment of Equipment Surface Treatment Facility; (2) TEST: Extension of High Pressure Gas System.

Recommendation Withheld: AERO: High Reynolds Number Simulation Facility.

→ Again!!

B

9/28 9/20

1. Alpha Meters for IB/Centaur: Aero-Astroynamics Laboratory has requested that the initial Saturn IB/Centaur vehicles be equipped with direct measuring angle of attack meters. Accurate angle of attack measurements will be necessary for analyzing data from steady and fluctuating pressure measurements which are to be located in the nose region of the vehicle. The two instruments being considered for use are the "Q-ball" and Edcliffe type alpha meters. ✓

2. IB/Centaur Proposed Payload Shape Change: JPL has requested MSFC to investigate feasibility of increasing the volume of the payload shroud for the Voyager mission. Primarily, JPL desires to increase payload diameter above the present limit of 260 inches. This request arose due to recent Mariner IV data concerning the Martian atmosphere which indicated that larger entry capsules will be required to maintain a ballistic factor of .15 to .25 slugs/ft². The two vehicle configurations being investigated are: (1) An extension in length of the present cylindrical shroud by approximately 176 inches, and (2) a 300 inch diameter hammer head shaped payload shroud with an increased cylindrical shroud length. Aero-Astroynamics will determine aerodynamic data, investigate pertinent unsteady aerodynamic phenomena, conduct rigid body response analyses at $q \propto \max$ and $q \max$, and assess the payload penalty due to increased shroud weight. ✓

3. 6th Research Achievements Review: On September 16, 1965, the 6th Research Achievements Review, subject: "Environmental and Aerodynamics Research at MSFC," was conducted in the auditorium of building 4200 (agenda attached). The meeting was attended by less than 100 people; one laboratory director - not actually involved - represented MSFC's total management attendance, and only one representative of NASA Headquarters was present. Representatives from Army Material Command, Air Force (AEDC, Wright-Patterson Air Force Base, Cambridge Research Laboratories, Pacific Missile Range); MSF, and JPL were in attendance. We wonder whether the considerable time and effort needed for preparing these presentations is justified in view of the level of attendance.

Jim Shepherd ↗

I share Dr. Geissler's feelings. But every time I attend these research achievement reviews, I find them most fascinating. (This time, I was on Annual leave). What do you suggest?

B 10/3

9/28 7/20

B10/3

1. S-IVB-201: A summary of the actual or suspected discrepancies on S-IVB-201 when off-loaded at KSC: Common Bulkhead wrinkle which will require further examination; tank insulation debonding, ultrasonic checks at KSC have been recommended; high stress in the LH₂ and LOX jamb weld with resulting cracks, jamb welds will be reinforced at KSC; the LOX Loading System, P.U. System and the Auxiliary Hydraulic System are to receive special observation due to prior problems encountered in checkout and static firing. ✓
2. S-IVB-203: The S-IVB-203 is in the preliminary phase of post manufacturing checkout at Huntington Beach. Arrangements have been made by IO for a four-week checkout extension period. This additional time should permit a satisfactory checkout if no serious shortage or component failure problems occur. ✓
3. F-1 ENGINES: A decision was reached last week to change to "gold-plated" injectors for the F-1 engines. ✓ Test data obtained to date indicates that this change will eliminate the previous problem of injector cracking. ✓
4. UNSATISFACTORY CONDITION REPORTS (UCR): In accordance with our efforts to initiate an improved UCR system a contract change has been negotiated with DAC, at a cost of \$209,000, and automated data will be received starting with S-IVB-203. A recent meeting with Boeing determined that the failure reporting system was generally in accordance with MSFC requirements. IO is now processing a formal change request; little cost impact is expected. NAA's proposal on failure reporting in accordance with the new system has been negotiated at a cost of \$67,000 and is awaiting final approval by IO. A request for a "no cost" change order was submitted to the IU IB/V Stage Office after a meeting with IBM revealed the automated system could probably be initiated without a scope change. The system will probably not become operational until IU-204. The CCSD failure reporting system presents the greatest problems. The internal forms, procedures and ADP system will require considerable revision in order to meet MSFC requirements. A scope change and possible delay of receipt of complete data on the IB stage for several months is anticipated. We have requested IO to obtain a cost impact. ✓
5. TRAINING: To familiarize Defense Contract Administrative Services Region (DCASR) NASA representatives with our requirements, a special course on NASA Quality Requirements and the NASA Plant Representative has been prepared, at the request of NASA Headquarters, Code KR, for presentation during November 15-28. The course has been shortened from ten to eight days and will concentrate on those areas of particular interest to DCASR personnel. KR will provide assistance in instruction and scheduling. ✓
6. STAGE RELIABILITY PROGRAMS: All stage reliability program plans have been reviewed for items that should be added before incentive contracts are negotiated. These items are being coordinated with the Industrial Operations Reliability and Quality Assurance Offices and brought to the attention of the Stage Managers. ✓

9/20

1. 201 DIGITAL FLIGHT COMPUTER AND DATA ADAPTER: The 201 digital flight computer and data adapter arrived by aircraft from Owego, Sunday noon. The functional checkout was successfully finished Sunday night and the operational program is in progress. So far, there are no major difficulties; therefore, we are confident that the delivery to IBM, Huntsville, for installation in the 201 IU will be met Tuesday night as originally planned. ✓✓

2. IU TEST FLIGHT FOR SUPER GUPPY: Two taxi runs of the Super Guppy with 200 Vibration IU aboard were made on Saturday afternoon, and two test flights were made this morning (9/20). The data on the taxi runs look very good; the vibration levels are below that of the first Guppy. It is planned that P&VE will have completed the analysis of flight data within two days. ✓

B10/3

1. S-IVB TEST STAND (MSFC)

Test S-IVB-006 was conducted on the S-IVB Test Stand (MSFC) for a planned duration of 400 seconds. Performance of the engine, stage, and facility was satisfactory. Awaiting delivery of engine J-2027 for the next hot test; approximate delivery is 10/1. ✓

2. S-IC

The initial checkout of the automatic checkout equipment was performed using the Ground Equipment Test Set (GETS). Only one distributor was received from MEL last week, leaving 10 others to be delivered. These were supposed to have been installed last week. ✓

3. F-1 ENGINE, STTW

Test TWF-066 was conducted on F-1 engine S/N F-1002-3 on 9/13, with a duration of 56 seconds. Primary purpose of this test was to qualify the Flexonic inboard suction ducts. This engine was removed after the test and engine F-4T2 (502 configuration) was installed. Next tests will be Wednesday and Thursday of this week. ✓

4. F-1 ENGINE, West Area

Tests FW-014 and FW-015 were conducted on 9/15 and 9/17, respectively. The durations of these tests were approximately 150 seconds each. The purpose of these tests was to evaluate the high strength injector, which now has been subjected to approximately 972 seconds in 10 starts. No damage occurred during these tests. ✓

5. S-11-T, SEAL BEACH

Insulation system checks have not been started, but plan to start on 9/22. Plans are to start preparations on 9/19 for shipment on 9/24. If insulation checks have not been made prior to shipment, worthiness of insulation on -T will not be known until -T is at MTF. ✓

6. S-IVB-202 VEHICLE

The on-stand repair of the jamb weld of lox and LH₂ tank is to be completed on 9/17; other tasks proceeding satisfactorily. ✓

7. LOCAL LOX STORAGE (see NOTES 9/13/65 FELLOWS, copy attached to Dr. von Braun's and Mr. Weidner's copies only) ✓

Lox storage, West Area. This project was disapproved by Congress as an FY 1966 C of F item. It has been resubmitted as an FY 1967 item, and has been approved locally, and by the Facility Review Board in Washington. Upon the advice of Mr. Lilly, we are processing a request for expedited construction using R&D funds. This will require Congressional approval. ✓

NOTES 9-20-65 HOELZER

JVS 9/20

B 11/3

Negative Report

NOTES 9/20/65 JAMES

B 10/3

9/20/65

S-IB-201: We met with CCSD, R&DO and KSC today to determine the course of action relative to the damaged bulkhead in Fuel Tank #1. The bulkhead was "pushed out" under approximately 27 psi of hydrostatic pressure last Friday. X-ray examination revealed cracks and gross irregularities remain in the configuration. We have concurred in CCSD's recommendation to replace the tank. CCSD is concurrently pursuing two methods of removal: the first method would develop tools and techniques to remove the tank, lifting over the longitudinal CG of the tank. This, of course, can only be done with the S-IVB-F removed from the stack and the S-IVB flight stage cannot be erected until the replacement tank is in place. We have suggested that CCSD pursue a second method which consists of a counter-balance beam lifting fixture which would permit removal and replacement with the upper stages in place. R-ME has applied this scheme on previous occasions and feels it is entirely possible. KSC generally concurs but is checking out any possible clearance problems. There are approximately five days of buildup work to be done on the replacement tank after the damaged tank is removed. Also, the automatic loading test and the APS test remain to be completed on the facility vehicle. The replacement tank is due at KSC on 9/25/65. CCSD is currently proceeding on a course of action to utilize the counter-balance beam method which will make the tank removal and replacement relatively independent of the remaining facility test and the follow-on launch vehicle preparation. If this scheme is successful, minimum overall delay would be anticipated and possibly not more than one day. If the other scheme is used, a possible overall delay of 2 days would be anticipated. ✓

S-IVB-201: Arrived at KSC and was unloaded on 9/19/65. ✓

I. U. -201: As scheduled, we plan to complete checkout for shipment by Super Guppy to KSC on 10/9/65. I. U. -200V was flight tested in the Super Guppy this morning. ✓

AS-201 MISSION RULES RED-LINE VALUES: We are working with R&DO and Dr. Speer to incorporate the vehicle red-line values into the Mission Rules. R-P&VE and R-ASTR have the major input for these values. The consolidated list of these red-line values will be the first time MSFC has presented one complete formal list to KSC. ✓

LOX VAPOR INTERFERENCE WITH THEODOLITE: We are working with R&DO on a scheme to resolve the problem experienced on Saturn I vehicles. We are preparing a memo to you with a full explanation and disposition of this action. ✓ The proposed solution would have prevented the difficulties we experienced during SA-6 and SA-8 countdown. ✓

BW/3

153 9/20

1. S-IC-501 Progress Report: The major factors in meeting assembly milestones are the control of completion of documentation and the control of delivery of parts. The status of component delivery for -501 as of 9/17/65 is as follows:

Total number of Boeing undelivered line items for -501; 180
 A number of these items are not needed for check-out, and consequently their delivery is scheduled for a later time. These are items like Fins, Fairing, Insulation Panels, Batteries, Ordnance System Items, Retro Rockets, etc.

Total number of such line items, not needed for completion of stage check-out: 60

Number of line items needed for completion of stage for check-out: 120

Delivery still expected prior to 9/27/65: 49

Expected shortage (line items from Boeing) at delivery on 9/27/65: 71

This shortage consists of 40 pieces of Instrumentation, 7 Valves and Control Devices, 19 Brackets and Miscellaneous Parts and 5 Cables.

In addition to the shortages from The Boeing Company are some shortages of Marshall Center responsibility, for instance Pressure Switches. These shortages are caused by a variety of reasons such as qualification problems, rejects at acceptance tests, late changes, etc. The effect on -501 of work interruption at Michoud by the hurricane and the strike is not serious because the majority of shortages are not parts manufactured at Michoud, but rather parts coming from Boeing vendors. Every single item is being followed-up and expedited on high supervisory levels. Work-around methods (use of dummy hardware) have been used whenever feasible. We still had a very busy weekend in the assembly and supporting shops such as tube fabrication, valve clinic, electrical shop, cleaning, etc. Preparation of the transfer document is underway. ✓

S-IC-502 Manufacturing Milestone: The structural sub-assembly of the Thrust Structure and Fuel Container, including painting of this unit, was completed in the tower. This sub-assembly has been moved into the new Multi-Purpose Vehicle Technology Facility; this beneficial occupancy of the south bay of this building was obtained last week. Final completion of the center and north bay is scheduled for October 23, 1965. ✓

9/23 9/20

B 10/3

1. MARSHALL AAP PLANNING REVIEW - A review was held of Marshall's plans and requirements for the AAP Program on September 17, 1965 in preparation for the presentation to you and Center Management on September 23, 1965. The review included a description of earth orbital and lunar surface phases of the AAP program of interest to Marshall, a summary of Marshall's role in payload integration, resources requirements and the estimated availability of Marshall's manpower to assume new work. It was determined that the available manpower fell far short of the requirements for the proposed Marshall AAP tasks. After your review, on September 23, 1965 we plan to submit to OMSF a proposal of Marshall's role in the AAP program. ✓

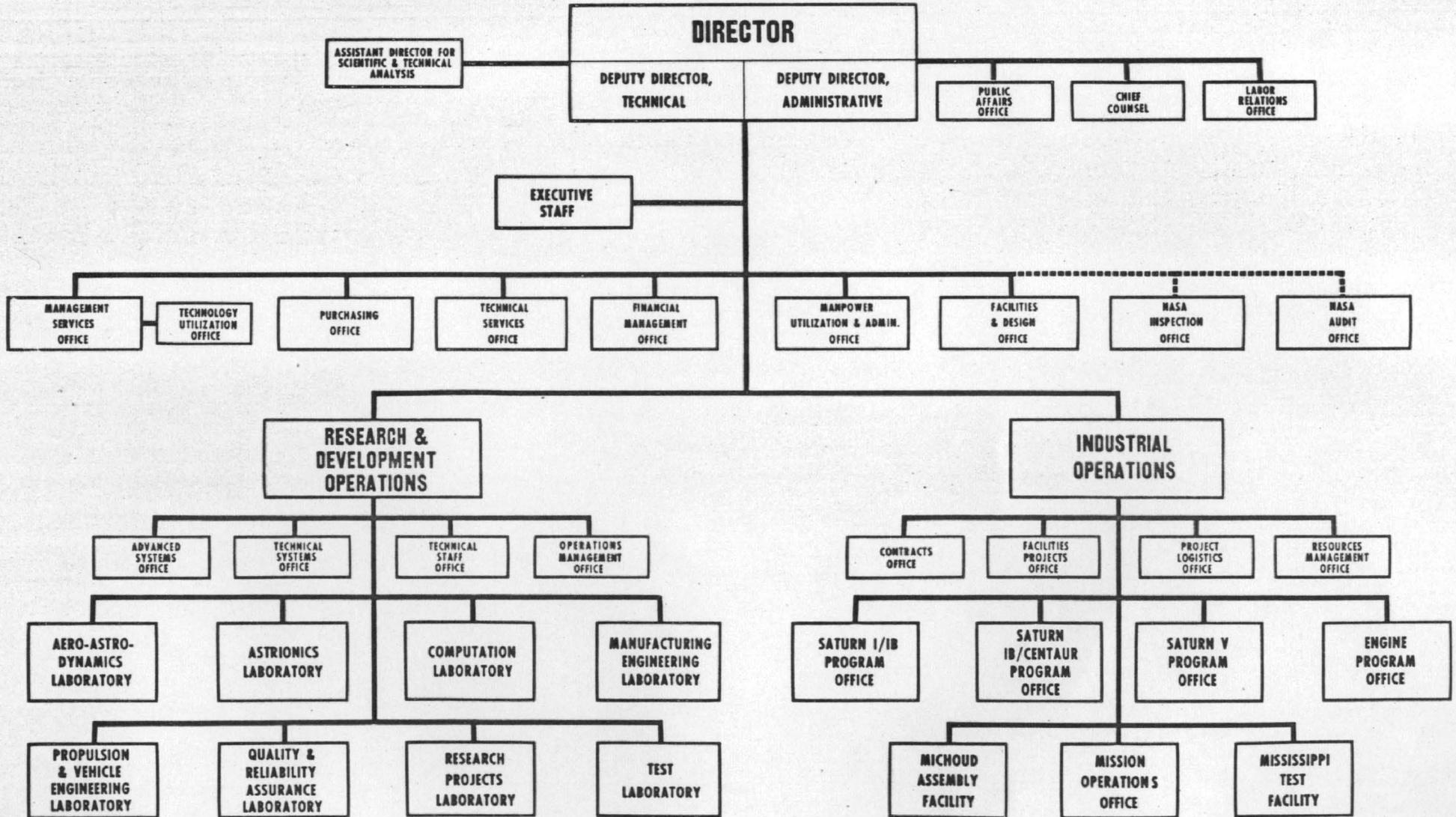
2. BOB VISIT - We have received, through Mr. Bernie Johnson, the BOB team's proposed agenda for the MSFC Review, during the week of September 27, 1965. A working copy of this agenda has been distributed to all Marshall organizational coordinators.

Mr. Crabill, of BOB, will be accompanied by Mr. H. Theodore Heintz Jr., a new man to whom this trip will be primarily an orientation tour. Don Crabill plans to limit his discussions with the laboratories to approximately one hour each, probably because of his familiarity with their activities. In contrast, he has asked for more time with Saturn V project office (six hours) than with any other session. ✓

This year, Mr. Crabill seems to be emphasizing an interest in ADP management and utilization, manpower workload and projections, organization, personnel management, and the utilization and management of in-house support contractors. ✓

3. MSFC ORGANIZATION CHART - On September 15, 1965 Mr. Postelle, OMSF, informed us by telephone that Mr. Webb signed the MSFC organization chart, copy attached, approving the Advanced Systems Office; Operations Management Office; Technical Staff; and Technical Systems Office of R&DO; and the Mission Operations Office of IO. These offices will be converted into the current organization book. ✓

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION GEORGE C. MARSHALL SPACE FLIGHT CENTER



APPROVED _____
DATE _____

NOTES 9/20/65 REINARTZ

B 10/3

No submission this week.

NTB 9/20

NOTES 9/20/65 RUDOLPH

B 10/3

958 9/20

1. Boeing Strike - A daily "Flash Report" of the strike activity is being issued by the Saturn V Program Control Office to the appropriate MSFC Management. A preliminary assessment of the effect of the Boeing strike on the Saturn V Program was distributed on Friday, September 17, 1965. ✓
2. Hurricane Betsy - Damage at Michoud Operations has been estimated at \$5.0M. The Saturn V Program will provide the required funds. These costs will be reimbursed at a later date. ✓
3. S-IC Stage:
Incentive Contract Conversion - Our conversion schedule is in jeopardy because of the lack of firm Government Furnished Property (GFP) delivery dates. Mr. Weidner's assistance has been requested to assure total R&DO support in developing the required information. ✓
4. S-II Stage:
Common Bulkhead Test Tank (CBTT) - The Notes 9/13/65 Rudolph reported in error that the next LH₂ fill test was scheduled for the weekend of Sept 18-19, 1965. The next scheduled fill test is scheduled for September 25, 1965. Pressure cycle test will also be initiated on that date. ✓
5. Vehicle GSE/ESE - Preliminary information from KSC indicates no impact on SA-501 launch schedule provided ESE is delivered by January 15, 1966, as planned. On Wednesday, September 22, 1965, GE will provide latest ESE manufacturing and delivery schedule. Impact will be further assessed after receipt of new GE schedule. ✓

NOTES 9/20/65 SPEER

B10/3

9/28/20

1. JOINT OPERATIONS GROUP: We have indications from Hqs. that the Joint Operations Group, cochaired by Phillips and Christensen, will be abolished soon. Minutes of the last meeting (5/19) were never published. There appears to be no reason for objection from MSFC. ✓
2. KSC APOLLO/SATURN OPERATIONS PLAN: Subject plan has been received from KSC with a request by Dr. Debus for MSFC comments, particularly in the KSC-MSFC interface area. I-MO will coordinate. ✓
3. AZUSA/GLOTRAC: Problems associated with the use of the Azusa/GLOTRAC tracking system on Saturn vehicles have been given considerable urgency by recent developments culminating in several action requests from MAO. Primary questions pertain to (1) possibility of a frequency change; (2) transponder development and procurement; and (3) requirement for continued use after SA-503. Although OSRO has informed DOD (Sept. 9) that Azusa/GLOTRAC support should be planned through the entire Apollo program, a thorough investigation and resolution of several problems is required. I-MO is taking action in conjunction with I-I/IB, I-V, and R-ASTR-I to coordinate an MSFC position and to obtain resolution of problems with NASA Headquarters, KSC, and ETR. ✓
4. GT-5: According to MSC sources, the spacecraft water impact was 280 nm West of the intended point. The onboard computer was updated during the last orbit from Carnarvon. The updating command from the Houston real time computer contained an analytical error involving the proper time of earth rotation (siderial day). Over 8 days of flight the small error (undetected in shorter simulations) accumulated to the above value. ✓

NOTES 9-20-65 Stuhlinger

9/28/65

B 10/3

1. PEGASUS: After a short period of inactivity during which the data system of Pegasus III had been switched off for as yet unexplained reasons, the satellite resumed normal operation with all systems. No significant change in flux rates. Pegasus II continues to operate properly. The half angle of its precession cone is now 28° ; it was 20° on September 5. ✓
2. RESEARCH ACHIEVEMENTS REVIEW: Our last review contained excellent presentations by Aero. Unfortunately, attendance by MSFC management was again low. Out-of-house visitors included: 1 from Army Missile Command, 8 from AF, 1 each from JPL, OMSF, Pac. Missile Range. ✓
3. AAP: Implementation of our FY-1966 program for AAP Lunar Surface Experimentation (with OSSA) is progressing well. Great effort has been expended recently, together with ASO, to define a useful and feasible program for earth orbit payloads. RPL is contributing the sub-programs "Science and Advanced Technology Payload Systems", and "Scientific Passenger Experiments." ✓

NOTES 9/20/65 WILLIAMS

B 1073

9/28 9/20

1. AES. An internal dry run/working meeting was held on Friday, September 17, on the MSFC proposal for AES, including the MSFC role in the program. In general, we have "closed the loop" on a first rough cut at what we plan for MSFC to submit in response to various Headquarters' (Mueller, etc.) requests. After some additional rework early this week, the plan will be presented to Center management on Thursday afternoon, September 23. A few of the highlights which seem to be evolving from our efforts (most of which aren't new) are:

a. From a technical scheduling standpoint, payloads could be developed and delivered for each launch vehicle according to the current flight schedule provided inhouse manpower and money were available.

b. The inhouse Civil Service manpower requirements far exceed our current availability projections for at least the next two to three years, and it does not look as though single support contractor support will completely solve the problem without some major policy revisions.

c. The funding requirements for MSFC's proposed portion of AES are considered to be far in excess of what can be expected for the next two or three years, unless the Apollo requirements are reduced or the overall MSF budget is increased considerably. ✓

Some of the questions which require Center resolution prior to completion of the material to be forwarded to Headquarters are:

a. The nature and extent of the proposed inhouse MSFC participation in certain phases of the AES program. ✓

b. The division of responsibility within NASA and MSF for various AES activities (i. e., lead Center, integration Center, operations Center, etc.). ✓

c. Do we tailor our AES proposal and the Center's participation in it to conform to our manpower availability and the probable funding constraints or present the "bill" to meet the "Headquarters' guideline schedule." ✓

An agenda and proposed attendance list (which will be restricted to basically the Executive Council plus presentors) for the Thursday meeting (1:30 to 5:30) will be distributed by Tuesday, September 21. ✓

2. Visit of Dr. T. O. Jones, National Science Foundation. Dr. T. O. Jones, Head, Office of Antarctic Programs, National Science Foundation, will visit MSFC on Tuesday, September 28. Dr. Jones is interested in certain aspects of the AES science program. Our office, with RPL, is arranging for briefing Dr. Jones. Afterwards, he will be given a tour of some of the Center's facilities. ✓

Did Kattam?

Walt -

Reference our brief talk
today about attendance at

Mr. Shephard,
The Research Ach. Reviews -

Of the six Research Ach. Reviews which they
produced record of attendance, the following
MSFC management attended:

Mr. Weidner	4 reviews
Dr. Geissler	4
Dr. von Braun	3
Dr. Rees	3
Dr. Haussermann	2
Mr. Hellebrand	2
Dr. Hoelzer	2
Mr. Heimbarg	1
Mr. Hueter	1
Mr. Heller	1
Mr. Dannenberg	1
Dr. Stuhlinger	1
Mr. Newby	1
Dr. Lange	2
Dr. Lucas	2

This is some info that Nancy
compiled to indicate who & when
people are attending - Any idea
Nancy

as to how to improve attendance -
Should

OFFICE OF DIRECTOR - MSFC

CODE	NAME	INIT.	<input type="checkbox"/> A C T I O N	<input type="checkbox"/> I N F O R M A T I O N
	Mr. Shepherd			
	Put into after <u>Mr. ...</u>			

REMARKS

I suggest the Research Reviews be set up around Dr. V. Bi's calendar so that he can attend. If he is there you will not have to worry about other management types.

Hewby
10-5-65

CODE	NAME	DATE

Call Watt on file

1380

GEORGE C. MARSHALL SPACE FLIGHT CENTER
HUNTSVILLE, ALABAMA

Memorandum

TO : Interested MSFC Personnel

DATE Oct. 15, 1965

FROM : Director, Research Projects Laboratory
R-RP-DIR

SUBJECT: MSFC Research Achievements Review No. 8

The eighth MSFC Research Achievements Review will be held on Thursday, October 28, 9:00 a.m. - 12:00 noon, in the Morris Auditorium, Bldg. 4200.

A copy of the agenda is attached. All interested MSFC personnel are invited to attend.

George L. Bucher

per Ernst Stuhlinger

1 Enc:
As stated





MSFC RESEARCH ACHIEVEMENTS REVIEW

MSFC RESEARCH ACHIEVEMENTS REVIEW NO. 8
MORRIS AUDITORIUM, BLDG. 4200
THURSDAY, OCTOBER 28, 1965
9:00 A.M. - 12:00 NOON

WELCOME

9:00 - WELCOME

Dr. Ernst Stuhlinger, Director, Research Projects Laboratory, MSFC

9:05 - INTRODUCTION TO GUIDANCE, OPTIMIZATION, AND ASTRODYNAMICS RESEARCH AT MSFC

Dr. E. D. Geissler, Director, Aero-Astroynamics Laboratory, MSFC

9:20 - SCOPE OF GUIDANCE AND ASTRODYNAMICS RESEARCH AT MSFC

Mr. Gentry Miles, Chief, Research Program Office, Research Projects Laboratory, MSFC

9:30 - SATURN GUIDANCE CONCEPTS

Mr. Clyde Baker, Chief, Astroynamics and Guidance Theory Division, Aero-Astroynamics Laboratory, MSFC

A question and answer session will follow Mr. Baker's presentation.

10:20 - RESEARCH ACHIEVEMENTS IN OPTIMIZATION TECHNIQUES

Mr. C. C. Dearman, Scientific Assistant, Aero-Astroynamics Laboratory, MSFC

A question and answer session will follow Mr. Dearman's presentation.

11:10 - ASTRODYNAMICS RESEARCH

Mr. Arthur Schwaniger, Chief, Astroynamics Branch, Aero-Astroynamics Laboratory, MSFC

A question and answer session will follow Mr. Schwaniger's presentation.

12:00 - ADJOURN

OFFICE OF DIRECTOR - MSFC

CODE	NAME	INIT.	<input type="checkbox"/> ACTION	<input type="checkbox"/> INFORMATION
	Mr. Shepherd			

REMARKS

I suggest the Research Reviews be set up around Dr. V. Bi's calendar so that he can attend. If he is there you will not have to worry about other management types.

Healy
10-5-65

CODE	NAME	DATE

MSFC - Form 495 (Rev August 1963)

sent to
Shepherd
10-5-65

W. Kelly
9/20/65

SEPTEMBER 27, 1963

NOTES BALCH 9-27-65

*Balch
notes were
late VB
did not see.*

1. T-Bird - The T-Bird is now scheduled to arrive at MTF on October 16, 1965.
2. GSE - The S&ID plan for GSE delivery still supports the January firing, but as reported last week there is growing concern relative to the unknowns that may be uncovered in the integrated checkout.
3. The negotiations with S&ID were discontinued on Friday, September 17, after an impasse was reached on the numbers of personnel required at MTF for the S-II program. The problem was referred to the MTF Manager and the S-II Stage Manager.
4. Negotiations were started on the estimate to complete Contract NAS8-14014, but have been suspended temporarily while Aetron revises their plans and related costs. The contractor projects at this time that \$749,649 will be required to complete the GSE installation.
5. Negotiations for GE FY 66 continued through this period with agreements being reached in many of the areas. The major items remaining to be finalized are those of the contract articles and provisions, the final estimated costs and fixed fee. Also, several of the workscopes, particularly materials and logistics, IRA, Engineering Support, and Quality Assurance are in the process of being clarified and some difficulty has been encountered in reaching agreement in these areas. It is anticipated that negotiation will be finalized by October 1.
6. Discussion between Manager, MTF, and Manager, GE, regarding participation of GE contractor-type subcontractors on the local committee of the President's Missile Sites Labor Commission resulted in that GE did not object to such participation. Unofficially, it was the opinion of the MTF Manager that GE would hope for such participation. MTF will follow up.
7. Organization staffing plans and personnel job descriptions are in final stages of completion. Target for completion is three weeks. Organization staffing plans are approved through the MSFC Personnel Office. All elements of NASA MTF are in process of moving to the second floor of the L&E Building. This will result in greater efficiency and reduce the confusion and dangers inherent in the present locations of MTF and contractor personnel.
8. Two major labor problems developed during the week. One involving the pipe fitters union and the second involving the IBEW. The latter has been temporarily resolved and all electricians returned to work today. The former is continuing to present a problem and hopefully can be satisfactorily resolved.

NOTES 9/27/65 WILLIAMS

RS 9/27

B 9/28

No NOTES this week due to the fact that all pertinent items from this office were discussed during last week's AAP meetings.

J-2 ENGINE The production contract incentive conversion package has been at NASA Headquarters since September 16, awaiting final approval.

R&D engine J018, a 230K/5.5 MR engine, has demonstrated the service life requirement of 3,750 seconds. The engine is presently undergoing inspection and leakage checks to investigate the possibility of hardware degradation. The engine will remain in test to evaluate the engine start sequence.

It is my understanding the procurement plan for J-2 sustained engineering effort is in Mr. Gorman's office for final Center staffing. ✓

RL10 ENGINE Significant points from the RL10 Program Review Meeting last week are as follows: (1) RL10A-3-3 (uprated Isp engine) development is proceeding satisfactorily. (2) General Dynamics is studying operation of RL10 engines in the "low-idle" mode versus a programmed thrust peroxide ullage rocket system for keeping propellants settled in the tank between the first and second burns in the Voyager application. (3) Films taken on the E-6 test stand at P&WA of hydrogen exhausting from the engine cooldown valves show that solid hydrogen does not block the discharge line. Size and momentum of ejected solid hydrogen particles are being studied to determine their effect on the spacecraft during retromaneuver. The next Atlas/Centaur flight, AC-7, scheduled for mid December, will carry an engineering model of the Surveyor spacecraft. ✓

H-1 ENGINE Negotiations for 22 engines, in support of SA-210 through SA-212, have been rescheduled from September 27 to October 19, 1965. This rescheduling is a result of a request from Rocketdyne for additional time to revise their proposal.

The first 205K Production H-1 Engine will be acceptance tested at Neosho next week. The first five of these 205K uprated engines will be delivered in October for use on Saturn IB Vehicle SA-206. ✓

F-1 ENGINE A turbine manifold torus halves inner weld rupture occurred on R&D engine 025-1 at three seconds into mainstage. This torus had a total of 5,370 seconds in 100 engine system tests, exclusive of pit testing; the failure is attributed to old age. The configuration included the old light hanger bracket design which has been a contributor in previous manifold failures. ✓

Engine F-4020 (fourth S-IC-2 engine) has been accepted and is awaiting shipment to MSFC by truck. It will be instrumented to obtain additional accelerometer data for the purpose of gaining confidence in this transportation mode. ✓

Engine F-4021 (fifth S-IC-2 engine) arrived at MSFC on September 21. ✓

Engine 2011 was removed from S-IC-1 to install the retrofit FRT injector (high strength braze) and to permit Rocketdyne welding teams on two shifts to reinforce the calips pressure switch boss. ✓

GENERAL North American Aviation negotiations with the UAW/AFL-CIO Union for a new contract have not reached agreement. The current contract expires September 30, 1965. The union has not served notice on the intent to strike and a period of ten days after serving notice is observed prior to strike. Rocketdyne management is aware of our concern and is keeping us apprised of the situation on a daily basis. ✓

NOTES 9-27-65 CLINE

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NEGATIVE REPORT

9/27/65

1. BOEING STRIKE

The IAM (International Association of Machinists) strike against Boeing has not been settled and picketing is continuing at those gates assigned specifically for Boeing utilization. An average of approximately 500 of 1800 hourly workers reported to work during this past week. Based on the remote possibility of a prolonged strike of four weeks, Boeing assesses no schedule impact for the following stages: S-IC-D, S-IC-T, S-IC-F, and S-IC-1. Daily reports are being received with weekly assessments requested. ✓

2. HURRICANE BETSY DAMAGE REPAIR

Excellent progress is being made to repair damage caused by Hurricane Betsy. J. A. Jones Construction Company and Tri-State Roofing Company continue to assign additional personnel and material to the job site. The barge "Promise" was removed from the levee on September 24, 1965, with no apparent serious damage. However, arrangements are being made to put the "Promise" in drydock for complete inspection and necessary repairs. The Levee Board has progressed to a point opposite the new Vehicle Component Storage Warehouse in its levee repair and is continuing on a 12 hour day, 7 days a week schedule. Michoud appreciates the support of MSFC Purchasing Office, IO Contracts Office, and the Facilities and Design Task Force for the assistance provided for inspection of damaged facilities, preparation of sketches, specifications, and estimates, and contract negotiations performed in connection with the hurricane damage. ✓

3. SCHEDULED EVENTS

Activities scheduled at the Michoud Assembly Facility for the week of September 27, 1965, include the Thirteenth Quarterly Review by Chrysler Corporation Space Division, visit by the Bureau of Budget representatives, and tour by the Apollo Executives Group and Paris Match briefing and tour. ✓

NOTES 9-27-65 DANNENBERG

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1. MSFEB Meeting on 9-20-65

a. Three experiments proposed by MSFC have been approved for flight by the Board, and this office will request IO to assign these experiments to specific flights. The source of funds is still in doubt. The approved experiments are:

- MSFC #1 Dielectric Materials
- MSFC #3 Propellant Mass Determination
- MSFC #4 Interface Determination ✓

b. Eight MSFC experiments were approved for feasibility studies to determine accommodation possibilities, program impact, cost, and schedules. The experiments to be studied are:

- MSFC #5 Boiling Heat Transfer
- MSFC #6 Cryogenic Propellant Transfer
- MSFC #7 Super Insulation
- MSFC #8 Mechanical Properties
- MSFC #9 Lubrication
- MSFC #11 Hydrostatic Gas Bearing
- MSFC #13 Antenna Patterning
- MSFC #14 Tracking and Navigation (AROD) ✓

c. Two experiments were referred to OART for a determination of interest. OART has funded the development studies in the Laser Radar Area. The OART Representative requested that the experiments be handled as Technology Experiments. OART will have a position on these experiments in the next MSFEB meeting:

- MSFC #15 Precision Optical Tracking
- MSFC #16 Optical Guidance System ✓

2. Experiments Funding - Discussions with Mr. Flattery and Dr. Turnock of the Apollo Program Office gave the following picture of the funding situation:

a. No funds are available in the Apollo Program Office for experiments activities.

b. Dr. Turnock stated that MSFC has the prerogative to assign program funds to the experiments effort, within the funds assigned to the program offices or to R&DO. Dr. Turnock also recommended MSFC to investigate the possibilities of getting funds from the Advanced Systems Program Office (Dr. Gray).

This office will pursue these possibilities and present recommendations for MSFC action. ✓

K.D.
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NOTES 9/27/65 FELLOWS

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1. Future Planning Guidelines: Future planning policy matters, which were outlined at the September 24 Staff and Board Meeting, have been prepared in the form of guidelines to R&D Operations laboratories and offices. Mr. Weidner has scheduled a discussion of these guidelines with laboratory/office directors prior to BOB visits to the laboratories later this week. ✓
2. Project Support Agreement (PSA): Last week, the Saturn IB PSA Activation Committee met with IO representatives. By mutual agreement, an activation schedule was established. The PSA is to be negotiated and ready for signature by the Directors of R&D Operations and IO by the first of the year. ✓
3. POP 65-4 Guidelines: Guidelines to support preparation of POP 65-4 were released last week to the R&D Operations laboratories and offices. ✓
4. S-IVB Technical Review: A technical review of the S-IVB Stage (for both the Saturn IB and V) is scheduled for October 20. The review will be conducted along the same lines as the recent S-II Review. Laboratory project engineers are developing the agenda in coordination with this office. The Review will include, as a special topic, the flight readiness of the S-IVB-201. ✓

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NOTES 9/27/65 GEISSLER

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1. (C) Current Performance of Saturn IB, IB/Centaur and Saturn V: The following figures represent estimated payload capability (pounds) for the various vehicles. Figures in parentheses represent the change in payload capability from last month's values. All values are based on September 1965 current weight status.

- a. Saturn IB: SA-203:20, 427(+131); AS-204:36, 282(+5); AS-205:38, 171(+5); AS-206:38, 909(+5); and AS-207:39, 330(+26). ✓
- b. IB/Centaur: SA-301:9, 114(-213); SA-302 and SA-303:9, 649(+322); SA-304 and SA-305:9, 768(+441). (C_3 = injection energy = $25 \frac{\text{km}^2}{\text{sec}^2}$ in each case) ✓
- c. Saturn V: AS-501:89, 329(+404); AS-502:89, 582(+433); AS-503:89, 840(+452); AS-504:99, 609(+332); AS-505:99, 639(+333); and AS-506:100, 560(+333). ✓

2. Range Safety L/V Shutdown Lockout: The question of increasing the Saturn IB L/V booster "shutdown lockout" from 40 seconds to 65 seconds flight time was discussed with the Eastern Test Range (ETR) personnel on 9/22/65, at Patrick AFB. Personnel from OMSF, MSFC, MSC, and KSC attended the meeting. ETR is requesting a lockout until about 65 seconds to decrease the probability of significant damage to launch facilities and industrial areas in case of destruct action. MSC would like to hold this lockout near the 40 second time so that an abort, if necessary, could be made from a non-thrusting booster after 40 seconds of flight time in order to permit reasonable LV/SC separation distance prior to L/V destruct. It is now primarily a problem of ETR and MSC to evaluate the tradeoffs between crew risk factors and degree of protection of launch facilities and industrial area. ETR appears to be quite firm on the 65 seconds time for unmanned missions but is willing to give somewhat on the manned missions. A resolution is expected in the near future. ✓

3. GD/C Centaur Design: The second monthly progress report of the study being conducted by GD/C (Design-Analysis Study for Saturn Application) was held September 22 at KSC. No progress was reported on their guidance system study. However, GD/C reported that a major problem to Centaur resulting from the Saturn application is the propellant level in the LH₂ tank during the orbital coast phase (zero g condition). For AC-8, the first two burn Centaur, approximately 80% of the LH₂ is consumed during the sub-orbital first burn phase. For Saturn IB/Centaur, only 20% of the LH₂ is consumed during the first burn. Problems arising from this condition include possible liquid propellant venting, sloshing, etc. GD/C is continuing this investigation. ✓

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1. S-IC-501 STAGE: The S-IC-501 Stage moves today to this Lab for checkout. The checkout will be extremely difficult due to engine injector changeouts and missing parts in most systems. Part shortages are not expected to be entirely cleaned up until sometime in late November. Nevertheless we intend to make the schedule with overtime, shift work and various workarounds. ✓
2. F-1 ENGINES: F-1 engines 4018 and 4019, which have been received at MSFC and processed through receiving inspection, exhibited a smaller number of discrepancies than experienced on previous F-1 engines received at MSFC. This may be indicative that our efforts to have both the Air Force and Rocketdyne at Canoga Park take corrective action may have been fruitful. A review was made of the Rocketdyne cost proposal for converting the F-1 production contract from CPFF to CPIF. Recommendations were made that reliability verification testing and quality verification testing be combined under one manager to prevent duplication of efforts. Also, a recommendation was made that the requirement to use two F-1 engines for quality assurance testing be deleted. Since F-1 FRT testing has been completed and a qualification test series is scheduled, there is no significant data that could be obtained from the quality assurance testing program. ✓
3. H-1 ENGINE RELIABILITY PROGRAM: Rocketdyne has submitted to Engine Program Office a Reliability Program Plan and Reliability Demonstration Procedure for the H-1 engine. These documents had not been available for the H-1 engine previously. We now have Reliability Program Plans and Demonstration Procedures for all engine programs. ✓
4. S-IVB QUALIFICATION TESTING: A representative from this Laboratory visited DAC for the purpose of attending the Quarterly Program Review Meeting. Prior to and following the meeting, the S-IVB-201 qualification test program problem area histories were updated. At the present time approximately 49 items will not meet the S-IVB-201 Launch Mandatory Milestone (10-15-65). As a result of these problems and the nearness of the flight milestone, MSFC and DAC are establishing a mutual qualification task force to establish test priorities and minimum qualification test requirements for flight. ✓

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- AD 9/27
1. SATURN-APOLLO GUIDANCE BACKUP: About six months ago MSC had requested that a complete guidance backup simulation with flight equivalent hardware be carried out at MSFC. Because of the high cost of the implementation, MSC has now changed the original request to simulation with computers only (no use of flight type hardware). Meetings are scheduled for this week to review and more formally document an overall plan based on the new ground rule. ✓
 2. ASTRONAUT STABILIZATION AND MANEUVERING CHESTPACK: We have familiarized ourselves with S&ID's work. It appears to be a worthwhile development, however, it should be sponsored by MSC according to their mission assignments.
 3. LAUNCH VEHICLE DATA ADAPTER CIRCUIT FAILURE: A failure occurred 9/25 during IU-201 checkout in the LVDA discrete output circuitry which interfaces with the RCA-110-A ground computer. The IU checkout can be programed around this failure and is continuing. The failed module will be replaced at a later date. The cause of the failure is being investigated. ✓

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H. Weidner

Not necessarily, if
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are our MSFC
Assignment!
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NOTES 9/27/65 HEIMBURG

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1. S-IC

Engine F-4T2 (502 configuration) is now in place on engine position 1, making complete the engine changes for the forthcoming test. Five prevalves are yet to be installed. Two prevalves, 1 fuel and 1 lox, have not been received to date. The lox loading probe and "black box" supposedly will be on hand by 9/29. A lox tank vent valve will be changed, provided the hardware is available in time. ✓

2. S-IVB TEST STAND (MSFC)

The shakedown test series of the S-IVB Test Stand (MSFC) has been completed. Preparations and modifications are being accomplished to allow installation of the S-II or S-IVB hydraulic system; also certain other systems are being installed. No tests are planned for this week. ✓

3. S-II

-T (SEAL BEACH) Insulation tests using the Bell Jar Vacuum method have located 60 debonded areas of 75% of the sidewall area of the fuel tank checked so far. The repair and pressure check is scheduled for 9/28, with shipment to MTF scheduled for 9/29. ✓

-B/S (SANTA SUSANA): The official firing date is now 11/19, after a review shows slips in the parts delivery and a limit in overtime to S&ID cuts out a "round-the-clock" operation. The LH₂ chiller A7-71 will not be available until 12/65 at Santa Susana. ✓

4. S-IVB (SACTO)

Pre-static checkout is in progress on 2002, concurrent with manufacturing activity at SACTO on Stand Beta III. ✓

5. GSE RANDOM MOTION SIMULATORS

The acceptance test of the S-IC forward position was successfully completed 9/22. S-IVB aft and forward test positions are now in checkout. ✓

6. SATURN IB - COMMAND MODULE ACCESS ARM TESTING

The access arm, less the environmental chamber, is being tested with a weight simulator equal to that of the environmental chamber. Results have been satisfactory. The environmental chamber is due to be received 9/28 from the vendor, Hayes, for testing. All equipment is scheduled to be on dock at KSC by 10/20, which cuts test time to a minimum. ✓

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1. ADDITIONAL COMPUTER CAPACITY: The Data Center Division has replaced one of the two central 1410 computers with an IBM 7010. The 7010 is faster and adds additional capacity for central processing in keeping with transition toward on-line data processing activities. No reprogramming is involved, and heavy utilization of the 1410's dictated this upgrading of the 1410 equipment. ✓

2. THIRD GENERATION COMPUTER SYSTEM:

The Procurement Plan for the third generation computer system is in NASA Headquarters for approval. Approval is expected in about ten days. Contract award is anticipated approximately March 1, 1966.

The alternate plans for facility modification have been presented to the Computation Laboratory who has them under study.

In cooperation with Communications Branch, it was determined that sufficient cable pairs would be available for third generation remote devices. Communications is currently preparing cost estimates on the data set requirements. ✓

3. TELEPROCESSING TERMINAL INSTALLED AT BROWN ENGINEERING:

An IBM 1050 Teleprocessing terminal was installed at Brown Engineering Company on September 23, 1965. This remote inquiry station will be used for retrieving data from the 1410/1301 computer in Building 4491. The initial application using this facility will be the Parts Reliability Information Center (PRINCE). All inquiries from off-site users will be entered through the Brown terminal. Retrieved information will be recovered via the same mode and disseminated from the remote station. ✓

4. SMOKE AND FIRE DETECTION SYSTEM:

For the past several years, Computation Laboratory has attempted to have installed in Building 4663 and Building 4491 a smoke detection device for protection against fire in computer rooms. The nature of electronic computers is such that water sprinkler heads cannot be used because of costly damage to the equipment. The installation of an ionized smoke and fire detection system is approximately 90% complete in Building 4663 and approximately 40% complete in Building 4491. It is considered by officials of this Laboratory that these systems, when completely installed, will be adequate fire protection for the expensive computer equipment in the computer areas. ✓

NOTES 9/27/65 JAMES

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S-IB-1: S-IVB-F will be removed from the stacks at KSC tomorrow morning and work will proceed immediately on the removal of the S-IB fuel tank using the "overhead lift" method. The new tank will be installed on 9/29/65 and reinstallation of cabling will follow. If we can accomplish this plan successfully, we will have succeeded in replacing the tank with essentially no overall schedule impact. I am having the Stage Office look in detail with R&DO and CCSD at this operation to insure that we take all precautions to eliminate any possible degradation of reliability as a result of the tank change-out. ✓

S-IB-3: S-IB-3 Stage is on the static test stand and is scheduled for static firing week after next. ✓

S-IVB: Automatic loading of the S-IVB-F was completed 9/23/65 at KSC with no apparent problems. ✓ The APS loading is scheduled for today. S-IVB-F will be removed from the stack tomorrow morning. ✓

S-IVB-201 is at KSC and the planned modifications are proceeding on schedule. The stage will go to the stack 9/30/65 pending successful installation of the S-IB tank replacement. ✓

IU-201: We were advised by Mr. Goodrum that the Super Guppy sustained airframe damage in flight over the weekend. Although many of the facts are not available at this time, it now appears highly unlikely that we would ship IU-201 on the Super Guppy. We had recently stopped IU checkout to incorporate several previously approved changes. All but two of these were completed and they can be done with no impact at KSC. Checkout was started again Friday with a forecast for completion of 10/7/65, with preparation for shipment to follow immediately. In light of the recent developments with the Super Guppy, we are meeting with R&DO and IBM this afternoon to re-evaluate the work to be completed and to establish an early as possible availability-for-shipment date. The schedule will then be reassessed against this date and a barge shipping mode. ✓

T. V. FOR AS-206: We have been asked by Dr. Shea to provide T. V. coverage on the IU to monitor LEM deployment. Currently this request is being impacted with our contractors and with R&DO. We plan to accommodate this request, impact permitting. ✓

9/27/65

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1. Saturn S-IC Stages: After delivery of -501 to R-QUAL Laboratory this morning for check-out, we are now concentrating on the assembly of the second flight stage, -502. Installation of systems hardware into the Thrust Structure/Fuel Container Unit has been started in our new Multipurpose Vehicle Technology Facility. The major problem for this stage is again the delivery of components from Boeing and Boeing vendors. Two facts affect the deliveries: (1) the assembly of -503 runs almost parallel in Michoud to the -502 assembly here, with both places being hungry for parts, and (2) the strike of Boeing personnel at Wichita, which is already being felt in a slowdown of deliveries and might develop into a serious problem. ✓

2. Saturn S-II-T Stage: The shipping date of this stage has been delayed from September 24 to September 29, 1965 because an LH₂ insulation panel on the S-II-2 stage failed (debonded) in a proof pressure check. Therefore, NAA decided to perform a vacuum chuck test on the entire S-II-T stage prior to performance of the insulation pressure check. Three-shift operation has been planned for this activity. ✓

3. Assessment of Tube Brazing Techniques in the Field for LEM and Command Modules: Last week a meeting was held at KSC to examine the field service requirements peculiar to brazed systems plumbing. The meeting was arranged and chaired by ME Laboratory in response to a request by Dr. Shea for assessment of S&ID Apollo and Grumman planned efforts. McDonnell Aircraft's support in this meeting was obtained to assure that these programs would benefit from the learning and experience at the Cape with Gemini. A true field repair capability will result from this effort. ✓

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1. MSF TIME/COST CORRELATION TECHNIQUE - Col. Seccomb and Jerry Kubat from General Phillips' office visited Marshall on September 23 and 24, to review our progress in the pilot test we are conducting on the time/cost relation technique initiated by MSF. In reply to a question on the use of this system, Col. Seccomb stated that the same system is in a pilot operation at MSC and contributed to the recent Headquarters' decision to transfer FY-66 funds from MSFC to MSC. ✓

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2. GE INCENTIVE CONTRACT EXPERIENCE - Col. Seccomb commented very favorably on the GE presentation to NASA Headquarters in which GE highlighted their experience with incentive contracting for the past 4 - 5 years. We have initiated action to obtain a copy of this presentation and will also request GE to make this presentation at Marshall if deemed appropriate. ✓

3. SENATE SPACE COMMITTEE VISIT - The Senate Space Committee Staff, headed by Mr. James J. Gehrig, plans to visit Marshall and other NASA installations around the time of the GT-6 launch. No senators will accompany the group. Bob Freitag will furnish the specifics after plans have been firmed up. ✓

B 9/28

1. SUPER GUPPY - On September 25 at approximately 8:15 a. m. PDT, the Super Guppy was in flight test over Edwards, California, flying at 8,500 feet, 240 knots indicated (design speed 280 knots - approximately 300 MPH) when the big portion of the fuselage nose collapsed. The airplane was safely landed at Edwards AFB. FAA, CAB, Aero Spacelines, and Strato Engineering have agreed as to how the airplane will be repaired. It is estimated that at least a minimum of three weeks is required for this repair. Mr. Conroy indicated September 27 that next week would be the earliest he could come in with the proposal because he has additional costs on the airplane. ✓

As we had always planned, we have the Barge Palaemon as a backup to haul IU 201 to the Cape. The program people are proceeding to effect delivery of IU 201 to the Cape via water. ✓

2. BARGE PROMISE - Barge Promise was afloat at 10:47 a. m. CST September 24. Merritt-Chapman & Scott Corporation, a salvage firm under contract to the U. S. Navy, was utilized to refloat Promise. Arrangements have been made to put Promise in drydock on or before October 1, 1965, to repair any damages as a result of Hurricane Betsy. There are no obvious damages. ✓

There have been a number of areas within IO not covered in any of the NOTES submitted to you; items such as the transportation, liquid hydrogen, facilities, etc. The NOTES from Ed O'Connor will attempt to cover these items not covered by others such as Belew, James, Rudolph.

9/27 JTS

NOTES 9/27/65 REINARTZ

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GD/C STUDY CONTRACT: The second progress report meeting on the GD/C study was held on September 22 at KSC. Agenda items were limited and the meeting was a very cooperative one. It was agreed that the following five ad-hoc groups would be established: (1) in-flight, boost venting; (2) zero "g" venting; (3) ESE; (4) MGSE; (5) insulation. Ad-hoc group members, meeting dates, and agendas will be established next week. ✓

GSE MEETING WITH KSC: We have requested that a meeting be held with KSC to establish ground rules concerning GSE. Tentative date of this meeting is September 30. This meeting is required prior to detailed GSE discussions with LeRC. ✓

ALTERNATIVE CONFIGURATION STUDY: The two-week study of Saturn IB/Centaur alternative shroud configurations requested by JPL has been completed. The results are being correlated into a presentation and will be available in final format on Friday, October 1. The study compares ground wind loads, flight wind loads, wind restrictions, acoustics, and performance degradation for the following three configurations: (1) the baseline, or the SA-203 LH₂ experiment nose fairing; (2) a 15 foot cylindrical lengthening of the 260-inch diameter section; (3) an increase of payload fairing to 302 inches diameter which lengthens the vehicle approximately the same amount as case 2. ✓

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1. Incentive Contract Conversion - A great deal of effort is being devoted to the S-IC, S-II and S-IVB incentive contract conversion. The S-IVB is now in negotiations. The approval to proceed, as a result of the pre-negotiation conference with Washington, was received from Dr. Mueller on 17 September. The initial negotiations have not yet given an indication as to whether this will be a long term affair or whether the existing major discrepancies can be cleared up. The actual negotiations began Tuesday, September 21, at Huntsville and are scheduled to continue through the week of September 27. The pre-negotiation position for S-IC and S-II is scheduled for presentation to Dr. Mueller on November 1. ✓
2. PSAC Meeting at MSC - October 14, 15, 16 - Answers to basic set of questions furnished by PSAC are in preparation. Mr. Moody expects to have final coordination with IO/R&DO to be completed so that the answers can be furnished to Gen. Phillips by 1 October. ✓
3. Pending Strike at NAA Plants - The possibility of a strike at NAA plants currently exists. It is expected that the union will serve management with the contract cancellation notice effective around October 10. In the meantime, the union may use "hit and run" tactics, such as having certain categories of employees to leave their job in order to attend special union meetings. These meetings usually will be for a one day duration; however, the activity makes it impossible for management to plan workaround methods of minimizing the impact of these unscheduled walk-outs. "Flash Reports" will be initiated as appropriate to keep Marshall management informed. ✓
4. Servo-Actuators for S-IC - The MOG Servo-Actuators have encountered troubles on the S-IC-T test. Approximately 33 have been returned for rework. It is expected that the Qualification Program will resume in approximately one month with reworked hardware. Final assessment of the impact is not yet available.
The backup development being conducted by Hydraulic Research is progressing reasonably well. Two actuators have passed portions of the Qualification test. A third unit started Qualification testing this week. Final assignment of actuators cannot be made at this time. However, some flexibility remains in that the better actuator can be selected and installed on the flight vehicle at a relatively late date. ✓
5. GE ESE - General Electric (GE) presented an analysis in depth of ESE deliveries for the SDF, IU Checkout Station, and VLF 39-1 on September 22, 1965. This analysis is not considered a schedule; however, it indicates at least a two-month schedule slippage in the last two months (in isolated instances, i. e., power and DDAS, a four and six month schedule impact is indicated).
GE will present a plan on October 4 of how they will regain ESE delivery dates. If GE is unable to deliver individual items on our demand dates, alternate sources of design, manufacturing, and procurement may be necessary. The dollar impact on the total GE ESE situation has not been assessed; however, any further funding reductions are impossible. ✓

NOTES 9/27/65 SPEER

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1. AS-201 RANGE SAFETY: A meeting between ETR Range Safety and NASA (KSC, MSC, MSFC, HQ) personnel was held on September 21, 1965. Points of interest concerning AS-201 are: (1) Cutoff of the S-IB is prohibited in case of abort during the early seconds of flight by an onboard sequence timer (to prevent vehicle pieces from striking Cape Kennedy). MSC stated that 45 sec was the latest cutoff could be prohibited on a manned flight and insure astronaut safety. ETR feels 65 sec is the earliest they will permit cutoff on the unmanned SA-201, based on worst case wind conditions. Action is on ETR to affirm their position. If they do so, NASA must decide whether to accept 65 sec with added risk to the S/C on SA-201 and whether to allow a change in the sequence time as late as 4 hours before launch to permit relaxation of the 65 sec if actual winds are favorable. MSFC position is against a late time change. (2) Abort will also be inhibited by range safety during the early seconds of flight on SA-201 to guard against an aborted S/C descending on industrial buildings. The time the inhibit is released will depend upon actual winds and actual vehicle trajectory, and will be a real time decision by the Range Safety Officer. NASA has asked ETR to identify typical release time based on the current nominal trajectory and different wind conditions. General Bolender subsequent to the meeting expressed some dissatisfaction with the NASA-ETR range safety relationship, with respect to documentation of problems and agreements and with respect to the responsiveness of ETR in this area. ✓

2. JOINT OPERATIONS GROUP: Re: Notes Speer 9/20/65. Decision to dissolve this group is now awaiting Christensen's signature. Replacement will be by two groups: (a) Executive Operations Group (Dr. Mueller, Gen. Davis, Admiral McDonald); (b) Operations Management Group (Christensen, Holcomb, Edwards, Slayton, Kraft, Petrone or Preston). MSFC should request participation in the latter group. (Copy of Notes attached to Dr. von Braun's copy) ✓

NOTES 9/20/65 SPEER

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1. JOINT OPERATIONS GROUP: We have indications from Hqs. that the Joint Operations Group, cochaired by Phillips and Christensen, will be abolished soon. Minutes of the last meeting (5/19) were never published. There appears to be no reason for objection from MSFC. ✓
2. KSC APOLLO/SATURN OPERATIONS PLAN: Subject plan has been received from KSC with a request by Dr. Debus for MSFC comments, particularly in the KSC-MSFC interface area. I-MO will coordinate. ✓
3. AZUSA/GLOTRAC: Problems associated with the use of the Azusa/GLOTRAC tracking system on Saturn vehicles have been given considerable urgency by recent developments culminating in several action requests from MAO. Primary questions pertain to (1) possibility of a frequency change; (2) transponder development and procurement; and (3) requirement for continued use after SA-503. Although OSRO has informed DOD (Sept. 9) that Azusa/GLOTRAC support should be planned through the entire Apollo program, a thorough investigation and resolution of several problems is required. I-MO is taking action in conjunction with I-I/IB, I-V, and R-ASTR-I to coordinate an MSFC position and to obtain resolution of problems with NASA Headquarters, KSC, and ETR. ✓
4. GT-5: According to MSC sources, the spacecraft water impact was 280 nm West of the intended point. The onboard computer was updated during the last orbit from Carnarvon. The updating command from the Houston real time computer contained an analytical error involving the proper time of earth rotation (siderial day). Over 8 days of flight the small error (undetected in shorter simulations) accumulated to the above value. ✓

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1. PEGASUS: Pegasus III systems continue to operate properly.
The valid hit count on September 17 was: 28 on 0.4mm, 15 on 0.2 mm and 57 on 0.04 mm panels. ✓
2. AAP - LUNAR SURFACE: Contractor briefings by Boeing and Bendix on the LSSM were held this week. Both contractors presented their vehicle baseline concept with Bendix proposing a 4-wheeled isotope-powered unit and Boeing a 6 x 6 vehicle employing a rechargeable battery power system. Scientific mission aspects were discussed at length with members of RPL. As recommended by the Geophysics Working Group at Woods Hole this summer, a greatly expanded mission for the Emplaced Scientific Station (ESS) is presently being studied. As a consequence, the vehicle contractors will concentrate on providing sufficient vehicle performance to accommodate the enlarged ESS. ✓
3. AAP - EARTH ORBIT: Considerable effort was expended in cooperation with ASO to define Scientific Passenger Experiments, and science and advanced technology payload systems, for earth orbit mission modules. A number of payload systems were identified in which one of the Headquarters Program Offices, and either MSFC or one of the other Centers, have shown interest. A more detailed description of these systems will be given in one of the next Future Projects Planning Board meetings. ✓
4. SUPPORTING RESEARCH AND TECHNOLOGY: Approximately 75 Procurement Requests, totaling more than one million dollars, were processed this week against the FY-66 approved OART Program. ✓

OMSF informed us that Program Authority in the 904 Program will be increased from 8. - million to 9.45 -million. This increase includes authorization of a task on Expulsion Bladder Technology. Our requested FY-66 Program with OMSF amounts to about 22. - million. ✓
5. CONSULTING ACTIVITIES: Mr. M. O. Burrell, RPL, is attending the NASA-DOD coordination meeting on space shielding at Aerospace as the NASA consultant for computer programs. ✓

NOTES 9/27/65 WILLIAMS

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No NOTES this week due to the fact that all pertinent items from this office were discussed during last week's AAP meetings.