

August 5, 1963



Gannon

NOTES TO HOLMES 8-6-63 DEBUS

1. Meetings at LOC. A review of the FY 65 C of F budget with Freitag was held 2 August. An APOLLO-SATURN Launch Operations meeting is scheduled for August 6 and 7, and Dr. Shea's Panel Review Board meets 9 and 10 August.

2. Railroad. Bids were opened on the FY 1963 railroad project on July 30. The low bid, by B. B. McCormick of Jacksonville Beach, Florida, and the Government estimate for the basic work plus three additive items were as follows:

	<u>Low Bid</u>	<u>Gov't Est.</u>
Basic	\$2, 131, 759	\$2, 169, 999
Additive #1	212, 691	239, 731
Additive #2	132, 884	142, 034
Additive #3	216, 593	246, 902
	<u>\$2, 693, 927</u>	<u>\$2, 798, 668</u>



Funds are currently available to cover the basic bid plus the first additive; therefore, it is planned to award on this basis in order to get the job started, and thus maintain the original completion schedule of January 1964. Headquarters has been requested to approve transfer of funds from FY 63 C of F Project No. 7618, NOVA Launch Complex, to the railroad project to cover the deficit. It is planned to negotiate for the additional work as soon as approval is received from Headquarters.

3. Inspection and Supervision Services for Construction of LUT's 1, 2, and 3, LC 39. Negotiations have been completed, total CPFF contract value will be \$582, 586. It is expected the contract will be forwarded to Headquarters for approval on or about August 9, 1963.

4. Dispensary. Bids opened 30 July 1963. Eight bids received. Low bidder was H. J. High in the amount of \$185, 930. 00; Government estimate \$174, 062. 00

5. Problems with Trade Unions. More and more small problems are developing now in the area of what work has to be performed by the trade unions. It is a frequent occurrence now for our people to be questioned by the construction contractor people about why we are doing work that belongs to the union.

We believe this stems from the fact that we used Noble to do work in areas that we normally do in-house, but lacked the manpower to do at that particular time. Once the trade unions do this type of work, they consider that all work of this nature falls in their category even though we have not changed our position.

We feel that even though the problems are not significant at the present time, they may develop into some serious problems.

6. Cape Canaveral Project Stabilization Board. At its next meeting the Board will hear and consider the positions of the representatives of the Bricklayers, Masons, and Plasterers Union and the PAFB Contractor's Association with respect to the reasonableness of wage rate increased negotiated. The Board will then determine its position in the matter. The negotiated agreement of the Operating Engineers will also be considered at that meeting. There appears to be a serious question of discrimination presented by the language employed in the agreement, i. e., applicable only to Government contracts at Cape Canaveral and PAFB rather than a multi-county area covered under previous agreement.

7. IBM Contractor Support. A memorandum of agreement was prepared for IBM contractor support at AMR between MSFC and LOC which is currently being staffed within LOC. It is the purpose of this agreement to establish responsibilities concerning the development of requirements, budgeting, funding, and contracting for IBM contractor support at AMR for checkout services on the instrument unit.

8. NOVA Launch Facilities Study. On July 25-26, 1963, personnel of the contractor's (Martin-Marietta Corporation, Denver, Colorado) NOVA Launch Facility Study Management Team visited LOC, Cape Canaveral, for conference with LOC personnel directly concerned with the technical areas of the study program. Detailed discussions were held on the technical problems in each major area of the Cape operations. These discussions included status of planning for the SATURN V and the relations between the SATURN V and NOVA planning requirements.

9. Equal Employment Opportunity. On July 23, the Personnel Officer and two members of his staff met with three local Negro leaders in Cocoa to discuss job opportunities and explain procedures in applying for employment. The Negro leaders present were the Reverend H. S. Brockington, President of the Brevard Council on Human Relations; Mr. Elber Silas, President of the Cocoa Civil League; and Dr. H. R. Jerkins, a physician and surgeon.



NOTES 8/5/63 CONSTAN

B 8/10

* 1. INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS (IBEW) -
SOUTH LOUISIANA ELECTRICAL CONTRACTORS ASSOCIATION

Chrysler, Boeing, and Mason-Rust directed their sub-contractors to put the electrical work on schedule. The sub-contractors have been attempting to man the job but have been unsuccessful. At this writing we have had no picketing and do not expect any. The contractors and union are still meeting in an attempt to arrive at a new contract. ✓

2. NASA HEADQUARTERS VISIT - THE CROBAUGH GROUP

On July 30 and 31 Messrs. Al Crobaugh, Jim Smith, Harry Mitchell, Bernard Maggin, Roy Angell, Egon Kafka, and Peter Koutsandreas accompanied by Mr. C. E. Andressen of MSFC Huntsville visited Michoud Operations. The group conducted discussions with elements of Michoud concerning production related activities, policies and procedures. ✓

3. NASA HEADQUARTERS VISIT - THE CADLE GROUP

On July 31 and August 1 Messrs. Don Cadle, John Croxall, Wallace Velandar and Fred Stevens accompanied by Mr. Chauncey Huth of MSFC Huntsville visited Michoud Operations. The group was concerned primarily with procurement procedures and matters and program control procedures and reporting. They solicited opinions on the usefulness of the report we now receive and ideas and suggestions for improved control and reporting methods. ✓

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8-5-63

NOTES ~~AUGUST 5, 1963~~ DAVIS

Please adhere to form.
Jm

No Notes.

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gem

Progress at MTO: Thirteen construction contractors are underway at Mississippi Test Operations. There are 200 construction workers, 32 Corps of Engineers and 18 GE employees on board. Appearance of the Test Facility changes daily, with more areas being cleared, roads to building sites being laid, piles being driven for construction dock. The hydraulic dredge excavating the harbor has struck a layer of beautiful white sand indicating a beach of unknown antiquity. Fossils are being collected if possible without delaying the work. GE is now submitting weekly progress reports on their activities.

→ So we'll have our own
Project Dinosaur! B Good!

*1. Meeting on "Guidance and Space Flight Theory" Contracts: The 14th ^{Jan} Technical Meeting between MSFC and contractor representatives concerning Guidance and Space Flight Theory Contracts was held at Marshall on July 17 and 18, 1963. The meeting was successful and several useful contributions to space flight science were made. Total attendance was about 80. Agenda is attached. ✓

2. J-2 Engine Test Facility: P&VE Division requested and is receiving Aeroballistics support in the evaluation of the J-2 engine altitude simulation diffuser design. The design of Vertical Test Stand 3 at Rocketdyne, Canoga Park, California is being studied to determine whether a minor redesign will eliminate undesirable pressure fluctuations in the altitude test chamber. Regardless of the results of this study, the information gained will be useful in designing Delta 2 Test Facility. This facility is being designed and it is not too late to incorporate more efficient components. Both theoretical and experimental studies are being made. ✓

*3. Apollo Reentry: On August 13, a small group from MSFC (AERO, P&VE, and ASTR) will make a technical presentation to MSC to better appraise MSC program and management people of what is being studied and planned at MSFC concerning Apollo reentry shots. *I've called Gubota to pave the way for E. McNair and see to it that they get necessary attention*

*4. Saturn I and IB Payload Capabilities: Payload capabilities of the two ^{stage} operational Saturn I and Saturn IB vehicles at local escape velocity have been computed. Escape capabilities at an altitude of 200 km were found to be 860 lb and 2,100 lb for Saturn I and Saturn IB, respectively. The Saturn IB trajectory appears reasonable, however maximum q is quite high (4,000 kg/m²) on the Saturn I trajectory and aerodynamic heating problems might arise from the flatness of the trajectory. *Plus high accelerations towards STV cutoff!!*

Not much on top of STV!

5. Special Fluid Mechanics Facility: Re: Your question on Item 1, Notes 7/29/63 Geissler: We are preparing a separate memo in answer to your question. We have received tremendous support from your staff (Central Planning, Facilities Engineering, Administrative Staff and Dr. McCall). The situation presently looks very promising, but we realize that we are not yet "over the hump". In our memo, which you will have very soon, we will suggest ways you could help us. ✓

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1. S-I-6 POST-STATIC CHECKOUT: The S-I-6 vehicle post-static pressure checkout has been completed and the vehicle has been transferred to the bldg. 4708 WAAMAC area for alignment and weighing operations, which are expected to be completed by the end of the work day on August 5, 1963. Post-static instrumentation checkout, performed concurrently with the pressure testing, resulted in the completion of one hundred and fifty-three measurements. ✓

2. S-I-7 PRE-STATIC CHECKOUT: Pre-static testing of S-I-7 was suspended due to a short circuit which developed in instrumentation harness 9W99, causing damage to six cables and to measuring distributor 9A6. The short circuit was apparently caused by a kinked wire, aggravated by heavy foot traffic through the stage. ✓

* 3. S-IV-5 CHECKOUT AT SACRAMENTO: Phase 2 operations on the S-IV-5 stage were completed on July 22, 1963, including subsystems tests. "As run" procedures are being reviewed by Quality Assurance Division personnel, however, four procedures are not available at this time. The Sequence and Abort Test was conducted on July 27, 1963, with approximately ten discrepancies noted. Turbine spin and helium bubbling tests were run on July 29, 1963 and July 30, 1963. Approximately seventeen items must be cleared up prior to static firing; therefore, Monday, August 5, 1963 appears to be a realistic date for this. ✓

* 4. S-IV-6 CHECKOUT AT SANTA MONICA: During the first attempted run of the S-IV-6 Simulated Flight Test, delays in operation allowed the flight-type batteries, used for internal power, to run down to a very low voltage. As a result of this low voltage, the flight inverter and possibly other components were damaged. Meanwhile, the multicoders of two telemeter packages were sent to Sacramento for S-IV-5. No spares are available at either location. ✓

5. AUTOMATED PRESSURE SWITCH PANEL: The automated pressure switch testing equipment has been used successfully during checkout of the S-I-6 stage. Several improvements will be incorporated to increase the speed of pressure switch checkout. After these changes are made, the automated pressure switch testing method will be a considerable improvement over the previous method which required manual pressurizing control, reading of the gage and observing indication lights simultaneously. ✓

6. TRAINING: The following courses are presently in operation under the Quality Assurance Division:

- a. Reliable Electrical Connections (soldering)
- b. Basic Optical Alignment

The Quality Assurance Plant Representative Course is undergoing a revision in a combined effort by this Division and the Office of Reliability and Quality Assurance in NASA Headquarters in order to adopt the course to requirements of MSFC personnel as well as personnel from other Centers. ✓

NOTES 8-5-63 GRUENE

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Chrysler Contract: A discussion was held on August 1, 1963 with Messrs Gompertz and Nichols from Chrysler for determining scope of mission of the Chrysler contract. It seems we finally found a solution satisfactory to Chrysler and us. Further discussions to work out details have to be held between LOC, M-SAT and Chrysler. ✓

- * 1. STATUS OF MAJOR CONTRACT ACTIONS: This subject was discussed in detail *gem* 8/1 between Messrs. Freitag, Smolenski, Rees, Gorman, Lange, Kroeger, and myself. Captain Freitag promised to exert all efforts to get the IBM, Bendix and RCA-110 contracts through Headquarters with presently available back-up material. We agreed to provide Captain Freitag's office with an IU Management Plan in the near future which will serve to integrate the IU Development Plan (as presented to Captain Freitag 6/6) and the Component Procurement Plans. *W.H. Please send me copies B*
2. S-IVB STAGE FOR SATURN V BREADBOARD: A request for a complete flight type S-IVB stage is being forwarded to M-SAT. This request will include justification and description of the stage. In general it will be used to test and verify the S-IVB stage hardware during the planned 6.5 hour orbit. ✓
- * 3. STABLE PLATFORM SLIP RING DESIGN OF INTEREST TO GEMINI CONTRACTORS *gem* McDonnell Aircraft Corporation and Minneapolis-Honeywell representatives assigned to the Gemini program visited our laboratories last week for consultation on stabilized platform slip ring design. We gave them our latest Saturn slip ring specifications but believe that their problem will only be solved by shortened stabilized platform test running time. They stated that the first two Gemini platforms had already logged 1800 and 1600 hours. We told them that we anticipate a maximum 200 hour running time for the Saturn's ST-124 platform including all operation up to the time it is launched in the vehicle. ✓
4. PRINTED CIRCUIT CABLING: The first application of printed circuit cabling will be in the IU 500 FS (Flight System Test Unit). Following satisfactory tests results, it is intended to introduce this type cabling in Saturn V flight IUs. ✓

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*1. SOUND SUPPRESSOR:

9am

A Sound Suppression presentation was made to Captain Freitag, Mr. Lilly, and others from OMSF, 7-31-63. It was decided that model and other type studies would be continued, but that the proposed suppressor for the MSFC S-IC stand would remain in the FY 65 C of F budget and not be constructed in FY 64 due to lack of funds. ✓

2. S-IC BARGE:

S-IC vessel (Barge No. 3) contract plans have been completed and were approved by the American Bureau of Shipping 8-2-63. ✓

*3. CRYOGENIC BARGES:

9am

A meeting with Air Products personnel and U. S. Coast Guard representatives was held in Allentown, Pa., on 8-1-63, to discuss problems relating to Cryogenic Barges for MTF. The Coast Guard indicated that they cannot accept presently proposed design for modification of these barges. The Coast Guard stated that LOX and LH₂ should be considered "most hazardous" as a commodity although current Coast Guard classifications do not classify them as such. If the Coast Guard succeeds in making the "most hazardous" classification stick, the barges will require additional compartments in order to comply with the rules. This will increase our cost per barge \$12,000.00. Further investigations and studies in this area are being conducted.

K.H.

What's the status of the "fast ship" for SII and SIVB shipments from California to MTF and/or Cape, — now that the Cuban Ferry is a dead issue?

— "Point Barrow"

— That jet-powered ship

— The "designed-to-specs" ship

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NOTES 8-5-63 HOELZER

No report.

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LUNAR LOGISTICS SUPPORT:

a. Efforts continued toward development of an overall test program for the Apollo Logistics Support System (ALSS) for submission to NASA Headquarters by August 15. In addition, an overall planning schedule was started to define the tasks and timely interfaces for developing the ALSS during the Fiscal Year 1964-1965. ✓

b. Flip charts were prepared for a status briefing on the ALSS to the MSFC Board. In lieu of presentation on Friday, August 2, the date has now been tentatively set for August 8. ✓

1. SATURN MARKETING

Following your suggestion, I have started to prepare a paper, for publication in Aviation Week or a similar paper, with the working title "LONG OPERATIONAL LIFETIME PREDICTED FOR SATURN LAUNCH VEHICLES." I will collect all arguments which support such a statement, and I believe it will not be difficult to convey the message that all expenditures on SATURN are a very good investment. When I have the paper ready, I will send you a draft for transmittal to Mr. Webb, which you stated would be very appropriate. At the same time we have advised our contractors and our own staff members to keep NOVA out of Aviation Week, Missiles and Rockets and like Journals. ✓✓

2. SYSTEMS DISCUSSION

We all know that it is very unlikely that we will be able to afford to develop a new engine for each stage for each new launch vehicle the country might develop in the future. Therefore, we feel it is appropriate at this time to discuss this subject with our airframe contractors (the big six). We have scheduled a meeting for August 27 and 28, which I will chair, to compare notes with two representatives for each of the big six ^{airframe} engine contractors, plus two representatives each for the big three ^{engine contractors}. Our engine people will also be invited, of course. ✓ This meeting is systems-oriented and will complement the recent Washington meeting which was propulsion-oriented. The objective of the meeting is to try to identify the minimum number of new large engines required for new launch vehicles potentially needed in the national booster program. This will require compromises on the airframe and systems optimization side, and that is the subject we want to discuss. If this meeting produces some results, it will probably be followed a few months later by a larger meeting at Headquarters level with AF participation. Does this meeting meet with your approval? ✓

3. NOVA

Frank Williams will go to Washington this week to clarify the NOVA funding. We are approaching a critical time, since the NOVA study contractors will drop the pencil in four weeks because all the funds will have been exhausted as planned. There is still an argument between Freitag and Lord as to whether we should stay at the \$5M a year level, as originally decided by Dr. Seamans, or whether it should be reduced to \$2M a year. This would mean cancellation of one of the study contracts, which is paramount to a political decision which Mr. Webb would have to make. Time is running out. ✓

*1. Resume on Manufacturing Engineering Working Group Activities during July 1963:

S-IV: Five splinter group meetings were held. Topics of discussion were; Damage of Dynamic Test Stage during propellant loading tests; DAC man rating program; Familiarization of DAC manufacturing personnel with S-IC facility and tooling program; Manufacturing of test hardware for composite structures test program at cryogenic temperatures. ✓

S-IVB: Five splinter group meetings were held on the following topics: Review of possibility of explosive sizing bulkhead segments; Familiarization of DAC personnel with explosive forming techniques used at Ryan. San Diego, for S-IC; Limitations of bulge forming and stretch forming techniques; General exchange of information on manufacturing techniques between DAC and NAA top echelon management. (Participants included; Mr. Parker, Vice President; Mr. Van Leuven, S-II Manufacturing Manager; Mr. G. Lewis, Staff; Mr. D. Clemens, DAC Tooling Manager; Mr. L. Elias, DAC Production Design Engineer; Mr. E. Voss, DAC Plant Superintendent, General Manager; et al) ✓

S-II: Six splinter group meetings were held for discussion of following subjects: Tube welding development for elimination of leaks in tube connections; Selection of sub-contractor for fabrication of LH₂ skin panels; Review of chemical milling and stretch forming at Chemical Contour Company; Manufacturing plan and tooling concepts for strip seal design; Honeycomb bonding techniques for common bulkhead; Discussion of Technical Directive on common bulkhead back-up hardware program. ✓

RIFT: Four discussions were held on: Possible utilization of S-IC tooling for RIFT container fabrication; Review of packaging and handling procedures; Protection of LMSF on proprietary information in manufacturing techniques. ✓

Micrometeroid Payload: We had three meetings on review of tooling program, application of protective coating, and procedure for use of master drill jig for interface. ✓

These meetings did not directly result in many action items or Technical Directives to the contractors. They help, however, immensely to spot critical areas and problems arising or anticipated in manufacturing processes. Problems detected are currently monitored by follow-up discussions on different working levels until satisfactory solutions have been found. ✓

2. Benefit of ADP Program: By utilizing the ADP generated Assembly Standard Hardware Requirements Report to check the latest Excess List (In-House Review List of Excess Materials) the checking time was reduced from approximately 70 manhours to only 12 manhours. The excess list had approximately 4500 items on 698 pages. ✓

1. SATURN I/IB: S-IV-5 - The static test firing at SACTO of the S-IV-5 stage is scheduled for 2 p.m. on 8-5-63.

The shipping date for S-I-5, IU-5 and SA-5 payload has been established as 8-10-63. This shipping date is subject to change based on the requirement for a successful S-IV-5 static firing prior to shipment of the S-I stage.

* *gcm* The negotiations on the CCSD S-IB supplemental agreement have been completed, except for fee. Fee negotiations began 8-5-63. ✓

2. SATURN V: S-IC - Test welds continue with all components of importance. The weld quality has improved based on interim measures, such as portable filter and dehumidifier units. A welding consultant assists in the resolution of problem areas. - Foundations for the Thrust Structure Assembly Fixture are being prepared. - The Boeing manpower was on 7-25-63 within the SATURN Booster Branch 5,003 people, and equivalent to 1560 people for the Wichita and Seattle effort. ✓

S-II - M-SAT evaluation of the NAA proposal for Amendment 5 is nearing completion. It is anticipated that negotiations will be delayed because of a late division response to our request for review and approval of contract specification amendments. Cost negotiation cannot begin until agreement is reached regarding the technical scope of work. ✓

* *gcm* S-IVB - The problem with cracks during forming of the cylinder skins has apparently been resolved. Two skins were rejected and two will be utilized on the hydrostatic test stage. Reason for the cracks has been defined, and corrective action is being taken to recontour the teflon pads for the transition pockets and the excess trim material is being removed prior to forming. ✓

* *gcm* Instrument Unit - The Apollo LEM design data package has been received from MSC. The data is considered preliminary by MSC, but indications are given that it is valid as concerns the final configuration. P&VE is presently evaluating the information. ✓

The procurement plan for the follow-on action to Contract NAS8-5276, for the Advanced SATURN Guidance Computer has been handcarried to NASA Hqs. ✓

3. APOLLO: Panel Activities - For the forthcoming Panel Review Board Meeting (Shea) an MSFC position is being established after discussion with Dr. Rees. You will be briefed prior to meeting. Mission Control Operations Panel and its "Simulation Panel" met at LOC. A Ground monitoring program for crew safety measurements (approx. 100) for Mission Control Center is being prepared by Crew Safety Panel and Instrumentation Panel. ✓

EDS - A Center-wide uniform Test Program has been initiated, with Astrionics carrying over-all responsibility. SATURN IB and V preliminary EDS criteria are expected within 6 weeks. ✓

MSC - MSC has requested launch vehicle information for Space Station Study. Information presently available is being supplied. Apollo Project Office (reorganized after Frick departed) has sent some key representatives including Astronaut Borman for a visit to MSFC to improve cooperation. ✓

NOTES 8-5-63 MAUS

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1. VALIDATION EXERCISE AND OVERALL MSFC MANAGEMENT SYSTEMS REVIEW

- Neither Don Cadle's nor Al Crobaugh's teams will be at Marshall this week. At their request four Central Planning Office representatives will be in NASA headquarters to assist them in reviewing and analyzing their findings to date. *H.M.?*

2. PERT APPLICATION TO FACILITY PROJECTS - The first Facility PERT training course will start tomorrow, August 6, in Building 4200, P&C Conference Room. The training session will be conducted by Messrs. Offenberg and Peterson, Management Systems Corporation. ✓

What's your personal impression about the outcome?
B

*3. PROPELLANTS MANAGEMENT - On August 1 Stearns - Roger replaced Air Products as operating contractor of Air Force Plant #74, at West Palm Beach. Production is expected to resume today. RL10 engine production schedule has not been affected by the shutdown for the changeover, but there has been some impact on the development program. The full impact will not be known until we see how well the new contractor can start and keep the plant producing. ✓

gam

The unannounced change of contractors, and the unannounced shutdown of Air Force Plant #74 came as a surprise to us. Since we must deal with Air Force through NASA headquarters, we are trying through Capt. Freitag's office to (1) improve the channels of communication concerning propellant requirements and distribution and (2) participate more closely with NASA headquarters and Air Force in decisions and plans affecting propellant production and availability. ✓

4. APOLLO SCHEDULE - We have received unofficial information that as a result of the July 30 OMSF Scheduling Review for Apollo, there will be major reprogramming resulting from slippage in spacecraft delivery schedules. ✓

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NOTES 8-5-63 MRAZEK

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W.M.
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- 1. ENGINE-START SEQUENCE TIMING AFFECTS THE GROUND SUPPORT EQUIPMENT SUPPLY AND CHECKOUT UNIT: To assure optimum thrust structure loading during F-1 engine ignition, Structures Branch has requested that the engine-start sequence timing be lowered from 450 milliseconds to 300 milliseconds. This timing change imposes different flow requirements on the Engine Hydraulic Supply and Checkout Unit, and The Boeing Company is preparing a complete analysis for presentation to MSFC at the next Vehicle Design Integration Working Group meeting. Greer Hydraulics, Inc. has virtually completed the unit design. Any change to the engine start sequence timing may result in a delay in hardware delivery.
- 2. SATURN PROPELLANT DISPERSION SYSTEMS: (Reference NOTES 7-15-63 MRAZEK, paragraph 3, copy attached.) Discussion on attachment #2. ✓
- 3. ROVER PROGRAM SCHEDULING: In a memorandum dated 7-19-63, from Mr. Schroeder, Chief, Space Nuclear Propulsion Office-Cleveland, to Mr. Finger, the planning schedule for NERVA engine development was proposed. The key milestone dates contained therein are compatible with the RIFT schedule. Whereas, in the past, the RIFT schedule indicated a one-year discrepancy between engine availability and RIFT need, this memorandum indicates that the engine will not be available until at least one year after RIFT need dates. The detailed evaluation in integration for both schedules is currently in process by the Nuclear Vehicle Projects Office. The so-called derated engine development concept appears to show development promises based on this proposed NERVA schedule. Our evaluation should be completed on or about 8-19-63. ✓
- 4. MOFFETT FIELD ACTIVATION: Lockheed has been formally notified by MSFC Procurement and Contracts Office to begin moving experimental tool program into the hangar at Moffett Field based on an interim agreement with Commanding Officer (CO) at Moffett. The operating agreement has been signed by both MSFC and CO, Moffett, and is being used as the interim-use agreement pending approval of the overall NASA/Navy agreement. The overall agreement is currently in the office of Mr. Belieu, Under Secretary of the Navy, for signature. ✓
- 5. MICROMETEOROID MEASUREMENT CAPSULE (MMC) REQUIRES THERMAL SHUTTER SYSTEM: This view is shared with Fairchild-Stratos Corporation (FSC), and is viewed as a major problem area in the MMC program. FSC will try to widen those prohibitive temperature tolerances from a viewpoint of realistic reliability. ✓

→ W.M.
See my remarks on last page of attachment #2
B

Attachment #1: NOTES 7-15-63 MRAZEK
Attachment #2: Use of Liquid Explosives for SATURN
Propellant Dispersion Systems

USE OF LIQUID EXPLOSIVES

FOR

SATURN PROPELLANT DISPERSION SYSTEMS

In the last few months, the use of a liquid explosive--instead of linear shaped charge--in the Saturn Vehicle Propellant Dispersion System (PDS) has been discussed in several meetings at Cape Canaveral. The use of liquid explosives was proposed, first, when installation difficulties at the arming tower were presented. Approximately 400 to 500 feet of shaped charge have to be installed. The advantage, according to the proposer, of using the liquid explosive is that containers can be installed at the Vertical Assembly Building or sooner, and the liquid explosives could be poured into the containers at the arming tower. The second time the advantages of a liquid explosive was mentioned was during an Apollo Destruct System meeting at Cape Canaveral where it was stated that:

a. Manned Spacecraft Center cannot tolerate an active destruct system on the Service Module (SM) and Lunar Excursion Module (LEM) after the escape tower is jettisoned because the SM propellant system will be needed in case of an abort of the mission.

b. If the SM carries an active destruct system, subsequent destruct command for the vehicle would also destroy the SM, with the crew compartment attached, and obviously kill the astronaut.

c. Because the liquid explosive can theoretically be drained from its container on the SM, when required, and thereby eliminate payload danger, it was again suggested that such a system be used.

The Vehicle Engineering Branch and Assembly Engineering Section investigated the use of a liquid explosive, "Aerex," for use in the Saturn Vehicle PDS. Mr. M. D. Beck of Assembly Engineering Section attended a presentation on the west coast in 1960, where Aerojet-General Corporation demonstrated different applications of a liquid explosive ("Aerex"). The above presentation and later investigation presented the following disadvantages of liquid explosives:

a. Reliability is not satisfactory because of ignition failure during witnessed tests.

b. The igniter must be submerged in the liquid explosive for propagation.

c. A little air bubble between igniter and liquid explosive does not propagate the ignition.

d. An air bubble stops propagation of the liquid explosive.

Attachment #2

- e. The liquid explosive is approximately four times more sensitive to impact than the present explosive (shaped charge).
- f. The liquid explosive deteriorates electrical wiring insulation.
- g. The liquid explosive produces a corrosive action with aluminum.
- h. The liquid explosive is toxic because the main ingredient is Unsymmetrical Dimethylhydrazine.
- i. The freezing point is -20°F and the boiling point is 124°F .
- j. If used on the vehicle, the liquid explosive requires a confined container and special valves and fittings.

Mr. Prasthofer, Assembly Engineering Section, will visit Aerojet-General, while he is in California for the static firing of the S-IV stage, to obtain more information on "Aerex."

In addition, we learned that the Air Force plans to use a liquid explosive destruct system on one vehicle. Assembly Engineering Section plans to obtain more information from the Air Force on the application of this system.

W.M.

The present difficulties with AEREX don't convince me that we shouldn't pursue this matter further. I can see some real long-term advantages to such liquid explosives, — and maybe the chemical industry can produce better ones than AEREX.

For example, how do we get the solid linear shape charges out of a Saturn V sitting on the pad, when a 24 hr — hurricane warning comes up and we must "crawl" it back into the hangar? — B

NOTES 8-5-63 RUDOLPH

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No Notes.

FY-1965 C of F "Mock Hearings": As of now NASA can expect a 13% FY-64 CofF Budget cut based on House Committee action. It is assumed that this was due in part to inadequate justification of FY-64 projects. In order to avoid a similiar situation next year, OMSF has formulated a plan for the submission of the FY-65 budget is:

August 19-MSFC to OMSF

October 1-to Bureau of Budget

September 1-to NASA Headquarters

January-to Congress

As part of the sharpening plan a "Mock Hearing" was held at MSFC on July 31 and August, by an OMSF team, headed by Bob Freitag and Bill Lilly. The Marshall divisions and offices presented their projects and answered questions by the OMSF team. Frankly, Marshall did not look good.

Comments by Bob Freitag during the Mock Hearing included the following:

✓1. Congress likely will be even tougher in FY-65.

✓2. Projects which have the best chance for survival are those directly related to approved programs and schedules. Our submissions to Headquarters, Bureau of Budget and Congress must show this relationship. Other projects will fall into the following categories which are given in decreasing order of priority:

a. increased vehicle production rate

b. follow-on Programs

c. basic technical capability

✓d. institutional facilities

✓3. We must indicate good planning in our project write-ups by avoiding duplication and inconsistency.

✓4. We must have the best possible cost estimates since major reprogramming will become more difficult starting in FY-64.

✓5. Considerable backup information must be available, including hardware flow diagrams in areas such as manufacturing and testing.

✓6. Marshall's budget submittal should be based on 6 vehicles per year. However, we should be prepared to submit a budget based on 12 per year.

✓7. Marshall should re-submit those projects deleted in FY-64 if still required. OMSF will be responsive to other changes as they occur until the budget is finalized.

✓8. Services of OMSF personnel are available as required by MSFC.

The divisions and offices are re writing their projects to include the recommendations of the OMSF team. A coordinated schedule and other backup material is being prepared. In addition a Marshall Ad-Hoc Committee has been formed to ensure that we have complied with all of the OMSF suggestions and recommendations. ✓

Frank
ruhlinger
Adj.
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page)

B 8/10

1. RPD SPACE VEHICLE RESEARCH LABORATORY: Presentations on our proposed Space Vehicle Research Laboratory were given to Mr. Al Crowbaugh and Mr. Bernie Maggins, Office of Programs, on July 24; to our own MSFC Facility Review Board on July 24; and to Captain Freitag and other OMSF personnel on August 1. Our story was termed "good" by Bob Freitag, but he also requested further improvements. He accepts the philosophy that a research laboratory is not, and should not be, justified on the basis of scheduled projects, but as a basic and integral part of an installation such as MSFC. The basis for our justification should be the generally accepted importance of research for our projects. We have been asked by OMSF to prepare a presentation to OMSF, OART, and other Headquarters people within the next ten days. One point of concern seems to be duplication of our work with activities at other places. Our presentation will elaborate on this point. ✓

E.S.

That's true,
but anything
sells better
if it's a
vital element
in meeting
our immediate
obligations.
See Shepard's
NOTES 8-5-63

2. OMSF LAUNCH VEHICLE SUPPORTING TECHNOLOGY: Last week several members of OMSF visited RPD to discuss our FY-64 Launch Vehicle Supporting Technology (LVST) program. We have submitted requirements in the amount of approximately \$17 M to OMSF; indications are that OMSF might have \$13.2 M for funding. However, it now appears, unofficially, that OART feels that approximately one-half of our OMSF LVST requirements should belong to OART. This is rather disappointing, because OART can fund only about 50% of the requirements we submitted to them under their own OART programs. ✓

B 8/10

This again points up the urgent need for a local MSFC FY-64 "Dry Lake" technology program. ✓

1. F-1 ENGINE: The installation of the new flame deflector on Test Stand 1B has been completed. Two short tests, using engine 012, were conducted to check out the new deflector. Performance of the flame deflector was good.

A review of the film of the explosion on Test Stand 2A-2 on 7-24-63, and reported last week, revealed that the explosions appeared to take place in the LOX dome, LOX duct, and LOX flowmeter areas. We believe that LOX dome contamination might have initiated the explosions. Testing on the new position (2A-1) of the stand will start 8-15-63; however, it is estimated that two to three months will be required to repair the stand facilities on the 2A-2 position (Instrumentation, ducting, lines, etc.). Downtime of side 2A-2 will not adversely affect PFRT. The early activation of side 2A-1 will lessen the impact on the program. ✓

Calculated Loads Exceed Allowable Loads to F-1 Pump Inlet Flanges - The major portion of the calculated loads are dynamic in nature and are due to vibration. A redesign to accommodate the high loads as calculated would cause an intolerable time delay, so an Ad Hoc Committee was established to study and review the situation, especially the assumptions which had to be made for the analysis. ✓

2. J-2 ENGINE: Hydrogen Turbopump Net Positive Suction Head Determined - One test was completed using a new inducer in hydrogen and indicated a NPSH of 90 feet. Though this test is insufficient to predict NPSH requirements of all pumps using this inducer design, it is a first indication of Rocketdyne's success in meeting the 130-foot NPSH requirement specified. ✓

3. RL10 ENGINE: The follow-on R&D procurement plan is currently being delayed until a detailed single-source justification is signed by you, Dr. Seamans, Dr. Dryden, Messrs. Webb, Brackett, Lingle, Johnson, Mueller (or Low), as per the latest NASA requirement for justifying non-competitive contracts. We have prepared this detailed single-source justification and started it on its approval route. In the meantime, authority to request a proposal and to allow anticipatory costs for this work is urgently needed as these delays are jeopardizing our ability to meet the RL10-A-3 qualification test completion deadline. ✓

In accordance with the above, a TWX has been requested from the OMSF director to you to allow us to request a proposal and to cover anticipatory costs for this effort. ✓

August 8, 1963

* 1. ENGINEERING AND OFFICE BUILDING

Last week the contract for \$6,352,000 for the third and largest construction phase of the Engineering and Office Building at the Marshall Michoud Operations in New Orleans was awarded to the J. A. Jones Construction Company. The Jones Construction Company will build a one-story reception area, two-story engineering portion and smaller structures including cafeteria-kitchen area and a service area. The structure will provide approximately 506,000 gross square feet of office space. Phase I of the construction -- grading, drainage, filling and pile driving -- is presently ahead of schedule. Phase II of the construction -- erecting precast concrete columns, structural steel and steel decking -- is presently slightly ahead of schedule. ✓

2. VISIT OF BUREAU OF BUDGET PERSONNEL

On August 9, 1963, Marshall Michoud Operations was visited by Messrs. Don Crabill, Terrance King, and Franz Kretzman from the Bureau of Budget. They were accompanied by Raymond Bathrust of OMSF, NASA Headquarters. The purpose of their visit was a familiarization of the Michoud organization, its relationships and its facilities. In addition to answering their questions on the subjects indicated above, two areas were emphasized in the presentation to the Bureau of Budget personnel: 1. The relationship of Michoud Operations to the Marshall Space Flight Center and strong dependence upon the technical and management skills of the center: 2. The number of personnel that will be required to accomplish the programs at Michoud Operations. Mr. Dave Newby was in attendance. ✓

* Proposed Industrial Gas Facility: The Air Reduction Sales Company announced plans to build an Eight Million Dollar plant for manufacturing LOX, Nitrogen, and Argon adjacent to the Michoud Plant. Special wharfs and docking facilities will be installed to accommodate barges for intracoastal waterways and movements up the Mississippi River. In addition to water transportation, a fleet of tank trucks and railroad cars will be provided. Target date for completion was not announced.

BD

How does this affect our
propellant planning operation for MTF?
I'm referring to the criteria we provided
for OMSF and Brackett about 8 weeks ago.
B

*
1. Progress of MTO: There are now 230 construction workers, 37 Corps of Engineers personnel, and 22 General Electric employees on board. We are taking aerial pictures from a helicopter this afternoon to provide up-to-date slide coverage of the work that is underway. Inasmuch as the next Board and Staff Meeting is not scheduled until August 23, I will make the slides available to Ray Kline when suitable in case you want to see them before the 23rd. ✓

Yes I do
B

2. Construction Schedules for First S-II Test Stand at MTO: This morning I discussed with Colonel Palmer the possible need for preliminary labor charges which may be necessary to complete the first S-II stand by April 1965. We can include this as an alternate in the Invitation to Bid to be put out by the Corps of Engineers, setting a deadline for sometime next spring before we decide on its necessity. By then the stage schedules should be much firmer. I shall discuss this further with Palmer and Shepherd when we fly up to Washington, Wednesday, regarding our other funding problems at MTF. ✓

B 8/13

1. Special Fluid Mechanics Facility: The facility outlook for FY-65 is more promising than in previous years. However, we realize the real battle will come at Bureau of Budget and Congress. We are getting good support up through OMSF. Freitag's staff has been most helpful and we feel that Capt. Freitag is aware of the general situation. For obvious reasons, the project is justified on the Saturn V program; but NASA cannot afford to "bury its head" to the longer range consequences.

Since you asked if you could help in any way, we can offer the following as a suggestion: If during informal discussions with Freitag, Holmes, Seamans and others at the Headquarters level you could advance some longer range thinking along the following guidelines, I believe our case will be strengthened.

a. Technology in fluid mechanics peculiar to large launch vehicles is seriously lagging. This cannot be overemphasized. ✓

b. No other NASA Center has time, interest, or facilities to devote to the needed R&D on a timely and urgent basis. ✓

c. Our ability to successfully fulfill our mission and adequately evaluate the performance of our growing list of prime contractors will be in jeopardy if the very technology on which design criteria is based is not advanced. ✓

The proposed project will provide MSFC and NASA a minimum capability in these areas. ✓

2. Revisions for SA-5 Flight: Due to the change of injection altitude (200 kilometers to 250 kilometers), it has been decided to establish revised coefficients for the guidance function, even though the guidance loop will not be closed for the SA-5 flight. It is desired that the guidance function be sufficiently applicable to prevent spilling of the ST-124 passenger platform. Due to the present launch schedule for SA-5, which requires launch during the windy season, the decision has been made to bias the tilt program to the median tail wind expected for the month of launch. ✓

* 3. Project LIEF: Near the end of the last reporting period, we were informed that Dr. J. Shea, OMSF, has approved Project LIEF. ✓✓

4. Base Heating Article in Missiles and Rockets: During the past week, Mr. Gettler of Missiles and Rockets Magazine visited Cornell Aero. Lab. to obtain information for an article on our base heating work there. The article will deal with the short duration testing technique and its advantages over more conventional techniques. The article has been discussed with MSFC personnel, and is expected to be published about Aug. 19, 1963. ✓

1. S-I-6 CHECKOUT: Post-static checkout of S-I-6 is in progress. The vehicle was received August 5, 1963, and connected to the electrical support equipment on August 6, 1963. Networks tests are now in progress. ✓
2. S-IU-6: Pressure-functional testing of the Instrument Unit for the SA-6 vehicle has been completed with the exception of the ST-90 and ST-124 gas bearing systems. The Instrument Unit has been released to Performance Test Branch. The ST-124P gas bearing regulator and associated pieces of tubing were missing at the time of release. The gas bearing systems flow tests and pressure drop-off tests will be performed at a later date. ✓
- * 3. DESIGN REVIEW STATUS ON SATURN V CHECKOUT EQUIPMENT: The status of concept design review for the Saturn V program is approximately as follows:
 - a. S-IC Stage - 90% of the necessary documentation has been received and is currently being reviewed. This documentation review represents a preliminary to actual Phase I review. ✓
 - b. S-II Stage - 62% of the documentation for concept design review has been submitted. Of this amount, approximately 70% is satisfactory and has been approved. ✓
 - c. S-IVB Stage - Concept design review on the S-IVB stage electrical GSE system is approximately 90% complete. Review of component checkout equipment is approximately 50% complete. Review of electromechanical equipment is under way at this time. ✓
4. DAC SURVEY: Preparations have been made for a quality survey of Douglas Aircraft Company, the Air Force quality control organization at Douglas, and the resident Quality Assurance Division personnel. The survey is scheduled for the weeks of August 19-23 and August 26-30, 1963. ✓

NOTES 8-12-63 GRUENE

B 8/13

- * 1. Saturn V Access Requirements Meeting: We are attempting to arrange a complete Saturn V Access Requirements Meeting at the Cape during the week of August 19th between personnel of P&VE Human Engineering, P&VE Assembly Engineering and the LVO Systems personnel. ✓

2. Apollo/Saturn Launch Operations Panel: The Panel met on August 6 to cover agenda items as planned by the Plans and Project Management Office. The Launch Preparations Sub-Panel reviewed the sequence of launch vehicle and spacecraft operations. The sub-panel was given the task of determining the time of spacecraft umbilical disconnect. The factors to be considered are being reviewed in order to make this decision. ✓

3. LC-39 VAB: Ninety per cent design review was held at the AE's office 6-9 August 1963. ✓

1. STATUS OF MAJOR CONTRACT ACTIONS:

RCA-110 and ST-124M for SATURN IB:

*Rafel advised us late Friday, 8/9, that these had been approved by Headquarters. Announcement of award was to have been held for 24 hours at request of the White House. *To be released at 3:00 p.m. (Washington time) today.* ✓

IBM Astrionics Contract:

Representatives of OMSF are here today for a follow-up meeting of discussion held in Headquarters 8/7 in which Mr. Gorman, Mr. Davis and Mr. Kroeger participated. Details to be included in procurement plan are to be defined today---no major problems are anticipated. ✓

*Mr. Norman Rafel works under Mr. Smolensky, Assistant Director for Vehicles, Launch Vehicles & Propulsion (Capt. Freitag)

NOTES 8/12/63 HEIMBURG

B 8/13

* 1. S-IV-5, DAC/SACTO: The cause of the fire detection abort on the first hot firing has not been determined. No hydrogen leaks were found. All test results were favorable. Second hot firing scheduled for today, 8/12/63. ✓

2. BLOCK II HOLDDOWN ARMS, SATURN I: LOC has delivered eight of the twenty-four new pins. The pins were fabricated from the recommended 17-4 PH stainless steel material.

The eight pins were installed in the second set of Block II hold-down arms and load tested. The arms were uploaded to 250,000 pounds and downloaded to 400,000 pounds. Upload is the critical load for the pivot pins since most of the upload is transferred from the vehicle to the base arm structure through the pins.

At conclusion of the load test, the pins were removed from the arms and dye-checked in all critical areas for cracks by a Quality Assurance Division representative.

The pins were found to be straight with no cracks. They are considered satisfactory for installation in set I of the Block II holddown arms now installed on LC-37B. ✓

The pins were shipped to LOC-Florida on 8/8/63.

The third set of Block II holddown arms were shipped to LOC-Florida for installation on LC-34 on 7/9/63. ✓

3. DEPARTURE OF SA-5: Barge PROMISE with SA-5 aboard departed 5 a.m., Sunday, 8/11/63; scheduled to arrive Cape Canaveral, 8/22/63, 11 a.m. ✓

* 4. CRYOGENICS BARGE, 30% REVIEW: A meeting was held with US Coast Guard regarding proposed regulations governing the design of cryogenics barges. US Coast Guard strongly advises our adherence to their proposed regulations, which regulations are not law and are still to be accepted by industry. It is the opinion of Test Division that NASA should comply with these proposed regulations as a means of affording maximum security for lox and LH₂ while in transit. Estimated cost increase per unit (barge and tank), \$35,000.00. ✓

O.K.
B

B 8/13

NOTES 8-12-63 HOELZER

1. VISIT BY GENERAL MANAGER OF GENERAL ELECTRIC COMPUTER DEPARTMENT: Mr. Harrison Van Aken, General Manager of the General Electric Computer Department, Phoenix, Arizona, visited Huntsville on Thursday, August 8, to review the performance of the Huntsville Operation of the Computer Department in support of the Computation Division. He was given tours of the Computation Division and the Manufacturing Engineering Division. ✓

B 8/13

1. LUNAR PAYLOAD ACTIVITIES: Program planning will proceed along the guidelines and decisions you gave during the presentation Aug. 8. My understanding of those are attached. I hope that you will be able to discuss the matter with Headquarters soon in order to avoid that MSFC is either giving too little or too much support in that area. We are providing necessary background material for you.

We intend to present our over-all technical requirement for an Environmental Simulator to Maj Evans on Aug. 15. This has been coordinated with the divisions. No particular requirement has turned up yet which is not covered by the Lunar Payload requirements. You might want to have a short briefing on what we are going to present prior to our get-together with Headquarters.

2. SATURN IB/3 STAGER: According to Dr. Lee, OMSF has forwarded our funding request of \$5 million to support studies and experimental work on the MMM stage to Dr. Seamans.

Some funds can be expected from OSS in the SR&T area of interest for the S-VI stage according to Al Nelson, OSS. An additional \$300,000 is already available at OSS and will be programmed for extended studies in the S-VI/Voyager area not accomplished by Oct. 1 (date of submittal of Voyager study to Headquarters).

The go-ahead signal on the Mariner-B program to JPL and their obligation to reduce to their 4,000 space manpower ceiling from the present 4,200 will have a delaying effect on the Voyager project. The submission of the project proposal to Headquarters scheduled for October cannot be held. ✓

3. MISCELLANEOUS: As to your invitation to the A. F. Conference on Expandable Structure from General Ruegg where you named me to coordinate the matter within MSFC and to represent you, W. Mrazek felt very strong about this being his field and he should represent MSFC. Considering the extensive studies made by P&VE in this field, I agreed. He finally named Mr. Blumrich to represent you at that meeting. I hope you agree considering the circumstances. ✓

O.K.
B

B 8/13

1. NOVA

It is expected that Dr. Seamans approved Saturday, or will approve today, a 2.5 million dollar allotment to continue the NOVA study. In addition to this, we expect \$1.0 million for studies in the area of very advanced chemical and chemo-nuclear launch vehicles, which will give an indication of the operational lifetime and the growth potential of the elements of the NOVA system. ✓

We have now arrived at an approach as to how to implement the NOVA study program this fiscal year, specified the objectives, funding distribution and management approach. I would welcome an opportunity to present our plan to you, Dr. Rees and Mr. Weidner or the Future Projects Planning Board. Unfortunately, time is pressing, because the contractors are funded only through September 9, 1963. We have not been able to move earlier because the Headquarters decision was a slow process. The situation is complicated since it was recommended to Dr. Seamans that one of the contractors be dropped at this point. We consider this would not be in the best interest of the government and believe that we have found an acceptable solution to avoid such a step which amounts to a political decision and will draw plenty of opposition. We might need your support to get Headquarters approval for our plan, provided you endorse our ideas. May I ask for a 30-minute appointment? HHK

Yes, sure.

Make it 1 hr. B

2. PERSONNEL QUESTIONS

I would like to discuss the following personnel questions at your convenience (30 minutes should be sufficient):

a. A replacement for Frank Williams as Deputy Director, Future Projects Office, ✓

b. Krafft Ehrlicke wants to join NASA in about six months after he has completed the three studies he has presently with us. I believe he would be a great asset to MSFC and I have an idea where he would fit in our organization. ✓
He will also talk to MSC and Headquarters.

c. I have a suggestion for a potential applicant for the position of Director, Industrial Operations, in case you are looking for more suggestions.

Yes, I am B

no. Mr. Young just gave
his acceptance for
1 year. (phone call mid-
afternoon 8/13/63 from Seamans).
Pds

B 8/13

NOTES 8-12-63 KUERS

* 1. Saturn V, S-IC Stage:

A major milestone in the fabrication of the Fuel Test Container has been accomplished by successfully welding the cylindrical section to the bulkhead. The weld (.810" thick) was accomplished by simultaneous use of two welding machines from inside and outside staggered a few feet apart. It took 4 1/2 hours to accomplish this operation. Quality of the weld is very good with only 4 or 5 porosity repairs required. ✓

2. Visit of Mr. MacKay, Production Control Manager of DAC:

Mr. MacKay, who manages the Production Control for the whole Douglas Company (approximately 500 people), visited with us for a study of our system for control of component flow and incorporation of modifications. It is now apparent to DAC management that an improvement of their system, to provide more flexibility in rapid follow-up of design modifications in production, would be beneficial for the stage development. Such means as ordering of material and designing tool and equipment modifications for EO changes in advance from verbal information, usage of preliminary documentation for hardware actions, close coordination of manufacturing and design engineers, etc. are not yet being utilized sufficiently. The thinking of key people of all stage contractors is still too much geared to quantity production rather than to the development.

✓ I agree
B

B 8/13

1. SATURN I/IB: Second S-IV-5 firing is scheduled for noon, 8-12. Provisions for GH₂ leak and fire detection systems include (1) shorten fire detection cables; install six cables (one per engine), (2) apply temperature sensitive paint to cables and cages around engines, (3) increase water flow around diffusers, (4) install cloth tufts to observe flow currents during firing, (5) correct pickup for GN₂ purge temperature, (6) increase GN₂ purge around Fill and Drain Valve, and (7) place another GH₂ detector below engine deck. ✓

S-I-5, IU-5, and SA-5 payload have been shipped on 8-11-63. ✓

S-IVB Contract - Agreement on fee was reached 8-6-63, and contract is at DAC for signature. DAC was authorized to continue work through 9-30-63. ✓

2. SATURN V: S-IC - Test Fuel Tank documentation is still incomplete for manholes, gaskets and seals, but MSFC operations are progressing in such areas as upper bulkhead Y-Ring weld to circular skin segment; gore segments for lower bulkhead, including fitting weld problems encountered with outlets; fabrication of second circular skin section. Electrical Systems hardware is the most critical for S-IC-T. ✓

S-II - The first dome for the 54" aluminum mandrel test program was heated to 320°F. The "oil cans" improved; however, the J-ring had to be heated to permit expansion removal. The first heat-age test will begin this week. ✓

The accumulator reservoir manifold assembly failed the proof test at 5500 psig on 6-3-63. Re-test on 6-27-63 passed proof test pressure, but failed the required burst pressure of 9200 psig at 6700 psig. Additional tests on manifold assemblies will be run to determine necessary action. ✓

It is understood that you agreed with Bob Kamm on 8-6-63 at S&ID to request contractor to investigate the possibility of moving S-II Engineering to Seal Beach on Navy property. ⊗

S-IVB - Bids on Huntington Tooling tower are in. Diversified Builders, Inc. received on 8-2-63 letter of intent. ✓

* Instrument Unit - The Apollo-LEM design is being evaluated as to impact on the I. U. Final design release is scheduled 8-15-63. ✓

Contracts with Fairchild Stratos and Hamilton Standard for the Environmental Control System water boiler, were executed on 8-6-63. ✓

MSFC was authorized to proceed with the Advanced Saturn Guidance Computer. ✓

* 3. APOLLO: The Panel Review Board was briefed at the Cape by Panel Chairmen on past activities. OMSF participation in panels was agreed and OMSF "boards" will be established as panels. Launch Operations Panel met at Cape to discuss access to spacecraft on wind-swaying L/V (about 1 cps, 1 ft. double ampl.).

MSC said S-IB flight missions must guarantee 32,500 lbs. at end of orbital coast. Otherwise, LEM landing stage qualification will require an additional SATURN V flight.

W. Mrazek
feasible?
B

O.L.
⊗ Not quite correct: I suggested that S&ID should prepare a "leasing and financing plan" which showed in detail how they propose to gradually move S-II engineering from Downey to Seal Beach. They wouldn't implement anything before we agreed to this plan! B

1. MONTHLY OMSF PROGRAM STATUS REVIEW - The OMSF Program Status Review will be held in OMSF on August 22 and 23. An internal MSFC review of the scheduling submission is set for 9:30 a.m., August 15. ✓
 2. CONTRACTOR PERSONNEL - Current manpower plans indicate a phasing out of Chrysler people at Huntsville and a buildup of other support contractors. The surplus engineering types are not readily useable at Michoud under the present contract, and will have to be terminated unless a change in plans is made. One possible corrective action would be to assign Chrysler more systems engineering responsibility on SATURN I and IB, under their prime contract.
- || We will coordinate with Mr. Gorman, Mr. Weidner, and Col. James in a further review and evaluation of this matter. ✓
3. ADMINISTRATOR'S PROGRAM REVIEW OF GEMINI - At Mr. Webb's annual review of the Gemini program, the program was said to be generally on schedule, although there are problems in vibration and reliability in Titan II launch vehicle and in second stage engine instability.

Following the technical presentations, Mr. Webb used the entire discussion period for a discussion on NASA project management. He expressed concern whether NASA is learning from the Gemini experience, how to become better project managers. He feels that Gemini should be a step toward Apollo, not only in the technical field but also in relationships with industry in project management and contract administration. He stated that NASA should learn how to have industry do the work without such close supervision as in the past, and feels that incentive type contracting can do much toward achieving this objective.

Mr. Webb indicated that top management from both NASA and industry should sit together and review management practices, and requested members of his staff to pursue this further. ✓

1. REVIEW OF SURFACE TREATING PROBLEMS AT BOEING-WICHITA: A visit was made to The Boeing Company-Wichita to evaluate surface anomalies evident on several S-IC propellant tank parts fabricated from 2219 aluminum alloy, and to review the chemical procedures used to process these parts. Several recommendations were made to improve conditions; and an agreement was reached with The Boeing Company on an acceptance criteria for these parts. ✓

* 2. SATURN S-IV-5 STAGE STATIC TEST ABORTED: The acceptance firing was manually aborted after approximately 65 seconds burn-time because of an indication of fire from the engine area. No visible damage was found and no significant leakage to cause a fire was found in the propulsion system. Other difficulties encountered were:

a. The cold helium regulator in the LOX tank pressurization system failed in open position and the backup bang-bang system cycled 21 times. ✓

b. A high internal pressure surge of approximately 41 psia at cutoff caused damage to the hydrogen vent stack. ✓

c. The main cold helium shut-off valve in the LOX tank pressurization system leaked prior to LOX tank pre-pressurization, but leakage stopped when the valve was cycled for pre-pressurization purposes. ✓

d. The LOX tank vent valves appeared to close slowly. ✓

The next firing is scheduled for 8-12-63.

* 3. SOLID PROPELLANT GAS GENERATOR INITIATOR FAILS QUALIFICATION TESTS: Preliminary information from Rocketdyne indicates that about 30% of the McCormick-Selph initiators failed the 250-volt no-fire test after exposure to the high and low temperature test series. This is a serious problem because McCormick-Selph is the sole supplier of the SPGG initiator. The Fleming initiator was disqualified for flight use after those used on Static Test SA-13 leaked. ✓

Review of Special Tooling and Facilities:

Major Barnett has completed the review of S-II and S-IVB programs and is currently involved in reviewing Michoud activities. Based upon findings in the S-II program, P&C intends to redirect the review by NASA-O of the contractor's approval submissions toward a more conservative interpretation of the NASA Management Manual. The S-IVB program contained no controversial items beyond the Tooling Tower Complex at Huntington Beach. The NASA Resident Representatives at Douglas Aircraft Company requested and received further guidance on interpretation of the NASA regulations. Douglas Aircraft has agreed to the MSFC interpretation and contract modifications have since been successfully negotiated on that basis. ✓

NOTES 8-12-63 RUDOLPH

B8/13

No Notes.

B 8/13

1. SPACE VEHICLE RESEARCH LABORATORY: The final version of the justification and a detailed description of RPD's proposed Space Vehicle Research Laboratory have been submitted to Facilities Engineering Office for incorporation into the overall Marshall submission of the 1965 Construction of Facilities budget request. As a consequence of OMSF constructive criticism, we added 122 K of scientific equipment to be included in the laboratory building description. ✓

E.S.
Request a technical briefing on your construction and equipment plans
B

A dry run and detailed discussion of a Headquarters presentation was held on August 9 with members of RPD and Mr. Norman Crone of Captain Freitag's office participating. A presentation on RPD's activities and needs for a laboratory will be given to OMSF and OART at Headquarters August 21. ✓

2. VISIT BY DR. W. F. LIBBY: Dr. W. F. Libby, head of the Department of Chemistry at UCLA, and well known as a co-developer of the Carbon-14 dating method, visited MSFC last week on a tour through NASA centers, to which he had been invited by Mr. Webb. Dr. Libby stated that NASA could, and should, improve its operation in at least two areas: ✓

(a) NASA should do more for the education and training of young scientists (The Huntsville Research Institute was right down his line!) ✓

(b) The centers should do more to establish and maintain direct contacts with senior members of the scientific community. ✓

E.S.
What do you suggest to implement this good suggestion?
B

1. RL10 ENGINE: NASA Headquarters approval of the follow-on R&D procurement plan has not been received as yet. Approval is needed to minimize further slippages in such efforts as the completion of RL10A-3-1 qualification test program (scheduled for completion 12-17-63), substantiation of changes for the RL10A-3-1 production engines (to be delivered starting in 1-64), and other Saturn and Centaur support. ✓

* 2. F-1 ENGINE: This week we will have a technical problem and status review (assessment meeting) on the F-1 engine at Rocketdyne. Joe McNamara has informed me of their preference of selection for the PFRT injector. Their choice does not coincide with ours yet. This will be discussed in detail out there. I am hoping for an early agreement.

A 4° circular gimballed pattern test was run at a frequency of four cps. This is the first 4° gimballed demonstration of an F-1 engine and is the first gimballed test on the new Stand 1B deflector.

Following the repair of Test Stand 1B and after the first full-duration firing on 8-1-63, a major problem of expansion (crown) joint cracking (flame deflector) was discovered. These cracks were found in 150 linear feet of the crown joints which provide for thermal expansion of the flame deflector segments. Forty feet of joint was replaced and the remainder repaired by welding. The cause of the joint cracking is unknown, since no signs of overheating can be found. Further, this same joint design has been very successful in the flame deflectors at MSFC. ✓

Following these repairs, two gimballed tests of about 60 seconds total duration were conducted and an inspection revealed about 50 additional feet of cracks. ✓

An early solution to the crown joint problem is necessary to prevent lost time for repairs following static firing. Test Division is investigating. ✓

The 24-shingle nozzle extension is being installed. Testing is scheduled the early part of this week. ✓

A Rocketdyne-instructed course in F-1 engine familiarization has been scheduled for the week of 8-12-63 at Cape Canaveral. ✓

H.W.

Why do we have to go thru this cumbersome sole-source justification procedure in this case, where a simple follow-on problem is involved? B

August 19, 1963



ELITE
RECEPTION
ACID-FREE

B 8/22

NOTES 8/19/63 CONSTAN

1. VISIT OF JAMES T. KOPPENHAVER, DIRECTOR OF OFFICE OF RELIABILITY AND QUALITY ASSURANCE, NASA, WASHINGTON, D. C.

Mr. Koppenhaver visited Michoud Operations on August 13, 1963, to get acquainted with the Quality Assurance and Reliability Chiefs at Michoud. He was invited to attend the Quarterly Review of Chrysler Space Division activities. After the meeting he toured the plant and was given a brief presentation on the organization and status of Michoud. ✓

* 2. INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS, LOCAL 130 & SOUTH LOUISIANA CHAPTER OF ELECTRICAL CONTRACTORS

On August 13, 1963 the President, Missile Sites Labor Commission, took jurisdiction over the dispute and asked that the unions man the jobs. On August 15, 1963 the dispute was sent to the Electrical Association's Industrial Counsel for settlement in Washington. A decision is expected on August 20, 1963 for settlement and a new contract. On August 19, 1963, the electricians began returning to work. The problem is considered settled at this point. ✓

3. CHRYSLER QUARTERLY REVIEW

Chrysler Quarterly Review was held on August 13, 1963. A problem of some concern to Chrysler is the lack of documentation in the Astrionics area. A meeting was held at Michoud among personnel of Chrysler, Michoud and Astrionics Division to attempt to resolve this problem. Action items were assigned at this meeting. ✓

B 8/22

NOTES 8-19-63 DAVIS

Proposed Industrial Gas Facility: (Reference NOTES 8-12-63 DAVIS, copy attached) The MSFC criteria for propellant operations for MTF are not affected at this time by the announced construction of a LOX, Nitrogen, and Argon plant near Michoud. It seems clear that Air Reduction Sales Company has sufficient market to other customers for the initial construction and also may have long range plan for expansion to serve MTF. This is all according to unofficial statement to me by a company representative. ✓

Attachment

Notes 8-12-63 Davis

NOTES 8-19-63 FORTUNE

B 8/22

1. Visit to NASA Headquarters August 14-15, 1963: Shepherd, Tessman, members of the MTF Working Group and myself visited OMSF Wednesday in connection with an apparent shortage of funds for the first S-II Test Stand at MTO. Our previous estimates and budgetary approval were for approximately \$20M., whereas the current working estimates indicate that approximately \$26M. will be needed. The Corps of Engineers will need the money before ← *all?*
FY-64 funds become available. Reprogramming cannot take place in time and the only solution which will prevent delays of our operational readiness date of April 1965 is for Headquarters to provide the money from some extra funds they may have from other Centers. Thursday, I listened in on a dry run by Freitag, and staff on their proposed briefing for Dr. Mueller. I also talked to Bob Long and Diaz on facilities personnel needs at MTO, to other NASA personnel on the land management agreement with the Corps of Engineers, a branch bank at MTO, loan of military helicopter, and to S. Cox, Assistant Commissioner in the U. S. Treasury, on the banking problem. ✓ *though 1.8M more will do! B*

2. GE Problems in Connection with MTO Activation: Bill Eaton took up most of Friday discussing with me the problems facing him relative to the GE activation studies. It was his understanding from Gorman, Heimburg and myself that he should get high quality personnel in to help plan the activation, check out their operation of all MTO's facilities and that the higher the quality of personnel, the greater would be GE's participation in this. He has built up to some 37 persons but heard last week from Edwards that the MTF Working Group could only support 20, these strictly in the activation area, not operations. His buildup took me by surprise as it must have Edwards; however, I feel that we need good planning assistance from GE in the overall picture, not only the activation phase, but in their preparing to assume both test and plant support operations on schedule. I will discuss this with Heimburg as soon as practicable. ✓

3. Periodic Meetings with Mississippi Test Managers of Boeing, NAA, and GE: I have proposed bi-monthly meetings with John Culley, Harry Cox and Bill Eaton to discuss MTO progress, future planning, etc. This seems to have been well received by the contractors and should reduce pressure by Boeing and NAA to have premature representations here. Our next meeting will be held September 4 at MTO. ✓

B8/22

* 1. Saturn V/RIFT Control Analysis: A preliminary control analysis for the Saturn V RIFT vehicle has been completed. Based on the ground rules that the S-IC stage will not be altered for Saturn V RIFT launches, analysis indicated that angle of attack in jet stream is limited to 6.5 degrees. ✓ Structural limitations of S-IC stage, as designed for LOR vehicle wind conditions, impose a maximum wind velocity limitation of 42 meters per second on the RIFT vehicle which is a 50% launch probability. An increase to 90% probability may be realized by using the March 105 degrees flight azimuth, median wind speed profile, as a pitch plane bias in the tilt program. This wind-bias tilt program should be used for launch azimuths from 90 to 105 degrees, at Cape Canaveral for launches scheduled from October through May. Zero-biased tilt program should be used for launches scheduled from June through September. ✓

2. Apollo Reentry: Apollo reentry meeting mentioned in Notes 8/5/63 Geissler, took place on August 13. Summary of meeting conclusions is attached. ✓

* 3. Mississippi Test Operations: Arrangements are progressing toward establishment of a functional meteorological group under the MTO organizational structure. Our efforts will be phased out slowly over the next year. Aeroballistics Division will then maintain technical cognizance over the Mississippi Test Operations-Meteorological Office, with actual work responsibilities being transferred to the MTO personnel. Training of the Office Chief for a six-month period is expected to start about November 1963. ✓

E.G.
Is this
was a
major
issue
with HQ?
B

4. Computer Audit: Mr. Smith, a representative of NASA Headquarters Auditing Department, visited Aeroballistics on August 7 and 8. Purpose of visit was to investigate 7094 machine time usage by MSFC and to determine feasibility of a Headquarters investigation of MSFC output and the need for such output. We were requested to furnish some specific information on our computer output during the month of June. A summary with estimated time for each area of output was prepared and given to Mr. Smith.

5. New Study Reporting Requirements: Reference Notes - Koelle 7-29-63, Item 2. Aeroballistics Division must take issue with Mr. Koelle's volunteering to assume responsibilities for study reporting. As an alternative we suggest: a) that the Divisions continue the technical liaison they have exercised in the past, and b) that the scheduling and reporting work should be performed by Central Planning, per their charter, and with technical inputs and support from the Divisions. *The new MSFC organization may affect the manner in which these things are to be coordinated.*

atch #2

Yes B

Memorandum

TO Distribution

DATE August 14, 1963
M-AERO-PS-115

SUBJECT Summary of Reentry Meeting Held at MSC on August 13, 1963

1. A small group of MSFC personnel attended a reentry meeting at MSC on August 13, 1963. This meeting had been especially arranged at the request of MSFC in order to brief MSC on the reentry studies now being performed at MSFC and to solicit their assistance in justifying the use of the S-VI stage for the Saturn IB three stage reentry shots.

2. Four technical presentations were given by P&VE, ASTR, and AERO personnel. The agenda and speakers are included in the enclosure. The meeting attracted, as indicated by attendance list of enclosure, most of the upper echelon at MSC.

3. The presentations were well received by MSC. The discussion of the advantages and disadvantages of the Saturn IB to perform the reentry shots resulted in quite conclusive statements by Mr. Faget and Mr. Piland of MSC. MSC concluded that they could not support the S-VI stage for the Saturn IB reentry shots even if the stage had sufficient performance to do the job. The main argument was that they would not like to see the Apollo reentry shots, and consequently the Apollo program, tied now to a new stage development. MSC felt also that the development for the S-VI stage would have to be a "crash" program to meet the proposed schedule, thus diluting the main stream Saturn/Apollo effort. Dr. Gilruth was not present during the discussion and summary period.

MSC stated that they wanted to stick to the Saturn V for the reentry shots. MSFC and MSC are presently in disagreement on what type of trajectory profiles are to be flown on Saturn 504-505 flights. MSFC wants to stay close to the LOR type profile through earth orbit stay time. MSC desires not to have any orbital or long distance trajectory. The reentry flights are to be further discussed at the next Flight Mechanics, Dynamics, Guidance and Control Panel to be held at MSC on August 20 and 21. It is expected that at this meeting MSC will request that MSFC fly an off loaded payload (about 40,000-50,000 lbs) with a short no orbital trajectory. They insist that the SM not be used for the reentry shots.

4. In view of the above stated situation, it is recommended that MSFC urgently gather and document the latest supporting data for the reentry shots, both for the S-VI stage proposed as third stage of Saturn IB and the Saturn V. It is further recommended that when all data is gathered, the overall question of reentry shots be discussed at the management council level.

Lewis L. McNair

2) Lewis L. McNair
Aeroballistics Division

E. Weisler
I think they don't realize that the problems in doing these reentry shots with Saturn V haven't been solved, either. I shall invite Dr. Mueller to reopen this issue as soon as he gets on board!
B

Distribution:

MSFC Attendees

Dr. von Braun	M-DIR
Dr. Rees	M-DEP-DIR-R&D
Dr. McCall	M-DIR
Mr. Hueter	M-SPA
Mr. Duerr	M-SPA
Dr. Geissler	M-AERO-DIR
Mr. Jean	M-AERO-DEP-DIR
Mr. de Fries	M-AERO-S
Mr. Tidd	M-AERO-S
Mr. Horn	M-AERO-D
Dr. Kuettner	M-SAT-AP
Dr. Mrazek	M-P&VE-DIR
Dr. Haeussermann	M-ASTR-DIR

ENCLOSURE:

AGENDA

- I. S-VI Stage Design Characteristics and Some Applications
Speaker: Mr. Jerry Laue M-P&VE
- II. Astrionics Systems for Three Stage Saturn IB Reentry
Speaker: Mr. John Pavlich M-ASTRO
- III. Saturn IB Three Stage Performance
Speaker: Mr. Joe Cremin M-AERO
- IV. Summary of Saturn 504-505 Flight Profiles
Speaker: Mr. John Winch M-AERO

ATTENDEES

MSC	MSFC	
1. Dr. Robert R. Gilruth	1. Mr. J. Laue	M-P&VR
2. Mr. James Chamberlin	2. Mr. John Pavlich	M-ASTRO
3. Mr. Calvin H. Perrine	3. Mr. Lewis L. McNair	M-AERO
4. Mr. Caldwell C. Johnson	4. Mr. Joe Cremin	M-AERO
5. Mr. David M. Hammock	5. Mr. John Winch	M-AERO
6. Mr. Alfred D. Mardel	6. Mr. Clyde Baker	M-AERO
7. Mr. Max A. Faget	7. Mr. Bill Clingman	M-AERO
8. Mr. Robert Piland	8. Mr. John Massey	M-SAT
9. Mr. Robert P. Smith		
10. Mr. John McNaulty		
11. Mr. Robert R. Tillet		
12. Mr. Gene Rice		
13. Dr. Rolf Lanzkron		
14. Mr. Owen G. Morris		
15. Mr. Cris C. Kraft		
16. Mr. Robert V. Battey		
17. Mr. Clay Hicks		
18. Mr. Ted Skopinski		
19. Mr. Lyle Jenkins		

- * 1. S-IV-5: The S-IV-5 stage was static fired for 477 seconds on August 12, 1963 and first evaluation of the data revealed no discrepancies. Based on the successful firing as indicated, Douglas Aircraft Company will incorporate approximately 22 items of work on the stage while data evaluation is continuing. An estimated two weeks are required for this modification work and it is anticipated that post-static checkout will start on September 3, 1963. ✓
2. S-I-6: Networks Tests on the S-I-6 stage have been completed and testing has been suspended temporarily while Engineering Orders are being installed in the stage distributors. A defective auxiliary hydraulic pump was found on Engine No. 1 and will be replaced. The stage is scheduled for cleanup pressure and functional testing during the period of August 30 through September 3, 1963, after which it will be released for preparation for shipment. ✓
3. S-I-7 PRE-STATIC TESTING: Electrical pre-static testing of the S-I-7 stage was completed on Wednesday, August 14, 1963. Cleanup pressure and functional testing should be completed on August 20, 1963 and the stage released for static firing. ✓
- * 4. RCA-110 COMPUTER CONTRACT: The problem concerning Government Source Inspection on subcontracts material on the RCA-110 computer contract was resolved. RCA had objected to having Government Source Inspection at the subcontract level although it was a contract requirement and had threatened a cost increase and schedule delay. RCA's primary concern stemmed from the fact that this computer is also sold commercially resulting in the purchasing and stocking of certain material in large quantities to be used for both government and commercial spare parts supply. After considerable discussion RCA stated that no scope change request would be submitted and that all purchase orders on which Government Source Inspection had been requested would be amended to include the appropriate Government Source Inspection statement by August 1, 1963. ✓

B 8/22

NOTES 8-19-63 GRUENE

H.F.
Don't understand
Please make sketch for next NOTES
B

* 1. I. U. Modification: Vibration test of the SA-5 I. U. has resulted in a modification to the I. U. to prevent vertical and rotational movement. An attempt is being made to get the hardware in time for all drilling and bracket installation work to be accomplished prior to erecting the I. U. This will leave some of the rod installation work to be done at some later time, which could be fitted into the schedule. There is still some question as to interference with other hardware and cable routings. Mr. Zeiler is making a thorough investigation.

* 2. Ground Electrical Test Set (GETS) Complex 37: The RCA-110 was used for the first time in a demonstration exercise to automate the checkout of the Electrical GSE. We consider this a very successful operation.

3. Participation in Evaluation of Little Joe II Electrical System: MSC requested we furnish one man to serve as a member of a team analyzing the Little Joe II circuitry for ground loops, sneak circuits, etc. Frank Bryan of the Electrical Systems Branch, has been assigned this mission and will spend several days at White Sands on this task this week.

* 4. SA-5 Schedule: LVO, together with DAC-AMR personnel, is preparing the SA-5 schedule at AMR. Based on discussions held August 16, a delivery date of September 27 is assumed. LVO expects that all modifications will be performed at Sacramento, unless a good expediting effort can provide the hardware at AMR before shipping date.

5. Strike on Complex 34: We had a one day walk-off of the electrical and pipe fitters union on Complex 34. Workers went back on the job Thursday.

NOTES 8/19/63 HAEUSSERMANN

B8/22

No submission for this week.

BP/22

MARINE ACTIVITIES:

* gm | Barge PROMISE departed New Orleans, 8/15, for Cape with SA-5 on board. Voyage transgulf without incident. ETA Fort Pierce today.

RE: Test Division Weekly Notes, 8/5/63, and Dr. von Braun request for vessel status (Attachment 1):

Present plans worked out with NASA Headquarters and Military Sea Transport Service are for the use of two AKD type vessels: Point Barrow and TAURUS. ✓

A modified plan is being considered which substitutes an S-IVB aircraft and a 27-knot vessel in lieu of above, but modifying POINT BARROW for backup purposes. ✓

Modified plan was recommended to NASA Headquarters per correspondence dated 8/15. Balch will brief Freitag and Rosen on Monday, 8/19, regarding modified plan. ✓

MISSISSIPPI TEST FACILITY WORKING GROUP:

Presentation to NASA Headquarters made by MTF Working Group representatives and MSFC on August 14 concerning overall FY-63 - FY-64 MTF Budget. This presentation reflected a 21.4 million shortage which does not include proposed cuts by Congress in the FY-64 program. Indications appear favorable for early release of additional 5.8 million of FY-63 funds to alleviate our funding deficit for construction of first S-II test stand. ✓

A 90% drawing review of the S-II test complex was completed at S&P in St. Louis on August 17, 1963. ✓

ATTACHMENTS:

NOTES 8/5/63 HEIMBURG

TESSMAN Notes

B8/22

NOTES 8-19-63 HOELZER

1. VISIT BY MANAGEMENT SPECIALIST: The ADPS Branch was visited by Mr. Robert Stirland, Management Function, Hill Air Force Base, Ogden, Utah during the past week. Mr. Stirland was interested in reviewing MSFC's approach to management data presentation. As a result of his visit, prospects are good that we can obtain a surplus B-47 flight simulator in conjunction with our orbital rendezvous studies. ✓

*2. DATA REDUCTION EQUIPMENT FOR STAGE CONTRACTORS: During the past two months this division has been coordinating a study of data reduction equipment planned by stage contractors. All MSFC divisions and offices, including Michoud and LOC, have participated and furnished inputs for this study. Presentations have been given by the four stage contractors and a recommendation is being prepared for Saturn Systems Office which may serve as a guideline in the over-all data reduction facilities problem. This was an attempt to bring into focus the equipment needs and plans of all concerned in the Saturn program. ✓

1. APOLLO LOGISTICS SUPPORT PROGRAM: Four Northrop personnel reported on board on Monday, August 12. One is assisting in RPD; the other three are in the Apollo Logistics Support group. Northrop is conducting a two-day lecture this Wednesday and Thursday (August 21-22) on Life Sciences. Representatives of the MSFC divisions have been invited.

The first preliminary draft of the test program for the Apollo Logistics Support program was handcarried to NASA Headquarters for discussion today. In addition, our inputs to the design criteria for the Environmental Chamber (Lunar Simulation Facility) were handcarried. ✓

2. VOYAGER STUDY: Routine work on Volume V has been conducted. Chapter 2 of Test Plan is in final draft. Chapter on "Manufacturing Plan" was discussed with Manufacturing Division. ✓

3. REENTRY MISSION: MSFC's proposal to use MMM as third stage for reentry tests did not receive support by Houston.

4. MMM FUNDING: Dr. Holmes sent a letter to Dr. Seamans requesting reinstatement of \$20 million for FY 64 and \$80 million for FY 65 for MMM development. ✓

H.H.
 // I'll reopen
 this issue
 after Dr.
 Mueller gets
 on board
 B

* gm 5. SATURN-IB/CENTAUR/VOYAGER STUDY: The second technical review for the Centaur Study was held at STL on August 7. The configuration selected for a preliminary design effort is the 154" diameter with the Centaur Guidance on top of Centaur. A payload of 6000# and an energy level of $C_3 = 22 \text{ KM}^2/\text{sec}^2$ for an orbital start is possible without structural modifications in the S-IB vehicle.

Major effort is centered on the cost and schedule analysis for Centaur as a third stage on Saturn. Present schedules for the study are essentially being met, with the draft of the final report being submitted on September 4, and the final report submitted on September 20. The control analysis will be delayed, but will be in the final report around October 8, 1963. ✓

B8/22

1. NOVA

We are now in the process of writing the work statement for the NOVA Phase III follow-on study, assuming that the money (\$1.5 million) will come down to MSFC this week and that we can go out on RFP early next week. If it is to be one contractor only, we will make it competitive between the two - whoever gives us the better deal will get the follow-on contract. We will now try to obtain another million, which is tentatively in the budget for very advanced NOVA concepts, such as single stage recoverable and chemo-nuclear. We might give Martin, Douglas and GD/A a chance to compete for this package (after the money is in the bank), as those three are presently working in these areas. ✓

HHK
I'm afraid it is B

2. FY 1964 NASA STUDY REVIEW

Last year Dr. Seamans sat up the "Rothrock Committee" to integrate and review all systems studies within NASA under participation by the Centers. This year it will be different. The Centers are now excluded unless they are invited by one of the program offices as consultants. We managed to get an invitation from OART and will send Dr. Ruppe to see to it that our share will not be too small. This meeting is now scheduled in Washington on September 3, 4 and 5, 1963. ✓

What's that?
New to me!
B

3. THREE-YEAR SUMMARY

We now have the final figures of the last three years of systems studies. Most of them were on competitive bidding. Here are the 10 most successful companies and the number of study contracts they have won:

FUTURE PROJECTS STUDIES (thousands of dollars)		
Company	Total Number of Contracts	Total
Gen. Dynamics	14	3,117
Martin	9	2,502
Lockheed	14	1,993
NAA	6	1,012
CV/A	4	920
STL	6	897
Boeing	5	891
Douglas	6	754
RAND	3	291
Ryan	1	146
Other (6 companies)	6	442
TOTAL	76	12,965

✓

B8/22

* 1. Welding Technology Development: The Grumman Aircraft Engineering Corporation has officially requested through NASA Headquarters, Office of Technology Utilization, that we give a presentation on our new welding and tooling techniques to a greater number of their personnel. This is the result of the publication of our booklet "Selected Welding Techniques" and a recent visit of some key manufacturing people. The Vice President of Grumman stated in his letter to NASA that these techniques developed at MSFC would be of value for their development program for the Lunar Excursion Module. ✓✓

2. Saturn V, S-IC Stage: The second cylindrical section of the Test Fuel Tank has been successfully welded. Meridian welding for the lower bulkhead for this container featuring eight outlets of different sizes will start next week. ✓

3. Saturn V, S-II Stage:

a. A periodic contour check of the inspection fixture for the aft common thin gores revealed a discrepancy between the check fixture and the master facility template. It was found that the master facility template was in error, probably as a result from handling and moving this fixture. All corrections have now been accomplished with no effect on the schedule. The back-up stretch forming effort, however, has been delayed approximately five weeks because of this occurrence.

b. A program for the fabrication of the back-up strip seal common bulkhead has been proposed by S&ID as requested by directive from Saturn Systems Office. The proposal specifies in detail which new tooling and modifications to existing tooling are required. The cost, totaling \$1,500,000, and schedule for the program are included in the proposal. We are presently reviewing this manufacturing plan in all details. ✓

B 8/22

NOTES 8-19-63 MAUS

- 1. OMSF NEW PROJECT STARTS - FY 65 - The following is the most recent information received on OMSF New Project Starts for FY 65.

Multi-Purpose Cryogenic Space Stage (Multi-Mission Module).
 Brainerd Holmes sent a letter to Dr. Seamans last week, subject: Request for Guidance on FY 64 Funding of MSFC's Multi-Purpose Cryogenic Space Stage. In this letter, he recommends that this project be reinstated in the FY 65 budget at a level of \$80M and that \$20M be provided in the FY 64 budget for an early start on the development of the Multi-Mission Module with a target date for operation as the third stage for the Saturn IB in CY 1967. ✓

Apollo Logistic Support System (LEM Truck). Doug Lord advised that Mr. Holmes plans to submit another proposal to Dr. Seamans to initiate this project in FY 65. ✓

- 2. PROJECT SUPER COORDINATING BOARD - At the second meeting on August 9 of the Project SUPER (Support Programs for Extra-terrestrial Research) Coordinating Board, fourteen specific research tasks were discussed for possible accomplishment by Air Force Systems Command Research Installations. These task titles and objectives are being furnished to you today in a separate document from Major Bollinger.

Preliminary discussion indicated that the AFSC has the capability to perform these tasks, and is interested in accomplishing them. A target date of September 1 has been established for AFSC to furnish detailed proposals on each task to MSFC.

Also, at this meeting, the Board prepared an MSFC-AFSC memorandum of agreement for formalizing relationships and procedures for the Project SUPER Coordinating Board. This paper is being staffed at MSFC and AFSC in preparation for your and the AFSC Commander's signature.

H.M. It must be cleared thru Washington as discussed B

- 3. VALIDATION EXERCISE - The MSFC portion of the Validation Exercise, headed by Al Crobaugh of Office of Programs, has been interrupted for several weeks, to permit the team to make an evaluation of MSC Apollo slippage. ✓

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INCLOSURES

ARE DETACHED
B8/22

NOTES 8-19-63 MRAZEK

1. GEORGIA NUCLEAR LABORATORY (GNL): Informal information has been received from Lockheed Georgia Company that they have been approached by General Services Administration to determine if they are interested in purchasing GNL. Lockheed Georgia Company has this under advisement and expect to reply in about three weeks. ✓

2. LIQUID EXPLOSIVES: (Reference NOTES 8-5-63 MRAZEK, attachment #2, page 2, copy attached.) Liquid explosives might have some installation advantages. I have instigated a more complete investigation. ✓

3. F-1 ENGINE 24-SHINGLE EXTENSION: The 24-shingle, gas-cooled nozzle extension was fired three times on F-1 engine 012. The tests were for 15, 50, and 150 seconds duration. Hatband buckling at the aft end of the skirt and some inner slot rippling has been the two noticeable effects after the first two tests. The 23rd shingle was lost on the third test. ✓

* 4. S-II STAGE HYDRAULIC PUMPS: Several main hydraulic pumps have failed after a few hours of routine testing at Space and Information Systems Division (S&ID), North American Aviation, Inc. Failures were connected with the rotating group. Based on these failures and the previous accumulator-reservoir malfunctions, S&ID is considering more in-house verification testing. This is another step toward the MSFC testing concept. ✓

* 5. RL10 ENGINE: (Reference NOTES 8-12-63 WEIDNER, paragraph 1, copy attached.) The follow-on R&D procurement plan is still in NASA Headquarters. The plan is being delayed because of the latest NASA requirements for justifying non-competitive contracts. MSFC is prepared to issue the Request for Quotations to Pratt and Whitney Aircraft upon approval of the procurement plan by NASA Headquarters. ✓

6. MECHANICAL INTEGRATION PANEL: The fifth meeting of the Mechanical Integration Panel was held 8-15-63. Action items will be attached to next NOTES. ✓

7. SATURN IB: For the Saturn IB vehicle, we have committed George C. Marshall Space Flight Center to inject a 32,500-pound MSC payload into a 105 nautical mile circular orbit with launch azimuth 72° east. (Reference memorandum from secretary, Flight Mechanics, Dynamics and Control Coordination Panel (MSFC), dated November 26, 1962.) Any orbital requirements for the S-IVB Stage and the Instrument Unit will reduce this 32,500-pound MSC injection payload. A four and one-half hour coast mission will allow an MSC payload of 31,570 pounds. A three-hour coast mission will allow an operational MSC payload of 31,823 pounds. (Reference memorandum No. M-P&VE-VA-175-63)

Attachment #1: NOTES 8-5-63 MRAZEK, page 2 of attachment #2

Attachment #2: NOTES 8-12-63 WEIDNER

→ Has this info been passed on to OMSF/systems? What's their reaction?

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INCLOSURES
ARE DETACHED

CONFIDENTIAL

B

B8/22

NOTES 8/19/63 RUDOLPH

No Notes

FY-65 C of F Budget

The FY-65 C of F mock hearing with Bob Freitag and Bill Lilly at MSFC resulted in a rewrite of all our 65 facilities projects, which are being transmitted to Headquarters today. The submission today represents a more coordinated effort than has been given to any previously submitted budget by Marshall. ✓

A great deal of work is required to meet all of the guide lines that have been received through August 15. The August 15 guidelines from Office of Programs require considerably more detailed back-up information than was required in earlier guidelines. This detail is due at the Office of Programs on September 2. OMSF is requesting a delay of submittal to Office of Programs until October 15. This extension would provide MSFC time to prepare better data. However, Dr. Seamans has not made a decision on time extension. ✓

*
gem/ The "mock hearing" approach is very helpful, however, a well coordinated set of Headquarters guidelines as a basis for future "mock hearings" and budget submissions would be extremely beneficial. ✓

- *1. METEOROID MEASURING PROJECT: I visited Fairchild Stratos at Bladensburg and Hagerstown to discuss the present project status. The project is moving along satisfactorily; the problem of radiation damage to the sensors is not yet completely solved, but it seems that we are close to a solution. A thorough project review will be held in Bladensburg on August 28, with 20 to 30 members of MSFC participating. ✓
2. OSS BRIEFING AT MSC: On August 20, representatives of Special Assignments Office and Research Projects Division will attend a briefing on the Office of Space Sciences' Supporting Research and Technology Program. This briefing is being given to MSC in Houston to acquaint MSC with OSS contracts that may have some bearing on the manned space flight program. OSS also invited MSFC to send observers, because of our work on LLS payloads. ✓
3. AIR FORCE RESEARCH PROGRAM: In a direct letter to me, Captain B. Freitag asked me to submit the research tasks which we intend to propose to the Air Force, to his Office for review. Major Bollinger and RPD are working together to comply with this request. ✓
4. OFFICE OF APPLICATIONS: On August 12, the Applications Office was host to Mr. Arthur Meyers, Special Assistant to Congressman Staebler (Michigan) of the House Space Science Committee, and Mr. Harris Eisenhardt, President of Veda Incorporated of Michigan. Marshall was the fifth NASA center to be visited by these men. Their main purpose seemed to be the evaluation of the NASA Technology Utilization program as to how it may contribute to the Technology Utilization Center to be established by the state of Michigan. ✓

Hausman

F. J. I.

B

August 26, 1963

MADE IN
UNITED STATES

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OFFICE OF DIRECTOR

MSFC ROUTING SLIP				
	CODE	NAME	INIT.	<input type="checkbox"/> ACTION <input type="checkbox"/> INFORMATION
1		<i>Newby</i>	<i>DN</i>	
2				
3		<i>Dorman</i>		
4				

REMARKS

CODE	NAME	DATE
------	------	------

MSFC - Form 495 (Rev. February 1961)

Basman

NOTES TO HOLMES 8-27-63 DEBUS

1. Construction Feasibility of Launch Complex 39. On 21 Aug. 63, Catalytic Construction Co., under contract to the Corps of Engineers, presented their preliminary report on the construction feasibility of Launch Complex 39 to NASA and the Corps. In general, if optimum construction conditions prevail, the Catalytic analysis indicates that the NASA "need" dates for the various facilities at LC #39 can be met. However, some adjustment to joint and beneficial occupancy dates for the crawler-way and the arming tower park position foundations will be required to maintain a feasible construction schedule for those items. Any slippage of any other element of the program such as GSE, launch vehicle and firing schedules, should be reflected back into NASA construction need dates since it is entirely possible that there could be significant cost savings in the construction.

2. 1965 Budget Estimates - Operations. Dr. Seamans' guidance for preparation of the 1965 budget estimates for Operations (personnel costs and operation and installation) and C of F were received. The Operations submission is due in NASA Headquarters on September 16, 1963. The C of F presentation is due on September 3, 1963.

3. SA-5 Booster. Arrived at LOC on August 21, 1963.

4. 37 Service Structure. The 37 structure has been checked out and is ready for erection of SA-5. New anchors have been installed at Pad A for launch park position and these have been verified by positioning the structure on them.

The hurricane gates (enclosure around lower portion of booster) have been fitted. Considerable cutting had to be performed on the gates to clear the top of launcher. We have accomplished considerable pre-planning with PAA for hurricane preparation on the complexes and feel we will be ready.

5. Contract Coordinating Group. Discussion with the Canaveral District, Corps of Engineers has resulted in the establishment of a Contract Coordinating Group (CCG) for each NASA construction contract. Membership includes the Resident or Project Engineer, District representative and a NASA representative. Weekly meetings are scheduled. Contractor, sub-contractors and architect-engineers may be called to attend meetings as necessary. The CCG will consider



field changes and any other items affecting job progress and provide a more effective and rapid means of determining time and cost change implications. Minutes will be prepared and distributed after each meeting.

6. Launch Equipment, Launch Complex 37B. The Automatic Ground Control Station (AGCS) electrical installation has reached completion. Preliminary checkout has been made with the launch equipment Ground Equipment Test Sets (GETS) and AGCS checkout panels. The launcher ground networks electrical installation has been completed and is being checked out.

7. Launch Complex 37B, LH₂ Burn Pond Modification. During 37B wet test it was discovered that water was siphoned into the LH₂ piping through the burn pond bubble caps when vent valves were cycled prior to LH₂ loading. A modification to correct the trouble was accomplished by LOC. A test was performed the week of Aug. 5, 1963 on the LH₂ storage area burn pond which verified that the modification solved the problem.

8. Launch Complex 34, Propellant Services Modification Contract NA10-178 - Winger Construction Company. The contract completion date of August 12, 1963 was not met by the contractor, and the right to proceed was withdrawn by LOC. Launch Support Equipment Engineering Division and Launch Vehicle Operations assumed responsibility for completion of the remaining work at the contractor's expense, and the contract was modified accordingly.

9. Launch Complex 34, Environmental Control System, Installation is approximately 95 percent complete. Acceptance testing was performed from August 6 through August 12, with satisfactory results. Currently the contractor is taking corrective action on unsatisfactory items found during the acceptance testing and performing minor clean-up work to the system.

10. Status of LUT Fabrication. Fabrication of launchers is to begin August 29; fabrication of mount mechanisms (pedestals) is under way. Launcher bases are to be made in Decatur, Alabama; umbilical towers in Birmingham; mount mechanisms in Pennsylvania; cranes in Seattle; and elevators in New Jersey and New York.

11. Propellants and Pneumatics System for Complex 39A. At a meeting in Washington on 14 August, tentative agreement was reached

with Headquarters P&C on a procurement plan for Management Contractor for the Propellants and Pneumatics System for Complex 39A. This plan will be presented to Dr. Seamans for approval.

12. Other Contracts Status.

- a. Radar Boresight Range, MSC. Design was completed Aug 19. IFB is scheduled to be issued August 30.
- b. Access Channel and Hydraulic Fill for LC 39. Final inspection scheduled for 23 Aug 63.
- c. Networks Rooms Addition LC 34. Awarded Bucon Construction Co. 16 Aug 63 in the amount of \$95,800.00.
- d. Compressed Air System Hangar "AF." Final inspection held 19 Aug 63.
- e. Theodolite Building LC 37. Final inspection held 21 Aug 63.
- f. LC 34 and LC 37, Operational Intercom System Expansion. Letter contract has been approved and contract to be let on or before Sept 9, 1963.
- g. VAB. 90% design review held in New York 5-9 Aug. 63.
- h. CIF. 60% design review conference was held at Merritt Island on 14 Aug 63 at the Corps of Engineers Office.
- i. Cable Storage and Maintenance. Contract awarded 14 Aug 63 to Martin Construction Co. in the amount of \$295,507.
- j. Central Telemetry Facility. Contract awarded 14 Aug 63 to Martin Construction Co. in the amount of \$1,802,515.
- k. Orsino-Indian River Causeway. Bids were opened 8 Aug 63; low bidder was Houdaille-Duval in the amount of \$4,999,276.69; Government estimate \$4,929,122.70.
- l. Hydraulic Fill for JPL Explosive Safe Facility, Contract NASA-5. Final inspection held 14 Aug 63.
- m. MILA Communications Contract. RFP's were mailed Aug. 21 by P&C for this contract. In addition to the 10 original offerors, an additional 19 companies requested copies of the RFP. Expect to convene evaluation board on September 12 to review bids received.

n. Maintenance - MILA. Assumed maintenance responsibility for the first building on Merritt Island (Telephone Central Office). Mr. Ragusin is LOC-BOD representative. Completed two major jobs and 16 routine support requests during the past week.

o. Barge Channel. Further investigation of the Saturn Barge Channel indicates that we must take immediate action to correct silting conditions by contracting for dredging. Two avenues are being investigated, i. e., increase PAA maintenance dredging to two shifts to deepen channel, or a separate contract. Costs and November required usage date are key considerations in making decision.

p. MILA-Banana Creek By-Pass. Final acceptance inspection and all arrangements to close off the old bridge have been made. Action of closing off the bridge should be completed by the end of August. Involves erecting barricades and reflector lights.

q. Temporary Water Supply Treatment Vans. These are being activated at MILA although indications are that the temporary well water will require very little treatment. The Corps of Engineers state they will probably not require this water source for another 30 days.

r. Procurement of Base Operations Support Services (MILA). The procurement plan is at Headquarters for approval. Indications are that it will be approved within a week. As of the present time, there are 62 sources to be solicited.

13. Problem with Contractor Personnel. On August 13, 1963, the matter of gambling under the pad at Launch Complex 34 was referred to the FBI for presentation to the U. S. Attorney for his prosecutive opinion. On August 14, the FBI advised the U. S. Attorney had declined prosecution. At approximately 12:15 p. m., August 15, LOC Security and PAA Security Police entered the Battery Room under Pad 34 and found gambling (card games) in progress. Each participant was identified, logged, and told he could return to his duties. Representatives of the companies involved (American Machine and Foundry and Hicks and Ingle) are being instructed in writing that in the future any employee involved in gambling will result in disciplinary action in accordance with CCMTA regulations. This covers anywhere from a three month suspension to complete barring from the Cape immediately. This warning will be extended to all contractors of NASA at LOC.

14. Disposition of Measuring Equipment - BH 26. The local Goddard people have requested that portions of the measuring equipment in Blockhouse 26 be transferred to them for their use. Since extensive modification costs would be necessary for use of the recorders in Complex 34, 37 and/or 39, it is in the best interest of NASA to transfer the equipment to GSFC. Action is, therefore, being taken to turn over the equipment through official channels. Measuring equipment remaining in Blockhouse 26 that Goddard does not have a need for will be removed.

B 8/28

NOTES 8/26/63 CONSTAN

1. INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS - IBEW - SOUTH LOUISIANA ELECTRICAL CONTRACTOR ASSOCIATION

The electrical situation has been settled and the work is back to normal. The impact on the program was very slight. ✓

2. GENERAL ACCOUNTING OFFICE REVIEW OF MICHLOUD OPERATIONS

General Accounting Office has requested an entrance conference on August 26, 1963 preparatory to review of selected items of Michoud Operations. The auditor advises that initially the selected items will be a survey of contracting methods and cost items. ✓

3. ENGINE DAMAGE - S-1-8

During reinstallation of Engine H-2019 on the S-1-8 four bolts and a key were sheared on the Beam Ray fixture causing the engine to rotate and fall into the tail structure of S-1-8. The engine was damaged to the point that it will be stripped and shipped back to Rocketdyne for evaluation of internal damage. A spare engine was shipped to Michoud from Huntsville for replacement. A complete analysis of the report of the Beam Ray failure will be published by Quality Assurance and Reliability, Michoud Operations. ✓

4. FATALITY

A fatality occurred on August 16, 1963 to a Boeing sub-contractor employee when he fell from a height of about 35 feet to the concrete floor in the manufacturing building. The sub-contractor was Welding and Manufacturing Company and the employee who sustained fatal injuries was James R. Oglesby. FC

If you think this is a good idea and not too late, please prepare (through PIO) a letter to the widow for my signature B

B 8/28

NOTES 8-26-63 DAVIS

No Notes.

1. Shortage of Funds for S-II Test Stand: In reply to your question of last week, attached, Shepherd tells me the 1.8M you referred to must be the Seal Beach shortage he has discussed with you. It does look like we can raise approximately 1.3M from savings in Michoud Engineering Building and 1.7M by slipping Seal Stand Portion of the MSFC Components Test Facility, and possibly 2.9M by delays in MDE procurement of High Pressure Water Pumps. We will still need 1.5M from Headquarters if the S-II schedule is to be maintained. ✓

2. Meeting With HHFA Officials: Last Monday I met with Mr. Ratchford, Regional Administrator of the Housing and Home Finance Agency from Atlanta, Mr. Collins, Regional Administrator from Fort Worth, Texas, Mr. Yerger, who is to be assigned to MTO from HHFA to coordinate our community development needs with the various government agencies, e.g., FHA, CFA, ARA, etc. Mr. Yerger will spend some weeks with us getting fully acclimated, then visit on a TDY basis for a week or so to help B. U. Jones alleviate community impact. We visited Michoud after lunch. Dr. Constan gave a presentation on Michoud Operations, adequacy of local housing, etc. I reviewed the MTO construction and operational picture for them, then they were shown around the plant. Tuesday and Wednesday, B. U. Jones took them to Slidell, Picayune, Bay St. Louis, Waveland, Pass Christian, Longbeach, and Gulfport. to meet the Mayors, other local government officials, and discuss HHFA assistance. ✓

3. GE Contractual Status: Our plant and test support amendment to the basic 410 contract appears to have cleared all channels in NASA Headquarters, and was expected to be signed by Ernie Brackett today. The facility activation amendment which we are extending for two months to get a better definition of work statement, scope, etc. is nearing consummation. GE has dropped their fee request to 9% whereas we will offer 6 1/2%. This will probably go to Bill Davis for final adjudication. John Hauth and Tom Edwards are trying to draw up a procurement plan to bring GE into a management assistance position with phases two and three of our technical systems, which will satisfy conditions imposed by Brainerd Holmes, yet not lose control by MTF Working Group personnel. We hope to finalize this by Thursday of this week. ✓

1. Optical Visibility of SA-5 in Orbit: Reference your question during SA-5 review. The stellar magnitude of SA-5 in orbit will strongly vary depending upon four parameters: (1) angle sun - vehicle - observer; (2) distance satellite - observer; (3) satellite attitude; (4) satellite albedo. For a nominal orbit (perigee 257 km, apogee 618 km) the stellar magnitude under best observation conditions will be near -3 (Venus) at perigee and 0 (α - Centauri) at apogee. The limit for visual observations is approximately +6. ✓
2. Apollo Tracking Ships: Dr. Glaser and Mr. Sennewald of Bellcomm discussed with Dr. Speer the need for Apollo tracking ships. This is in preparation of a presentation to Dr. Seamans on September 16. It is our position that two ships (NASA or DOD) are required for launch vehicle R&D and are very desirable for subsequent operational flights. We feel we must insist on continuous tracking of the entire power flight through insertion into orbit. ✓ MSC appears to be satisfied with one NASA ship for flight operations purposes but wants to limit the azimuth window to 26 degrees to secure satisfactory tracking. ✓
3. Apollo Mission Control: We received from E. Bertram, LOC, an unofficial proposal (copy enclosed as enclosure 1) for an understanding between LOC and MSFC with regard to our joint support for the IMCC during Apollo missions. He proposes that all recommendations or responses to requests from IMCC be made through LOC and not direct from MSFC to MSC. This does not appear to be an acceptable solution for the difficult operational interface problem between LOC and MSFC. A discussion between Bertram, Speer and others is scheduled on August 27 in an attempt to reach a more satisfactory solution.
4. Structures and Materials Panel of NATO Advisory Group for Aeronautical Research and Development: At the invitation of Dr. Hugh L. Dryden, National delegate to AGARD, Bill Vaughan, Chief of our Aero-Astrophysics Branch will attend the next meeting in London in early September as consultant to the American delegation on wind shear problems. ✓
5. Computer Audit: Re: your question on Notes 8/19/63 Geissler, item 4, copy attached as enclosure 2. This appears to be a routine investigation being performed throughout all NASA field centers and does not seem to be a critical issue. ✓

E.G.
I've
readied
understanding
with
Dr. Speer
on
MSFC's
position
B

DATAFAX TRANSMISSION

Log No. 557

TO : W-AERO-S, Mr. Nathan

DATE Aug 19, 1963

FROM : E. P. Bertram, LO-PE

TIME _____

SUBJECT: Concept Paper

Forwarded for your study and comments. This is unofficial, and represents LOC understanding of the manner in which we will support flight operations.

enc 1

#1

MEMORANDUM OF UNDERSTANDING

LOC-MSFC FLIGHT OPERATIONS CONCEPTS

I Purpose: It is the purpose of this document to define launch and flight operations concepts within the assigned authorities and responsibilities of the MSFC and LOC. The general policies herein agreed upon will form the basis for integrating and supporting the Launch Vehicle Portion of Flight Operations, and for assuming proportionate authority and responsibility.

E.P.

gross over simple flight to the moon in this decade is an R&D problem if there ever was one!
B

II Background: Center responsibilities by assignment are functionally divided into either operational or developmental categories. The LOC falls principally in the operational category, and the MSFC principally into the development category. During the design phase, the operations organizations provide support by feedback of operating requirements through the working groups or the Apollo-Saturn panel structure, and during the flight phase the development centers provide consultant support as required by the operations centers.

III Functions: Based on the above categorical concepts, the following functions applying to launch and flight operations are established:

A. MSFC Functions:

1. Through the Assistant Director for Launch Vehicle Operations, (LO-V), MSFC will assure the flight readiness of systems, components, and vehicle-peculiar GSE.
2. Through LO-V, MSFC conducts tests and supports the countdown schedule.
3. For manned flights, MSFC will provide specialized systems engineering personnel for assignment to INCC and remote network stations in support of in-flight monitor requirements.
4. Through LO-V, the various MSFC Divisions will provide engineering and consultant services on a "call" basis during the prelaunch checkout period.
5. For manned flights, MSFC will develop and provide flight simulator and simulation programs for use by the INCC.
6. By direct communication link and through use of a Huntsville Operations Support Facility, MSFC will provide LOC with continuously available engineering consultant support for solution of extraordinary problems from beginning of the launch countdown until final separation of the spacecraft.

7. MSFC will render to LOC a timely recommendation on S-IVB and IU status from liftoff to spacecraft separation.

B. LOC Functions:

1. LOC will plan, coordinate, acquire and route all flight instrumentation and resultant data at the AIR and MILA.

2. LOC will supervise preflight preparation of the integrated space vehicle including all launch supporting instrumentation at AIR and MILA.

3. LOC will manage and supervise the countdown and launch during which period it will be responsive to the assigned Mission Director.

4. LOC will monitor flight from liftoff to spacecraft separation and provide launch vehicle stage status indication. For manned flights, LOC will provide status information to MDC and MSFC.

5. LOC will provide engineering and consultant service responsive to the assigned mission and/or flight Director, from beginning of the countdown until separation of the spacecraft.

6. LOC will provide real-time launch site flight data to other operations Centers as previously agreed upon.

7. LOC will provide launch simulation support as required.

IV Implementation: In order to carry out the defined functions and responsibilities, the following implementation will be the responsibility of the designated center.

A. MSFC:

1. Will develop coordinated concepts and MSFC Operations Support facilities based on launch vehicle design and LOC operations requirements.

2. Will analyze and define real-time data requirements at the MSFC Flight Operations Support Facility necessary for active consultant support to LOC during countdown and flight.

3. Will fund for interface conditioning and switching equipment at the MSFC operations facility, and will also fund one-half the cost of the LOC to MSFC communications link.

4. As co-chairman of Mission Control Operations Panel will assure that agreed upon LOC/MSFC concepts and procedures are promulgated for manned flight.

5. For manned flight, will negotiate a communication link between NSFC and IACC as required to support flight operations.

D. LOC:

1. Will provide data required by the NSFC Operation Support Facility which are necessary for performance of engineering services until separation of the spacecraft.

2. Will fund for interface conditioning equipment at the launch site and for one-half the communications link between NSFC and LOC.

3. Will develop, equip and staff a flight operations support facility at the launch site.

4. Will define data and display requirements necessary to support launch vehicle flight operation at the launch site.

Wernher von Braun

Kurt H. Debus

1. S-I-6 POST-STATIC CHECKOUT: Final electrical checkout of the S-I-6 is continuing in checkout station B of Building 4708. ✓
2. S-IU-6 FINAL CHECKOUT: Alignment and status checks on the SA-6 Instrument Unit were completed. Electrical checkout has been delayed pending completion of installation of Engineering orders in the distributors modifying the bus distribution system. ✓
3. S-I-7 PRE-STATIC CHECKOUT: The S-I-7 Stage is located in the pressure cell in Building 4705 where cleanup pressure and functional tests are in process. Modified anti-slosh baffles have been installed in the propellant containers. ✓
4. MICHOUD S-I CHECKOUT COMPLEX: All of the Packard Bell automatic checkout equipment for the first S-I complex at Michoud has been delivered and accepted by the Chrysler Corporation Space Division. ✓
5. S-IV B TRACEABILITY DISPUTE: Discussions have been held with representatives of Procurements and Contracts Office concerning the Douglas Aircraft Company Scope Change, S-IVB-1051 for traceability. The MSFC Contracting Officer made a final determination in July that the traceability requirements of NPC 200-2 are within the scope of the present NAS7-101 contract. Douglas has appealed this decision, under the disputes clause of the contract, to the appeal board at NASA Headquarters. ✓
6. OPERATING TIME RECORD: MSFC 4-3, "Vehicle Operating Time Record," a procedure for recording operating time on critical components installed on a vehicle, has been published and distributed. With the introduction of this procedure, which closes loopholes in a voluntarily followed practice, the operating time records will be more accurate. ✓

NOTES 8-26-63 GRUENE

B 8/28

1. Labor Relations: As mentioned last week we had some problems with the labor union on modification work on Complex 34. Mr. Styles obviously reached an agreement with the union, but we have to take a very close look to determine if we can live with his proposal. ✓

2. SA-5 Schedule: We were not able to reach a complete agreement on a firing schedule with DAC because the total amount of modification to be left for AMR will not be known before August 28, 1963. Our present estimate calls for a possible firing between December 6 and 13. ✓

3. Reference NOTES 8-19-63 GRUENE (copy attached). Sketch is furnished as requested. ✓

NOTES 8/26/63 HAEUSSERMANN

1. STUDY ON THERMAL-VACUUM TEST OF FORWARD S-IVB/IU COMBINATION:

We have written our study criteria and will get together with M-P&VE, M-QUAL, M-ME, and M-SAT to incorporate their requirements so that the task can officially be forwarded to DAC. ✓

2. SPACE FLIGHT SIMULATION FACILITY: H. Hoelzer is looking into the legal aspects of obtaining GE personnel on his GE contract for support of the space flight simulation facility and its development. However, he still needs yours or Dr. Rees' "green light" to obtain .5 more contractor spaces above the present contractor voucher strength. ✓

3. PERSONNEL QUALITY STEP INCREASES: Executive Order 11073 dated 1/2/63 provided for the establishment of a program to supplement the more restrictive promotion policy which accompanied the pay increase action of 10/62. Specifically, the Quality Increase Program is to increase or motivate interest of class act employees and to make salaries more compatible with job assignments. The Civil Service Commission accomplished its part in the implementation by 2/13/63; NASA Headquarters accomplished its part by 4/9/63; and MSFC is still working on its part. Finalization of the Center's implementation procedure is badly needed in order to give monetary recognition to deserving personnel for whom promotions cannot be obtained. ✓

1. MTF WORKING GROUP:

A 30% drawing review of the S-11 vehicle service building and a 60% drawing review of the S-1C booster storage building were completed at Sverdrup & Parcel (S&P).

Contract NAS8-3444 with S&P was extended from 8/22/63, to 1/31/64, to continue MTF PERT activity and studies for future vehicles at MTF.

The number of GE technical personnel assisting the Working Group has been increased to 18. ✓

B8/20

NOTES 8-26-63 HOELZER

1. COMPUTER AUDIT: Reference is made to Geissler's NOTES 8-19-63, Item #4 (copy attached). This was Mr. John Smith from the General Accounting Office, not from NASA Headquarters. Mr. Smith informs us that the scientific usage of computers is not a major issue as far as the need of the computer output is concerned. This was just a small part of the overall audit that Computation Division has been undergoing for the past 5 or 6 months. This audit is nearing its conclusion and we should have the exit conference sometime in September. ✓

1 Enclosure - NOTES 8-19-63 GEISSLER

B_{8/28}

1. APOLLO LOGISTICS SUPPORT SYSTEM (ALSS): The preliminary test program plan for the Apollo Logistics Support System was hand-carried to Headquarters on Monday, August 19. In addition, our comments on and design requirements for the Environmental Test Chamber were furnished Headquarters. Plans have been made for a discussion between Maj. Evans and representatives of his office, and Special Assignments Office and MSFC Division representatives for Tuesday, August 27, at MSFC. The meeting is intended to discuss the details of the test program and facility criteria presented to Headquarters and the differences in the facility criteria being recommended by Headquarters and MSFC.

Mr. Francis Evans and several other members of the Payload group visited MSC on Tuesday to discuss various aspects of the Apollo program. During this trip it was learned that the height volume of the LEM had been reduced by approximately 2 ft. This will cause moderate revisions to our payload concepts.

Plans are being made for a presentation by representatives from Ames Research Center on their Center's activities and capabilities on September 17 and 18.

2. SATURN 1B/CENTAUR/VOYAGER STUDY: A schedule of significant events during the final phases of this study are as follows:

- a. Centaur Study Presentation to Dr. von Braun - September 27.
- b. Submission of final presentation material for NASA Headquarters to Dr. von Braun's office - September 30.
- c. Centaur Study Presentation to OSS - October 4.

B 8/28

1. FUTURE OF THE SATURN FAMILY

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

HHK
You're an optimist, but then, so am I!
B

a. Advanced launch vehicle studies in the SATURN class area have clearly established that there will be no new launch vehicle superior to SATURN IB or V before 1975 or possibly 1977. Even beyond that date, there will be a need for the "old reliable SATURN's." Thus a 10-year operational lifetime, and production numbers of at least 50 for SATURN IB and 100 for SATURN V, seem virtually to be assured. ✓

b. We have an in-house study in progress on the use of both SATURN vehicles for space station transport and logistics support. Our next review date is September 3, after which we should be ready for a summary report to you. ✓

c. We will receive \$400,000 in a few months to study the growth potential of the SATURN V, which is primarily in the area of propulsion system redesign and integration into the vehicle. ✓

d. We have a study going with Boeing (in the second year) which is concerned with an attachable wing to the S-IC stage to make the first stage recoverable and reusable. This approach looks promising from the technical viewpoint. ✓✓

e. We are in the process of starting an in-house study on the use of SATURN V's for selected early manned planetary flybys. ✓

f. We have a study of early manned planetary flights (based on SATURN capabilities) going with Lockheed in the second year. ✓

g. We have completed a work statement and expect to receive funds for a study on a cryogenic tanker vehicle for SATURN V and later possibly up to NOVA sizes. ✓

h. We have the Lunar Logistics Study (Direct Flight Pair) with STL, supervised by the Aeroballistics Division, for lunar base support. ✓

i. We have a RIFT application study, out of Col. Fellows office, for a nuclear SATURN V Lunar Logistics Vehicle. ✓

j. We have a major in-house study on the Tripple M, in support of both SATURN vehicles, to give them a wider mission applicability. ✓

k. We have asked for FY 1964 funds to study an electrical lunar cargo vehicle, based on SATURN V. ✓

HHK (with a NERVA-type boost out of earth orbit?)
l. We have asked for FY 1964 funds to study an electrical planetary ferry vehicle (along the lines of the GE proposal), compatible with SATURN V capabilities. B

(Several other studies on this subject will be discussed later.)

B 8/28

NOTES 8-26-63 KUERS

1. Saturn V, S-II Stage: Last week I spent three days at the West Coast to review the progress of the S-II Stage and to participate in the Quarterly Manufacturing Engineering Review Working Group Meeting for the S-IVB. The following are some highlights of my observations:

a. Explosive forming of all gore segments (thin and thick) for the common as well as the other bulkheads is well under way with good quality results. We considered to slow down this operation after complete sets for 3 vehicles have been produced, NAA is presently working in 3 shifts on this operation. ✓

b. The first results of the Al. mandrel sub-scale tests (54") are very promising. However, some modifications of the mandrel are necessary to prevent chilling of the preheated dome before the dome is firmly seated on the tool. ✓✓

c. Welding progress of the thin to thick gore segments is very good. Test welds on the Meridian Welder are not yet so successful. NAA is presently modifying these fixtures by adding vacuum chucks--as we have--for better control of the whole contour. By their present rigid clamping method they control only the edges which might result in more pronounced Mae West effects from shrinkage which they can less afford than we can because of the close contour tolerances required for bonding. ✓

d. A problem exists presently on selecting the best forming method for the LH₂ skin panels. NAA is trying to accomplish this operation by press brake forming with T-6 material. All sub-scale test show cracks at the ribs, We recommend strongly the age forming method with which we have had very good results with in the S-IC program. Los Angeles Tool Engineering agrees fully with us. S&ID management does not want to change the method because they have already the material for 7 vehicles on hand in the T-6 condition. I brought this item to the attention of Mr. Parker. We will arrive at a final decision in two weeks from now after sub-scale tests at NAA of our proposed method have been conducted. ✓

e. The bulkhead assembly shop at Seal Beach is too marginal in size. NAA needs urgently more floor space for these operations. ✓

2. Saturn IB, S-IVB Stage: The Manufacturing Working Group Meeting was attended by NAA and Lockheed personnel. There are no major problems in tooling and manufacturing of this stage since the proven concept and methods of the S-IV are being used with a few exceptions. DAC is very interested in our Electron Beam Welding development. They would like to apply this method as a product improvement method for their T-Ring welding which is very similar in shape but much smaller than our Y-Ring. We agreed further to establish a committee for weld wire improvement jointly with DAC, NAA, Lockheed, and ME. The presently available quality is definitely not good enough to accomplish perfect welds. The Huntington Beach facilities are in good shape except the vertical assembly tower which is approximately two months behind schedule. DAC has established a close follow-up with their constructing company. ✓

WK
How you
are
calling
me,
What do
you
suggest?
You was
lets
pouchy
this
Seal
Beach
situation
is!
B

I know
B

B_{8/28}

- * 1. SATURN I/IB: The S-I-5 Stage, IU-5 and the SA-5 payload arrived at AMR on 8-21-63. ✓
S-IV - All Systems Vehicle - A successful propellant loading test was conducted 8-21-63. Build up of ASV for hot firings will proceed and is expected to be complete approximately mid-November. ✓

O.L.
 o.k. I
 had over-
 looked the
 fact that
 this is for
 SIC (T)
 only! B

- 2. SATURN V: S-IC-T - Re Notes 8-19-63 LANGE - (Attachment 1)
 → The S-IC-T Task Force Group was initiated by M-SAT in response to a direct request from Dr. Rees. This group is specifically charged with the responsibility for identifying and assuring implementation of S-IC-T oriented problems in order to minimize schedule slippages on this essential research vehicle. The Task Force will not duplicate the efforts of the working groups, but will endeavor to refer critical, technical problems to appropriate working groups for resolution and will monitor the problem until it is solved. The next meeting is scheduled for 8-27 at MSFC. ✓

- * S-II - Contractual authorization was given to replace many checkout GSE end items with NASA approved designs. ✓
 Control drawing approval is a problem. Coordination between divisions and working groups does not always happen, resulting in multiple approvals and disapprovals being given to S&ID at different times on the same drawings. The Ad Hoc Committee for Engineering Documentation Policy is looking into it. ✓

- * The maintenance of the battleship schedule remains a prime problem area. Pittsburg Des Moines, a subcontractor for tank fabrication, continues to be late -- they have considerably overrun a fixed priced contract and have lost incentive to hurry completion. ✓

- S-IVB - S-IVB Quarterly Review is scheduled for 9-12-63 at MSFC. ✓
 Hydrostatic test and calibration of the hydrogen tank of the battleship stage have been completed. Leak checks are being made. Tank insulation is to start in the near future. ✓

In view of development difficulties with the 150-pound attitude control motors (TAPCO), M-P&C has been requested to authorize DAC to initiate a back-up development program aimed at the ullage motor requirements for S-IVB / SATURN V. ✓

- 3. APOLLO: Flight Mechanics Panel discussed at Houston flight missions for IB. MSC will have proposal ready in 2 weeks. They visualize not more than 3 manned flights on SATURN I. ✓

- * Documentation - Repository procedures signed by Mr. Piland and Dr. Lange are at LOC for signature. List of existing interface documentation is now available. ✓

- Awareness program has started. ✓
Astronaut Borman has been assigned to Saturn Launch vehicles. ✓

O.L.

I thought
this was
a function
of the
working
groups.
Let's
not
pile
committee
on
committee
Request
details
B

O.K. B

S-IC-T A Task Force Group of representatives from Boeing and concerned MSFC Divisions has been formed under the chairmanship of M-SAT (Mr. Delionback) to expedite the vehicle instrumentation configuration, the electrical system configuration, etc. Next meeting is scheduled for 8-20-63 at MSFC.

Attachment 1

B 8/28

NOTES 8-26-63 MAUS

- 1. PLANNING NETWORK FOR APOLLO PROGRAM - OMSF (Bill Lilly's office) has initiated the construction of a top level planning network for the Apollo program. This should be valuable in confirming the Level 1 schedules. I have appointed Tom Smith in charge of MSFC's participation in this effort. ✓

We expect representatives of OMSF to be here late this week to give guidelines and review the information that we have available. Target date for completion is October 1. ✓

- 2. OMSF SCHEDULING PROCEDURE - The Standing Committee for OMSF Scheduling System met on August 20 - 21 in OMSF. Center's comments were discussed and agreement was reached on most of the items except our request for quarterly submissions. OMSF plans to publish the revised procedure by September 1 for use with subsequent schedule submission. The revised procedure does not change materially from the present procedure. ✓

Too bad B

- 3. VALIDATION EXERCISE AND OVERALL MSFC MANAGEMENT SYSTEMS REVIEW - Reference NOTES 8-5-63, copy attached. You requested our impression of the outcome of the Validation Exercise. At this time I will comment only on the Cadle group. The result of Cadle's exercise will be a four part report listing (I) Background (II) The Basic Problems uncovered by the survey in Project Management (III) Recommended change in the systems for handling new projects (IV) Recommended improvements in the system for on-going projects. There are several major recommendations that appear to be taking shape on new projects:

- 1. Spend more time and money definitizing projects before letting major contracts. *Agree*
- 2. Develop systems that tie together in a better way precontract planning and contract execution. *Agree*
- 3. Select contracts more on a technical basis and far less on cost estimates to eliminate "leaning out of the window." *Agree, maybe*
- 4. Recognize the necessity of a contingency in early estimates. *Agree*

2 - please contracts!

When the reports are finished we will prepare a summary for you.

Sounds good B

B 8/28

NOTES 8-26-63 MRAZEK

1. MECHANICAL INTEGRATION PANEL MEETING: (Reference NOTES 8-19-63 MRAZEK, copy attached.) Attachment #2 shows action items from this meeting.

2. KIWI B-4B COLD FLOW: The cold-flow series for KIWI B-4b was completed on 8-21-63. All test objectives were met--no vibrations were found instrumentally. Camera data has not yet been reduced. B-4b reactor incorporated the Los Alamos "fix" for the vibrations encountered in previous B-4 tests and included improved radial support and hot-end gas seal. It should be noted that the last two reactor cold-flow tests have shown no vibration. ✓

3. F-1 ENGINE: The 13th F-1 Technical Assessment Team Meeting was held at Rocketdyne on 8-14/15-63 with participation by NASA Headquarters, Air Force, MSFC, Lewis Research Center, and Rocketdyne personnel. The major decisions were that (a) increased hardware will be released to meet development milestones and reliability goals, ✓ and (b) a two-phase PFRT was recommended to provide a later flight rating test series on the Block II flight configuration engines. ✓ A decision was made outside the assessment team, including only NASA personnel of the Office of Manned Space Flight and MSFC, to go to a baffled injector for PFRT and first engine deliveries. This was agreed to by Rocketdyne's management and technical personnel. ✓

Construction on Stand 2A-1 has been completed and three tests were conducted to check out the facilities. Two ignition tests and one two-second checkout test with injector 079 and a solid wall chamber indicates there are no discrepancies in facilities or hardware. ✓

4. HANDLING INCIDENTS DAMAGED TWO H-1 ENGINES: Engine H-2019 for SA-8 was damaged at Michoud when the installation fixture failed and allowed the engine to hit the vehicle. Engine H-5024 for SA-9 was damaged when it rolled from a transporter at MSFC. ✓

W.M.

Has that
could happen?
B

5. SATURN IB: (Reference NOTES 8-19-63 MRAZEK, paragraph 7.) The Flight Mechanics, Dynamics, and Control Coordination Panel apparently agreed this week on the three-hour coast requirement with its associated payload reduction. If MSFC requires the four and one-half hours, we have to make up the difference in performance. The attitude control system is being designed for four and one-half hours. ✓ Details of the agreement will be shown in the minutes of the panel meeting. ✓

6. INSTANT NOVA: The use of a cluster of Saturn V stages for a Nova-class vehicle has been briefly studied. The vehicle considered would be a cluster of S-IC and S-II stages for a two-stage-to-orbit vehicle. This vehicle could be available earlier and with lower development costs than other configurations being studied. ✓ The arbitrary objective of the Nova-class vehicle is to deliver about 4.5×10^6 newtons (1,000,000 pounds) to a low-earth orbit. While the Instant Nova would only deliver about 3×10^6 newtons (660,000 pounds), it could probably be very competitive with other configurations in the Nova class. ✓ Very interesting.

W.M.
Has many S-IC's per cluster?
B

7. SATURN V JUNIOR: A brief investigation has been made of a two-stage-to-orbit vehicle which would utilize a modified (three-engine) S-IC stage for the first stage and an S-IVB/V second stage. The low-earth orbital payload capability of this configuration is about 44,500 newtons (100,000 pounds). Two minor problems are (a) the outboard F-1 engines are required to burn for approximately 190 seconds; (b) the inboard engine must cut off after 160 seconds of burning to reduce the axial load factor. ✓ Very interesting

Attachment #1: NOTES 8-19-63 MRAZEK
Attachment #2: Memo No. M-P&VE-VK-107-63

They are not
dropped like in Atlas,
are they? B

B 8/28

NOTES 8/26/63 RUDOLPH

No Notes

B 8/28

NOTES 8-26-63-SHEPHERD

Meeting with Long, Freitag and Hayes: On August 21, Bob Long, Bob Freitag, Rod Diaz and General Hayes visited Huntsville to be briefed on and discuss the management of the construction phase of the Mississippi Test Facility (MTF). The primary briefing was given by members of the MTF Working Group. Mr. Long's concern with Mississippi stems from the fact that he feels Marshall is not phasing people into the MTF early enough to monitor the construction being accomplished by the Corps of Engineers. Presently, there are active construction contracts for \$11.8 million at Mississippi with an additional \$22 million to be awarded by November 1, for a total of \$33.9. Present plans include the assignment of two General Electric personnel to assist the one member of the MTF Working Group now located at the site. Mr. Long and General Hayes seem to feel that we should increase the staff at MTF to cope with the problems that will arise during the construction phase. I feel it is imperative that we immediately develop a plan for phasing additional people into the work at Mississippi. This item will be included on the agenda for the next MTF Planning Board Meeting scheduled for August 29.

JS Let me know what transpires B

The group also was given a briefing on the management of our West Coast facilities projects and how facilities management is patterned after and integrated into the management of the R&D programs. Mr. Long appeared to be satisfied with the arrangement that we have, however, I feel that we should strengthen some areas, notably at Santa Susana.

Lunar Construction: Ralph Ulmer called on August 23 and asked whether or not this Center had any contracts pertaining to construction on the moon. Mr. Ulmer was told that we do not have any such contracts. This information is apparently needed for Mr. Webb.

→ No CoFF advanced design funds available! B

NOTES 8-26-63 Stuhlinger

B 8/28

1. METEOROID MEASUREMENT PROJECT: The radiation damage to the meteoroid penetration sensors inside the Van Allen Belt region appears to be tougher than previously believed. Experimental work is presently underway at Langley Research Center, at the Admiral Corp. in Chicago, and at the Chance Vought Company in Dallas, to provide data for our own theoretical analysis. If it is agreeable to you, we would like to give you a briefing on the situation around September 5. ACTION REQUIRED ✓

Yes,
please
B

2. PRESENTATION ON RPL BUILDING: Members of FE and RPL gave a two-hour presentation on the RPL building to OMSF and OART on August 21. Stan Smolensky chaired the meeting. We met with very positive support from both Program Offices; our chances to obtain the desired FY 65 funding were termed "very good." ✓

3. OSS BRIEFING IN HOUSTON: Several members of RPL and I attended a briefing given in Houston by the Office of Space Sciences to MSC. Mr. F. Evans and Mr. Bob Jones from Special Assignments Office also attended the meeting. The purpose of this briefing was to discuss OSS-sponsored supporting research and technology effort which might have a bearing on the manned space flight effort. The presentations were very informative, and were presented in a very condensed form. The presentation on scientific instrumentation developments was of particular interest to RPL, in connection with our present work in defining scientific objectives and instrumentation for the Apollo Lunar Support System. ✓

4. OFF-THE-JOB TRAINING: From September 1962 to June 1963, Mr. R. N. Seitz of our Nuclear and Plasma Physics Branch attended Case Institute of Technology to work further on his doctorate degree in physics. Dr. Winterberg of Case has informed us that Mr. Seitz made the highest grade on his qualifying examination out of a group of eighteen candidates.

Mr. George Bucher will leave RPL for a number of months to work on his doctorate degree in research management at Oklahoma State University. ✓