



12 / 4 / 1961

RECEIVED  
GENERAL INVESTIGATION  
DIVISION  
DEPARTMENT OF JUSTICE  
WASHINGTON, D. C.

NOTES 12/4/61 CONSTAN

B12-5

PERSONNEL

Mr. William Bailey will transfer from AOMC on 12/17/61 as the Finance and Fiscal Officer. ✓

Mr. James Finlaw will transfer from ABMA to the Facilities and Equipment Office. ✓

Mr. Reginal Nolley, Central Contract Management Region USAF Dayton, Ohio will transfer to the Contract Administration Office. ✓

RENOVATION AT MICHLOUD

Office Building: Roof-95% complete: Painting - East wing both floors almost complete: Floor - tile is being replaced: Electrical - East wing complete. ✓

Manufacturing Building: Check-out of Electrical Sub-Station 65% complete. ✓

HOUSEKEEPING CONTRACT

The Evaluation Committee completed the evaluation of the proposals and Mr. Gorman and Mr. Nester presented the findings to the Administrator on 11/30/61. ✓

Harry G.

Request building B

SEAMANS VISIT TO NEW ORLEANS

Dr. Seamans will visit the Michoud Facility on 12/11/61. Constan will meet Seamans in New Orleans and accompany him through the facility. ✓

VISIT TO THE PROPOSED TEST AREA

A tour of the proposed test area on 12/7/61 is planned by Newby, Constan, Huth, Wible, Kent, Aden and Bain. ✓

TRANSFER OF PROPERTIES

It is planned to effect the transfer of real and personal property to NASA o/a 1/1/62. A team from MSFC will visit the Michoud facility next week to inventory the properties to be transferred. ✓

MEETING WITH CONGRESSMAN F. EDWARD HEBERT

Messrs. Abernethy and Martin, Michoud Operations attended a meeting between Congressman Hebert, representative of the city of New Orleans and private concerns on 11/30/61. The city and private concerns were making a "pitch" to Congressman Hebert for federal funds to build bridges and tunnels across or under the Industrial Canal. ✓

George If that's the plan,  
Can't we get those obstacles  
(bridge, high-tension line)  
out of the Michoud  
runway approaches? B

NO NOTES RECEIVED FROM Dr. Debus

4-4-61

divided the...  
12-6-61 / ch...  
000116

Suggest Mr. Ballance  
touch with Jim Carter who has  
MSFC will be profully  
quite rightfully - pointed out that  
this area unless we act immediately. Please keep me posted on  
actions taken.

B 12-5

NOTES - 12-4-61 - GEISSLER

fe  
d  
in  
letter to the Div Directors urging better support

1. SPACE ENVIRONMENTAL SIMULATION WORKING GROUP: Mr. James Ballance, M-AERO-E, recently appointed MSFC member of the NASA Ad Hoc Working Group on Space Environmental Simulation, attended the first meeting of the group at NASA Hqs in early November. This working group is one of several within NASA concerned with advanced spacecraft technology. Its purpose is to consider all NASA requirements for research and development in methods to simulate the space environment in ground test facilities. The members of the group are to be the means thru which each NASA Center presents their areas of requirement to NASA Headquarters. The MSFC members will need considerable support from the Offices and Divisions to obtain the input information required by the working group. ✓

2. REPLY TO ABE SILVERSTEIN: In accordance with your suggestion, we have prepared a letter of appreciation for your signature, to Abe Silverstein for Lewis efforts in the base heating studies. It will be in your office for review by December 5, 1961. (Omit this type info: Jan) ✓

3. OPERATIONAL FLIGHT CONTROL: The contract for "Saturn Operational Flight Control" is being negotiated by P&C office. Most likely, RCA will be awarded the contract. ✓

4. SA-1 FLIGHT EVALUATION REPORT: The completion of the SA-1 Flight Evaluation Report is expected for next week. All division contributions have been received and are being combined and edited. ✓

5. S-IV STAGE HYDROGEN VENTING: On November 16, a visiting group from The Langley and Lewis Research Centers met with Aeroballistic personnel to discuss problems related to the venting of Hydrogen from the S-IV stage. The objectives were to inform Langley and Lewis of our problems and formulate experimental programs. Significant conclusions were:

- a. Langley will extend their Centaur venting program to include parameters suggested by Marshall. ✓
- b. Marshall and Lewis will work together on research to develop better instrumentation for gas concentration studies (includes base heating as well). ✓
- c. Marshall will conduct general venting studies in the Aeroballistics facilities. ✓

6. SHROUD FOR APOLLO CAPSULE-TOWER: ~~(Aeroballistics Division recommends that an aerodynamic shroud be designed at MSFC for the Apollo capsule-tower. In normal flight, the shroud would be carried away with the escape rocket a few seconds after second stage ignition. This shroud would be developed as an option to the basic exposed capsule. A short summary of this problem area is attached. Please note that Mr. Gilruth's statement about absence of low frequency noise is not supported by present Langley study results.~~

Ernest Geissler  
I'm all for the shroud,  
but let us discuss  
our strategy. B

Attachment: (1) Weekly Notes 11-20-61  
(2) Saturn-Apollo Compatibility

NOTES - GORMAN - 12-4-61

B 12-5

Subject

1. ^ The RIFT procurement plan was signed by Dr. Seamans and a contractor briefing set for December 7 at Huntsville. Proposals will be requested on the basis of the work being performed at Michoud. ✓
2. ^ Headquarters requested that Northrop Aircraft be numerically evaluated for the "housekeeping" contract at Michoud, prior to the final selection by Mr. Webb. This was done - TWX to Webb went out this morning. Mason-Rust is Webb's choice for negotiation -- a good one. ✓
3. ^ Status of the strike of janitorial workers: A strike probably will not occur before Christmas. An emergency plan using civil service personnel has been readied in case the contractor cannot perform. ✓
4. ^ Discussed with Seamans the need for Headquarters guidance on community support program for Mississippi, New Orleans, and Florida. Seamans directed Siepert to get started on this. We will establish a small office similar to the Industrial Relations Office at MSFC to make recommendations and carry out any guidance received from Washington. ✓
5. ^ Eberhard Rees and I have agreed on "ground rules" to be used as a basis for contract negotiations with Chrysler and as a basis for planning Chrysler activities under the new S-I contract, including phasing of the work from MSFC to Michoud. ✓

Harry G.

→ Please coordinate this with  
 Bart Slattery who has a major  
 PIO problem with the many  
 Michoud contractors. B

B12-5

## NOTES 12-4-61 GRAU

1. COMPLEX 39 HARDWARE: Representatives of the Division attended meetings with LOD personnel relative to contractors for Complex 39 hardware. The contractors involved will be contacted for the establishment of ground rules which allow participation of the Government Inspection Agency as well as the Quality Assurance Division. ✓
2. SOLID PROPELLANT GAS GENERATOR PARTS: Evaluation of Solid Propellant Gas Generator metal parts is continuing. This action was initiated after an explosion of a solid propellant gas generator at Rocketdyne. Approximately 150 cases will be inspected. To date 65 have been inspected and 6 rejected for wall thickness below specified minimum. ✓
3. H-1 ENGINE: A completely revised H-1 engine procedure for receiving inspection and functional analysis was finalized. It will be requested that this procedure be incorporated as part of the new contract. ✓
4. NAA S-II CONTRACT INSPECTION SERVICE: WOO was instructed through Dr. Lange to request inspection services on the S-II contract from the Los Angeles Ordnance District. In discussions, LAOD has assured us that it will comply in all respects with NASA Quality Assurance Policies and with our Quality Engineering Bulletin Nr. 1. (which, by the way, will become an official NASA wide document by December 15, 1961)
5. CENTAUR CONTRACT MANAGEMENT: Eventually, agreement was reached with P&C and Mr. Huth that the NASA Quality Assurance Policies and requirements thereof as amplified in the Quality Engineering Bulletin Nr. 2 (which also will become an official NASA wide document by December 15, 1961) will be included in the contract when MSEC takes over the contract. Impact on the contractor as well as the Government Inspection Agency at the contractor's plant (Air Force) will be investigated immediately. Additional effort (compared to the past effort) from both the contractor and the Air Force will be required. I hope that the necessary negotiations for this increased effort will be successful. ✓
6. RIFT: Personnel of this Division participate in review of the RIFT program contract proposals. ✓

→ Dr Lange

I thought you were opposed to  
this plan! B

Relayed this info.  
to Dr Lange's office  
at 0945 hrs, Dec 6, 1961/ekm

BR-5

1. MEETING ON NOV. 29 & 30 WITH MSC AND MIT REPRESENTATIVES: Mr. R. Chilton (plus 1 MSC member), Mr. M. Trageser (and others from Dr. Draper's Instrumentation Laboratory) and this division gave mutual presentations on concepts, systems, and hardware for the Spacecraft and Launch Vehicle guidance and control system and our automatic checkout development. Round-table discussions followed on all pertinent subjects. We agreed to work in the future closer together "on the working level;" my impression is that the postponement of this meeting was more due to the desire to get prepared for an exchange of ideas than to avoid our inputs. It seems that we are further advanced in general and MIT is very willing to accept our concepts on interfaces, checkout methods and system integration. We agreed (over Mr. Chilton, full-heartedly) to develop the ST-124 system as a backup system to the MIT system; for both, we will try to include all requirements for the total flight.

MSC considers the propulsion unit, which we call R2 vehicle in orbital operations, their responsibility. MSC plans to have a contract for this soon. This is different from our concept in which we considered the R2, MSFC's responsibility. *Walter H. Who is Mr Chilton? This is still "cooking"! B* *is he for or against? B*

Fine

2. RECENT DISCUSSION ON POSSIBLE CONTRACT TO STL: To use STL for the ground support equipment and automatic checkout system development has been discussed with personnel of the Navigation Branch; it revealed that we cannot justify sole source to STL. RCA has a considerably better background and a proven capability from the Atlas system. ✓

3. CERAMIC GAS BEARING FOR THE SPIN AXIS OF THE GYRO MOTOR: To increase the lifetime of the bearings of the gyro spin axis (for ball bearings with 10..20g preload about 2000 to 1000 hrs.), Minneapolis-Honeywell has developed for the ST-124 type gyro a self-lubricating gas spin bearing built of ceramic material. The first prototype has been delivered and works functionally very well. The gyro will be completed in-house and tested for accuracy. This development is very promising for precision gyros in long duration space applications before more futuristic concepts as the cryogenic gyro will be applicable. ✓

4. TEST OF POWER SUPPLY FOR ARC-JET ENGINE: A 1 KW constant-current power supply has been tested successfully with a Plasmadyne arc-jet engine; it provides through magnetic amplifier control a wide voltage range (140 V at no-load, about 90 V at operational load). Adaptation to an AC power source is easily possible. Transfer of the power system's further development to the Electric Propulsion Project of Lewis Research Center is in progress. ✓

5. FLOTATION BEARING SUPPORT FOR SATURN DYNAMIC TEST VEHICLE: A meeting has been arranged with representatives of P&VE, AERO and TEST Divisions on December 4. ✓

~~NOTE: NO FURTHER DISTRIBUTION~~

1. PEARL RIVER TEST AREA:

a. Personnel of Test Division and OTS will represent MSFC in discussions on Interstate Highway Access and clearance at the Pearl River Test Area with the Bureau of Public Roads in Washington, D. C., Tuesday, 12/5/61. ✓

b. Interviews with prospective A-E prime contractors for Pearl River Test Area will be conducted Wednesday and Thursday, Dec 13 & 14. ✓

2. SAT-20:

The 20th static firing of SA-T was performed on 11/30/61. Cutoff was executed at approximately 95 seconds by the fire detection system and the N<sub>2</sub> purge extinguished the fire preventing any appreciable damage. The cause of the fire was several LOX, fuel, and hot gas leaks. Intended duration was 107 seconds. ✓

3. DYNAMIC TEST STAND:

a. Testing on SA-D will continue for 2 or 3 more months, as requested by ASTR and P&VE divisions. ✓

b. A meeting will be held in Test Division Conference Room today on the proposed water bearing suspension system for dynamic testing. ✓

4. LIQUID HYDROGEN TEST FACILITY:

The diffuser system at the hydrogen facility will be completed and two P&W cold flow engines are due to arrive from Convair this week. ✓

5. DR. RICHARDS:

Mr. E. J. Richards from the University of Southampton, England visited Test Division Nov. 13 & 14 to speak on acoustic and noise suppression problems. In his discussion on noise suppression, Mr. Richards made several suggestions to noise suppression program now being conducted in Test Division with model engines. ✓

B12-5

## NOTES 12-4-61 HOELZER

1. PROCUREMENT PROCEDURE: Receipt of the Bureau of the Budget Circular No. A-54 and the accompanying letter from Mr. Siepert makes it imperative that we revive our efforts to establish a local procedure on procurement of ADP equipment. In attempting to establish such a procedure several months ago we encountered difficulty in staffing it through some of the divisions and nothing conclusive was ever arrived at, so as it stands today anyone has the right to procure ADP equipment at their discretion. We will get together again with Operations Analysis and attempt to get an official procedure established. *Good, keep me posted! B* ✓
2. COMPUTER SYSTEM FOR STRUCTURAL TESTING OF BOOSTERS: The various company proposals for this computer system were evaluated in conjunction with our procurement and contracts people and it was decided that a GE 225 computer system was the most feasible economic system. An order has been placed for this system. It will replace the obsolete Datatron system now used in P&VE Div. ✓
3. COMPUTATION DIVISION DATATRON 205 REPLACEMENT: The obsolete Datatron 205 formerly used by Data Reduction Branch has been discontinued and the rental money will be used for smaller, more modern computers. ✓
4. STATUS OF THE VEHICLE: On Wednesday, November 29, we made a preliminary presentation to Mr. Neubert, Dr. McCall, Mr. Slayden, and others on a proposal to study Center-wide information flow concerning the status of the vehicle. The object of the meeting was to determine if they thought such a study was feasible and should be pursued. Their recommendation was that the presentation be formalized and presented at the staff meeting on December 15. This we plan to do. ✓
5. ASTRONICS FLIGHT SIMULATOR PROJECT: We are working with the people from Astrionics Division on the combined effort in modifying our flight simulation facility. We have determined that it can be done but not in the most elegant manner. We are still pursuing in detail their requirements and various ways of modifying our facility in order to determine the most economical approach. We expect to have the details pretty well worked out by Dec. 13, on which date we will give you a combined presentation. Please ask Mrs. Holmes to check your calendar to be sure that this is scheduled. ✓

*Bonnie*  
*o.k.?*  
*new*

B12-5

NOTES 12-4-61 KOELLE

H. H. Koelle →

Didn't Studings own into trouble with OLVP getting approval for such a contract? Why should it be simpler now that we have lost electric propulsion?

1. NUCLEAR-ELECTRIC PROPULSION STUDY

It is planned to establish a contract for \$50,000 entitled "Low-Acceleration Space Transportation Systems." Sole source will be the RAND Company. This study will be the low-acceleration counterpart to the RAND high-acceleration nuclear systems study, which they did for Mr. Finger's office.

2. SATURN D STUDIES

The final presentation on our SATURN D studies will be:

Dec. 11, 1961	9:00 - 12:00	Director's Conf. Room	Gen. Dynamics
Dec. 12, 1961	1:00 - 4:00	Director's Conf. Room	Lockheed ✓

3. ORBITAL OPERATIONS TECHNOLOGY FUNDS FOR FY 62

Is there any word concerning the Orbital Operations Technology funds for FY 62? (See attached note).

→ Rosen told me he did not believe George Low crooked up the 7.75 M. I'll call him again.

12/4/61

NOTES

12/4/61

KUERS

Subject

B 12-5

1. Panels are being prepared for weld tests using types M-594 and 5356 filler wires on Alcoa type M-593 Al alloy sheets. The M-593 material has considerably better tensile strength and yield point than the 2014 material and with excellent elongation and weldability properties. One of the major advantages of this material is that after heat treatment it remains in soft condition until aging process is completed. It is the only material with which it will be possible to complete and accelerate the aging process by filling a container with steam. This material is still in an experimental state and cannot be planned for application in the C-4 program. It is anticipated, however, that sufficient tests and data will be available to evaluate the material for use in the NOVA program. ✓

2. A demonstration was given by this division and MSC representatives of possible difficulties of maintenance and repair in space. Typical tests were performed, under a combination of conditions, various tools and suit pressures, by an individual wearing Mercury-type space suit while standing on an air-bearing platform. The results indicated their space operations are feasible but will require considerable improvement in space suit design and operational techniques. ↗

3. A Project for Hydrostatic Test Tower was approved by Mr. Holmes of NASA. It now requires congressional approval. In the meantime, Tech Services Office will try to obtain sufficient funds from NASA to initiate engineering design. ✓

No Kuers

Next time invite me, please!

B

NOTES/ 12-4-61 MRAZEK

B<sub>12-5</sub>

1. CENTAUR TITANIUM PROGRAM: The Titanium Program as outlined in Internal Note-M-P&VE-M-61-10 (attached) is essentially on schedule. Although no thin-wall containers of the 10' dia. variety have been built, it is believed that the problems of fabrication, notch sensitivity, and quality control can be overcome in a straight-forward engineering manner. The question of titanium-oxygen activity must be answered first (see IN-M-SGM-M-61-7, attached). Experimental tests have shown that Titanium (A-110 alloy, 0.010 or 0.025 in. thick) diaphragms, internally pressurized to 35-50 psi with Gox, frequently ignite upon puncture by external sharp objects. With room temperature Gox, the metal burns rapidly and violently. With Gox at approximately -290°F, detonations frequently result. Coatings which desensitize titanium to impact in LOX did not prevent reactions on puncture.

Difficulties are being experienced in the welding of high pressure helium lines for Complex 37 at Cape Canaveral, due to the requirement of welding carbon steel pipe containing a copper-nickel liner for corrosion resistance. Metallurgical support is being provided to LOD by M-P&VE-M. ✓

2. VIBRATION EQUIPMENT: A Ling L-200 vibration exciter was delivered last week. The system has a maximum rated force output of 22,000 pounds. Components (including brackets) up to 700 pounds may be excited at frequencies from 5-2000 cps and maximum accelerations up to 100 g's. Due to a low moving element weight, this exciter has more available force than any other system on the market today. Installation will be completed and the system operational in Bldg. 4619 in approximately one month. ✓

3. RIFT: The RIFT Procurement Plan was finally approved and signed by NASA Headquarters this past week. ✓

4. C-4: Requirements were placed on all MSFC design organizations to achieve a unipotential structure with regard to electrical interferences. This is a must for the C-4 in connection with the automatic checkout and will be introduced to the greatest possible extent in the C-1, S-I design. ✓

5. ENGINE PROJECTS:

F-1: Word received on 12-1-61 that the negotiated supplemental agreement for the F-1 engine "deepened effort" was disapproved by NASA Headquarters after holding same an entire month. Depending upon the objections, this may seriously jeopardize the availability of the F-1 engine for programs now being studied.

J-2: The shutdown of the AF LH<sub>2</sub> Plant at PGWA on 11-17-61 required that some West Coast LH<sub>2</sub> production had to be diverted to PGWA. Through 12-15-61, Rocketdyne will receive only 50% of the requirements for the J-2 due to this diversion and has been directed to perform only the most critical tests and to determine the impact on the J-2 program schedules. ✓

6. WATER BEARING FOR SATURN BENDING MODE TESTS: (See Excerpt, Notes 11-20-61, Haussermann, attached.) Although the water bearing appears to be feasible and has many advantages, it is felt that more development is required. A cable support system will be either the prime or back-up suspension system used, dependent upon the development of the water bearing. A meeting will be held 12-4-61 with Haussermann, Geissler, Heimberg and Hellebrand to discuss this further. ✓

Attachments: 1. Internal Note-M-P&VE-M-61-10  
2. IN-M-SGM-61-7  
3. Excerpt: Notes: Haussermann 11-20-61

*Herb. Bidus*  
Please see me on this B

Excerpt - NOTES: 11-20-61 Haeussermann

2. AIR BEARING FOR SATURN BENDING MODE TESTS: Ref. Item 3, Notes of 11-13 (copy attached). Since it is intended to use water on the supporting medium, this item would be more appropriately identified as a fluid bearing. The device is being designed to support heavy space vehicles (i.e. SAT. C-1 and C-4) during dynamic tests. This approach shows promise of eliminating the disturbances and difficulties experienced in the use of the cable suspension (e.g., introduction of false resonances and measurements being disturbed by adding forces on the suspension points. ✓

Mrarek

NOTES - 12-4-61 - SMITH

B/12-5

NASA-PERT

A. Training - Phase I of the PERT training course to be offered by University of Alabama will begin tomorrow, December 5, 1961. Interest in the training was much greater than expected. Approximately 90 MSFC employees applied to the Training Section. Three classes (25 members per class) will be conducted instead of two as originally planned. ✓

B. SATURN SA-5 - Refining of networks is continuing. Even though several changes in the networks have been made, the latest computer printout still indicates the launch date to be 13 months late. ✓

C. CENTAUR - Operational phase is continuing and the regular bi-weekly reporting cycle is being supported by PERT. Quarterly PERT coordination meeting of Centaur contractors and government agencies will be held at MSFC Tuesday, December 5, 1961. ✓

PROGRAM-BUDGET

Pursuant to your request, final costs for MSFC's recent effort in the Dynasoar (C-1) program have been established at \$132,404, and M-FIN is forwarding a billing for this amount to USAF through NASA Headquarters. The above amount includes both in-house and contract (Douglas S-IV) costs incurred solely in benefit of the Dynasoar effort. ✓

NOTES 12-4-61 Stuhlinger

B12-5

1. ELECTRIC PROPULSION PROGRAM: The transfer of this program is proceeding satisfactorily. Lewis Research Center has named technical supervisors to the major contracts, and will do the same for the minor contracts very soon. It is planned that the existing MSFC technical supervisors and their counterparts in Lewis will visit each contractor together to assure complete understanding by everyone involved. A group from Lewis will visit this week to discuss further details of the arc engine development and technology contracts. One of our major contracts, for the 30 KW Arc Engine (AVCO) has been transferred to Hqs. in accordance with a directive from Mr. Finger. The majority of the contracts will be transferred directly to Lewis. ✓

2. SUPPORTING RESEARCH PROGRAM - FY 1963: Upon Hqs. request through Technical Program Coordination Office, RPD submitted an estimated FY-63 Supporting Research Program jointly with FPO. The total program, broken down into 9 items, amounted to \$24 million. A reduced program, totalling \$20 million as suggested by Hqs. was also submitted. A member of Hqs. had verbally requested TPCO to submit a program for a total of only \$9.7 million with the implication that \$10.3 million will be retained by Hqs. for contracts to be let by Hqs. Since we had not received this request in the form of an official letter, we did not reflect it in our submission.

The directive from Hqs. did not contain a line item for Orbital Operations Technology (OOT). We interpreted this fact as evidence that Orbital Operations are contained in the allocations to the Apollo program. Consequently, we have not submitted a program for Orbital Operations Technologies. However, many specific projects which we would include in our OOT program could also be rightfully included in the Launch Vehicle Technology program, provided that sufficient funding is made available for that program. Decision required after we have received funding figures.

3. 3 STAGE C-1 FOR LUNAR MISSIONS: After extended discussions during the past two weeks with yourself, Dr. Rees, Dr. Lange and Mr. Maus concerning possibilities and implications of a Saturn C-1 three stage vehicle project for lunar exploration and technology, I met last week in Hqs. with Dr. Newell, Mr. Cortright, Mr. Nicks and Mr. Milwitzky. Dr. Rees was present during most of the discussions. After Mr. Nicks and I had described to Dr. Newell the rough outline of a possible program, I offered (as approved by you on Nov. 21) a preliminary study over a period of two to three months, covering the following major points: Launch vehicle; lunar landing vehicle; possible scientific and technological objectives; possible project organization, tentative project development plan. Nicks and Milwitzky would have accepted this offer eagerly and gratefully, but Dr. Newell and Mr. Cortright did not accept it. While they termed the project necessary and very valuable, they would like to decide first who in Hqs. should manage the project, and which field center(s) should participate in its execution. I left with the impression that MSFC will not soon receive a directive to contribute to this project, except perhaps by building a three-stage Saturn C-1. Dr. Rees shared this impression.

*Ernst St. That's what I expected,  
JPL will get it! B*

NOTES - GORMAN - 12-4-61

B 12-5

Subject

1. ^ The RIFT procurement plan was signed by Dr. Seamans and a contractor briefing set for December 7 at Huntsville. Proposals will be requested on the basis of the work being performed at Michoud. ✓
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Harry J.

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Bart Slattery who has a major  
PIO problem with the many  
Michoud contractors. B

DECEMBER 11, 1961



NOTES 12/11/61 CONSTAN

B<sub>12-12</sub>PERSONNEL

Twenty three positions have been filled or committed. Most of the key personnel have been selected.

RENOVATION AT MICHLOUD

Office Building: Roof - will be completed this week: Painting - East wing complete, West wing continuing: Floor - about 80% repaired: ✓

Manufacturing Building: About 85% of the partitions have been removed: About 70% of the check-out of electrical sub-stations have been completed. ✓

HOUSEKEEPING CONTRACT

The Mason - Rust Company has been selected as the housekeeping contractor. Negotiations will begin with the company during the latter part of this week. ✓

RIFT

Proposals for Phase I of RIFT are due January 3, 1962. Phase I is to determine if proposers have sufficient past experience and present capability to serve as a system prime contractor. ✓

NOTES 12/4/61 CONSTAN \*

The possibility of removing the obstacles in the Michoud runway approaches will be investigated. ✓

MECHANICAL ASSEMBLY TRAINING

A tentative program schedule for those contractor employees that will receive mechanical assembly training at Quality Assurance Division and then go to Michoud Operations has been completed. ✓

\* George:

Please use some kind of reference system; otherwise Dr. von Braun will not even know what question you are answering. JCM 12-11

1. HOUSEKEEPING CONTRACTOR - Headquarters has authorized the selection of Mason-Rust for negotiations toward a contract to provide "housekeeping" at Michoud. Mason-Rust submitted a joint-venture proposal between the Silas Mason Company, Inc. and the Rust Engineering Company. Headquarters publicly announced the selection December 8. ✓
2. LABOR - Paul Styles and I met with labor representatives Tuesday, December 5. We took a firm position with the union with regard to the interface points. The union representatives were unhappy in that we were unwilling to compromise our position. They referred to us as "untouchables" -- a bit of humor. An "untouchable" was later defined by one of the union officials as a Catholic Negro in Civil Service. We are preparing a position paper for Mr. Webb in anticipation of an appeal to him through the international presidents. Our position is sound and supported by LOD. We are confident that Webb will back us up. ✓
3. CHRYSLER CONTRACT - Following our meeting with the Chrysler people last Wednesday, Bill Davis and I had a follow-on meeting with them. Target date of December 15 has been set for contractual agreement with Chrysler. The contract must go to Washington for approval since it is in excess of \$1 million; however, we at MSFC will authorize Chrysler to begin their activation plans for Michoud immediately. They can move into New Orleans shortly after December 15 if agreement is reached by that time on a contract. ✓
4. RESEARCH INSTITUTE - Now that an additional \$3 million has been authorized for the Research Institute, Marshall should determine the manner in which the institute would support the Center, including the areas of continuing research in which the institute should participate. This should be the first necessary step towards the culmination of a contract agreement and the justification for budgets to support the continuing requirements placed on the Institute by Marshall. It would be unfortunate if we found ourselves unable to take full advantage of the Research Institute by reason of certain procurement restrictions which would apply to informal and uncoordinated case by case negotiations with the University.
5. MISSISSIPPI TEST SITE - Neubert, Newby, Constan, Huth, Kent, and Aden visited the Mississippi Test Site last Thursday. A luncheon and tour of the area was hosted by officials of Hancock County and Bay St. Louis, including Congressman Colmer from Mississippi. The questions raised during this tour emphasize the necessity for setting up our Community Relations Program immediately. Marion Kent is being assigned full time, starting today. ✓

Dr. McCall

→ Please take this up with Harry and Stuhlinger and initiate necessary action.

B

NOTES 12-11-61 GRAU

1. Nothing of importance to report this week. ✓

B12-12

1. TANK WELD SEAM LEAKAGE IN CENTAUR: Combustion & Explosives Research, Inc. and connected MSFC personnel visited Douglas Aircraft Co. and Convair Astronautics on November 28-30, 1961 for familiarization with the Saturn S-IV and Centaur hardware. While at Convair, the group was immediately drawn into the discussion of leakage into the double-walled bulkhead separating the Centaur LOX and LH<sub>2</sub> tanks. It was concluded that no detonation hazard exists with these pore-size leaks; increased heat conduction (~ 50 times) is therefore their main result. (It is striking to what an extent gaseous conduction dominates the heat transfer through the gap separating the 2 concentric bulkheads, even though it is filled by a fiber mat that is compressed by the 30 psi overpressure of the LOX-tank.) It is understood that this problem of leaking welding seams is particular to the thin-steel structure of the Centaur, and is not expected to occur with aluminum structure of the S-IV. ✓

2. NEW FACILITIES: New facilities in Aeroballistics Division include a Hot Air Launch-Deflector Facility and a Cold Air High-Altitude Diffuser Facility. These were designed to support the LOD and Test Division. The altitude diffuser facility may be used to develop diffuser design criteria for the high altitude S-IV static test tower if required by Test Division. A 24-inch hypersonic shock tunnel is under construction (M = 8 to 15) with operation expected in late 1962. ✓

3. SA-5 CONTROL: A meeting was held with Astrionics Division and Saturn Systems Office concerning the control requirements for SA-5 (and following vehicles of Block II). Present studies by Aeroballistics indicate that the addition of fins will reduce swivel requirements substantially, but even so, use of simple attitude control will probably not be advisable, since angles of attack caused by wind could come too close to structural limits. Thus use of accelerometer or angle of attack meter will be needed. Decision between these two requires further studies. Replacement of the previously used local  $\alpha$ -meter by a Q-ball is planned for 3 reasons: (1) If we fly the Apollo-capsule and tower without shroud, local  $\alpha$ -meters can not be used. (2) The Q-ball will be a basically more reliable device. (3) The company building the local  $\alpha$ -meters (U.S. Science) is in difficulties and may not be able to furnish these items until some time from now. The Q-ball  $\alpha$ -meter can probably be used for control on top of the escape tower regardless of whether there will be a shroud or not. Even if accelerometer control will be used, measuring the angle of attack will be highly desirable for flight evaluation and eventually monitoring purposes. There will be a passenger flight for the Q-ball on SA-4. It was decided to let a contract to Northrop for about \$235,000 to develop and manufacture 6 Q-ball units. Design work on a possible shroud is being continued by Mr. Blumrich of M-P&VE, although up to now no really attractive solution has been found. ✓

↑  
Dr. Geissler

Suggest you ask Dr. Kuetner  
Crews appointed Apollo-Chief at MSFC)  
to take this whole matter up with MSFC again  
(I think the partial  
shroud should be  
entirely acceptable!)

B

1. Meeting on Nov. 29-30 with MSC and MIT Representatives: Reply to your last weeks' note on Mr. Chilton of MSC: Mr. Chilton took Mr. Faget's former position in STG; he is responsible for the G&C part of Apollo and is the technical supervisor of the MIT Apollo guidance contract. He himself full-heartedly is for the ST-124 system as a backup to the MIT system. ✓
2. Visit of Personnel of NASA's Electronics and Control Office of Advanced Research and Technology: Cmdr. Dr. Kelley and his staff visited Astrionics on Dec. 8 to discuss advanced research currently in progress and planned by MSFC. We presented particularly our technical and financial problems in the cryogenic inertial sensor field and in the computer area. My impression is that we established good relations and I am very optimistic that Dr. Kelley's office will support us as much as it will be in his power. Dr. Stuhlinger, Dr. Hoelzer and Dr. Speer participated in some of the conversations. ✓
3. Refinements on the AB-5 Air Bearing Gyro, such as flex-leads for current transfer to the floated part and high frequency servo loop pick-ups, have been incorporated on the ST-124 gyros. A recent delivery of 3 gyros from Bendix Eclipse Pioneer demonstrated repeatedly 0.05°/hr drift rates, which is ten times better than the original Pershing specification. ✓ *Good!*
4. Actuation of the J2 Engine: Recently, an agreement was reached with SIRAD, NAA that the hydraulic actuators should be the prime development for the SII stage. The request for development will be an open bid. Technical requirements for a backup gas actuation system for low temperature operation of the J2 engine have been prepared and proposal requests are being drafted.
5. Prof. Buchhold will visit us on Dec. 19 to inform us on recent research work for the cryogenic gyro. He also wants to gather information on our ground and checkout concepts for Saturn; it seems that GE, being responsible in this area for the MIT Polaris system, is strongly considered by MSC-MIT for a similar responsibility on the Apollo spacecraft. ✓

I understand this is under reconsideration. SIRAD definitely dislikes the idea of hydraulic actuators on the SII because of the difficult thermal environment. Please keep me posted.  
B

Suggest to bring this to Dr. Kuetter's attention, so we can aim at an overall compatible automatic checkout system for C-5/Apollo. Fichtner should discuss possibilities in this area with Kuetter. B

B 12-14

1. PEARL RIVER TEST AREA:

a. A meeting with the Bureau of Public Roads in Washington, D.C. and members of the Louisiana and Mississippi Highway Departments was held 12-5-61 to discuss interstate Highway access and clearance for the Pearl River Site. The Highway Departments of Louisiana and Mississippi are now working on study and plans to provide optimum highway access and water transportation clearance, and will report recommendations early January 1962.

b. Topographical survey and soil investigations of the Pearl River Site and hydrodynamic survey of the East Pearl River are well underway and are estimated to be completed by 2-15-62. ✓

2. DYNAMIC TEST STAND:

Meeting on proposed water bearing suspension system was held 12-4-61 between ASTR, AERO, PEVE, and TEST Divisions. Aeroballistics Division requested time for more study and preparation of a model test program. Next meeting is scheduled for 12-12-61. ✓

3. INDUSTRIAL WATER SYSTEM:

The addition of the new 30-inch line in Test Area water system was completed 11-27-61. The system has been operating most satisfactorily during routine activities and one 8-engine static firing. ✓

4. BARGE MODIFICATIONS:

The contract with Todd Shipyard for modification of the "Compromise" must be re-negotiated for an addition of approximately 50 man-hours to permit completion. ✓

5. WEST AREA STATIC TEST STAND:

A contract with AETRON for re-design of the West Area Stand was negotiated through the Mobile District Corps of Engineer Office 12-9-61. ✓

6. ROUGH COMBUSTION - H-1 ENGINE:

Test P1-308 on engine H-1020 was terminated by RCC device, 0.98 second after ignition. Investigation is underway to determine cause; also to determine if actual RCC occurred or other phenomena. No injector damages occurred as is usual with RCC, but severe tube splitting of the thrust chamber above the throat was evident. Unexplained "chugging" has been observed during previous runs with this engine. ✓

NEGATIVE REPORT FOR DR. HOELZER

NOTES 12-11-61 HUETER

B 12-14

1. CENTAUR

a. F-1 Launch: On December 5, I was officially advised by GD/A that the December 29 launch date could not be met. I have requested that LOD, in conjunction with GD/A, prepare a new flight test schedule with a new launch date. Indications are that the new date will be near the end of January. The TWX from Dr. Debus requesting that he be relieved of F-1 firing responsibilities was answered by me and agreed upon by Dr. Debus (copy of my answer attached). ✓

b. Intermediate Bulkhead Problem: GD/A has proposed an interim fix for the intermediate bulkhead problem on F-3. Mr. Goerner and my office have concurred in the fix. The fix will probably require a one month delay for F-3. The fix is essentially an increase in material thickness in the bulkhead area, improved manufacturing techniques, 100% x-ray inspection of welds, and increased thickness of insulation material. ✓

c. Centaur Payload Improvements: On Monday, Tuesday, and Wednesday, there were meetings at Headquarters with Col. Heaton, Mr. Dixon, Dr. Seamans, Mr. Rees and myself attending. The purpose of the meetings was to show DOD that in 1964, a vehicle would be available to place their Advent vehicle into a 24 hour orbit and simultaneously allow for lunar and escape missions with restricted payloads. The essential feature is that DOD relax their requirement for a direct injection into an equatorial orbit by agreeing to a walking orbit with inclination. A walking orbit with about 5° inclination would bring us slightly above the required payload of 1300 pounds. DOD seems agreeable and a new letter from Dr. Seamans to Mr. Rubel is being prepared which should go out early next week. The letter will state that by the beginning of 1964 there will be a vehicle available which can perform Advent missions with the restrictions mentioned above and that by 1965 NASA can provide a vehicle capable of meeting their original requirements. ✓

2. AGENA

a. Ranger 2 Evaluation and Ranger 3 Launch: The committee evaluating the Ranger 2 launch discovered no basic difficulties with the launch vehicle. It was decided that launch preparations for Ranger 3 would continue as planned, with a launch window of January 22 - 27. To minimize the possibility of failures such as occurred on Rangers 1 and 2, an engineering evaluation group is being organized. This group will convene December 14 to look into Agena checkout equipment and procedures and provide recommendations. MSFC, USAF, and Lockheed are represented in the group. ✓

b. S-27 Launch Postponement: The S-27 launch from PMR has been postponed 5½ months until September 1962 because of spacecraft troubles. This places the launch in a period when Vandenberg Pad 75-1 is scheduled for heavy occupation by Air Force launches. Resolution of this problem is being sought by the Air Force. ✓

B12-4

## NOTES 12-11-61 Koelle

1. SATURN D FOLLOW-ON STUDIES

A follow-on statement of work for General Dynamics and Lockheed has been prepared and coordinated with Mrazek, Col. Fellows, and Schramm. These studies will provide input into the RIFT program and the C-4/C-5 program so that upon completion of RIFT an early operational capability can be achieved without major redesign. Because of the competitive nature of RIFT, certain precautions must be taken in the SATURN D. The following has been worked out with Col. Fellows:

a. The contractor orientation on SATURN D will be held after January 3rd (RIFT proposal due date) and all RIFT bidders will be invited.

b. Prior to submission of the RIFT final proposals, MSFC SATURN D people will have no direct contact with the SATURN D contractors. Questions will be handled through Procurement and Contracts just like those concerning RIFT.

NOTES 12/11/61 KUERS

B 12 -14

1. SA-2 delivered to M-QUAL on 12/8/61 for final post-static checkout.
2. A C-1 budget review was held with M-SAT 12/9/61. The shortage of 5.881 million in FY-62 funds was the main topic of discussion. M-SAT will investigate availability of additional funds and reevaluate the C-1 schedule. If funds are not provided, delivery of vehicles SA-6, SA-7, and SA-8 will be seriously delayed.

## NOTES 12-11-61 Lange

1. SATURN Overall Mission Plan - A plan integrating all NASA C-1 and C-5/C-3 vehicle requirements is in process, attempting to utilize latest information from Headquarters Offices. ✓
2. FY-62 Funding - NASA will request SATURN supplemental funding in the order of 50 million in order to have sufficient dollars to cover our present planning total for the year, 278 million. Our present rate of effort is based on 278 million. Chances of a second supplemental request beyond the 278 are very poor. ✓
3. Douglas Stand 2A - An approval to DAC to proceed with AGE for conversion of Stand 2A for S-IVB compatibility was issued by DRY on December 6, 1961. Additional funds are required by January 1, 1962, in order to continue the effort to completion.
4. S-IVB Program - Hal Thomas (DAC) will be in MSFC on December 14 and 15, 1961, to discuss the second half FY-62 program for S-IVB (the \$7 million portion that was discussed during your visit to DAC). Also, DAC is expected to submit a total test stand requirement plan with costs and schedules. ✓
6. S-II Actuators - Pneumatic actuators were discussed in detail during the working group meeting last week. We expect a package from S&ID incorporating Rocketdyne inputs and establishing the NAA position as to advisability and program recommendation on the "hot-gas" actuators. ✓
7. Contract Status - S&ID will submit by June 12, 1962, an updated proposal for the basis of negotiating the entire program contract. February 9 is targeted for "go-ahead". ✓
8. Facilities Awards - Facility criteria and A-E contractor approval was given to S&ID for two portions of the Seal Beach facility: (a) site preparation, and (b) bulkhead fabrication facility. ✓
9. Government Support of Construction - The Navy (Admiral Davis from Bureau of Ships & Docks) at San Diego is putting out feelers to do the Seal Beach facility build-up. Like the Corps of Engineers, they would want full participation which probably would result in complications and delays in getting started. The present plan under contract NAS 7-90 with NAA is to have the contractor handle the entire Seal Beach job. Even if either the Navy or the Army Engineers were involved, NAA would still have to devote as much time in coordination, and furnishing criteria throughout the construction phase as they do in their direct contracting to the A-E contractors and construction contractors. Each A-E contractor will provide Title II services (construction supervision and inspection services). NASA retains the right to supplement such inspection with government inspectors of their choice as is deemed necessary to insure the best interests of the government are maintained. Following this plan of contracting with NAA, time delays will be reduced and total cost should also be reduced inasmuch as the Corps of Engineers or other government agencies can not assess the effort with a percentage charge. ✓

for info  
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reference is  
made to  
as alter-  
cate SIVB  
plans).

B 12-14

NOTES: 12-11-61 MRAZEK

1. ENGINE PROJECTS: Urgent need for funding exists in the H-1 (3.00), F-1 (5.20) and J-2 (4.37) programs for long-lead time hardware requirements. Unless these funds are made available in January 1962, slippage of schedules and increased costs may be expected. M-SAT and M-TPC have been informed.

NASA Headquarters' disapproval of the F-1 negotiated supplemental agreement for a "deepened effort" is being analyzed and a reclama is being prepared.

There has been no change in the official status of the M-1 Program since submission of the latest Preliminary Project Development Plan on 11-16-61. ✓

2. MANNED LAUNCH VEHICLES: M-SAT was asked to provide funding for an industrial firm to define criteria for launch vehicles of manned application. M-P&VE was suggested as MSFC's coordinating agency on man-rated matters. ✓

3. CENTAUR: Industrial proposals for third stages for the Atlas Centaur are being investigated for the ADVENT, MARINER, and SURVEYOR missions and a recommendation will be made to the M-L&M office in the next few weeks. ✓

4. SA-D: At the request of M-ASTR, a mounting arrangement for rate gyros is being investigated in the SA-D tail area. Results will be used in the design of flight vehicle mounting arrangements. ✓

5. SA-1 TAIL SPROUD UNDULATION: Engineering camera coverage film observing the operation of the retractable support arms, hold-down arms and short cable masts retraction during the launch of SA-1 showed undulation of the tail shroud. Test Division was requested to mount cameras on the static test tower to record the tail shroud of SAT-3 during static test SAT-20. The films are now being evaluated by the structural design personnel. Analysis will be completed in approximately two (2) weeks. ✓

NOTES 12-11-61 SMITH

B 12-14

PROGRAM BUDGET

This office and the Financial Management Office have held meetings during the past two weeks with Launch Operations Directorate personnel, to discuss and establish procedures which will permit the LOD to become "operational" (self-sustaining) in the program execution, procurement, and financial management areas; to the maximum extent feasible within their recently established capabilities for these activities. Effective January 1, 1962, MSFC will issue to LOD an approved Program Operating Plan under which LOD can and will operate (in effect) as a "sub-center" of MSFC, reporting to MSFC in the program and financial areas in the same manner as MSFC reports to NASA Headquarters. ✓

NASA Headquarters has not scheduled their normal quarterly review of MSFC programs for the 3rd quarter of FY 62, due to pressure of work at Headquarters on the FY 63 budget, etc. However, in order to keep you and your deputy directors abreast of our FY 62 programs and to obtain needed program decisions, this office is scheduling the MSFC program managers to present program reviews to you as soon as possible. The first review (S&E, Support of Plant, general-purpose facilities) is scheduled for December 14, a Saturn C-1/C-5 review is scheduled for Dec 18; others to follow. ✓

NASA PERT

Centaur - The quarterly PERT conference between the contractors and L&M Vehicles Ofc was held at MSFC on Dec 6, 1961. Discussions revealed that additional progress is being made in the operational phase; PERT replaced the PMP in this area about a month ago with PERT reports being furnished NASA Headquarters on a bi-weekly basis. P&W has presented a cost of approximately \$250,000.00 for PERT installation and reporting (this is the total for contracts NAS 8-2690 and 2691). Negotiations are being held this week to reduce cost and place in overhead category. ✓

Saturn SA-5 - Additional refinements have been made in the network but we still have about a 12 months schedule delay as revealed by the PERT network. A new computer printout is expected by Dec. 12, 1961. ✓

Training - Classes have started and are progressing extremely well. We have three classes consisting of 25 trainees per class with trainees representing all organizational levels. It is a possibility that an additional class will have to be scheduled since we could not handle but 75 and approximately 95 presented applications. ✓

B 12-14

NOTES 12-11-61 Stuhlinger

1. ELECTRIC PROPULSION PROGRAM: The transfer of program responsibilities to Lewis is proceeding well. Last week three newly assigned Lewis contract supervisors visited RPD to discuss all arc engine and arc technology contracts. It was agreed that eleven contracts would be immediately transferred to Lewis, and M-P&C has been requested to make the transfer. A Lewis flight test manager was named last week and he will visit RPD this week. M-P&C is now transferring the RCA flight capsule contract and power supply contracts to Lewis.

Beginning this week, several of our contract technical supervisors are visiting their contractors jointly with the new supervisors from Lewis. This should provide maximum knowledgeability to the Lewis supervisors. ✓

2. SUPPORTING RESEARCH PROGRAM: To date \$4,463,000 of the \$6,301,000 authorized Launch Vehicle Technology program for the 1st and 2nd quarters has been committed. This leaves a balance of \$1,838,000. TFC informed the Supporting Research Office that since the 3rd Quarter Review meeting would not be held until the end of January we should submit our anticipated funding requirements for the month of January. After studying the LVT Program we asked for \$400,000 of the \$1,814,000 3rd and 4th quarter requirements. ✓

3. JUNO II REPORTS: Efforts continue on the JUNO II technical summary reports for which RPD has responsibility. Reports on the Explorer VIII is held up pending further input from Goddard. Reports on the Explorer VII and S-46 payloads have previously been issued. The report on the S-43 is well along, and will be finalized as soon as inputs are received from Astrionics and Computation Divisions. One more report, on the S-15 payload, will also be written. ✓

4. SATURN C-1 WATER RELEASE: Drs. Johnson and Frary from RPD attended the Astronomy Subcommittee meeting last week to further develop the scientific test objectives for this program. ✓

5. FACILITIES TO SUPPORT NUCLEAR VEHICLE PROGRAM: Following discussions with General Dynamics personnel and Mr. Brooksback (NVFO), we are re-examining the existing nuclear facilities which might be used to support the nuclear vehicle program. The three best prospects, all "hungry" remnants of the ANP program, are: (1) Oak Ridge Tower Shielding Facility (2) Nuclear Aerospace Research Facility (General Dynamics) (3) Georgia Nuclear Laboratory (Lockheed). ✓

6. HARVARD ASTRONOMICAL OBSERVATORY: Dr. Lundquist and I attended a very interesting meeting at the Harvard Astronomical Observatory. Dr. Whipple reported about his work in the fields of satellite orbit determination, upper atmosphere research, and meteorite research. Some of his work is of immediate interest to our orbital operations project.

7. UNMANNED LUNAR EXPLORATION: Some further discussions during the past week convinced me (although with deep regret) that MSFC should not expect to play any substantial role in unmanned lunar exploration and technology projects. We should table our effort in this area for the time being (except for the boosters). ✓

8. ORBITAL OPERATIONS: While RPD's activities in electric propulsion are phasing out, we have begun to intensify our efforts in three areas essential for orbital operations: thermal design studies; radiation effects, and the meteorite problem.

Ernst St. ↑

This is, by all odds, our best and soundest bet. Suggest to include supercooled H<sub>2</sub> and O<sub>2</sub> problems, discardable heat/meteor, zero-gravity effects

cryogenic liquids etc

NOTES 12/18/61 CONSTAN

B 12-19

PERSONNEL

Twenty-four positions have been filled or committed. Most of the key personnel have been selected. ✓

RENOVATION AT MICHOU

Office Building: Roof - completed; Floor - first and second floor East wing completed; Plumbing - toilet fixtures completely renovated. ✓

Manufacturing Building: Removal of partitions completed. ✓

HOUSEKEEPING CONTRACT

Contract negotiations with the Mason-Rust contractor was attended on 14 - 15 December. ✓

S-1

A procurement action has been initiated to P&C for contractual action on the S-1 contract with Chrysler. Contract negotiation with the Chrysler Corporation was attended on 14 - 15 December by Mr. Constan and Mr. Stasy. ✓

S-1B

Boeing Aircraft's proposal for production of S-1B boosters at Michoud was reviewed. ✓

RIFT

Proposals for Phase I of RIFT are due January 3, 1962. Phase I is to determine if proposers have sufficient past experience and present capability to serve as a system prime contractor. ✓

Mr. Jensen accompanied Mr. Brooksbank from the RIFT NERVA Office to Michoud on December 9, 1961 to review allocation of production space to RIFT. ✓

GENERAL

Attended Procurement Counseling Conference held in New Orleans on December 13, 1961. Conference was sponsored by New Orleans Chamber of Commerce with various government agencies and Chrysler Corporation participating as counseling teams. It was estimated that approximately 800 representatives of industry in the Gulf states area attended. ✓

Visited Michoud Plant on December 14 and 15. Surveyed immediate needs for office equipment. Requisition being submitted December 19 covering desk, chairs, filing equipment, etc. for shipment to Michoud. ✓

Due to rain no exterior work has been accomplished. ✓

NOTES - 12-18-61 - GEISSLER

B 12-19

1. APOLLO SHROUD: A shroud design for the Apollo nose of the Block II is now reduced to a partial shroud that extends from the base of the escape rocket back to the 154" diameter of the capsule. A fully shrouded design was eliminated when the local alpha meter requirement was dropped by Astrionics Division. The partial shroud would be less than  $14^\circ$  half angle which is a very satisfactory aerodynamic solution. A Q-ball meter would still be incorporated into the force end of the escape rocket.

Langley's test data on small models in an accelerating flow now indicate no buffeting problem; however, scaling of the data is still very questionable. Another factor emphasizes that a shrouded version should be flown. Messers. Hoberg and Fichtner contend that the present Block II schedule is already unrealistic without imposing the additional instrumentation required of a blunt body flight. The partially shrouded design is shown in the enclosed figure. ✓

2. HYDROGEN VENT: Diverging opinions still exist on the hazards from the hydrogen vent and chilldown of the second stage. If the vent stacks were left off, one school of thought stipulates that the greater concern is associated with the voids between the clustered first stage tanks and not so much with circumstances at separation, while others argue the reverse order. The latter view would obviously be more amenable to the desired elimination of the vent stacks and their substitution by local exhausters. Short of conclusive test evidence, which is slow in forthcoming, answers to this question will remain opinionated for a considerable time. While wind tunnel tests will yield valuable answers, the effect of non-scalable phenomena is bound to prevent the obtainment of firm quantitative data. The installation of a simulated hydrogen-vent system - a gas other than hydrogen could be used - and a number of concentration sensors in the cluster voids or at other strategic locations on Block I vehicles would have the great advantage to give a chance for eventual elimination of the stacks in Block II - which will hardly be possible based on Block II flights. The impact on this schedule has not yet been explored, but would probably prove to be a severe hindrance. !!!

← Anyone exploring this with M-SAT?  
B

Dr. Geissler

What is the latest course of action for SA-5? Have we exchanged views with STG again?  
B

NOTES 12-18-61 GORMAN

B<sub>12-12</sub>

1. CHRYSLER CONTRACT - Lowrey and Lovett visited my office late Friday evening to say that Mr. Morrow, Executive Vice President of Chrysler, had contacted Seamans and Webb with respect to an early award of the Chrysler contract. As you know, we had established December 15 as a target date to obtain Chrysler's signature on a contract. We were unable to "button-up" all the details and it now looks like Wednesday of this week before we will have a contract we can send to Washington. I'm not sure of what Morrow is complaining about, but suspect it has to do with the term of the first phase of our proposed contract which is through June 30, 1962. Chrysler would prefer to negotiate for the whole contract period under a very broad scope. I plan to provide Seamans with the ground rules that you and I discussed with Chrysler. ✓

2. "HOUSEKEEPING" CONTRACT - Late Friday, I learned through Congressman Hebert's office that the Space Council was going to intervene with NASA on behalf of the unsuccessful New Orleans contractors with the request that NASA hear them out before awarding a contract to Mason Rust. The letter you spoke of in the Board Meeting was dispatched Friday with Webb's signature. I understand it is the "firm" but polite version. We have not received a copy. I believe we can consider this matter closed except for a possible debriefing of the disgruntled contractors. ✓

3. BOEING - With regard to Eberhard's memo of December 16, and his conversation with Wood and Stoner, we are prepared to develop ground rules for Boeing following receipt of their teletype. Believe it would be beneficial to have a discussion with Boeing, similar to the one we had with Chrysler, prior to contract negotiations. ✓

Harry J. ↑  
 Agree. But I suggest you discuss this matter with Eberhard first. He has some brand-new ideas on this subject.

(taken care of) + B

NOTES 12-18-61 GORMAN

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NOTES 12-18-61 GRAU

B<sub>12</sub>-19

1. COORDINATION OF QUALITY ASSURANCE REQUIREMENTS: In plants such as NAA where NASA has two or more major contracts from different Centers, such as our S-II stage contract and the Manned Spacecraft Center's Apollo, a confusion of Quality Assurance requirements and inspection organizations could come about. A NASA-Wide method of coordination should be established to cope with this problem, which is among the subjects I shall discuss in NASA Headquarters in Washington tomorrow. Meanwhile, Quality Assurance Division will coordinate any problems in this area on MSFC Contracts. ✓
2. INSPECTION SERVICE FOR S-II: During my visit to Los Angeles a week ago I learned of Mr. Dixon's suggestion that the NAA plant in Downey (where the Air Force is cognizant agency) be completely taken over by NASA. The Western Operations Office objects because it feels it is not staffed to do the job and can very well utilize some of the Air Force's capabilities (e.g., plant security, property administration). WOO tries to work out a plan in which some of the duties are assigned to a Government Agency while others remain in the hands of WOO. In support of this endeavor, I agreed to modify the request for inspection service from Los Angeles Ordnance District in the following way: The Army, Navy and Air Force will be supplied with the Manufacturing Plan and General Test Plan for S-II and QEB Nr. 1, and asked to give a proposal as to how they would comply and what the manpower and money requirements will be for the inspection service. From the three proposals the best one can be selected. The Saturn Systems Office is aware and in favor of this approach. I hope that by the time the proposals are in, (1) WOO has reached agreement with NASA Headquarters as to the general plan, (2) NASA Headquarters has reached an agreement with DOD on the inspection service problem, a subject which I shall also take up in Washington tomorrow. ✓
3. CONTRACTOR SURVEYS: Cosmodyne, Los Angeles, California and Winger Company, Ottumua, Iowa, subcontractors on the Blount Brothers-LOD contract for Complex 37 were surveyed this week. Solar and Cosmic Corporations, both of San Diego, California, are being surveyed to establish requirements for inspection on several M-ME-TL contracts. ✓

NOTES 12-18-61 GRAU

B<sub>12</sub>-19

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3. CONTRACTOR SURVEYS: Cosmodyne, Los Angeles, California and Winger Company, Ottumua, Iowa, subcontractors on the Blount Brothers-LOD contract for Complex 37 were surveyed this week. Solar and Cosmic Corporations, both of San Diego, California, are being surveyed to establish requirements for inspection on several M-ME-TL contracts. ✓

B 12-19

## NOTES 12-18-61 HAEUSSERMANN

1. HYDRAULIC SUPPORT FOR SATURN DYNAMIC TEST VEHICLE: Meeting was held 12/12 in which Landwehr presented the details of this scheme to familiarize all interested and concerned parties. Representatives of PAVE, TEST, AERO. and ASTR were in attendance. No final decisions were reached at this meeting, however additional meetings will be held during the next few weeks to discuss specific technical aspects, funding requirements etc. ✓
2. DIRECTION OF SATURN STAGE CONTRACTORS IN DESIGN OF ELECTRICAL GSE FOR CHECKOUT OF STAGES. Representatives of QUAL and ASTR (Electrical Sys. Integration Branch) met last week to establish areas of responsibility. It was basically agreed that QUAL will be responsible for design of electrical GSE for checkout at stage contractor facilities except for the Instrumentation Unit (IU) and Apollo Capsule. ASTR retains responsibility for design of electrical GSE for checkout of the IU. Responsibility for the Apollo Capsule in this area has not been decided upon. ASTR will be responsible for design of all launch site electrical GSE. ✓
3. ATTENDANCE AT LOD WORKING GROUP MEETING: ASTR (Electrical Sys. Integration Branch) representatives attended meeting which was held to correlate DAC's and MSFC's check-out operations at the launch site. ✓
4. POSSIBLE USE OF BERYLLIA FOR ELECTRICAL INSULATION: Results of tests using "Beryllia" (beryllium oxide) for electrical insulation of transistors give promise of a major improvement for the ST-124 Servo Loop Amplifiers. The material, produced by Brush Beryllium Co., has the combined properties of good electrical insulation and high thermal conductivity (equal to cast aluminum). It will allow operation of power transistors at a higher power level without excessive temperature rise. ✓
5. NORTRONICS Q-BALL FOR LATERAL CONTROL: It was concluded during a recent meeting with AERO Div. that development of this item would proceed as a backup for the control accelerometers. First flight (as passenger) would be on SA-4. Cost of development estimated to be \$250,000. ✓
6. CENTAUR PROGRAM: At the request of LOD, two programmer specialists are at the Cape this week to assist in resolving problems encountered. Second meeting of CENTAUR Guidance System Working Group will be held 12/18. ✓
7. AGENA PROGRAM: Three ASTR representatives are participating in AGENA Engineering Review from 12/14 thru 12/21. ✓

Job is  
 up to  
 MSFC/  
 STG  
 interface  
 panel  
 to  
 clarify!  
 B

B  
12-69

## NOTES 12-18-61 Heimburg .

1. MISSISSIPPI TEST SITE

Interviews were held with four companies this past week for selection of A&E Evaluation and final recommendations are now being prepared. ✓

2. SAT-21

SAT-21 is scheduled for test Tuesday December 19, 1961 (weather permitting). Helium will be used for initial LOX tank pressurization. Inboard engine position Nr. 5 will be cut off manually approximately 20 seconds prior to anticipated outboard engine cutoff. ✓

3. SAT-20

SAT-20, cut at 95 seconds due to fire indication, review after test indicated carelessness on part of personnel. ✓

4. BARGE COMPROMISE

Barge Compromise passing Vicksburg, Mississippi today traveling at 6 1/2 miles per hour, scheduled to arrive at Wilson Dam Friday December 22, 1961. ✓

## NOTES 12-18-61 HOELZER

Bram

1. CONSULTANTS: The division has felt for sometime a definite weakness in the field of theoretical and applied mathematics at the Ph.D. level. One mission of this division is to supply mathematical consultants to other divisions on problems requiring such. Considerable effort has been placed in recruiting personnel of this caliber, both in Civil Service and in General Electric. GE has been requested to hire seven people of this type during the first half of 1962. They anticipate being able to do so. We have placed three Ph.D.'s in consulting positions with our division. These are: Prof. Baylis Shanks, Head, Mathematics Dept., Vanderbilt University; Prof. Nathaniel Macon, Auburn University; and Prof. Leland Cunningham, University of California. At present we have two Civil Service employees at the Ph.D. level and two GE employees. This makes a total of seven people who we can call on for mathematical consulting work. ✓
2. PROCUREMENT PROCEDURE: We are still working on the procurement procedure mentioned in NOTES 12-4-61.
3. REPLACEMENT OF 205 COMPUTERS: Four proposals have been received for the replacement of the three 205 computers in Aeroballistics, Astrionics, and P&VE Divisions. A computer evaluation committee is being formed. One of these computers will be in the HIC Building. This has been discussed with and approved by Mr. Mrazek. ✓
4. DATA CENTER: The proposed discussion in Board Meeting on establishing a data center here was not held last Friday. ✓

→ Dr. Hoelzer:

When you reference something, please attach copy of reference. Otherwise, Dr. von Bram has no way of knowing what is being discussed. (This agrees with instructions sent out regarding handling & preparation of NOTES.) ✓

NOTES 12-18-61 HUETER

B12-19

1. CENTAUR

a. F-1 Launch: Launch is now definitely scheduled for the week of January 28. The main reasons necessitating the delay are late delivery of items which were not installed at GD/A, and launch complex modifications. ✓

b. Guidance Piggyback Launch: We are striving to re-schedule the Centaur guidance piggyback launch for some time this month or early January. I hope we get a DX priority for Centaur in the meantime, so we can bump a lower priority mission. ✓

c. Centaur Improvements: In a meeting at NASA Headquarters today and tomorrow, I will provide answers to Dr. Newell's December 12 teletype. Most of last week was spent evaluating GD/A's separated tank and third stage proposals, and at the meeting I will present MSFC-backed performance and cost figures, basically for a vehicle to fly in 1964. ✓

Both NASA and DOD are willing to fly with reduced payloads and modified orbits for an interim period. Therefore, the general goal is to have a vehicle available in 1964 for operational mission flights with restrictions, and to provide a vehicle in early 1965 that will fulfill spacecraft requirements. The 1964 configuration is to be either the present configuration with some improvements if we can solve the intermediate bulkhead heat leak problem, or, if not, a separated steel tank configuration with longer tanks. ✓

Titanium LOX-reactivity tests indicate more and more the seriousness of the problem. Investigations to keep titanium brittleness within acceptable limits are continuing. A decision on using titanium for Centaur will be made by January 15. ✓

2. AGENA

a. PMR Launch Management: No decision has been made on this subject by NASA Headquarters. I plan to discuss this while I am in Washington this week.

b. Ranger 3 Launch: The Agena-B vehicle arrived at AMR December 11 and the Atlas booster should arrive today. The Ranger 3 spacecraft arrived November 20 and has been undergoing checkout. Preparations are progressing satisfactorily towards a January 24 target launch date. ✓

NOTES 12-18-61 Koelle

B 12-19

1. AIR FORCE BIDS FOR INDUSTRY STUDIES

An Air Force request for bids has been issued for Industry studies of very large solid-boosted space launch vehicles. We understand that this work closely parallels Solid-NOVA studies planned as a follow-on to the Large Solid Booster Study, currently being performed by Boeing for MSFC. Air Force people at Edwards AFB were contacted by M-FPO on December 13, 1961, suggesting coordination of our study efforts to avoid duplication and to insure adequate coverage of all areas. Air Force (AFSSD) will respond to our inquiry at a later date, perhaps suggesting an AF/NASA meeting to effect this coordination. ✓

2. SATURN D (NUCLEAR) CONTRACTS

The SATURN D (Nuclear) contracts with General Dynamics and Lockheed are being extended. ✓

3. ACTION ITEMS -

A memo was forwarded to you on December 14, 1961 regarding desired action on the following:

- a. Electric propulsion mission study.
- b. Application of hydrogen/flourine for both C-1 third stage and APOLLO lunar launch vehicle.
- c. Early manned planetary mission study.

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

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

B 12-19

NOTES 12/18/61 KUERS

yes | 1. Funding for MR&D building has been disapproved by Bureau of Budget. It is ME's understanding that disapproval was basically due to the fact that the building would not be available until about 1964 and by that time it is anticipated that development work would be performed by contractors rather than MSFC. Consequently, present facilities should be available for in-house R&D work. ✓

2. Mr. Mrazek indicated that the single, NOVA type, cylindrical tank is not desirable because of wall thickness requirements. Therefore, Messers Rees and Mrazek strongly recommended continuation of in-house development work on multi-cell containers for application in NOVA size stages. P&VE and ME agreed that such development work must be accomplished on full size test tanks. However, funds must be made available before work can begin. ✓

3. Sufficient funds for the Hydrostatic Test Tower have been released to permit the initiation of engineering design. ✓

NOTES 12-18-61 Lange

B 12-18

M-SAT NOTES will be replaced by Program Review held in Director's  
Conference Room, December 18, 1961 ✓

## NOTES 12-18-61 Maus

B 12-19

1. The NOVA Master R&D Schedule is being revised to reflect a reduced funding level for FY-63. The new budget guidelines, allocating \$150 million for NOVA R&D in FY-63, were received during a recent telecon (12-12-61) with Mr. Canright of Headquarters. The original schedule is being specifically analyzed to determine the extent of slippage caused by the decrease in FY-63 funds. ✓
2. Recommendations are being obtained from the various Divisions relative to spending the \$2.3 million in approved FY-62 NOVA funds which are being held by Headquarters. These inputs will be used to develop an over-all MSFC allocation plan for presentation during the Quarterly Budget Review. ✓
3. Information pertinent to MSFC's possible participation in Orbital Operations was collected and integrated into a preliminary Orbital Operations Development Plan. ✓
4. In a meeting on 12-14-61, representatives of the General Electric Company disclosed that Project SMART studies have proved the economic feasibility of the space maintenance and repair concept. This, along with other conclusions formed during the study, support Marshall's general position on the subject. An attempt is being made to obtain copies of the official Air Force documents which cover details of this work. ✓
5. RCA is continuing its crash effort aimed at using the SAINT vehicle for NASA orbital docking tests. We are informed that a corporate-wide effort has been instituted in order to have an unsolicited proposal at MSFC by the first week of February 1962. ✓

B 12-19

NOTES: 12-18-61 MRAZEK

1. F-1 ENGINE PROJECT: Status of the problem wherein NASA Headquarters disapproved the F-1 negotiated supplemental agreement for a "deepened effort" is as follows:

a. Information from P&C Office indicates that the principal objections of NASA Headquarters relate to the technical areas.

b. Telephone discussion with Del Tischler on 12-12-61 disclosed that he would attempt to clarify the issue at Headquarters.

c. A reclama has been prepared by this office and will be sent to the P&C Office for their response to NASA Headquarters.

d. The "deepening" of the F-1 Program has been contractually underway since July 1961, and has committed considerable funds to date. Unless NASA Headquarters directs MSFC to reopen negotiations (unlikely), it is not expected that this problem will have any effect on the F-1 Program. ✓

2. RL10 ENGINE PROJECT: The second negotiation session with P&WA started 12-12-61 in Florida.

A full scale mock-up of the RL10A-3 Engine has been received at MSFC and is located in Room 100, Building 4610. ✓

3. 3rd QUARTER PROGRAM REVIEW: The problem, reported last week, concerning additional FY-62 hardware funding required for the H-1, J-2 and F-1 Programs will be the prime emphasis of the Engine Management Office at the 3rd Quarter Program Review in Washington on 12-20-61. ✓

4. SOLID PROPELLANT: The successful static test of the large United Technology Corporation segmented solid propellant motor P-2 on 12-9-61 was observed by one person from Propulsion & Vehicle Engineering Division. The motor weighed approximately 140,000 lbs and developed nearly 400,000 lbs thrust for 79 seconds. ✓

NOTES - 12-18-61 - SMITH

B 12-12

NASA PERT

Training - The first phase of PERT training through the University of Alabama Center was completed on December 14, 1961. Of the 76 people registered for the 8 hours of lectures, 57 attended 6 hours or more. ✓

SA-5 - Some refinements in the networks have been made by the various divisions but the latest computer printout still indicates approximately 12 months schedule delay. Efforts are now directed toward re-planning the network so that operations now shown in series will be in parallel, thus reducing the schedule delay. ✓

NOTES 12-18-61 Stuhlinger

B 12-19

1. ELECTRIC PROPULSION PROGRAM: The transfer is going along smoothly. Last week and this week several of our contract technical supervisors are visiting their contractors' plants accompanied by the newly appointed Lewis Research Center supervisors. We have made a special point to keep Harold Finger fully informed of our actions, and he has indicated his approval and appreciation. ✓
2. NUCLEAR PROGRAM FUNDING: Schwenk, Novik, and O'Neill of NASA Headquarters were contacted this week by Dr. Shelton as a preliminary to our efforts to get some Nuclear Vehicle Technology money in MSFC's 1963 RIFT budget. This promises to be a tough project because of the Headquarters penchant for using only Lewis Research Center consultants. ✓
3. RPD'S FUTURE ACTIVITIES: Further discussions were held with Mr. Maus to identify areas in which RPD could contribute to MSFC's portion of the Manned Lunar Landing Project. ✓
4. ORBITAL OPERATIONS: RPD is in the process of formulating an 8 million dollar Orbital Operations Supporting Research Program for MSFC. Have we received any indication from Mr. Holmes whether we will obtain funds for such a program?

↖ Was discussed, but issue is still open. Meanwhile, suggest you discuss with Hanssonman the new "Lady Richard Concept" of orb ops.  
B