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~~TOP SECRET~~

[redacted]

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26 September 1958

MEMORANDUM FOR THE RECORD

SUBJECT: Trip Report - CORONA

REFERENCE: [redacted]

1. As a follow-up to reference memorandum, CORONA items listed were discussed during the week of 15 September with representatives as indicated. The status of each item is in the same order as that listed in reference.

a. Draft of Operations Order - Prior to the meeting with Col. Sheppard at BMD, it was the impression that he wanted to work on the draft of the Operations Order which would concern the operational control procedures between Project Headquarters, BMD, and the Palo Alto Control Center. However, this impression was erroneous as Col. Sheppard was primarily interested in drafting an operations order which Col. Sheppard expects will appear as the Headquarters USAF Operations Order covering support requirements of all field activities concerned. He has been most concerned over the fact that there has not been any USAF directive covering support requirements and he feels that this is necessary before he runs into road blocks which may affect our launching schedule. Paramount to the preparation of this USAF operations order was the orientation of the cover story. [redacted] proposal was generally acceptable and the draft was prepared so as to be consistent with the proposed cover story.

b. Operational Control Lines and Procedures - Col. Sheppard agreed that there should be a document which formalizes the relationship of the Project, BMD and PACC. It should include as many of the aspects of Headquarters' policy and control procedures as is appropriate. Neither he nor L/C Mathison (Commander PACC) took any exception to the position that Project Headquarters should have complete operational control as regards timing of launches and target weather considerations. This point was also appreciated and accepted by Jim Plumer of LMSC. It was realized and understood that target weather considerations would introduce operational delays. However,

[redacted]

all agreed that this would not have any appreciable effect on the technical aspects during countdown. A draft of a "Letter of Understanding" will be prepared and coordinated with the staff prior to the next visit.

c. Central Message Format - L/C Mathisen stated that he had used a rather informal central message exchange between BSD and Patrick AFB when he was controlling launches from Cape Canaveral. However, these dealt with technical matters primarily. He did not have any examples of these messages for examination at the time, but may be able to get them prior to the next visit. At the same time, he could foresee no objection to any type format that we might want to use. Work is underway on preparation of the central message formats and sequence.

d. Structure of PACC under BSD as regards CORONA - Attached as enclosure #1 is a proposed task organization under BSD which will control CORONA launchings, as well as the biomedical launchings.

e. Physical Recovery

(1) As previously indicated, I have been quite skeptical on the feasibility of successful air recovery. After considerable detailed discussion with [redacted] (engineer in charge of recovery), Plummer, Mathisen, [redacted] (Commander of C-119 squadron) and his operations officer, I am a little more optimistic than previously! As was pointed out at the progress meeting, considerable and, I believe, adequate testing of the hardware will be conducted.

(2) By fortunate coincidence, [redacted] and his operations officer brought one of the C-119's into Moffitt Field on 19 September. This gave me the opportunity to look over the equipment and discuss techniques and procedures with these individuals. The All American recovery gear is reasonably simple and should be easy to maintain. It is certainly sturdy enough to do the job, as it was designed to pick up the much heavier loads associated with the 119-L program. The booms which hold the line are inserted manually into sockets horizontally and then hydraulically extended to position. There is a power winch installed which incorporates a slip clutch to relieve G loads.

(3) There are to be nine aircraft and nine crews. A crew consists of pilot, co-pilot, engineer, navigator, reel operator and four boom operators. For purposes of crew integrity, a crew will not

[redacted]

be considered in a ready status unless at least the pilot, navigator, read operator, and two of the boom men have trained and qualified together. [redacted] is quite enthusiastic as to the quality of the crews which have been provided. Most of the aircraft commanders were in the 119-L program. All crews will have been qualified at Edwards prior to deployment. It is also planned that continuing proficiency training will be conducted at Hawaii. Providing favorable contact can be established and the C-119 can get to the vicinity of the package, [redacted] is of the opinion that it is practically a surety that a pick up can be made on no later than the third pass. The reason that it may take as many as three is because crews are having it emphasized that unless all conditions, such as speed and altitude, are correct they are not to attempt to pick up. He further stated that practically all pick ups are made on the first pass.

(4) [redacted] stated that the aircraft were in acceptable condition when received and by the time they are deployed to Hawaii should be in top shape. He expects that to conduct a recovery operation he will have 100% of his aircraft in commission. This sounds reasonable as we should be able to give sufficient stand down notice in advance for maintenance purposes.

(5) The critical aspect of this method of recovery will be the ability to pick up the package by the radar installed in the RB 121's and vector the C-119 into position for visual pick up. The impact area is presently predicted by LMSD to be rectangular, 50x225 nm. Their plan is to divide this area into five smaller rectangles 50x45 nm. Providing the package can be picked up by radar soon after the parachute is deployed and it is within the predicted area, time wise, there should be no problem in getting at least one C-119 into position. Further assistance is available in the form of a receiver which should receive signals from a transmitter in the descending package. The weakest part of the air recovery principle is, of course, weather or other conditions which may prevent visual contact in sufficient time to make recovery before the package descends to the water.

(6) As pointed out at the progress meeting, there is a further back up in the event surface recovery is necessary. A minimum of five destroyers or other comparably fast surface vessels as levied by LAC is considered rather ambitious and probably beyond that which we would be able to get from the Navy. Further, if there proves to be any damage which would cause leakage, the pod may not float long enough for surface vessel recovery. In this regard, the possibility of some other and more positive means of surface recovery is being investigated. At the moment

this involves the use of amphibious aircraft and/or parachutists in addition to whatever surface craft can be made available. Further developments of this aspect will be reported upon later. Any action on these requirements will be done for or in the name of BMD.

f. Navy and Air Force Support Requirements - BMD and/or the PACC will arrange for the use of the Pacific Missile range and for the Navy to provide the down range telemetry ship. The status of the Navy surface ship requirements has been stated in previous paragraphs. BMD has been receiving excellent cooperation from all elements of the Air Force concerned with support. Publication of the USAF operations order discussed in paragraph a should formalize these requirements.

g. Handling of Recovered Pod -

(1) LMSD is designing an hermetically sealable container to go aboard each potential recovering craft, be it air or surface. Plummer advises that Walt Levison (ITEK) wants the condition of the recovered pod to remain status quo until delivered [redacted] for processing. This is a change from the original thought that, if the recovered pod had been exposed to moisture, it be flushed with and immersed in clear water for delivery [redacted]. The design will, therefore, be air and light type. A procedure will be established which will direct the recovering crew to immediately insert the recovered pod in the container and seal it in accordance with accompanying instructions.

(2) A procedure will also be established whereby the container will be taken from the recovering aircraft (presumably) and accompanied [redacted] by one of our security couriers. As elapsed time between recovery and processing is most important, arrangements will be made with USAF to provide fast transport. There will be no attempt to examine the condition of the film prior to arrival [redacted]

(3) Arrangements have been made with LMSD to provide a pod for [redacted] to use for practice unloading in the dark. Plummer stated that he could use the development model after GE is finished with it. This practice package will include the standard shipping container with enclosed pod and exposed unprocessed film. He further stated that he could arrange to have someone from GE go to [redacted] and show [redacted] how to use it. This has been passed on to [redacted]

h. Launch and Recovery Weather Criteria

(1) Mathiesen preferred to be non-committal on launch weather until he had an opportunity to discuss this with Douglas Aircraft. Previous THOR launchings have been delayed for favorable conditions in order to afford visual tracking as well as radar tracking. This subject will be dealt with in more detail after Mathiesen has had an opportunity to discuss it with Douglas.

(2) Recovery weather criteria have not been established. Ideally, it should consist of cloud free weather with good visibility below 10,000 feet. Quite naturally, as the percentage of clouds increases, the probability of successful air recovery will decrease. This, I believe, will develop into a matter for our decision at the time of launching, based on the recovery area weather forecast. This criteria will undoubtedly come into sharper focus as the C-119 unit gets into the simulated recovery phase of testing. This aspect will be monitored very closely with findings reported as appropriate. It is pointed out that this has direct reference to paragraph e above regarding more positive back up for surface recovery.

i. Orbit Azmith Selection - As announced during the Palo Alto meetings, the launch azmith has been established as 120°. This decision, predicated on range safety, is apparently firm. As this represents the necessity for boosting an additional 80 pounds (as compared to a 163° launch) any relaxation of range safety rules would give us adequate orbit azmith selection. This is further defined as approximately a selection between 170° and 180°. With this latitude of selection, almost complete ground coverage within the target area should be possible, especially when we get into orbits of two days duration.

j. Orbit Azmith Accuracy - Plummer did not have this immediately available and is mailing it to arrive sometime this week.

k. Orbit Time Accuracy - Here again, Plummer did not have this at his finger tips and will send it. He did make the prediction that accuracy should be within plus or minus one minute. With the eccentricity programmed, time in orbit is predicted to be 89.2 minutes.

l. Flexibility during Countdown - Based on the earliest time which PAFB advises they can have a complete vehicle ready for launching, any operational control or delay after that time is acceptable. The final

pad countdown commences three hours prior to launch during which the final check out of the two stages; erection and fueling is accomplished. Practically speaking, our go-no-go message, providing it reaches the unit by T-3 or 4 hours, should have no effect on the technical aspects. The one exception to this would be the necessity for maintaining the payload package on the pad during the delay period. As we get a little more insight into the climatological factors, it may prove more feasible to give the go-no-go at an earlier time so as to avoid having to transport the payload package to and from the secure area at Vandenburg.

m. Common Map Projection - The original idea here was to have a common chart from which we could calculate an orbit azmith which would give the most desirable and/or efficient terrain coverage based on target and weather considerations. However, after discussion with Plummer, this can be arrived at more accurately through use of a computer which LMSD has. As I understand it, this computer, when given the launch point, orbit time and geographical coordinates will produce the proper orbit azmith. At first blush, this may involve an unacceptably complex arrangement; especially in view of probable errors in orbit azmith and time. In the meantime, an orbit computer, the design for which I have gotten from Plummer, will be fabricated locally. This should give accuracy within five to ten miles of the computer answer and will be more flexible and can be arrived at quicker. This aspect will also be investigated further and the most feasible procedure established.

n. Camera Capability - [redacted] is making a set of charts for our operational use which will portray the range of acceptable photography. As now designed, the camera will incorporate no filters. There will be a speed selection of two types of film. He advises that any speed or film selection (the only variables) should be made two to three days before launch time. This will give adequate time to load the proper film and adjust the slit width. The programmer which controls camera turn-on and turn-off times will be accurate within 1° of latitude (or 60 nm). The programmer tapes are cut on the ground. However, to cover the eventuality that orbit time may be off, the programmer can be zeroed on any one of the nine orbits over which the telemetry stations will have control.

o. System of Mission Number Assignment - Mathison advised that, to his knowledge, there is no standard system of mission number assignment within the missile community. From viewing movie films of the Canaveral findings which Mathison had, it appears that the contractors probably numbered them similar to the manner in which [redacted] numbered our System IV sets; such as 101, 102, etc. Prior to settling on any system we will check with Art Lundahl to insure that there is no conflict with any other series of missions which he has catahoged.

p. Other Firings at Vandenberg during our Operational Period - There is to be one IRBM missile firing by SAC prior to the start of the 117-L series. From a cover standpoint, this, as well as the first two test launchings and the following two biomedical shots should satisfy most of the early interest and curiosity. The firings during our period are yet not known, however, it is assumed that SAC will have firings during this period. Except for pad availability this should have no adverse affect.

q. Communications Link - An administrative link in the Palo Alto area was not considered necessary by Mathison, Plummer and [redacted] They had no strong objection, but rather felt that the monthly meetings accomplish most of the business with occasional telephone calls handling the more urgent matters. However, Mr. Kuners felt, and I agree, that the use of the telephone too frequently is not only expensive, but can affect security. Space is available at both [redacted] and the PACC area. Plummer would prefer it in the PACC and Mathison is providing space in his control room. For cover purposes, the operator(s) would be a part of Mathison's shop and the link would ostensibly be with BMD. An operational target date of 1 December has been established. [redacted] will check into the space, security and operator requirements and place the necessary work order for equipment installation through [redacted] office. It is probably that billing will be accomplished through [redacted] office in the same manner as the installation at BMD.

2. As indicated in paragraph p above, the schedule of other firings during our period is not known. However, Mathison is checking into the availability of a second pad to cover our needs in the event of a pad disaster or overlap with either a bio-sed firing or a SAC firing.

3. Other items on which action will be taken as the time is appropriate are:

a. Determine reproduction requirements (from Mr. Huber and [redacted]
b. Order duplicating film
c. Determine titling format
d. Establish system of feedback

[redacted]

Lt. Col., USAF
Deputy Director Operations

Att:
[redacted]

[redacted]

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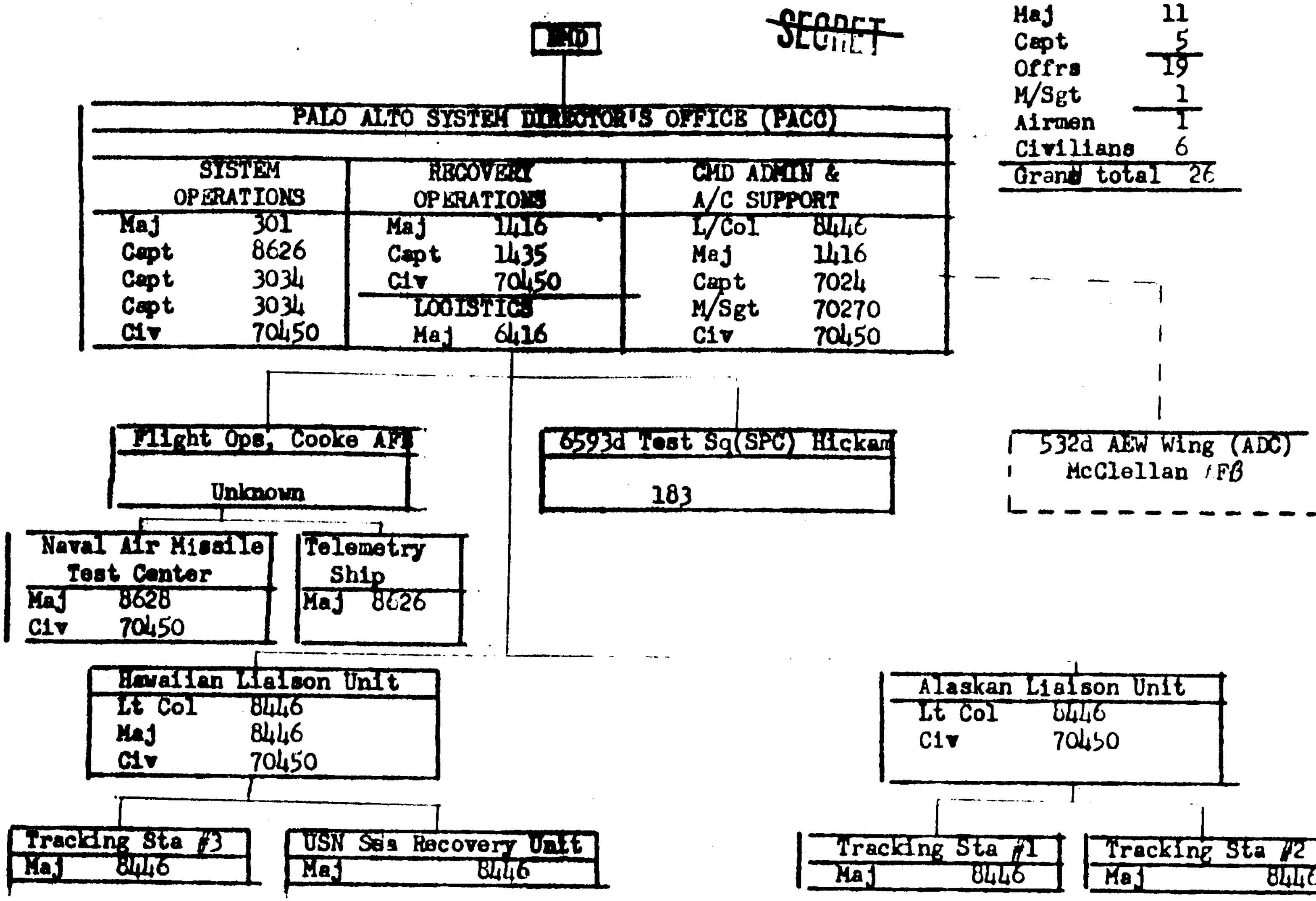

Agg	
Lt. Col.	3
Maj	11
Capt	5
Offrs	19
M/Sgt	1
Airmen	1
Civilians	6
Grand total	26

Note: 1. Proj Hqs will exercise operational control of CORONA launchings direct to PACC.
2. This chart is current proposal and subject to possible later changes.

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