

DEPARTMENT OF THE AIR FORCE
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REPLY TO
ATTN OF: AFCSG-11

SUBJECT MA3 Simulation Tests, Canary Island Station

29 March 1961

TO Capsule Communicator, Canary Island Station

Drs Stanley White and William Augerson, Space Task Group

1. As requested by you on 22 March 1961 this report constitutes a summary of observations of station activity at the Canary Island Remote Site Project Mercury Monitoring Station during conduct of simulation test 835 in preparation for MA3. During this period the undersigned participated in station tests as aeromedical flight controllers.

2. General Comments:

It appeared that the entire operation was started without adequate preparation. The briefing at Canaveral had too many people of diverse views and was more a discussion than a briefing. Little of aeromedical monitor value was obtained and thus if it is to be the pattern of future pre operations briefings there must be more detailed medical input. Such important things as what we were to measure and report on the simulation and on MA3 were left out and perhaps these are not yet finalized.

a. A separate medical briefing is indicated following the general team briefings. This could be held at the Cape and would answer many questions. On manned shots this should include a meeting of aeromedical monitors with astronaut and his alternate. A simulation run on the trainer at Langley would be helpful prior to mission if time permits.

b. On arrival at the station, unfortunately and unavoidably late, no time was taken to introduce all involved and then have a general briefing on what was to be done. As a result many people were in doubt. This is further complicated by conflicting instructions to various groups before departing Langley, and then by a lack of overall direction and inability of a given monitor to determine who is in charge and who does have the answers--if anybody.

c. There was apparent conflict and need for definition of the role played and authority possessed by personnel from Space Task Group, IRD and flight controllers (capsule communicator). Much of this undoubtedly resulted from a lack of adequate communication of information and more attention must be focused here if personnel are to adequately do their jobs. Millions have been spent on communications equipment for this project, let us spend a little on personal communication. If the site was indeed undergoing an acceptance test, it is suggested that in the future such tests be separated from operational exercises.

d. The chain of command for flight controllers must be understood and made clear to site personnel, i.e., the capsule communicator must be given complete control of his flight controllers so that he may schedule their work periods as he sees fit.

e. The station manager and the personnel seem to be a good working team and all know their jobs, but also suffer from a lack of information about the overall project, where their job fits in, and who is doing what to whom. A planned briefing from our group was given on Friday.

f. Monitors should be sent to sites as soon as possible and have ample time to become familiar with the local medical, and preventive medicine situation as well as with site personnel and their duties and capabilities. It is obvious that our monitors are not expert and thus need every opportunity we can be offered to obtain actual operational simulation of mission practice with the entire team. The very brief period at Langley has hardly qualified me as an instructor, and even the full time people such as capsule communicator and systems man are finding many problems in actual operation of communications equipment, etc. Again knowledge in one area does not necessarily qualify one as an expert in all fields. Two monitors will be needed and can be well utilized if we set our own schedule with the capsule communicator so they can rotate freely and handle both monitor and other aspects of the job. Adequate rest can thus be obtained, and it should be understood that two may frequently be at the console for training purposes. This site and Bermuda are to be used for training and it cannot be obtained by being relegated to the back room as was done merely for the sake of cutting down personnel in the control room.

g. We are both agreed that it is urgent that all aeromedical monitors be given some kind of ball park schedule to assist in planning their personal schedules. All have many other duties and also must accept engagements, plan leave, etc. If the current plans for MA3 are carried out, Lt Colonel Berry will have to cancel three important engagements for instance. These were all made months ago and are rather serious and important commitments. We are all adult enough to interpret such a ball park schedule realistically, and those in the ZI are fortunate in being able to contact the Cape direct. An effort should be made to give greater lead times in duty calls as orders, particularly overseas orders, are difficult to secure on short notice. Issuance of a book of TR's would also materially assist travel.

3. Medical Situation

The very dire reports received prior to deployment were exaggerated in my opinion. The island has problems, but the city of Las Palmas is large and has some rather modern facilities, including good restaurants. Bottled

water should be used and salads should be avoided. The butter is imported and good. I did not get to visit the hospitals nor did I have a copy of Dave Morris' report available. The latter should be available to both of us prior to next deployment. Dr. Ward saw a copy on file at the U.S. Embassy in Madrid. I talked with Dr. Roca of the British Hospital by phone. He is the Project Mercury local physician under contract or by use of charge account to the site manager. He was cooperative and anxious that I visit him. In view of the apparent adequacy of the local hospital facilities and the stated opinion of the site personnel that these facilities are adequate for their care, I see no need to assign a medical technician on a permanent basis.

a. Several site personnel have had rather serious diseases and the physicians were quite free to have them evacuated. Included were cases of questionable typhoid and meningitis. Three babies have been born to site personnel families and they are very satisfied with the service. Site personnel also stated that they felt the flight surgeon assigned should certainly bring his bag along and be available for emergencies, and I strongly concur in this feeling. No formal sick call need be held, but the monitor should be available for consultation if needed. The only diarrhea observed during the visit involved two of the aircraft crew. One also developed tonsillitis. Minor gastrointestinal complaints are common among site personnel.

4. Operations:

A lack of understanding of the human machines involved in this operation was displayed by several of the observers and critics. Totally unrealistic and excessive duty hours were established by the use of the 40 hour countdown. A general philosophy often pervaded the test that seemed to dictate that prolonged lack of sleep could be equated with project dedication. Although such devotion to the project may be commendable, during manned flight monitoring, more attention must be given to crew rest. We are in no position to comment on how this should be programmed but as physicians it was apparent that most of the site personnel became frequently and chronically fatigued. In order to arrive at 0200 or 0530 at the latest. It is not possible to return to the city (1½ hour trip each way) until the end of the working day, frequently 1800 hours, and no encouragement is given to any form of recreation on the site during slack work periods. Every effort should be made to keep the on station (duty) time to the least possible amount consistent with reliable countdown pressures and T-3 is certainly adequate for flight controllers for this mission.

a. Debriefings were excessively long, dull, and filled with trivia involving only a few people. Comments were often made without adequate basis of understanding the entire situation, and were thus frequently in error. There seemed to be a contest on for the person who could make the most damning comments and on the whole the attitudes displayed were quite childish.

b. Even with adequate rest, provisions must be made for flight

controllers to leave their posts on occasion, and all personnel should be allowed food and liquid either at their posts if necessary, or on a rotation plan. On one occasion posts were manned continuously from 0800 to 1630 without a break and without food or liquid. Use of any site playing facilities should be encouraged during periods of known inactivity.

c. Objections to newspapers, food and cigarettes should be overruled. The criterion for judging whether or not particular routine (i.e., reading a paper when events are slack in minus time) is acceptable or not should be based on whether the operator concerned is doing his job. While, for any operator, there might always be room for improvement, relaxation periods are necessary and do occur. It should not be necessary to put on a show of being extremely busy at all times. If any operator is not accomplishing his task whether or not he reads a newspaper occasionally in minus time, he should be informed constructively as to where his procedures need polishing.

d. The Capsule Communicator is obviously overworked and has difficulty in observing the events lights. Surgeons could possibly assist and we tried several things, such as helping with messages, recording the events, checking these on the events recorder in TM, etc. Suggestions were made that Surgeons screen all messages for Capsule Communicator and also handle the communications intercom during the busy pass period. These are good for MA3, but should not become routine for the Surgeon will be excessively busy on any animal or manned shot.

5. Communications:

Several comments were made with reference to communication procedures at the debriefings. This will be an area needing more practice by the Surgeon, but the procedures should be viewed critically if they are causing difficulty. The necessity for having flight controllers continually identify themselves is questioned, for they can look at each other while talking. What is the purpose of having this identification on tape? Is it to be used to pin someone after a flight?

a. Intercommunication System

1. A definite requirement exists for "monitor position" buttons for both Systems and Surgeon Flight Controllers for both "M & O" and "T/M". Frequent delays were encountered because of this deficit.

2. A "T/M Loop" button should be considered for both Surgeon and Systems Flight Controller, for calls directly to T/M for assistance in calibration.

b. Messages

1. It is recommended that a central (GSC) master number be given all messages transmitted to stations from GSC for ease in filing. Time of origination of message by writer should appear in summaries and time of

start of punch to time of end of punch of TTY tape noted. This is not to put undue pressure on TTY operator but to find out whether it would be advantageous to split summary message from events and send events first. They are important at beginning of mission especially and to hold up events for meter readings (possibly a minute or two) (maybe more) seems to be a practice open to question. Let Capsule Communicator (CYI) originate an events message, independent of summary message and send it as soon as key events have occurred.

c. Summary Message

1. Summary message formats should be supplied by STG and not locally reproduced on station.
2. Overlays for decoding summary messages are essential and should be furnished by STG.
3. The order of appearance of figures in the summary message should correspond with flight controller panel dial position.
4. Finalization of information to be contained in summary message for MA3 should be made.

d. Post-Pass Message

Flight controllers should be informed of desired data to be included in this message for MA3.

e. Flight Controller Panel

1. More realistic and accurate color coding limits for meters should be made. The dial face on cabin temperature gauge is incorrect having 5 divisions between 40 and 80.
2. Pulse meter can probably be permanently removed or blocked off, even for man missions since the same information is more immediately and more accurately available on the EKG scope. An alternative to this would be to reduce the amount of sampling time for this function.
3. If % scales will be used on the actual MA3, these should be immediately supplied to the station. Their use for biological parameters requires two decoding operations and should be seriously questioned.
4. Final criteria for tolerances of accuracy in calibration of dials should be made, i.e., at BST time.
5. If values for meters will be reported in %, consideration should be given to calibrating all meters at the same time Capsule Communicator determines integrity of event light panel.

6. It is recommended that for MA3 only 2 (5 & 10 mm/sec, Sanborn speeds be used for recording acceleration and motion at the aeromedical monitor position.

7. A clarification of range for pitch, roll and yaw rates must be made, i.e., $\pm 20^\circ$ $\pm 40^\circ$ or ± 13 or what?

8. A confirmation is needed that only $\#$ acceleration will be recorded at the Canary Station.

9. Pen recorder gate and channel assignments must be finalized.

f. Guidance is needed on a firm outline of the various messages and the medical input.

g. Countdown should be firmed and copies of all, trial or not, available to all flight controllers. In the countdown the times should be indicated as hours or minutes and kept that way. In the present one the plus time is in minutes but the symbols used are identical to the minus hours.

h. An early decision should be made regarding trend plots for aeromedical monitors and these should be used to gain familiarity at an early date.

i. There is an acute lack of current world news and NASA (shot etc) news at remote sites. A daily TTY message should be used to disseminate news to these stations. Standard TTY and message forms should be used. Too many abbreviations, most non standard, are used in all Mercury messages and publications including FCH-1 changes.

j. There must be some medical supervision of site sanitation.

k. The MA3 Capsule Communicator is distracted from more important tasks by communications checks which are valuable but not urgent. Obviously, he will give primary effort to mission operation data. Excluding intermittent voice transmission (in which timing is apparently important) observinv events for MA3 should present little difficulty.

6. Site Facilities

The site distance from town and the billeting, some one and one half hours by microbus, is a problem in scheduling and in obtaining adequate rest. It is rather isolated and in the primitive part of the island.

a. Food facilities are non existent except for the small "Howard Johnsons" across the street. It is run by a very obliging Spaniard, Antonio,

who has accepted the help of site personnel in screening the place and offering canned food, etc. The source of the water and the washing of dishes is suspect, (irrigation ditch) but there is limited fare. Further efforts should be made to secure his cooperation in assuring good water and dish washing, and fly control.

b. Food must be made available either here or by installing facilities on the site. This is especially important if current plans to billet crews at the site during actual countdowns are adopted.

c. There is a need for another toilet in the site building. One stool is inadequate, particularly when several have diarrhea.

d. A method of reproducing changing data such as countdowns is needed and should be standard for all stations. A verifax machine is recommended.

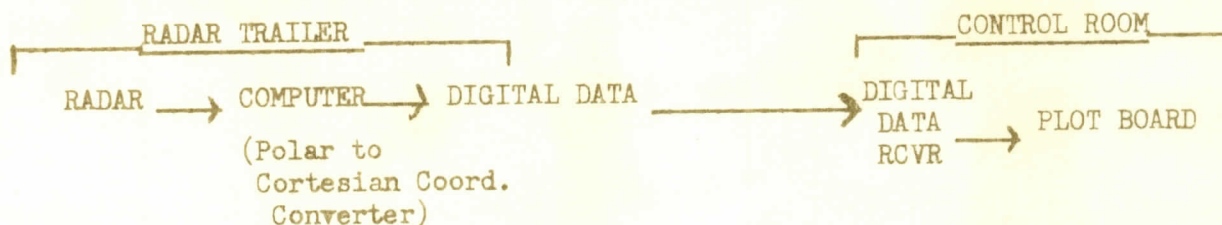
7. Miscellaneous

a. PLOT BOARD:

The plot board has been placed in the control room in an effort to offer additional information on capsule track to the flight control team. Its operation was discussed with the local operator and it was monitored during a simulation in order to determine its usefulness, limitations and manner of operation.

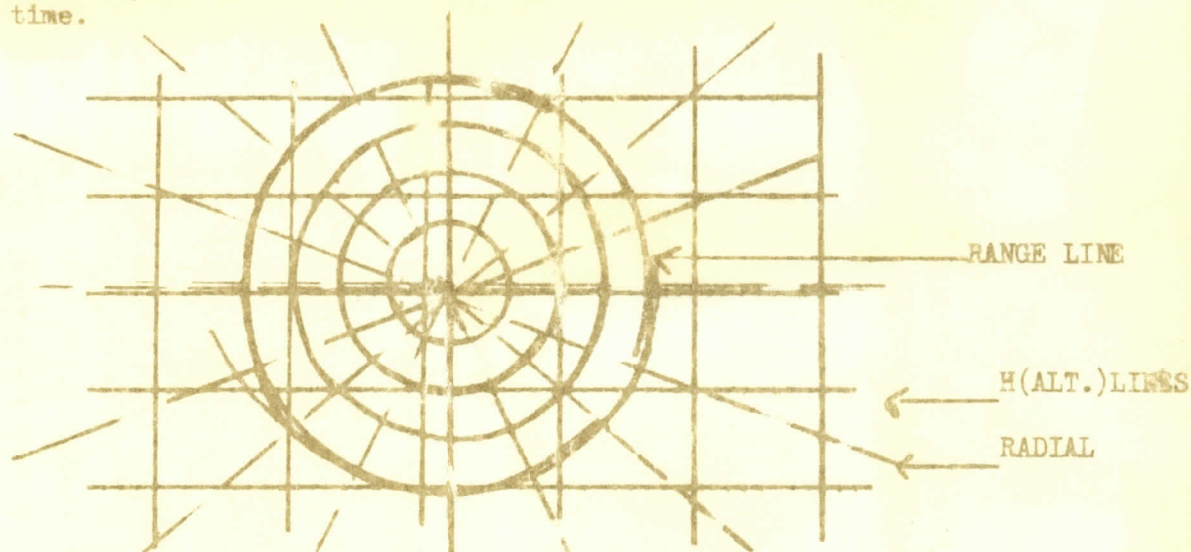
First the manner of operation is discussed. All data for plotting is obtained from radar. At most sites the proximity of radar and control room allow transmission of data via direct cable. At CYI the radar trailer is located some distance from the control room and thus a digital data link is involved.

The data flow is as follows:



The data to be presented involve the X and Y position coordinates or azimuth and the z or short range converted to H (height of capsule above earth's surface). The board consists of horizontal and vertical lines showing through the paper and assigned on altitude scale. Coordinates are presently drawn by the plot board technicians using the station as 0 point. Circular range lines are placed about the 0 point. A pre plot of the expected course is drawn on the board and when data are available the green pen marks capsule height or altitude, and the red describes the capsule course as the track gets closer to station or 0 point, it is desirable to

enlarge the scale for range and thus the capsule track pen moves farther out on the same radial as the scale is increased. This could perhaps be made less confusing by using a differently scaled plot paper at that time.



At present the range and radial lines are laboriously hand drawn prior to each mission. An attempt should be made to secure standard paper for each site having range and radial lines drawn, and also utilizing geographic features and inserting latitude and longitude which would aid in recovery location.

The plot board can then provide range and azimuth information concerning the capsule and thus be of value in determining overshoot, orbital passes, etc. It could also be of value in locating capsule after splash near Chl.

Its information is as good as the radar information it utilizes. Additional error could be introduced by having the digital loop involved here. It seems quite reliable. The operator is currently hampered by a lack of communications in that he has contact only with the radar men. He should be tied to M & O loop also.

b. Dr. Ward informed me that the recovery plan developed by Colonel Duff (USAF) is at odds with the plan to use aeromedical monitors in the contingency recovery areas. He has a plan involving USAF physicians stationed in Africa. This should be investigated.

c. When mission rules are being finalized, there should be definite medical limits established as guide lines. There is obviously no need for this on MA3 but we should be thinking of the biological flights.

Charles A. Berry
 CHARLES A. BERRY
 Lt Colonel, USAF, MC
 Aerospace Medicine Division
 Office of the Surgeon General
for
 J. E. WARD
 Major, USAF, MC
 Aeromedical Flight Controller