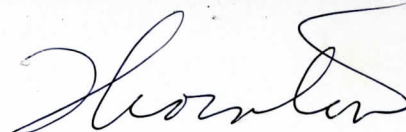


UNITED STATES GOVERNMENT

# Memorandum



TO : DD/W. R. Hawkins

DATE: November 3, 1969

FROM : CB/J. P. Kerwin

SUBJECT: Bioinstrumentation and Data Processing Requirements document, Revision A

I have reviewed the document and would like to comment on it as follows:

1.0 I agree that extra-vehicular activity (EVA) requires monitoring. I do not believe there are any intra-vehicular activities that require it. On such experiments as M509 I would suggest that we plan to monitor, but not make it a go-no-go requirement nor require that the data be available to the ground in real time, as IVA in a pressurized workshop is not hazardous.

As to crew activity in a compartment having a separated atmosphere, this is never the case. During EVA, the third crewman will be separated from the Airlock Module center compartment, of course, but will still be breathing cluster atmosphere; and there is no need to monitor him.

As to sleep monitoring, it is our understanding that the EEG-EOG system is an experiment (as yet unassigned) and not an operational requirement. I do not think you can justify it as an operational requirement. The crew would object operationally to wearing an EEG/EOG harness every night as an interference with sleep.

Now let's talk about the personal telemetry system. We certainly agree that, in the cluster, crewmen should not be encumbered by an umbilical. In fact, no such umbilical exists except for suited work and specific medical experiments, and we use speaker boxes for comm. To make a personal telemetry system useful to the crew it would have to include comm provisions, which you did not mention, and which unfortunately increase the power requirement, bulk and complexity of the device greatly. It cannot be used for EVA, because a) we do not want to have to design the suit and the Astronaut Life Support Assembly (ALSA) to interface with it b) film retrieval EVA involves being out of line-of-sight of Airlock Module antennas and c) comm reliability would be degraded compared to a hardline system.

A system without comm would be useful for medical experiments if you made it compatible with their data requirements, but again is not required. That leaves the "continuous monitoring" requirement, which you want but say you won't normally use. Personally, I cannot think of a medical condition which would a) require continuous (i.e. over ground



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stations) monitoring and b) permit the man to continue his normal activities. Frankly, what concerns us about personal telemetry is that if you get it, you will want to use it, and the crew will wind up wearing electrodes all the time.

To summarize:

- a. We have no basic objection to personal telemetry but
- b. we won't wear it in the CM
- c. we won't wear it EVA;
- d. we see no other requirement for it.

3.2 Onboard analysis: There is no onboard requirement for heart rate on the caution and warning system.

4.2.4 Event Modules: What is meant by astronaut location of activity? Are any crew procedures implied?

Table 1: We think we understand that a listing of "continuous" on this table does not indicate that the measurement will be monitored continuously, but only that the hardware be available at any time. To preclude later misunderstanding, I'd like to list our impression of when medical monitoring will be performed on a nominal mission, so that we can write a proper flight plan.

- a. Launch. Sensors normally removed when suits are doffed. Not mandatory if launch is unsuited.
- b. EVA
- c. Appropriate medical experiments
- d. Medical diagnosis as required. Since the present flight plan calls for each crewman to participate in a medical experiment at least four times a week, special additional "status checks" need not be scheduled.
- e. Experiments involving suited, pressurized IVA.
- f. Reentry, suited or unsuited.

*Joe*  
Joe Kerwin

cc:  
AAP Astronauts  
KS/C. Williams  
EC/M. Lippitt  
DA/D. Catterson