

UNITED STATES GOVERNMENT

Memorandum

TO : DE2/Dr. Sam Pool

DATE: June 17, 1969

FROM : CB/Dr. William Thornton

SUBJECT: Comments on PDR-GE "Flight Breadboard" IMBLMS first day

E.E.G. data gathering has been made even less useful through elimination of any attempt or consideration of sleep analysis. Lawton claims Earlson finds capacitance; Whitney gage and impedance measurements equally acceptable. This was not my impression on a recent lab visit. The pulse wave and velocity measurements have a number of errors as proposed. G.E. obviously intends to get a quadrapole mass spec. paid for by NASA. Are they most suited for this development? A glaring bit of myopia was the assumption that the environment would be sea level and shirt sleeve. This is obviously convenient to G.E. but only to G.E.

The behavioral areas had a couple of large omissions. The first was attempting any form of audiometric measurements and adequate, as for that matter, any noise isolation of the subject. This was further extended by total ignorance of probable on board noise levels as any attempt to isolate the subject. There is absolutely no point in attempting any sort of audiometry without adequate noise elimination, and the proposed attempt to do so reflects rather poorly on the knowledge and judgment of the proposer - useless as proposed.

Tests of mass discrimination, which was frequently confused with weight discrimination, in a Neutral Buoyancy tank, strikes me as somewhat futile. If the masses are rendered weightless they must, by definition, be of the same specific gravity as water. If they are not, one is testing wt., not mass. Conversely if specific gravity is 1.0, then the subject may as well grasp a handful of water since only resistance will be felt. In space one will attempt mass discrimination by acceleration of the masses and sensing the resulting inertial forces.

The proposed laboratory analysis meas. strikes me as by and large, useless. G.E. was to be commended on their criticisms of ion electrodes, yet when it comes to actual practice they are apparently being forced to use these electrodes. The whole electrode measurement system seems rather poorly laid out with no thought being given to such techniques as cross correction of electrode or for simplification. G.E. is to be commended for their recognition of the difficulty of handling fluids and performing lab procedures in space, but they show little ingenuity in solving these problems. Here, more than elsewhere, is demonstrated the contractor's total avoidance of difficult tasks, tasks which are usually of primary importance to NASA. The use of ESKA LAB gear is obviously based on availability not flight suitability. Their statement



that they avoided penetrating the skin of subjects because of legal and other problems, demonstrates what should be obvious. G.E. is good at computers and light bulbs but have no real biological capability. This leads to dummy testing of isotopes and elimination of bacterial studies which renders the procedure an exercise in futility.

In safety one hopes there is more circuit protection than simply 2 ma-fuses. The audio noise limit of 110 db. is 25 db. above damage threshold criteria (for 8 hr. day).

It is obvious that no attention has been paid to mass and specific gravity data handling. The interface has been ignored or is unknown. It is disturbing to hear the data handling engineers talk about using 60 Hz as a checkout signal for the EKG. etc.

Computer - why not send the computer up and leave the man behind. Again, G.E. demonstrates strength in power distribution and computers but lack of insight as to purpose of computer.

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