INTER-DEPARTMENT COMMUNICATION
THE MARTIN COMPANY

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TO C. L. Kober cc: W. H. Clohessy

FROM J. G. Gaume MAIL NO. A-153 EXT. PHONE NO.

SUBJECT Justification for RA 621 (Small Animal Research on Bioinstrumentation and Sealed Cabin Development) MODEL

Future programs in the Martin-Marietta Corporation include several manned programs for military space programs. Such programs are being planned on the assumption that man and space are 100% compatible. This assumption may or may not be true. In any case, the space environment and manned operations within it may have various detrimental effects on man and his ability to function in that environment.

Examples of this problem are: 1) Titov's nausea after several hours of weightlessness, and 2) the potential physiological effects of days, weeks, or months of weightlessness on the human.

Soviet reports recently have indicated that animals which preceded the Cosmonauts were also affected in a manner similar to Titov's difficulty, and that the Soviets are reluctant to plan prolonged manned flights until they understand better what occurs as a result of loss of gravity. Obviously, man cannot be used as the experimental subject in long-term weightless experiments and animals must, therefore, precede man into the chronic 0-g environment. Two reasons for this prevail: 1) to measure what happens in the animal and 2) to use animals as tools to develop new sensors, which are not now available, in order to measure 0-g phenomena when they occur. This sensor development must take place in earthbound laboratories and not in the space laboratory. Biological events cannot be adequately measured with present biomedical instrumentation when used in automated systems for prolonged stay in 0-g. Many of the present methods of sensing physiological events for these purposes ~~and~~ are entirely inadequate and not adaptable to the flight conditions which would prevail. Therefore, new methods of sensing such events must be developed. Animals are required in the development as tools only. The animal research is not the end in itself.

In missile and rocket development, every conceivable event which could happen in the bird in testing is provided for in the instrumentation package. As data are obtained that certain "problems" are no longer problems, the instrumentation is reduced and eliminated. If sensors are not available to measure what is desired, new sensors are developed and tested. In biomedical testing, we are in the last-named stage wherein sensor development and testing is the most urgent.

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