Exhibit SPL

# BASIC PHILOSOPHY

This document describes in moderate detail a flight program for exploring the less remote parts of the solar system during the period 1959 to 1964. Exciting discoveries and the verification of important scientific speculations are possible. Indeed, some of them such as extra-terrestrial life and the origin of the solar system are being anticipated and they tend to orient the space exploration program.

These criteria, their interrelationship, their conflicts, and their order of importance form the basic philosophy of the report. These criteria are:

1) The technical feasibility of specific space vehicles;

2) Assessment of the public's reaction to these flights;

3) The scientific and technical merit of these flights.

Each criterion (perhaps "area of consideration" is a more appropriate name) contains inherent elements of uncertainty. It is easier to evaluate the scientific merits of a specific space exploration than

it is to predict the extent of public reaction to its success or failure. Yet public reaction is less difficult to prejudge than the probability of success of rocket vehicles. It is a matter of record that by the time an original vehicle became reliable, a newer, more venturesome model was pushing a greater frontier. There is nothing to indicate the pattern will be different with rockets. But the major uncertainties arise in attempting to analyse hypothetical sequences of events.

While the ultimate value of space exploration depends upon the intrinsic merit of the scientific experiments it performs, their success in turn depends upon rocketry know-how and the public's willingness and ability to finance its implementation. The willingness of a free and honestly informed community to finance space science depends upon its collective curiosity and its pride, accompanied by a sense of urgency to satisfy them both.

Most scientific experiments succeed after many attempts have failed. This is the accepted pattern in science. Space science does not enjoy the same latitude because it is so expensive and because the public takes failures so personally. It is partially the public's self identification

with the space science program that makes them willing to finance it. Therefore, the restrictions placed upon space science become all the more fearsome when a rival nation is not only successful, but appears to have succeeded on its first attempt. Long-range flight scheduling becomes at the same time both essential and precarious. At any time it may be necessary to drop the score and play by ear.

Congressional hearings which culminated in the Space Act of 1958 make it clear that the preservation of the national reputation and the efficient pursuit of space knowledge are two of the Acts primary goals. International competition has made the American public feel more keenly about its reputation than about any other of the Space Act goals. This social situation poses the question, "Is it possible for the space laboratories to conduct an efficient research and development program with the nation peering over their shoulders and periodically demanding spectacular action?"

Part of the space flight schedule is conceived with the preceding question in mind. It is intended, that a logical, stable scientific program will be pursued rapidly, but on a non-crash basis. Some spectacular

"firstness" flights are necessary in order that personnel working on the basic scientific program are not forever diverted into the crash programs. These problems are more thoroughly discussed in Chapters IV and V.

Any realistic program planning requires that the scheduling is flexible. The synodic periods of Mars and Venus are not very helpful in this connection. Nevertheless it is taken for granted that as experimental data are acquired from early space flights, the plans for subsequent voyages will have to be modified. A certain degree of optimism is required.

For example, if a too pessimistic attitude is assumed towards the possibility of contaminating celestial objects, space exploration will be indefinitely postponed. By the time this document was prepared, CETEX, an international Committee on Contamination by Extraterrestrial Exploration, had not submitted its "code of conduct" to COSPAR. Inasmuch as the only method of enforcing a "code of conduct" is to rely upon the United Nations as a sounding board of public opinion, the code cannot afford to be too restrictive. Flight scheduling demands being optimistic, and assuming that contamination problems will be worked out as the program evolves.

However, it is necessary to leave open the possibility that planetary impacts will have to be postponed until after all the near misses and satellite flights are completed, and the microbiologists have had an opportunity to evaluate the observations.

The optimistic schedule does not include any nuclear explosions. It does include plans for sterilization research. Chapter discusses the subject in more detail.

Estimates of the information transmission rates that will be available in the next few years also reflect an optimistic outlook. This is partially compensated by conservatism in estimating the weights required for upper stage guidance and control and in the weights made available for scientific instruments. Even conservative estimates on the weights available for scientific instruments allow for the planning of some sophisticated experimentation.

In formulating the basic program for deep space exploration, certain ground rules naturally evolved. One such subcriterion is that the experimental apparatus required for observation be perfected as rapidly as are the rockets needed to transport them. It is a corollary

to this rule that the scientific instruments be more reliable than the rockets. These rules are consistent with the Space Act objective of "efficient and rapid pursuit of knowledge."

The above rules apply to the basic scientific program only. Occasionally, high reliable vehicles will be employed to test equipment for subsequent explorations. Nor do the rules necessarily apply to desperation flights where a vehicle of questionable reliability is employed and virtually any success is regarded as a moral victory.

Perhaps the primary technical project of the NASA is to put a man into space. This was originally regarded as a criterion in attempting to formulate a basic exploration program. However, it was never in theoretical conflict with the other criteria, primarily because virtually every space exploration experiment contributes something to the man in space program.

The National Academy of Sciences regards the man in space program as an end in itself. Until a scientist can be landed on another planet and returned to the earth, it is very improbable that his presence in space

will provide more definitive scientific information than the same weight of instruments returned to the earth. When the art of rocketry allows man to travel from other planets and back, the man in space program will create new relationships between the three criteria mentioned at the beginning of the chapter.

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