

We would also be carrying out observations of the local environment and conducting an extensive solar observation program and a planetary observation program from the various vantage points one attains from an orbit that is far removed from the Earth.

Mr. FULTON. Why couldn't you put an instrumented capsule in orbit that was a long elliptical orbit that would have two focal points, the Earth and Mars, and leave it there and man it from Earth?

Couldn't you do something like that rather than just a one-shot program?

Dr. MUELLER. That is possible. The major problem associated with that is that we are talking about a sizable telescope, at least 40 inches in diameter. It is a quite difficult task and we are reaching a level of complexity where man becomes an essential part of the system. The use of man becomes mandatory as the system complexity increases beyond a certain point, and for this kind of a mission it is clearly one that would have to be manned.

Mr. FULTON. So you really need a manned Mars mission as well as an unmanned flight?

Dr. MUELLER. That is right.

Mr. FULTON. That is all.

Dr. MUELLER. Now, the flight opportunities (MT 66-10,222, fig. 11) for such a flyby are relatively frequent in the 1970's, they run from

TYPICAL MARS/VENUS RECONNAISSANCE FLIGHT OPPORTUNITIES

LAUNCH DATE	LEGS IN DAYS	DURATION IN DAYS	ΔV INJECTION FEET PER SECOND	REENTRY VELOCITY FEET PER SECOND
MARS				
SEPT. '75	130/537	667	15,400	49,100
OCT. '77	145/533	678	14,800	48,700
NOV. '79	132/554	686	14,800	47,400
VENUS				
JUNE '75	117/250	367	12,000	44,600
JAN. '77	117/257	374	11,800	44,800
AUG. '78	116/249	365	11,800	43,300
APR. '80	109/250	359	12,000	45,000
VENUS/MARS				
DEC. '78	142/230/253	625	16,000	45,000
VENUS/MARS/VENUS				
FEB. '77		715	13,000	39,700

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FIGURE 11