

the terminals, satellites, and trained manpower necessary to achieve an early satisfactory operational satellite communications capability.

NO. 2, CAPACITY EXPANSION

"The initial system, for which \$112 million has been obligated through fiscal year 1966, was designed with too limited capacity. Despite the large investment, the system is designed to provide only two voice or a 'handful' of data circuits. There are options to expand this capacity with comparatively modest extra cost by redesign of ground and space equipment, or by adding terminals and satellites beyond those scheduled. Some capacity expansion will be obtained by improvement or redesign of ground terminals, now underway. The committee recommends that the Department of Defense expand the capacity of the initial system of 10 to 20 times by an optimum combination of capacity expansion factors."

Comment

In contrast to civil satellite communications systems, which emphasize capacity per unit cost, the most important measures of the value of a military satellite communications system are the extreme reliability, toughness, coverage, and flexibility which it provides to deployed forces, especially during any periods of duress—not simply the capacity of the system. We plan, of course, to have a total capacity available to our forces to enable them to meet the total military needs, including extreme crisis management. At present, we are expanding the capacity of the initial system by adding terminals and by upgrading, threefold, the capacity of some links. We will look to sources other than the military satellite communications system to provide the bulk of this total need.

NO. 3, SYSTEM REPLENISHMENT AND UPGRADING

"The initial system, planned with research and development objectives in mind, will be replaced by an advanced, operational system by 1970. It is important in the intervening period to maintain initial system replenishment by providing necessary boosters and satellites and timely launches for continuous effective operations, particularly after the research and development objectives have been achieved. The committee recommends that the initial system be replenished and upgraded for continued useful service until an advance system is in operation."

Comment

The Department supports the recommendation and agrees that it is important to provide the necessary satellites, boosters, and launches to achieve and maintain a useful, operating space subsystem. Eight satellites were added to the space subsystem in January 1967; these launches have established a minimally acceptable initial operating system. We expect to launch four more by mid-summer. Our current calculations show the probable need for additional launches in early 1968 and again, perhaps, in 1969. The early 1968 satellites will be of essentially the same design as those now in orbit; leadtime constraints preclude major redesign of the spacecraft for this launch. The possibility of deploying improved satellite repeaters to meet the 1969 date is being intensely investigated at the present time.

Before committing the DOD to a particular follow-on system, it is essential that we be in a position to fully capitalize on the experience and knowledge gained from the initial system. The primary objective of the initial system is to obtain system experience so that comparisons can be made with conventional communications means. To complete the system demonstration there remains the task of integrating satellite communications into the DCS network and the testing of procedures and techniques that will be required to obtain a true operational capability.

NO. 4, ADVANCED SYSTEM CAPABILITY

"The advanced system, for which six preliminary configuration studies have been made under contract, and which will enter the contract definition phase in fiscal year 1967 upon approval by the Joint Chiefs of Staff and the Secretary of Defense, will also be a multimillion-dollar project. To insure that the advanced system effectively meets essential military needs and yields a better return on the taxpayers' investment, the committee recommends that the system be designed and built to provide a significant fraction of military traffic. The system should have a capacity of at least 100 to 200 voice-grade circuits to