



MINUTEMAN

The West's Biggest Missile Programme

THE first generation of ICBMs of the USAF Strategic Air Command have cost the American taxpayer something like \$5,000,000,000. Bearing in mind our own rejection of Blue Streak, it might be thought that most of this vast sum had been wasted, for Atlas and Titan suffer from most of the British missile's disadvantages—and most of the first Atlas missiles are not even being put in hard emplacements (underground and protected from nuclear blast, radiation and fallout). But even if Atlas and Titan were militarily useless—which they are not—the money would have been well spent in making the Minuteman feasible.

During 1957 it became increasingly apparent that the first-generation ICBMs were far from optimum delivery systems; one high-ranking USAF officer has said "we felt there must be an easier way." This easier way crystallized as a combination of the following factors: state-of-the-art advances in all portions of the weapon system, to reduce bulk, weight, complexity and unserviceability; a slender, lightweight, ablative re-entry vehicle; a miniaturized thermonuclear warhead; miniaturized inertial guidance weighing under 300lb; high-impulse solid propellant, in a three-stage vehicle with quadruple swivelling nozzles in each

stage; and fully hardened emplacement or mobile deployment. The missile was designated SM-80 and named Minuteman—after the "instant readiness" citizens of the War of Independence—and the programme was placed on a crash basis in February 1958.

Prime contract for assembly and test was placed with the Aero-Space Division of Boeing Airplane Co, and some of the other major contractors are Space Technology Laboratories (engineering direction), Thiokol Chemical Corp (first-stage propulsion), Aerojet-General (second-stage propulsion), Hercules Powder Co (third-stage propulsion), NAA Autonetics (inertial guidance, and ground-support equipment for guidance/control system and electro-mechanical nozzle actuation), Avco (re-entry vehicle and support system), AMF/ACF Industries (launch and command vehicles for mobile system), General Motors (transporter/erector vehicle), Cessna Aircraft (missile container) and Bendix (erection system).

A history of Minuteman's development was contained in our special missile review issue on November 4, 1960. At the opening of this account it was stressed that the entire programme is riding on the back of the vast foundation of technological knowledge gained with the first-generation ICBMs. Everybody con-

