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Advanced Ballistic Missile Defense

The United States and the Soviet Union concluded the first phase of Strategic Arms Limitations Agreements, including an Anti-Ballistic Missile (ABM) Treaty, in May of 1972. The agreements limited significantly the deployment of certain offensive and defensive strategic weapons systems and permitted modernization of advanced ABM systems, but they placed only minor restrictions on ballistic missile defense research and development. The agreements therefore had little actual impact on the Army's ABM development program.

During fiscal year 1973, the Army broadened its technological base to support the development of a high-velocity, advanced ABM capable of intercepting an inter-continental ballistic missile (ICBM) in the exoatmosphere. The Fly-Along Infrared-II (FAIR-II) sensor vehicle flight test program was started to obtain target and background signature data, study was done on the feasibility of developing nuclear-hardened homing sensors capable of functioning in the outer reaches of the atmosphere, and the possibility of non-nuclear exoatmospheric intercept was investigated.

Live testing of designation and discrimination algorithms against re-entering objects continued at the Kiernan Reentry Measurements Site, Kwajalein Missile Range. Detailed designs were completed for a 5,000-element solid state phased array radar, and a contractor was selected to construct the radar at Kwajalein Missile Range. The new radar will validate the use of solid state, modular technology in future ballistic missile defense radars and will provide a unique range research instrument for the development and testing of new discrimination techniques. The preliminary version of a System, Environment, and Threat Simulator (SETS) that tests battle scenarios, which include re-entry vehicles, decoys, radar clutter, nuclear effects, and the engagement of interceptors, was completed and installed on the Combat Developments Command's 7600 computer at the U.S. Army Advanced Ballistic Missile Defense Agency Research Center, Huntsville, Alabama. Plans have been completed to "game" SETS against system software on a fourth-generation vector computer to measure the interaction of data processing hardware and software against postulated threats.

Other development efforts during the year included construction of a laboratory model of a new dome radar antenna that will provide hemispheric coverage from a single planar array antenna face, initiation of a program to use high-power lasers as ballistic missile defense radars, and completion of four successful Minuteman Special Target program flights that provided new data for the development and validation of advanced re-entry discrimination techniques. Also, a Technology Application Panel composed of experts from both government and industry was formed to identify new ballistic missile defense

concepts and technology. The panel canvassed numerous laboratories and uncovered several promising ideas that are currently under evaluation.