

ABSTRACT

SPEAKeasy is a United States Department of Defense program to develop a software programmable radio. A proof of concept program was awarded in 1990 to Hazeltine Corporation of Greenlawn, NY, TRW of San Diego, CA, Lockheed-Martin of Nutley, NJ, Motorola of Scottsdale, AZ and Rockwell-Collins of Cedar Rapids, IA. The 6ft tall prototypes had two programmable channels, used a VME bus architecture, incorporated a Texas Instrument quad-TMS320C40 multi-chip module for signal processing and a SUN Sparc 10 workstation as man-machine-interface. Models were demonstrated at wargames held at Hanscom AFB, MA, in September of 1995.

A second phase was awarded to Motorola, Scottsdale, AZ, ITT, Ft. Wayne, IN and Sanders, Nashua, NH in June 1995. This added to the Phase I work by refining the radio Open Systems Architecture, enhancing the RF design, and reducing the size. The SPEAKeasy Phase II Advanced Development Models successfully completed their first operational test at the Task Force XXI Advanced Warfighter Experiment (TF XXI AWE) conducted at the National Training Center, Ft Irwin, CA, in March 1997.

Software waveforms implemented included UHF Have Quick, VHF SINCGARS, HF, UHF Satcom, VHF AM and VHF FM. SPEAKeasy supported the mission of the Air Force's Tactical Air Control units at TF XXI, both the Blue Force (11th ASOS, Ft Hood) and the OpFor (Detachment 6, Ft Irwin).

The SPEAKeasy system modular-by-function, Open System Architecture enables the extensive use of COTS boards and modules. SPEAKeasy Phase II Model 1 was approximately 70% COTS including PCI mother boards, PCI and PCMCIA DSP cards, PCMCIA hard disk drives, an ISA Ethernet card and a PCMCIA GPS card.

Critical to the SPEAKeasy effort was the publication of the specifications for the Open System Architecture radio, modular by function, with many of the modules common, composed of component building blocks/modules. "Open"-- meaning that we publish the interface specifications, at the various layers and the various module boundaries, to allow the builders to focus on modularity by function, rather than by radio. With interfaces widely published, modules can be improved and enhanced; with numerous vendors making improvements. The SPEAKeasy Phase II specifications were transitioned to the Joint Tactical Radio System Joint Program Office (JTRS JPO) for their use in the development of that system. The use of open system specifications, and the emphasis on the use of commercial off-the-shelf (COTS) hardware, will reduce the costs to the DoD of acquiring production radios and lower the eventual overall logistics costs.