**Joint Tactical Radio System
Programmable, Modular Communications System**

Considered a pivotal Department of Defense (DoD) transformational program, the Joint Tactical Radio System (JTRS) was a Defense Department-wide initiative to develop a family of revolutionary software-programmable tactical radios that would provide the warfighter with voice, data and video communications, as well as interoperability across the joint battlespace. Existing radio systems lacked interoperability across the spectrum and had insufficient bandwidth to meet existing and then future communications challenges. The solution for interoperability was an all service radio and a new wideband networked waveform with the ability to provide mobile networked-connectivity across the battlespace while providing [compatibility](http://www.globalsecurity.org/military/systems/ground/jtrs.htm##) with the current waveforms in use by the DoD today.

The Programmable, Modular Communications System was a new initiative to acquire a family of radios for all DoD components. The PMCS approach would replace older, hardware intensive radios with software [applications](http://www.globalsecurity.org/military/systems/ground/jtrs.htm##) for waveform generation and processing, encryption, signal processing and other major communications functions. The PMCS approach would support military operations across the spectrum of environments, from backpacks to ships.

The PMCS program was operated by a joint Service office, located in the Washington, DC area. Acting Under Secretary of Defense (Acquisition and Technology) Noel Longuemare chose the Army to be the permanent Service Acquisition Executive for the program. The Air Force provided the first PMCS program manager, a three-year rotational position, and the Army and Navy provided deputy program managers. The Advanced [Information Technology](http://www.globalsecurity.org/military/systems/ground/jtrs.htm##) Services Office, a Joint Program Office of the Defense Advanced Research Projects Agency and the Defense Information Systems Agency, would play a critical role in developing the systems architecture for the PMCS program.

In March 2005 officials restructured the JTRS program to include a new Joint Program Executive Office, which would help coordinate development of the four radio versions.

Multiple contractors will be selected to produce the PMCS products using common core [software](http://www.globalsecurity.org/military/systems/ground/jtrs.htm##) and hardware modules.

**JTRS Origin and Components**

The Joint Tactical Radio System (JTRS and pronounced "Jitters" in military circles) family of radios would range from low cost terminals with limited waveform support to multi-band, multi-mode, multiple channel radios supporting advanced narrowband and wideband waveform capabilities with integrated [computer](http://www.globalsecurity.org/military/systems/ground/jtrs.htm##) networking features. These radios were required to conform to open physical and software architectures. The JTRS would develop a family of affordable, high-capacity tactical radios to provide both line-of-sight and beyond-line-of-sight C4I capabilities to the warfighters. This family of radios would cover an operating spectrum from 2 to 2000 MHz, and would be capable of transmitting voice, video and data. However, JTRS was not a one-size-fits-all system. Rather, it was a family of radios that were interoperable, affordable and scaleable.

The Joint Tactical Radio System (JTRS) was not a new concept. In fact JTRS had its genesis in lessons learned from inter-Service communication problems during the Grenada Operation and Desert Storm. The story was often told of Army troops calling in Air Support to Grenada using their personal calling cards and using Ft Bragg as an intermediary to communicate. In addition to interoperability issues, legacy systems had insufficient bandwidth capability to meet expanding requirements and these required expensive and complex logistics support systems.

The Software Communications Architecture (SCA), a nonproprietary open systems architecture, was an essential component of the JTRS strategy and was the basis for software waveforms. The JTRS Joint Program Office maintained the SCA and software waveforms, while the Services develop the Joint Tactical Radio (JTR) sets in Service-led acquisition efforts (called clusters).

JTRS was being developed in parts, initially referred to as clusters (these have all since been renamed). Five clusters were conceived in total:

The Army-led Cluster 1 (subsequently JTRS Ground Mobile Radio) was developing JTR sets for Army and Marine Corps ground vehicular, [Air Force](http://www.globalsecurity.org/military/systems/ground/jtrs.htm##) Tactical Air Control Party ground vehicular, and Army rotary wing applications.

The Special Operations Command-led Cluster 2 (subsequently JTRS Enchanced MBITR) was upgrading an existing handheld radio, the Multiband Inter/Intra Team Radio (MBITR), to SCA compliance.

Initially Cluster 3 was Navy led and was developing JTR sets for maritime and fixed-station applications. Similarly the Air Force led Cluster 4 to develop airborne JTR sets. Clusters 3 and 4 were combined to form a new program, jointly managed by the USAF and USN, JTRS Airborne, Maritime Fixed-Station (JTRS AMF).

The Army-led Cluster 5 program (subsequently JTRS Handheld, Manpack, Small Form Fit) was developing handheld, manpack, and small form-fit sets suitable for embedding in the Army's Future Combat Systems and other platforms requiring a small radio. A cluster for space applications was also being considered.

The JTRS SCA originally applied to waveforms operating at frequencies from 2 megahertz to 2 gigahertz. In June 2003, the ASD(NII) expanded the scope of the JTRS SCA to all waveforms operating at frequencies above 2 gigahertz.

The 180,000 software-defined radios developed through the $6.8 billion JTRS program to replace 750,000 existing tactical radios, which soldiers carry or mount on vehicles, aircraft and ships.

In the March-April 2005 issue of the Army AL&T [magazine](http://www.globalsecurity.org/military/systems/ground/jtrs.htm##), LTG Joseph L. Yakovac was asked to discuss his reaction to talk of the JTRS program failing. The following is his response to the question:

"I don’t think it is. I think what's failing is the strategy that we had. And I'm passionate about this, so this is a good question to ask me. This is again about complexity. The JTRS program as it was developed was basically, to me, an unachievable goal because it was looked on as being a radio replacement program. If we had unlimited [resources](http://www.globalsecurity.org/military/systems/ground/jtrs.htm##) it would be wonderful if I could design something better and go to a battalion and have them download their radios of record today and give them JTRS radios in exchange. But that is an inefficient way to use our resources. However, that radio replacement philosophy is what I believe has caused this program's problems. What we really want from JTRS in the near term is to enhance networking, not replace legacy radios. You want to introduce it with a focus on the live band networking waveform not just replacing the Single Channel Ground and Airborne Radio System for the sake of replacing it. What we have done in the last couple of months, in concert with the Office of the Secretary of Defense, is to slow the program to devise a holistic migration strategy for what we want from JTRS over time. It's an affordability issue too, even if we could do it. We cannot afford to throw away good stuff. We've got too many other programs that we need to prioritize".

