

P25 Technology Overview

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P25 History



Project 25 (P25) is:

- Created in 1989 by APCO, NASTD, the NCS, the NTIA, Department of Defense, National Security Agency.
- Standard for the design and manufacture of interoperable digital two-way wireless communications products.
- Developed in North America with state, local and federal representatives and Telecommunications Industry Association (TIA) governance and P25 has gained worldwide acceptance for public safety, security, public service, and commercial applications.
- Dedicated to ensuring interoperability in communications.
- Designed to ensure fast & secure communications between local, state and federal agencies when protecting the public's welfare.

P25 Benefits



- Interoperability between Agencies.
(P25 Compliance Assessment Program P25 CAP)
- Equipment Standardization according to TIA-102 Standard.
(Ensuring Multi-Vendor Compatibility)
- Multi-Brand Feature and Operations Compatibility.
(Ensures competitive pricing)
- Functions design based on actual Public Safety Needs.
(Specific to mission-critical communications)
- Security via Encrypted Voice Transmission.
(From simple Voice Scramblers to DES/AES Digital Encryption)
- Backwards Compatibility to Legacy Systems.
(Allows for gradual migration in mission-critical environments)
- Stimulated with US Federal Funding.
(Federal Grants available through Department of Homeland Security)

P25 Development Phases



→ Phase 1

12.5KHz FDMA Technology.

Currently most used P25 systems are Phase 1

→ Phase 2

Backwards Compatible to Phase 1

Still uses Phase 1 for Talkaround

12.5KHz TDMA Technology using Two Voice Paths per Channel

Main Advantage is Spectrum Efficiency

P25 Digital Vocoders



→ **IMBE Original Vocoder**

7.2kbps Vocoder mainly used in older P25 Radios

→ **AMBE+2 Vocoder**

Supersedes the IMBE Vocoder, Enhanced and Improved Version

7.2kbps and 3.6kbps Vocoder mainly used in newer, advanced P25 Radios

Better Performance and Virtually NO Background Noise

Ability to recognise and pass DTMF Tones

P25 Applications



Law Enforcement Agencies

Fire Departments

Emergency Management Services

Public Administration

Public Works

State Government Agencies

Federal Government Agencies

Military

Railroad

Utility

P25 Main Features

→ **Voice**

Open Voice Calls, Private and Group Calls, Emergency and Announcement Calls, Encrypted Calls, Telephone Calls

→ **Data**

Packet Data – IP Interface to Radio, Status Update Message, Status Query Message, Short Text Messages, Free Form Text Messages, Emergency Alarm Message

→ **Encryption**

DES 56-bit Key and AES 256-bit Key

→ **Operation**

P25 Conventional and Trunking, Analog Conventional, Simulcast and Mixed Mode Operation

→ **Other**

Scanning, Voting, Radio Inhibit /Uninhibit, Radio Monitor, IP and Telephone Interconnect



About RCA



RCA Communications Systems

The field of communications technology rapidly advanced over the course of the previous century and few of the big names of those early days maintained the name recognition and longevity into this new, twenty-first century. The Radio Corporation of America (RCA) is one name that did. It's positioned at the top of a short list of industry greats that has endured through time and continued to evolve over a revolutionary century of technology. RCA is known worldwide for its commitment to serving the needs of the communications market with unsurpassed durability and reliability. RCA has long understood its customer's need for communication devices that can perform even under the harshest of work environments: the first RCA radios were designed to withstand military purposes in wartime, combat conditions. As communication technology expanded beyond governmental and military use to a population of consumers welcoming and eager for technological advancement, RCA was the dominant industry leader. The name became synonymous with groundbreaking, trendsetting, communication innovation.

Today RCA Communication Systems is reinventing value in the two-way radio, developing two-way radio equipment using the latest DMR and Project 25 (P25) technologies. RCA connects people like no other company can, providing quality, reliable, cost-effective communications solutions.

Learn more and visit our website:

www.rcacommunicationssystem.com