Clear-Com®
AN HME COMPANY

Intercom Solutions For Network Centric Communications

"Our goal is to build a world leading, dynamic, professional audio communications company specializing in interoperable IP-based Command and Control applications"

Trilogy is a subsidiary of Clear-Com, the global provider of real-time communications and connectivity solutions. Founded in 1986, the Trilogy business addresses niche markets to provide intercom communications technology to the broadcast and defense markets.

With a track record of innovative development, flexible solutions and successful installations, Trilogy is an established UK defense supplier working with customers including Raytheon, Northrop Grumman, Lockheed Martin, Thales and BAE Systems. Trilogy continues to develop its reputation in the defense and security arena by integrating world leading systems and products from companies such as Motorola, Cisco, L3Harris, Ultra Electronics, Cobham and Selex.

Trilogy is ISO 9001:2015 accredited and is committed to designing and delivering only the highest quality products and services to our customers.

Existing Deployments

- Commercial & Military Test Ranges
- Unmanned Aircraft Systems
- Ground Control Stations
- Offshore Patrol Vessels
- Emergency Service Control Centers
- Training and Simulation Environments
- Disaster Relief
- Mission Control & Operation Centers
- Explosive Atmospheres
- Military Medical Facilities
- Radio Interoperability & Radio-over-IP (RoIP)
- Voice-over-IP (VoIP)
- Multi-level Security
- Cross Domain Communication Solutions
- Federal Government & Military Studio Broadcasting

Trilogy Mercury System

The Trilogy Mercury system is a real-time Voice-over-IP (VoIP) intercom communications platform that enables multi-channel full-duplex, one-to-one, group and conference communications over LAN, WAN and Internet. It provides seamless interoperability with other commonly used communication systems including commercial and military radios, mobile phones, conventional phones, and SIP phones. When using the Mercury ES platform, defense operations and intelligent functions are able to communicate between multiple levels of security and across domains.

Mercury Platform

Mercury is a proven technology for many applications with a large installed base in the defense, homeland security and commercial markets.

Mercury is a real-time intercom communications platform built on VoIP core technology. The system supports “one touch” full-duplex communications for one-to-one, group and conference communications. The system is scalable over LAN, WAN and Internet using terrestrial or satellite-based network connectivity. Audio, radio and telephone expansion modules provide a communications platform that is interoperable with virtually any type of communication device.

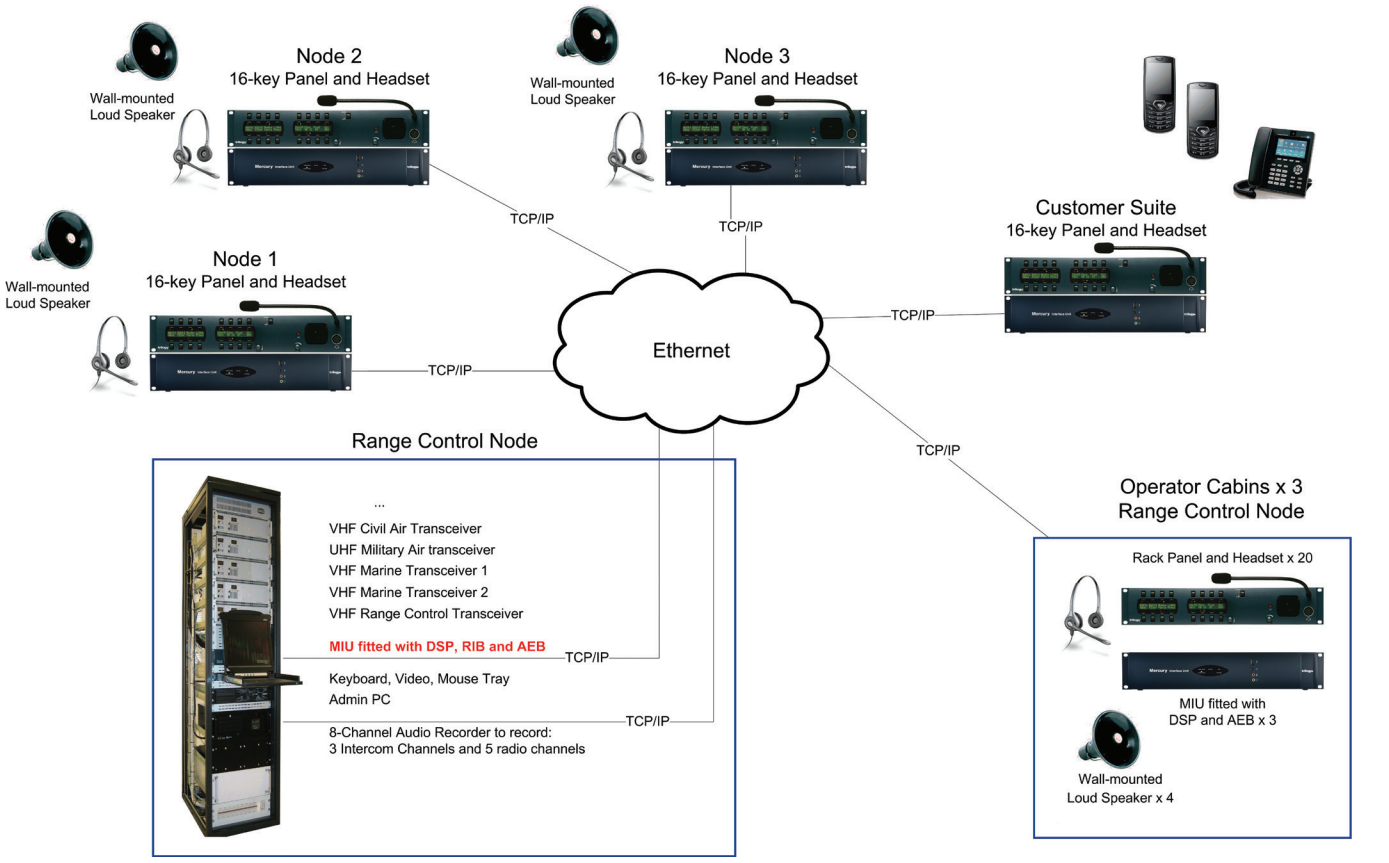
A Mercury system is comprised of one or more Mercury Interface Units (MIU), Mercury Communicator Units (MCU), Interface Boards, and User Panels. These devices, known as Mercury hosts, support two to thirty-two users each. Users can choose from a variety of hardware or software panels. These panels provide up to 256 one-touch buttons to support the workflow requirements of each user. Users can participate in, or monitor, multiple voice conversations simultaneously. This greatly simplifies complex communications workflow and speeds up how users can communicate across the enterprise. Audio quality is superior to that of typical radio and telephony.

All Mercury products operate with standards-based IT and network technologies - no special routers, switches or gateways are required. Security is implemented at the network level and standards-based encryption devices, including VPNs used transparently. Administration of the system takes place from centralized or decentralized points anywhere on the network. Administrators are given precise control over all relevant system and network parameters, including bandwidth. Functioning as a peer-to-peer run-time system, operation in even the most challenging environments is assured with no central servers or single point of failure.

Key Benefits

- Users can select who to talk and/or listen to
- Communication with any form of external device connected to the Mercury network is possible
- Group communications can take place across technologies - panels, radios, phones, etc.
- Recording of communications can be used to support training or safety requirements
- Users can communicate seamlessly using Mercury to bridge technologies
- Peer-to-peer or Client-server communicatons

Range Test Facility Using Trilogy Mercury Systems



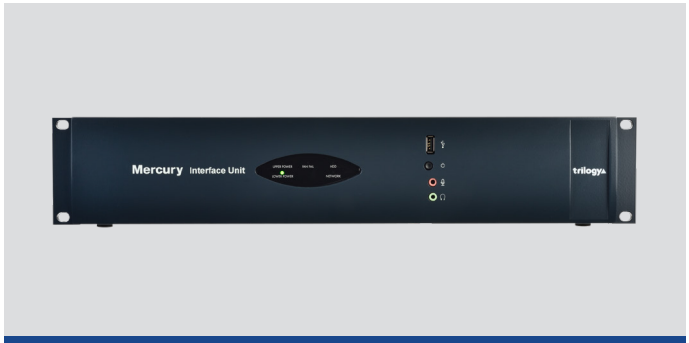
Andøya Test Center (ATC), Norway

Trilogy has supplied a range-wide communications systems for the ATC located on the island of Andøya, which offers a virtually unlimited area for testing systems, primarily for military customers.

Supporting tests of a high performance Unmanned Air System (UAS), the need for absolute safety imposed demanding capability and integrity requirements on the range systems responsible for tracking, and if necessary terminating, the flight.

Mercury integrates communications from military and civil, air and maritime radios and a range of other devices, all of which must be recorded. With an integrated subsystem, ATC is able to access any range asset at any given time and from any of its 24 operator locations.

The multiple sites are connected together using IP via a microwave link allowing all voice traffic including the radios to be passed between locations. The system also passes GPIO/logic information across the IP network to provide critical alarm management.



BAE Systems, Warton

Trilogy has supplied a communications system to BAE Systems at Warton for their Electronic Warfare Test Facility (EWTF). This facility is capable of installed and uninstalled performance testing of electronic warfare systems for current and planned fighter or strike aircraft.

A solution was needed to address multiple issues. The EWTF has a number of electromagnetically shielded areas, including a large anechoic chamber for whole aircraft testing, and is a TEMPEST secure environment supporting Red and Black communications.

The Mercury system handles Red communications traffic between the test cells with inter-area links connected over multi-mode fiber.

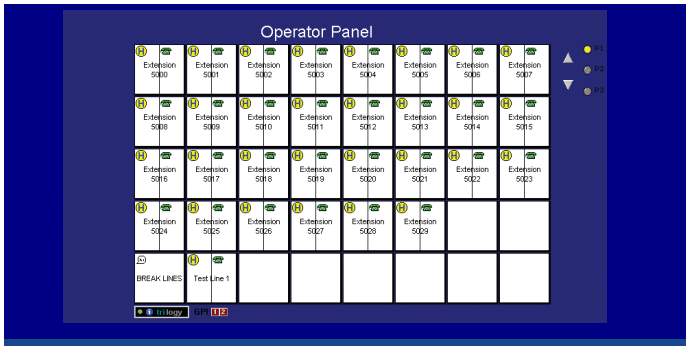
Within each of the operational areas, the system provides a local node capable of interfacing to multiple wired beltpacks, DECT wireless, fixed headsets and local speaker stations. These various operator interfaces are used to provide clear and precise communications between all areas during trials. The entire system is quickly and easily configured via a touchscreen PC in the control room for different trial requirements.

Irish Naval Service - Offshore Patrol Vessels

Mercury was chosen to supply a communications network throughout a number of offshore patrol vessels (OPVs). These vessels carry out a wide array of activities.

The major Mentor system will integrate mobile users operating on a range of marine radio channels covering VHF, UHF and HF with operators utilizing one of 10 Trilogy 16-key panels installed at locations throughout the vessel.

The installation also features a system designed to simply and quickly connect users in one of the pre-configured work groups. Users can connect through one of the 17 'plug & play' interfaces around the vessel. For example, when the 'weapons control' group is required, users might plug in at the bridge or gun positions. To change role, the user simply moves to their next task position and plugs in, becoming a member of the group associated to that position.



AMP Control, Australian Mining Industry

Working closely with AMP Control, the Mercury system developed a unique solution for the mining industry that provides the ability to take control of all subsurface to surface communications in an instant.

Day-to-day mine communications are carried out using Intrinsically Safe (IS) telephones at various locations that allow calls to and from other phones, an operator as well as calls to be made and received from external sources.

In normal operation this system works extremely well, however, with the inherent dangers found in mining operations the system must be equipped to deal with emergency situations. Critically important when responding to an emergency is the ability to keep the communications system open and available. The Mercury system guarantees this by providing the system operator with a 'break lines' key allowing for all external calls to be severed instantly while protecting all active internal calls for the duration of the emergency.

Mercury ES Platform

The Mercury ES IP voice communications platform provides defense operations and intelligence functions with a communications capability that is unprecedented in terms of quality, sophistication and speed. Unique multi-level security and cross domain features make information sharing and decision making across organizations easier than ever.

Mercury ES is unique in how it manages multiple agencies and users operating at different security clearance levels, often found in C4ISR operations

Mercury ES operates on LAN and WAN over terrestrial or satellite-based IP networks. Users access the system via browser-based control panels with up to 256 call buttons and an impressive 32-channel capacity. Unlike traditional communications technologies, users can participate in multiple communications simultaneously - including direct, conference, and monitor-only call types. In addition, radios, telephones, and other communications technologies can be linked to the system to provide users with a unified communications control panel.

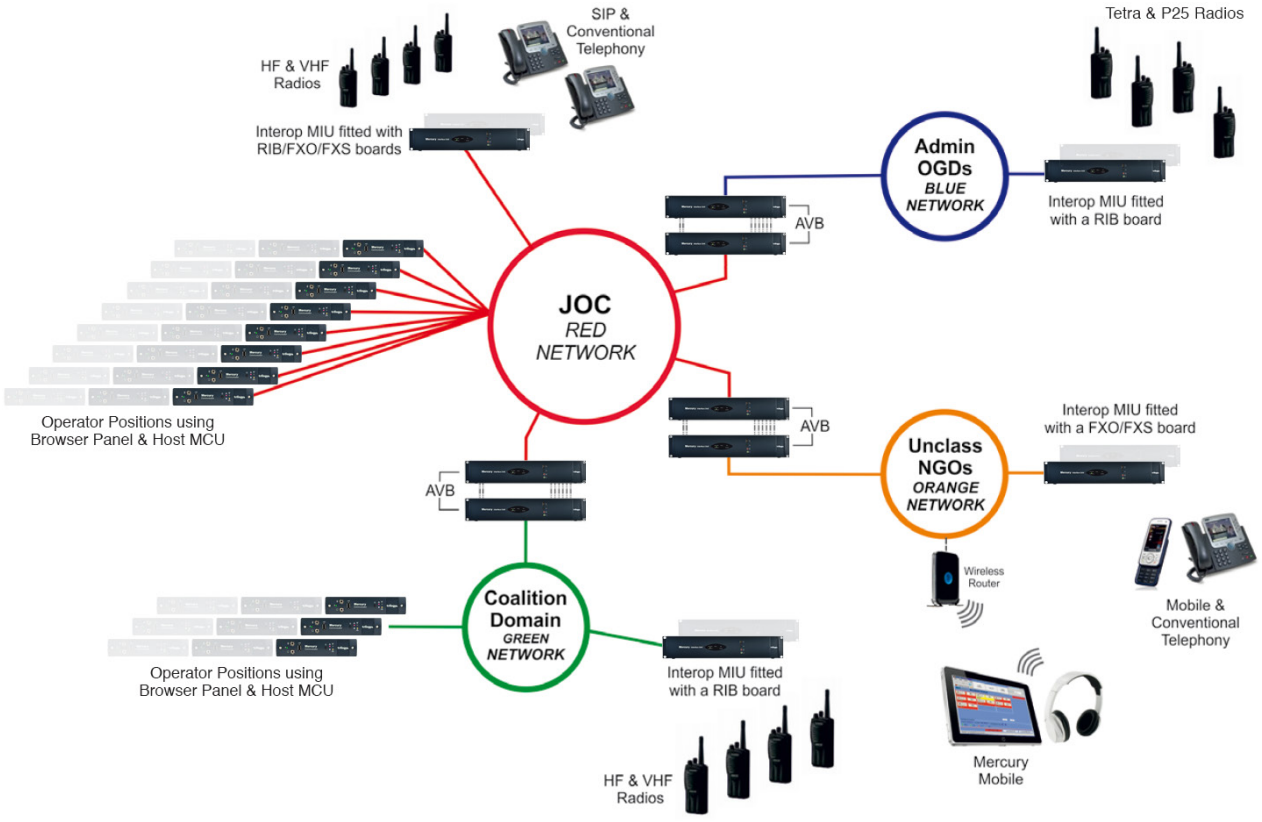
The Mercury ES platform also represents a major breakthrough for organizations who need to communicate between multiple levels of security and across domains. The Mercury ES Analog Voice Bridge is a first-of-its-kind technology that allows communications to traverse traditional network security boundaries without introducing the security issues that arise from joining the IP networks. To achieve this, a pair of Mercury Interface Units (MIUs) are configured to allow analog audio and signals to be passed securely between networks. The Analog Voice Bridges (AVB) are scalable and can be located at any site where joint, multi-national, non-governmental organization (NGO) or inter-agency communications links are required.

The hardware and software components of the Mercury ES platform are commercial-off-the-shelf (COTS) products designed to work with standards-based IT and network technologies. Any number of Mercury ES workstations can be linked together to create a communications platform with incomparable flexibility, capacity and efficiency.

Suggested Applications

- C4ISR & C4ISTAR including UAV operations
- Multi-Level Security between TOCs and JOCs
- Missile ranges and tracking stations
- Coverage extension of air-to-ground networks
- Integrated Communication Systems (ICS) for naval vessels
- Military training and simulation

Joint Operations Center Using Trilogy Mercury ES Systems



U.S. Navy, Broad Area Maritime Surveillance (BAMS)

Trilogy was selected by Northrop Grumman Systems Corporation to deliver its Mercury ES intercom products and services for the U.S. Navy Broad Area Maritime Surveillance Internal Communications (ICS) Program. The Mercury ES provides the multi-level security intercom for the BAMS UAS to enable mission communications.

Northrop Grumman BAMS UAS is a multi-mission maritime intelligence, surveillance and reconnaissance (ISR) system that will support a variety of missions while operating independently or in direct collaboration with fleet assets. The BAMS UAS will be able to provide a continuous on-station presence while conducting open-ocean and littoral surveillance of targets. When operational, BAMS will play a key role in providing commanders with a persistent, reliable picture of surface threats, covering vast areas of open-ocean and littoral regions, minimizing the need to utilize other manned assets to execute surveillance and reconnaissance tasks.

U.S. Air Force, Distributed Common Ground System

Trilogy supplied a key voice communications component of the U.S. Air Force Distributed Common Ground System (DCGS) via Raytheon which includes multiple installations around the globe.

The Mercury ES product is at the heart of the platform which provides real-time, multi-channel voice communications between intelligence operators regardless of security level or geographic location. The system provides enterprise-wide collaboration in support of intelligence, surveillance and reconnaissance missions.

The system is the first “Protection Level 4” accredited and deployed VoIP technology that includes a sophisticated information assurance component for the Department of Defense intelligence community.

Malaysia Armed Forces

Mercury ES provided a sophisticated voice communications capability to the Malaysian Armed Forces to integrate existing and new radio assets across multiple sites within the Malaysian territory. It provides a communications system that is able to extend the range and resilience of radio traffic while offering the potential for multi-level and cross domain security features.

Mercury ES allows the extension of radio communications over IP ensuring that neither range nor geography can disrupt them, banishing any possibility of a black spot. This guarantee of service allows the Malaysian Armed Forces to optimize its network-enabled operations. As the participants are able to share and assess information in real-time, they are able to capitalize on their situational awareness to increase mission effectiveness.

Royal Brunei Armed Forces (RBAF)

As a key sub-contractor, the Mercury ES platform provided the complete voice communications element of a Joint Operations Center command and control capability for the Royal Brunei Armed Forces.

The prime contractor, Northrop Grumman UK, supplied an integrated Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) headquarters system and a deployable Joint Operations Center (JOC).

The JOC has provided the RBAF with a facility that delivers command and control capability for military commands and civil organizations at both national and international level, and is interoperable with its NATO and ASEAN allies and coalition partners.

trilogy

A CLEAR-COM COMPANY

Trilogy Communications has supplied audio communications equipment to customers in more than seventy countries. The business provides video and audio infrastructure equipment for the television and radio broadcast market, and has expanded to offer its products to a wide array of customers in defense, emergency management, training and simulation, oil and gas, and other industries.

Trilogy Communications is a wholly-owned subsidiary of Clear-Com, LLC., a trusted global provider of professional real-time communications solutions and services since 1968. The company innovates market proven technologies that link people together through wired and wireless systems. Its history of technological advancements and innovations has delivered significant improvements to the way people collaborate in professional settings where real-time communication matters.

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