

MULTIPURPOSE INTEGRATED CHEMICAL AGENT ALARM (MICAD)



USACCS



NBC Detection & Warning for Now & 21st Century



U.S. ARMY CHEMICAL BIOLOGICAL
DEFENSE COMMAND

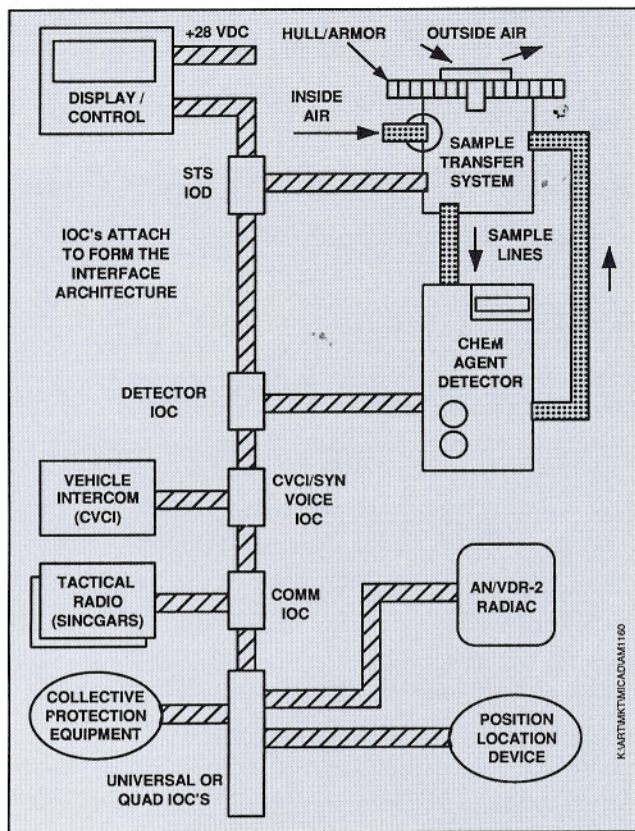


Figure 1. Alarm Monitor Group (AMG) Configuration

DESCRIPTION:

MICAD provides automatic warning of chemical and nuclear attacks throughout the battlefield, and NBC-1/NBC-4 reports to the chain of command over existing tactical communications (SINGARS and MSE).

KEY FEATURES:

- Operates with M43A1, AN/VDR-2 RADIAC Set, Future NBC Detectors (e.g., ACADA)
- Samples internal and external environments for chemical contamination
- Interfaces with Position Location Devices (PLD) and Collective Protection Equipment (CPE)
- Automates the local NBC warning and CPE activation processes
- Automates the NBC report preparation (NBC-1/NBC-4) and transmission process from platoon to battalion level
- Army Tactical Command and Control System (ATCCS) and Automated Nuclear Biological and Chemical Information System (ANBACIS) compatible
- Flexible design allows use in area warning role with Telemetry Link
- Designed for NBC survivability and ease of decontamination

SYSTEM CONFIGURATION AND OPERATION

The four MICAD Alarm Monitor Groups (AMGs) [Tactical Vans/Shelters, XM26; Area Warning/Tactical Vehicles, XM27; Combat/Armored Vehicles, XM28; Light Forces, XM29] are the centerpieces of an NBC Detection and Warning System for AirLand Operations.

The XM26, NBC Detectors, SINGARS Radios/MSE, M42 Alarm, and CPE will be mounted in a Tactical Van or Shelter, interconnected, and provided with connections to appropriate power sources.

The XM27, NBC Detectors, SINGARS Radios/MSE, and M42 Alarm will be mounted on a Tactical Wheeled Vehicle, interconnected, and connected to the vehicle power.

The XM28, NBC Detectors, SINGARS Radios, Voice Intercom, and M42 Alarm will be mounted in an Armored Vehicle, interconnected, and connected to vehicle power.

The XM29 for light forces and other stand-alone applications will be portable and interface NBC Detectors and alarms with SINGARS through a Telemetry Link.

The Alarm Monitor Groups perform the essential functions of pre-operational checks maintenance monitoring warning activating, and transmitting data. MICAD furnishes information to the battlefield command structure (ANBACIS and ATCCS) through SINGARS radios and MSE. Up to date locations of each host system and platform are derived from the Global Positioning System (GPS) or other position location devices. Interface to

vehicle collective protection equipment, when present, is automatic. Detection and alarm systems, principally the XM22 ACADA, with a Sample Transfer System (STS) is mounted on armored vehicles, vans and shelters to complete the MICAD hardware suite around the Alarm Monitor Groups. System support packages in the form of software and software development tools, maintenance items and packaging are also included in the deliverables. The soldier-machine interface is designed for easy use in cold weather clothing and MOPP IV gear and automates functions consistent with the mission requirements.

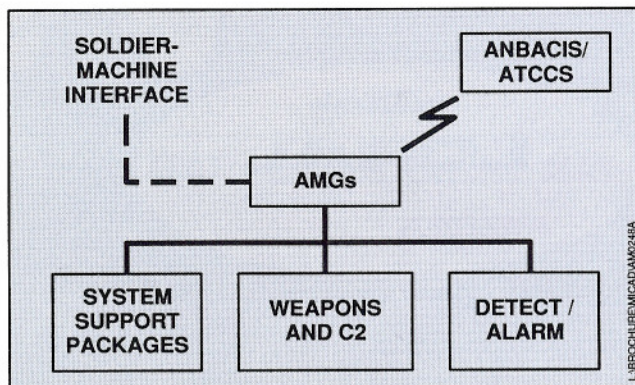


Figure 2. Detection and Warning System Configuration

MICAD PROVIDES INTEGRATED NBC DETECTION AND WARNING SYSTEM FOR COMBAT VEHICLES, VANS, SHELTERS AND LIGHT FORCES

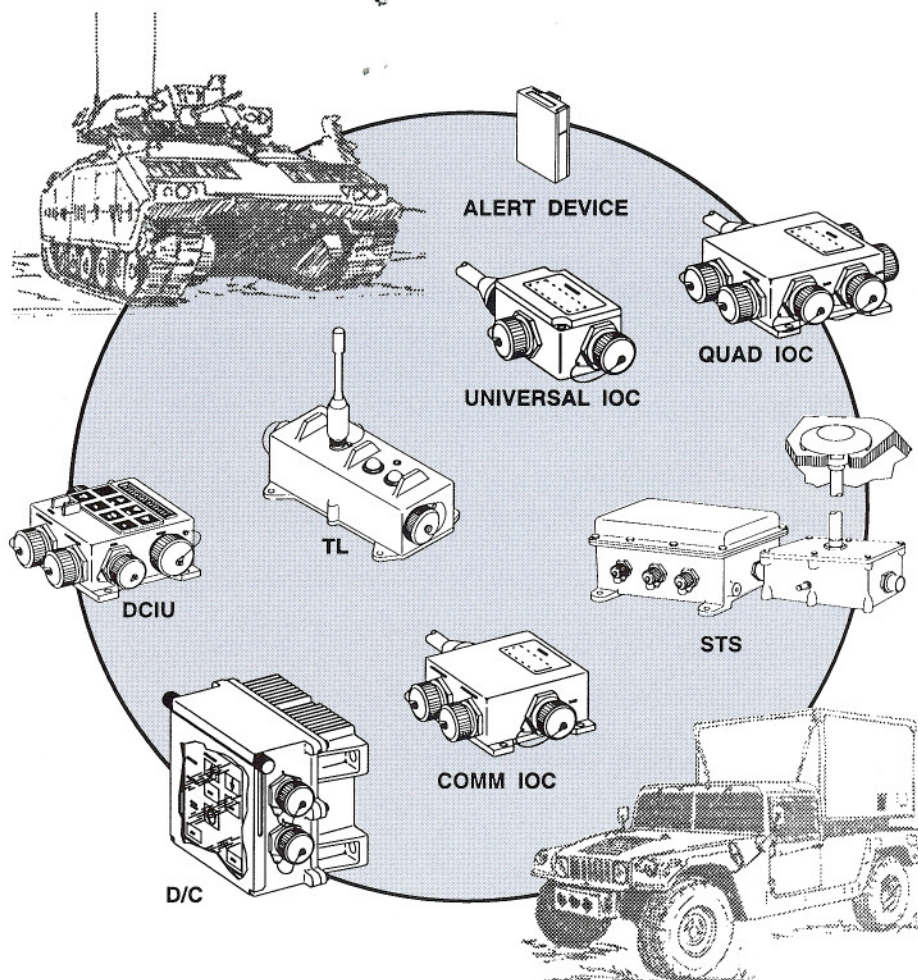


Figure 3. MICAD Components

DISPLAY/CONTROL (D/C)

The D/C is an integrated hardware and firmware component that allows the operator to configure, monitor and control the MICAD system. There are no external knobs or switches on the front and it can be mounted in any position. A MC68333 microprocessor, 8MB RAM, 1MB ROM, BIT, power down mode and touch panel display are featured in its design.

SAMPLE TRANSFER SYSTEM (STS)

The STS units for combat and armored vehicles (CAV), or tactical vans and shelters (TVS) are of one basic design and provide loss-free transfer of air samples from the interior and external environment to NBC detectors. It has a built-in interface to the Interface Architecture (IA) Bus for reporting and controlling functions.

DETECTOR COMMUNICATIONS INTERFACE UNIT (DCIU)

The DCIU is a control module used when a D/C is not required. The DCIU contains two of the same modem assemblies as the Comm IOC, but with an RS-232 interface to accommodate the detectors. It is designed to operate from external power, or from an internal battery pack.

UNIVERSAL INTERFACE OPTION CABLE

All non-communications device interfaces are provided by Universal Interface Option Cables (UIOC). They contain all circuitry necessary to interface with NBC detectors, Position Location Devices, Collective

Protection Equipment, Telemetry Links, Alarms, and voice intercom systems. They connect in tandem on the IA bus and are linked through firmware to the D/C.

QUAD IOC

Four IOCs are combined in one enclosure. The Quad IOC contains three Universal IOC channels and one Comm IOC, and is addressable as four independent IOCs over the IA Bus.

COMM IOC

Communications interfaces are provided by a two-channel Communications IOC that is somewhat larger than the Universal IOC. It contains two modem/processors that link tactical radios or switches to the Display/Control via the IA Bus. Each modem provides analog or direct digital message processing.

TELEMETRY LINK (TL)

The TL consists of a pair of identical small receiver/transmitters for relaying alarm data from a remote detector to the MICAD D/C via a Universal IOC or a DCIU. Its design includes features to reduce interference and detectability while improving battery life. The TL also functions as the activating transmitter for the Alert Device.

ALERT DEVICE

The Alert Device is a commercial type personal paging unit (beeper) which will be issued to each soldier to warn them of a chemical attack.

PERSONNEL AND TRAINING

Loral Librascope's MICAD system is designed to provide efficient operation and maintenance support by existing personnel. The equipment designed for all four system configurations (XM26, XM27, XM28 and XM29) is simple to operate by the individual soldier and requires no new personnel classifications. The XM26, XM27, and XM28 contain "HELP" screens, with stacked windows and pop-up windows, for tasks that must be completed before continuing.

MOS 31U soldiers can perform Unit Level maintenance, and existing MOS 39E soldiers can perform Direct Support maintenance.



THE MICAD TEAM

The MICAD Team is comprised of the user, represented by the U.S. Army Chemical Center and School (USACCS); the developer, the Chemical Biological Defense Command (CBDC); and the contractor group. The contractor group consists of: Loral Librascope, Loral Conic, Brunswick Defense, FMC, Calspan, and CSC.

Loral Librascope (Glendale, CA) - A long standing (over 50 years) and highly regarded developer and manufacturer of combat systems, electronic components, displays, and communications interfaces. Librascope is the prime contractor and responsible for subsystem design and development, system design, and system integration.

Loral Conic (San Diego, CA) - An experienced developer and producer of military telemetry systems, transponders, encoders, data links, power amplifiers, and range instrumentation. They provide the NDI Telemetry Link for MICAD.

Brunswick Defense (Deland, FL) - A well known and respected developer and producer of NBC detection

equipment. They are responsible for the design and development of the Sample Transfer System (STS).

FMC (San Jose, CA) - World renowned in the development and production of armored vehicles and combat systems. They are responsible for system installation in combat and tactical vehicles, vans, and shelters.

Calspan (Buffalo, NY) - Has vast expertise in NBC analysis, survivability, and testing. Of particular importance is their experience and research in transferring chemical substances across various surfaces. They are collaborating in the STS design in particular, and in all hardware design, in general, to ensure chemical survivability and ease of decontamination. They will also conduct all MICAD NBC agent testing at their Chemical Surety Chamber at Ashford, NY (in continuous operation since 1983).

Computer Sciences Corporation (CSC) (Bel Air, MD) Has continuing direct experience with MANPRINT in an NBC environment and will provide the MANPRINT expertise on the program.

LORAL
Librascope

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