ALMR INSIDER

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ALMR Turns 20 Years Old!

On September 19, 1997, the Department of Defense-Alaska (DOD-AK), the Alaska Federal Executive Association (AFEA - excluding DOD), the State of Alaska (SOA), and the Alaska Municipal League (AML) joined together under the existing Federal Alaska-Wide Land Mobile Radio (LMR) Executive Council for the purpose of providing a cost-shared, land mobile radio communication service encompassing participating federal, state, and municipal users in Alaska.

In a Memorandum of Understanding (MoU) signed on October 8, 1997, DOD-AK, AFEA, SOA, and AML chartered the Executive Council with:

1) identifying participating entities' disaster response and crisis management requirements and their associated communications requirements;

2) developing a combined migration strategy for implementing a single integrated statewide radio communications system to meet those requirements; and

3) developing a request for information to industry for possible solutions to meet those requirements.

The DOD and SOA, as primary infrastructure owners, selected Motorola P25 as the solution and provided that decision to the Executive Council for adoption by the cooperative stakeholders.

In a MoU signed on April 4, 2001, DOD-AK, AFEA, SOA, and AML provided approval for the Executive Council to move forward with implementation of a cooperative solution responsive to the signatories' mutual aid, disaster response, and crisis management missions, as well as to their day-to-day operational requirements. Further, the participating entities agreed that the Executive Council would represent the participating entities in providing oversight and direction for the implementation and continued development of the mutually agreed upon cooperative solution and system design within the boundaries of federal, state, and municipal laws.

The DOD, working with the SOA and Motorola through a DOD contract, initiated a proof-of-concept demonstration for a wide-area, single, shared infrastructure between federal, state, and local government agencies. To do this, they established two zone controllers (Tudor Road in Anchorage and Birch Hill in Fairbanks) and five initial sites (Atwood, Birch Hill, Peger Road, Saddle Mountain, and Ted Stevens Anchorage International Airport). This effort took the better part of a year to accomplish, but in early 2003 the proof of concept demonstration, based out of Valdez, took place, and the successful outcome speaks for itself. This event marked the beginning of the official ALMR system build out.

Following the successful demonstration of the capability, both SOA and DOD project teams were formed and worked together to implement 88 sites across the state. One of the many hurdles, aside from obtaining the $186M required to complete the project, was obtaining waivers to permit the use of non-federal frequencies with federal governmental frequencies that would be paired in a 50/50 fashion to ensure they could provide coverage statewide and there would be no interference between the radio sites.

The result was FCC and NTIA approval to allocate 120 frequency pairs in the non-federal public safety VHF range 154-156.65Mhz and federal band 138-144Mhz, a first in the nation waiver that enables the capability that ALMR has to this day. This technical approach and the use of shared spectrum facilitates daily intra-agency use as well as inter-agency interoperability use during cross jurisdictional, mutual aid, and task force incidents and places ALMR as one of the most robust interoperable systems in the United States today.

IWCE 2023: Connecting Critical Communications

The Alaska Land Mobile Radio (ALMR) Communications System and Alaska Public Safety Communication Services (APSCS) teams have returned from attending the International Wireless Communications Expo (IWCE) conference and are happy to report it was an excellent learning and networking event.

The four-day conference began with the first two days packed with learning seminars and the last two days a combination of seminars and meetings with technology vendors from around the country. As this was my first IWCE, I focused on the security and networking paths for my seminars. It was extremely beneficial to hear from other system mangers and to see what worked, what didn't work, and how they overcame their management concerns for true interoperability. I have learned over the years to listen and observe how other entities run their systems and to glean the best aspects and apply them to my system for optimum performance.

With the anticipated Fed ramp approval of new radios, I attended multiple security seminars with an emphasis on interworking. With LMR radio network communications possibly being augmented with new LTE devices, a robust P25 network is critical and must maintain a strong interest in communications security and encryption. P25 tech-nology remains critically important to public safety users and government agencies and its continued evolution with new standards, capabilities, and applications will be relevant as public safety networks continue to expand/evolve.

As we navigated over 275 individual booths, we focused on products from over-the-top technology vendors to include radios, towers, and system management equipment. I spent time talking with specific radio vendors, discussing their latest time division multiple access (TDMA) capable products and encouraged them to have their radios tested for approval on ALMR.

The APSCS team members visited with vendors to discuss the latest in LED tower lights, system shelters, routers, and radio signal strength testing equipment to optimize the ALMR system for our members. These included lightning strike indictors and system outage monitoring equipment which sends alerts when a piece of equipment is down, which would optimize maintenance response times, especially for helicopter-only accessible towers.

I learned a great deal attending the IWCE and look forward to sharing this knowledge with our members.

(Article by Mr. Paul L. Fussey, ALMR Operations Manager)

What is an iButton and How is it Used to Program Radios?

iButtons are small integrated circuits embedded in a rugged stainless steel case, often referred to as a "can." An iButton device uses its stainless steel can as an electronic communications interface. Each can has a data contact called the "lid" and a ground contact called the "base" with each of the contacts connected to a silicon chip inside. The name iButton originates in its similarity to button-cell batteries. Every iButton has a unique and unchangeable 64-bit registration number, which consists of a 48-bit serial number, an 8-bit family code and an 8-bit checksum. The registration is engraved on the iButton and allows for absolute traceability. When it comes to programming radios and communication, the data exchange with iButtons is serial via one-wire protocol. Only one data line, like the pin of a microcontroller, is needed with the data transfer and is checked for errors using a checksum.

The iButtons utilized by the ALMR team use accessories enabling an iButton to be connected to the USB port of a computer. The power required by the iButton is supplied by an internal 3V battery to maintain the data stored inside. The battery can last up to ten years; however, for security purposes all iButtons are programmed with a three-year internal clock. When using an iButton for programming radios, a countdown timer will appear on your home screen when approximately 45 days are left before the expiration date. Any ALMR organization can request their iButton be sent to the Help Desk to restart the internal clock and for programming.

Under the ALMR Asset Management Policy 400-8, Help Desk Procedure 400-13, and the System Key Usage Procedure 400-16, it is the primary responsibility of the agency to maintain an inventory of all iButtons. Agencies and vendors are also responsible for acquiring/purchasing the proper programming software and hardware (i.e., iButtons and iButton readers) necessary to program their radios. Agencies requesting iButton programming from the Help Desk should call first before dropping them off. The Help Desk will then open a service request to properly document the work done on the iButton. Any theft, loss, or destruction of an iButton should be immediately reported to the ALMR Help Desk at 907-334-2567.

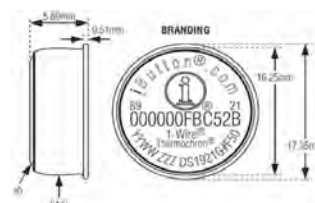Illustration of an iButton component Structure

Illustration of an iButton External View

(Article by Mr. Paul Fussey with excerpts taken from the Maxim Integrated iButton Manual, 2009, and excerpts and images taken from the MFE Labs iButton Manual, 2023)

The Alaskans Behind Our First Responders

Alaska's first responders are tasked with maintaining public safety throughout the state. Our responders wear distinctive uniforms and travel in high-visibility vehicles throughout our communities, and we often see them and their efforts whether it is a fire engine responding to an accident or fire, an ambulance attending to a patient, or a State Trooper on the side of the road. The individuals we don't often see are the support personnel who allow our frontline staff to function efficiently and effectively.

There is one group essential to almost all public safety functions, facilitating emergency communications via radio across the state. A team within the Department of Public Safety, known as Alaska Public Safety Communication Services (APSCS), has over 30 individuals who maintain the infrastructure required for first responders to communicate, receive information, and ask for assistance, when needed.

The ALMR network requires a tremendous amount of infrastructure and maintenance to ensure it is available at any time of the year and in any type of weather condition. The APSCS team maintains over 85 radio sites and microwave towers throughout the state. All these sites must be checked and maintained regularly to ensure they are constantly operational. Maintaining that amount of infrastructure is challenging, and the distance and terrain in Alaska adds another layer of complexity.

The ALMR system has recently undergone a major lifecycle refresh funded by all three infrastructure partners. The State of Alaska has funded over $24 million in upgrades to its public safety communications infrastructure to ensure continued operation of critical first responder and public works services. This project involved replacing 292 site radios with modern systems at each ALMR site and updating critical technology that was installed in the system decades ago. Work on this project will continue through 2023 and will result in doubling the voice capacity of the system and will introduce new capabilities on the system. Additionally, the APSCS team continually evaluates new technologies to expand the ALMR footprint to more areas of the state.

Alaskans everywhere benefit from reliable communications which dispatch our first responders quickly and ensure they can communicate with their partners easily in any circumstance. The APSCS team, including our public and private partners, provides a vital function of public safety and they are proud to serve both first responders and the people of Alaska.

(Article by Ms. Stephanie Richard, Director of Statewide Services at the Alaska Department of Public Safety. Director Richard oversees Alaska's criminal history repository, the Alaska Scientific Crime Detection Lab, APSCS, and other statewide public safety programs.)

Annual Agency Inventory Process Change

In the past, the Operations Management Office (OMO) distributed letters to every agency in January of each year along with a confirmation form to be signed confirming an annual inventory had been conducted and the agency verified it had accounted for all of its subscribers. This requirement stemmed from the 2012 State of Alaska Legislative Audit findings which concluded, "ALMR executive council should ensure user agencies conduct an annual inventory of ALMR equipment." To meet the mandate, the Operations Manager, as the executive agent of the Executive Council, was assigned the responsibility of ensuring the annual inventory was conducted.

Starting this year, confirmation of the annual inventory will be contained in the membership agreement form. When agencies renew their membership for State fiscal year 2024, they will note new language has been added to paragraph C, Member Radio Equipment, which is contained in Section V, Membership Obligations. The new language states "IAW the Asset Management Procedure 400-8, agencies should reconcile the annual subscriber audit report provided by the SMO against their records and forward any discrepancies via email or fax to the SMO."

The System Management Office (SMO) distributes annual subscriber audit reports to every agency with radios on the system at the end of each year, normally late November or in December. Agencies are to utilize the audit report to conduct their inventory and provide a notification to the SMO for any radio that is unaccounted for. This is normally done utilizing the Subscriber Request Form but can be done via email to the ALMR Help Desk, as well. If the radio is believed to be still in use by the agency, it can be inhibited by the SMO. This procedure means as soon as the radio is powered up, it will shut down and not turn back on until such time the SMO is informed it has been located. If located, the radio is easily reinstated to operational status by sending a Subscriber Request Form or an email to the Help Desk. Radios that are not located within a 30-day period will be deleted from the system.

Adherence to ALMR processes prevents unauthorized access to the ALMR system which could jeopardize not only the agency who has a missing radio, but other agencies that utilize the system, and could potentially negate the federal agencies' authority to operate.

By signing the newly revised membership agreement, which should be distributed in mid-to-late May and begin on July 1, each agency will confirm they have accounted for every radio assigned to their agency.

(Article by Ms. Sherry Shafer, ALMR Operations Management Office)

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The original system build out was completed in 2006 and ALMR was declared fully operational in 2008. It has weathered many changes throughout the years from the challenges of narrow-banding, the Army divesture of 41 of their radio sites, numerous years of funding short-falls, several separation studies, and the constant rumors that cell phones could provide the same level of service. ALMR persevered through all this and more to prove its value to the federal, state, and local government partnership and the combined public safety agencies within the partnership community, and it is still proving its value today.

ALMR currently supports 85 shared sites distributed between Zones 1, 2, and 3, and shared master sites located in Fairbanks and Anchorage. ALMR also collaborated with the Municipality of Anchorage (MOA) to include the Anchorage Wide Area Radio Network (AWARN) 700/800MHz system as Zone 4, providing expanded interoperability between the MOA and ALMR users in the AWARN coverage area.

Throughout the years the faces may have changed, but the dedication of the professionals who believe in the system remains undaunting. Additionally, if you asked the current 135 member agencies on ALMR today if they would be willing to go back 20 years to the stove pipe technology and lack of interoperability with other agencies, to the lack of dedicated maintenance support, to the lack of P25 standards, and to no guaranteed level of security, we believe the answer would be a resounding "NO."

Despite rapid changes in technology, ALMR will continue to support the public safety agencies in Alaska by evolving to meet their needs.

Cheers to the first 20 years of service and many more to come!

(Article by Ms. Sherry Shafer, OMO, with input from Mr. Tim Woodall, ALCOM J64)

Help Desk (In the Anchorage Bowl): 907-334-2567

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Fax: 907-269-6797

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Follow us on Twitter: @ALMR_SOA

TDMA is coming!

The ALMR offices want to remind user agencies that although the TDMA capability is not turned on yet, the deadline of December 31, 2026 remains in effect. All non-TDMA radios should be off the system by this date and agencies should already be working to replace their radio fleets. Additionally, non-TDMA radios will no longer be added regardless of whether the make/model is already approved to operate on ALMR.