

Transcript: What's in a Push to Talk?

Welcome to this Alaska Land Mobile Radio training presentation on push-to-talk in the ALMR system.

In this training, we would like to go a little bit behind the scenes of the ALMR network and explore what actually happens when a push-to-talk occurs. ALMR uses advanced technology to provide communications throughout our coverage area, and there's many steps and technical details that occur each time a user pushes the push-to-talk button. In this presentation, you'll see the abbreviation of PTT in the visuals when we're referring to a push-to-talk.

The design of the system ensures that authorized users are able to use the system and are able to receive the traffic in the talk group that they are tuned into. Before a radio is able to push to talk, radios must affiliate to the individual site and to the system when they're powered on. The system in general will check the radio and ensure that it is authorized to be on the system and doesn't have any particular restrictions or statuses. For example, if a radio that has been reported lost or stolen powers on and attempts to connect to the system, the system will disallow that radio from receiving or sending any traffic.

In addition to affiliating with the main ALMR system, each radio affiliates with one of the over 85 sites within the network. Sites are the individual towers that have equipment at each location in order to facilitate communications. In general terms, sites are made-up of radio frequency channels. These radio frequency channels consist of 1 control channel, which is the control channel is the data channel that the radios communicate through to assign different talk channels as well as to perform system maintenance functions. When we talk about a push-to-talk, it starts with the control channel.

In addition to control channels, there are various talk channels that are available at each site. The amount of talk channels can differ on each site and the capacity can differ depending on if the TDMA network is available on certain talk groups that are being used at that site or not.

When a user presses the push-to-talk button, that request goes via the control channel to the controller equipment that is located physically at that particular site. The controller will assign an actual talk channel to the radio when they press the push-to-talk. Two things can happen once this occurs.

Either a talk permit tone, commonly thought of as the chirp, where when you press the push to talk, you'll get the permit tone, which allows the user to talk on the system. A busy tone or a bonk may be returned if there is no available talk channel available on that particular site. This is known as a system busy.

There is a third type of error that somebody may encounter when pressing the push-to-talk button. Similar to the bonk or busy tone, you may hear a tone that results when the radio is unable to make contact with the site in that particular location. It may often be perceived as a site busy, but can be caused by geographic considerations that are not allowing the radio to communicate with the site at that moment, such as stepping into a building or having some other type of obstruction.

The individual site takes the radio traffic that is spoken into the radio and rebroadcasts it locally to the people on that site that are tuned to that particular talk group. This occurs and is the end of the communication when all of the traffic is local. In other words, if you're talking to somebody in a talkgroup and you are only affiliated with one site, this is the complete process.

However, the ALMR network is able to broadcast traffic throughout the system. So, let's look at what happens at the network side when there are other people tuned to your talkgroup from multiple sites. In an analog or conventional radio network, it is common for that to use simulcast technology. A simulcast simply refers that each piece of radio traffic is rebroadcast to all of the different sites within the network.

The ALMR system, with the exception of 1 zone within Anchorage, does not use simulcast technology. In other words, the push-to-talk that just occurred on one site will not be sent to any other site unless there is a user that is tuned in to that particular talk group at that particular site.

For instance, if we had a push-to-talk at one of our talk groups and there were two other sites throughout the network that had a radio tuned to that particular talk group, the ALMR network dynamically sends the traffic to only those two sites and does not send it to the network as a whole.

There are a few reasons for this methodology, but one of the primary reasons is that the amount of infrastructure that would be required to simulcast every talkgroup in the system to every site would be cost prohibitive, a maintenance issue, and is simply not necessary.

Most talkgroups are local. However, most talkgroups are not confined to simply one site. So for instance, if there was an agency based in the Matsu Valley, in general terms, most of

the sites that would be tuned into that radio or that talk group are radios that are in the Matsu Valley sites themselves.

From a network management standpoint, in addition to the radio infrastructure that is required to send that data, it's a lot of unnecessary computer traffic that is sending to sites that does not need to broadcast the traffic. Therefore, the ALMR system is very selective on where different sites are receiving different radio channels.

This is the same reason that scanning does not generally work in the same way that you may be used to on a conventional side, because the traffic is not always literally traversing over the radio frequency spectrum in order for the radios to pick it up. The radios must be actively requesting that particular talk group on that particular geographic site.

The network side of the ALMR system uses the State of Alaska Telecommunications System, or SATS. SATS is primarily a microwave-based radio frequency network that transmits information via microwave links. All of this information is converted into digital signals, just as if it was a Wi-Fi signal or an Ethernet signal. The speed of the network and the multiple routes on the network ensure that people receive the various push-to-talks with minimal latency or minimal delay.

The ALMR system processed over 2.4 million push-to-talks in September of 2025, and that number frequently increases. For instance, in the summer months with higher traffic and wildfire, you can expect to receive 2.8 million or more push-to-talks within that calendar month. We hope that this explanation has been helpful to you in how the network processes your traffic and how your radio works. If you have questions, please don't hesitate to reach out to the AMR help desk or the Operations Management Office for assistance.