

## AN400 CROSSBAND REPEATER SYSTEM

### FEATURES AT A GLANCE



- Capable of receiving and transmitting on any combination of frequency bands, AM, Lowband, VHF, UHF, 700 MHz and 800 MHz
- Robust construction, low current consumption and extreme temperature tolerance ( $-30^{\circ}$  to  $+60^{\circ}$  C)
- Redundancy switching is available as an option



### APPLICATION

A crossband repeater system enables system interoperability by changing frequency bands between two radio systems. For example, a police department using VHF may need to communicate with the local fire department on their UHF frequencies. The crossband repeater receives a VHF signal from the police department and then retransmits the signal on UHF to the fire department.

### THE PROBLEM

In the simplest application, a radio user on one frequency band needs to communicate with other users in a different frequency band. For more complex requirements interoperability between users on several different frequency bands is required.

In addition, distances or geographical features obstruct paths between users on a single repeater and a second repeater needs to be installed.

### THE SOLUTION

An elegant approach to this problem is to use a crossband repeater. As its name implies, it is a repeater that allows a radio in one frequency band to be cross connected with a second radio in a different frequency band. For example, a police officer using a VHF radio can be crossbanded to a fireman using a UHF radio. For the multiple band and multisite application a crossband link system can receive from a user on one frequency band, link to another repeater using a second frequency band and transmit to another user on a third frequency band. The system does not need to use different frequency bands since it can also work on different frequencies within the same band. Cross banding radios provide a simple and effective means of allowing interoperability between different radio technologies and different agencies, in order to provide coordinated emergency responses or facilitate routine communications. The system can also be configured as a P25 crossband repeater system. Both frequency bands are capable of operating in analog, P25 digital or mixed mode configurations. The repeater will pass all clear and secure (encrypted) P25 digital information. NAC codes can be programmed into the receiver and transmitter modules or the system can be programmed to repeat any incoming signals with the NAC intact.

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## CODAN CUSTOMER

A crossband repeater has the ability to transmit and receive on different bands. For example, if the crossband repeater received a VHF signal from the police department, it could retransmit the signal on UHF, and if the crossband repeater received a UHF signal from the fire department, it could retransmit the signal on VHF. The system can also be configured to retransmit on UHF to its own users at the same time it retransmits on VHF and vice versa. Codan crossband repeaters are capable of receiving and transmitting on any combination of frequency bands, AM, Lowband, VHF, UHF, 700 MHz and 800 MHz.

An elaborate example of crossbanding is shown in the photo to the right. This system is being used by an emergency response organization that had a need to be able to communicate with multiple agencies in an emergency. These agencies each have different frequencies of operation ranging from Low Band to VHF, UHF, 700 MHz and 800 MHz. In the event of a regional emergency this multicross band system can be quickly deployed to enable all agencies to talk to each other as they jointly respond to the regional emergency. Other examples of cross band radios include emergency response organizations:

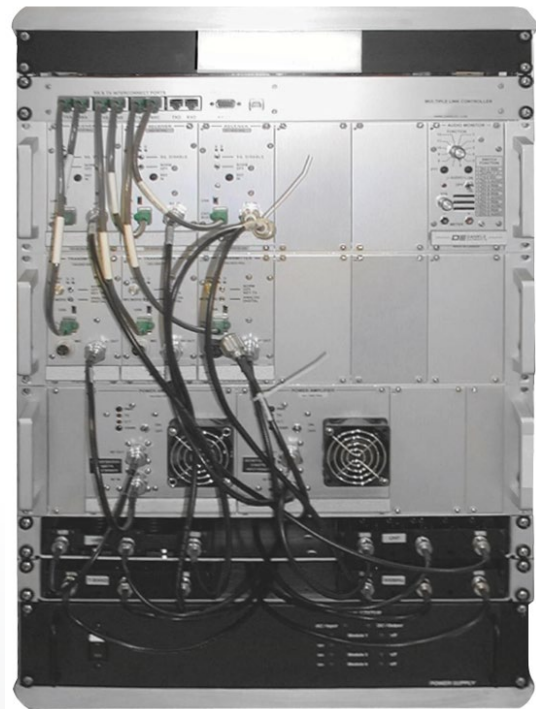
- **Search and Rescue** – Similarly in a search and rescue operation a cross band repeater allows the ground commander to coordinate search operations between the various agencies assisting in the search.
- **Fire Departments** – Fire departments can benefit from a cross band repeater in two ways. First they can cross band between their fire fighters (using UHF FM radios) and supporting helicopters (using VHF AM radios) that are being used in rescues from the tops of buildings. Secondly, it is possible to create tri-band cross banding to also allow the fire department to communicate with the police department (VHF FM radios).
- **Military** – the military will use crossbanded radios for non-combatant applications such as coordinating movement of equipment in the field or for firing range communications.

## THE BENEFITS

A typical cross band repeater (such as the ones manufactured by Codan) is shown below. The VHF repeater - transmitter and receiver modules are on the left, and on the right are the UHF FM transmitter and receiver repeater modules. The radios are modular and can be configured into a variety of different systems in a standard 19" subrack. Such systems offer robust construction, low current consumption and extreme temperature tolerance (-30° to +60°C) enabling them to be deployed in some of the world's harshest environments such as Alaska and Siberia. Redundancy switching is available as an option.



CROSSBAND REPEATER



MULTICROSS BAND SYSTEM

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