

Radio Communion Modes

- ❑ Simplex
- ❑ Repeater
- ❑ Trunking

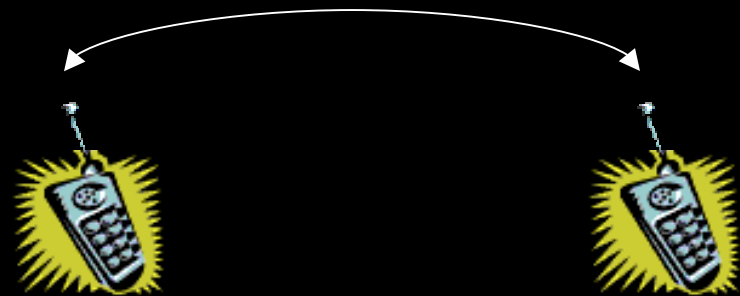
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By Phil Henderson, KF6ZSQ

Radio Communion Modes

Simplex

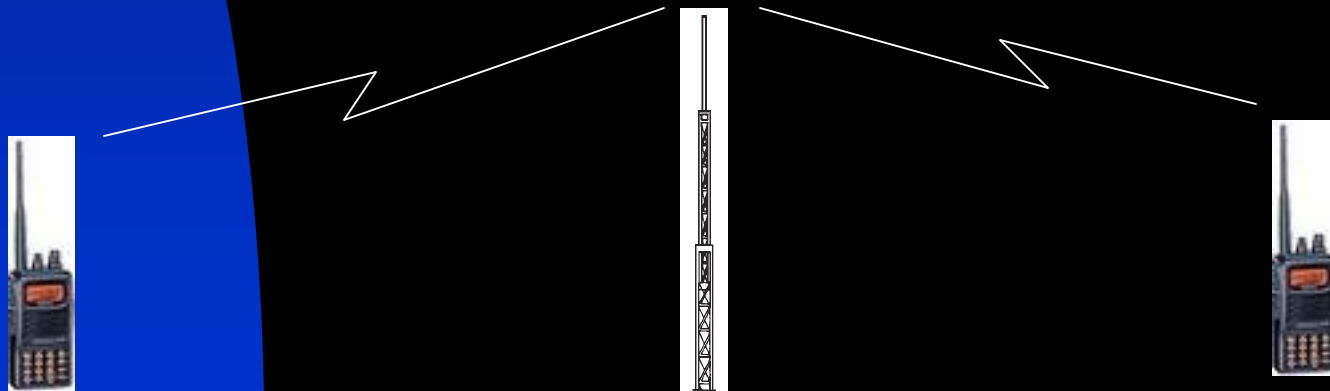
- ❑ Point to point communications between radios
- ❑ Ties up one frequency for the duration of the communication
- ❑ Limited distance



Radio Communion Modes

Repeater

- ❑ Radio transmits to a “repeater” that re-transmits the signal (Repeats) to a wider area, generally with a more powerful signal
- ❑ Ties up a pair of frequencies – the input to, and the output from the repeater
- ❑ Can have a large area of coverage



Radio Communion Modes

Trunking

- ❑ A generic term used to describe the sharing of a limited number of repeater frequencies (or trunks) among Many Users
- ❑ Uses a group of similar radio frequencies to create a “pool” for radio system users to access
- ❑ Systems can be built using VHF, UHF or 800 Mhz
- ❑ A Channel is NOT a Frequency...(generally)

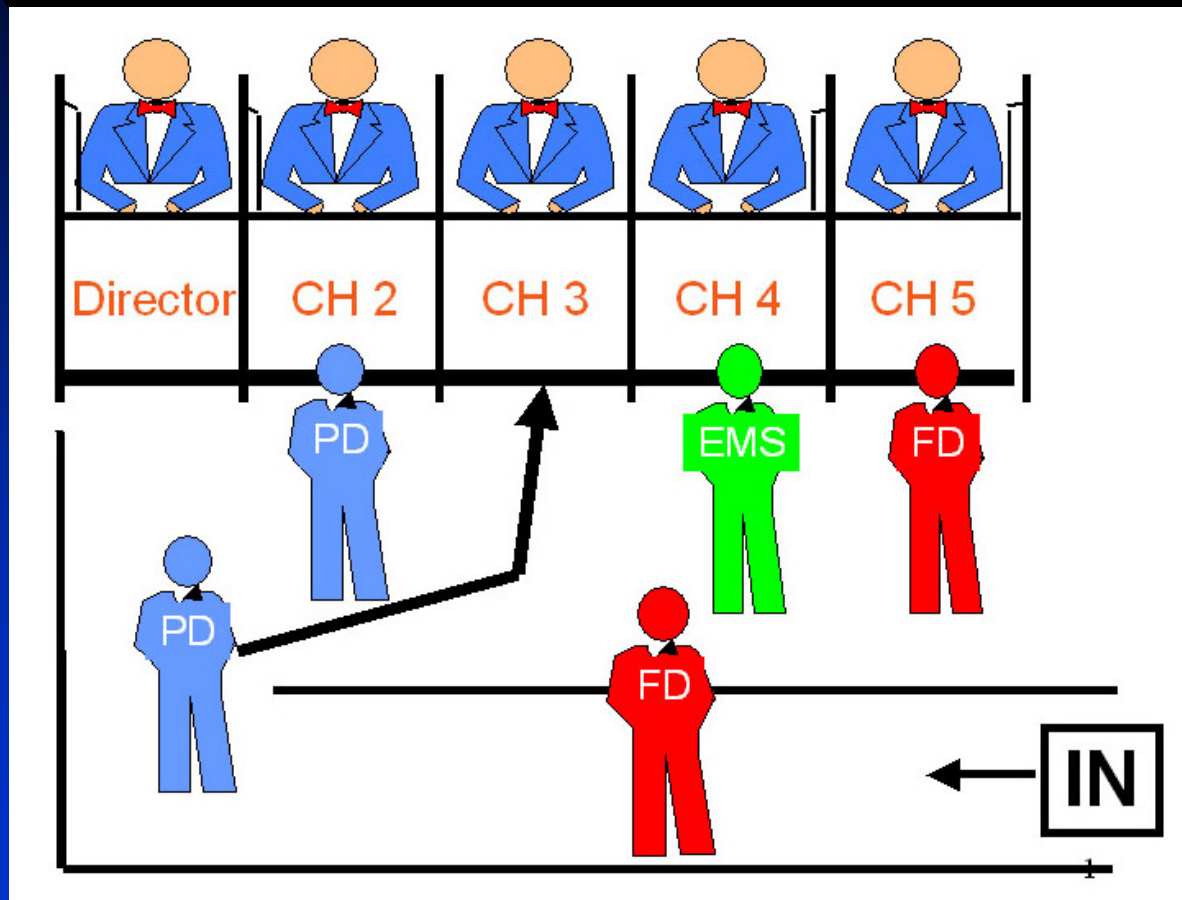
Radio Communion Modes

Trunking - continued

- ❑ A Channel (on your radio) is now a computer-generated code ...and is now referred to as a “Talk Group”
- ❑ The entire system is managed by a computer, often referred to as the “Central Controller”
- ❑ All radios in the system also are computer-controlled, and communicate to the central controller via one frequency known as the “Control Channel”

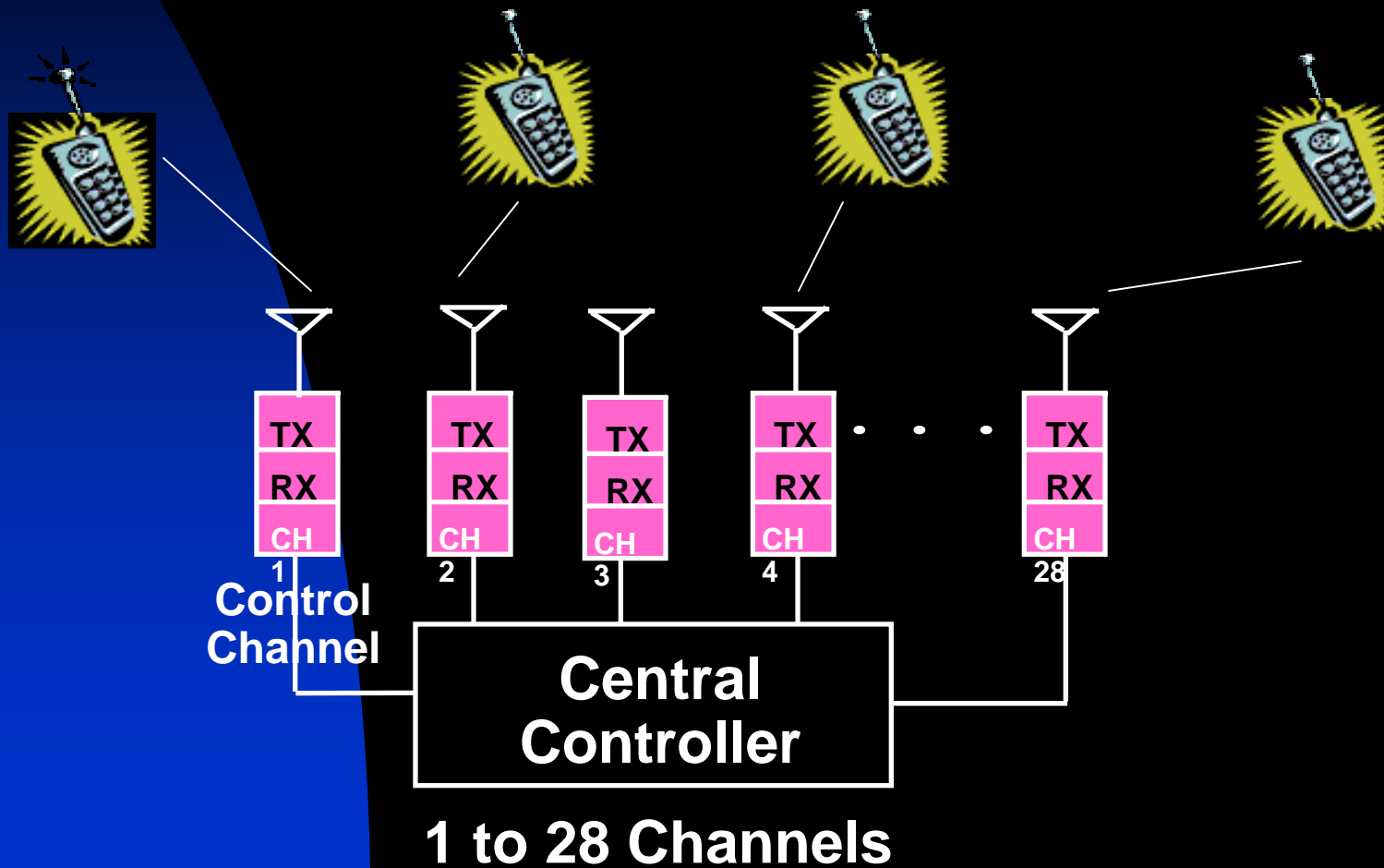
Your Bank Teller as Trunked

Queue by
First
Available
Teller



Radio Communion Modes

Trunking - continued



How Does Trunking Work?

- ❑ Each radio has a unique ID code which it uses to identify itself to the computer on the control frequency.
- ❑ Channels on the radio are set to Talk Groups, not specific frequencies.
- ❑ The computer (controller) knows which radios are on which talk groups.
- ❑ When a caller wants to talk to a particular person or group, he/she selects an appropriate channel (Talk Group) and pushes the talk button.
- ❑ The radio sends a coded signal to the controller.

How Does Trunking Work?

- ❑ The controller detects the talk group requested, assigns a repeater and signals all other radios in that talk group to switch to that repeater and listen.
- ❑ The controller then sends a signal to the requesting radio assigning the repeater and sounds a squawk in the receiver so the caller knows the link is created. This usually takes only a second or two.
- ❑ If all repeaters are busy with other users, either there is no squawk or there is a special 'busy' tone.
- ❑ The caller then can then talk to all units in the talk group.
- ❑ When the conversation is completed, the controller drops the repeater, and has it available for other users.

Trunked Radio Benefits

- ❑ Greatly improved usage of scarce radio frequencies
- ❑ Greater overall radio system flexibility, including:
 - Channel (Talk Group) capabilities
 - Various user features, including Emergency Alarm, PTT ID, Channel Regrouping, Call Alert, and Radio Inhibit
- ❑ Brings radio users together on a common radio system
- ❑ Consistency in radio coverage

Major Types of Trunking

- ❑ Motorola - Type I, II, III Hybrid, Smartnet, Smartzone, & Privacy Plus
- ❑ EDACS (Enhanced Digital Access Communication System - owned by M/A-COM)
- ❑ LTR (Logic Trunked Radio - mainly used in the private business sector)

Motorola Trunking

- ❑ Typical system has 1 or more geographically spread out tower systems.
- ❑ Motorola Systems are limited to 28 frequencies per tower site.
- ❑ A max of 4,096 talk groups or virtual channels, a max of 65,535 individual Logical ID's (LID) is supported.
- ❑ Motorola systems are able to connect a user to the telephone system.
- ❑ Some systems also use encryption on some talk groups.

EDACS Trunking

- ❑ EDACS: Enhanced Digital Access Communication System
- ❑ Typical system has 2 or more geographically spread out tower systems
- ❑ Each tower has, one control frequency
- ❑ EDAC Systems are limited to 25 frequencies per tower site.
- ❑ EDACS systems currently supports a max of 2,047 talk groups or virtual channels, a max of 16,382 individual Logical ID's (LID).

LTR Trunking

- ❑ LTR: Logic Trunked Radio
- ❑ LTR Trunk Systems do not have a control channel such as Motorola or EDACS Trunked systems.
- ❑ An LTR Trunk System data burst can be heard on each frequency of the system around every 10 to 20 seconds.
- ❑ Each business user on a LTR Trunked system is assigned a talk group ID(s) that consists of an Area Code, a Home Channel and a User ID.
- ❑ An LTR system can have a maximum of 20 channels (frequencies) and each home channel can have a maximum of 255 user ID's.

References

- ❑ Radio Technology Presentation, July 13, 2007, by Rey Freeman, GeoComm, to the Central Minnesota Radio Board (slides 4 – 7)
- ❑ Internet searches for “Trunking Radio”
- ❑ Information from Jerry Haag, K6GAC