Radio Programming – Systems/Groups/Channels/Names

This document outlines the limitations and some of the options a user has when creating radio personalities and solving personality size / radio memory size problems.

Unique Alpha Names

Alpha names are available for Groups, Systems, and conventional Channels. The radio is limited to 255 unique alpha names, but these 255 alpha names can be applied to different GID numbers as long as they are used in different systems. In this manner, a radio personality can contain 800 or more groups, they just cannot all have different alpha names.

For example: Group name "TAC-1" can be assigned to GID 1237 in system-1, the same name "TAC-1" can also be assigned to GID 1439 in system-2. This name re-assignment is possible in theory but may be impractical under most conditions.

Trunked Talk Groups

In EDACS, there are 2,048 GID (Group ID) numbers. In P25 trunking or EDACS-IP (Extended Addressing) there are 65,535 valid group numbers available. In the radio, you are limited to 255 systems and each system is limited to 64 groups. Therefore the theoretical limit is 16,320 groups. ProGrammer sets the limit to 13,824 groups. Memory space in the radio sets a limit to less than 13,824.

Trunked System-Groups

The number of allowable Trunked "System-Groups" is set by the feature encryption of the radio. Commonly used values for this number are 128 or 800. Conventional channels/systems are not counted here.

To calculate the number of System-Groups used in a radio personality, add together the number of groups in all the systems.

For example: a radio personality of 4 Systems with 10 Groups per system:
    10 grp + 10 grp + 10 grp + 10 grp = 40 System-Groups

Note that a tab in ProGrammer called "Synopsis" shows a summary of information for a personality file, including number of System-Groups and % of available personality memory space that has been used. See ProGrammer help screens to find out how to enable the synopsis tab.

System-Groups are limited by personality memory size

P7100 and M7100 are set by default to 128 System-Groups. This number can be increased to as many as 65,535 (max System-Groups) using a feature-encryption option. P5100 is feature limited to 128 System-Groups and cannot be increased. The final limiting factor is how many System-Groups will fit in the available personality memory space in the radio.

The number of systems and groups that will fit in the radio personality memory varies depending on many parameters, but it is usually in excess of 5000 System-Groups.

For example: If there are fewer group-sets and the same group-sets are reused in each system, the radio memory can accommodate more systems. Phone lists, I-call (select-call) lists, and scan lists also take up memory space.

Number of Systems
The number of systems allowed in the radio is set by a feature encryption limitation called "number of systems". In P7100, M7100, and P5100 this number is set to 255, which corresponds to the limit of 255 unique alpha-names for systems.

The number of systems that will fit in a given radio personality may be less than 255, systems with more groups take up more room – as described in the prior section.

Conventional Channels
Conventional channels are set by a separate feature encryption limitation called "number of conventional channels".
In P7100, M7100, and P5100 this number is set to 65,535.
Again, other factors limit the number to less than that:
- There is a limit of 255 unique RF channel frequencies.
- There is a limit of 255 unique alpha names
- Since there is a limit of 64 channels per system, the overall limit of conventional channels is also controlled by the number of systems (255) allowed
- The final limiting factor is the personality memory size of the radio.

255 systems max X 64 channels per system max = 16,320, the theoretical limit. Again ProGrammer further limits this to 13,824 possible channels.

As in trunking groups, the 255 frequencies and alpha names can be re-used in different systems.

For example: In system-1 there can be a channel called "POLNORTH" on 156.000MHz. In system-2 there can be another channel called "POLNORTH" that is on a different frequency. In system-2, 156.0000MHz can be re-used and called another name, "POLSOUTH". These name and frequency re-assignments are possible in theory but may be impractical under most conditions.

Although the P5100 radio is feature limited to 128 trunked System-Groups, it still has greater than 255 conventional channel capacity.

Feature Encryption Status
ProGrammer cannot determine the System-Group capacity or the Feature-Encryption status of a radio. A radio can be feature-encrypted to 128 System-Groups but ProGrammer will generate a personality in excess of 128 System-Groups for it. If this personality is loaded into the radio, it will display "INV SYS" when selected to and beyond the 129th System-Group.