

Subject: Radio Service
From: Frank Benn <11-17@nsfd.net>
Date: 12/14/2015 1:41 PM
To: mmcavoy@isabellacounty.org

Dear Ms. McAvoy

Thanks for the quick response. I suspect that, if you had absolute power, you would have the problem fixed quickly. I also suspect that your job is similar to herding a couple of hundred cats.

You may be interested to know that there is a decades old "history" regarding Pro Comm Inc and the Nottawa-Sherman Fire Department beginning with some strong differences of opinion before we made the decision to transfer our business to our local radio service technician. We have never regretted that decision.

I hope I am not insulting you by assuming that your knowledge of radio technology is at the layperson's level. If you hold an amateur (ham) radio license or are otherwise educated in these matters, please forgive my assumption and ignore all of the following.

Several factors are at play regarding 2-way radio communications. Before I address those, I must say that Motorola is notorious for designing proprietary digital systems. They deliberately make it difficult, if not impossible, to operate within their system using non-Motorola equipment. The "Mototrbo" system is probably no exception. This is a distinct disadvantage to agencies with limited financial resources. In October 1989, the APCO Project 25 set the initial standards for digital radio transmissions. The standards were formulated through the collaboration of six major communications agencies with the goal being more reliable communications between agencies involved in multi-jurisdictional disasters. Motorola, of course, wants everyone to buy their radios and has made it difficult for the initial goal of the collaboration to be achieved.

First, and most important, there is absolutely no field operational need to switch from analog to digital technology. The major incentive comes from the public's perception that anything "digital" is better. We are constantly deluged with advertisements to that effect. I fully understand the advantages from a dispatcher's point of view in that they don't have to listen to "skip" coming in from neighboring states and Canada.

The efficacy of radio signal repeater operations is primarily affected by the frequency of the radio signal, transmitter power and antenna height. Of these factors, antenna height is the most important. In the past, I have had no trouble whatsoever communicating with astronauts in orbiting space shuttles using only my hand-held, 5 watt transceiver. If Isabella County had a 2000' tower for fire service operations and transmitted with maximum legal power, there would be no coverage issues.

Generally speaking, the higher the frequency of the radio signals, the more easily they are

absorbed by buildings, trees, hills, etc. Chief Livermore and Assistant Chief Flaughter of our department have found the 800 MHz system to be more reliable out in the open than the digitized 154 MHz system now used for fire service communications. Neither the 800 MHz or digitized 154 MHz system will allow communications from within our fire station. The old analog system, using the same 154 MHz frequencies gave us that capability.

Digital modulation has one fundamental advantage over traditional analog modulation. It conveys information with mathematical precision. It's programming can even correct minor imperfections through mathematics. Unfortunately, the benefits end there, and come at the cost of some important advantages of traditional analog modulation.

Digital modulation precludes the ability of the human brain to decipher speech that has been corrupted by noise and interference. Additionally, audio recovery is impossible when the signal strength of a digitally processed signal falls below a certain threshold. With analog modulation, the human ear and brain can “decode” speech that is buried beneath noise levels that digital circuits and algorithms cannot contend with. While analog and digital transmissions are both subject to dead spots and interference, **digital modulation worsens human voice communications by eliminating the “gray area” afforded by analog equipment.** Digital equipment usually will not recover any audio in cases where an analog signal will be quite understandable, especially in cases where significant audio interference is present.

The software that converts human voice to digital data cannot adequately distinguish between voice and background noise. For example, a firefighter using a digital portable radio while standing next to a gasoline powered ventilation fan or hydraulic extrication pump may not be understandable over the radio because the software cannot isolate the voice from the engine noise. A police officer who is trying to announce his or her location during a pursuit may be unintelligible because of the siren, alarm system sounds or gunfire. A canine officer with a dog that is barking loudly may not be heard because of the competing noise from the dog. In all of these examples, it is likely that analog modulation would provide reliable communication.

That, in a big nutshell, is the reason why our old system provided more operational security for our department. It was not perfect, but could have been made nearly so by the addition of another repeater system and tower and better maintenance of the existing equipment. That solution would have been far less wasteful of our tax dollars.

Thanks for your time,

Frank E. Benn

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Frank Benn
Firefighter/EMT
N.S.F.D.

The only thing more expensive than education is ignorance.
- Benjamin Franklin (1706-1790)

The only thing necessary for the triumph of evil is
for good men to do nothing.

- Edmund Burke (1729-1797)

A MAJOR INCENTIVE FOR CRIMINALS:

Law abiding citizens are almost always unarmed.

THE SAFEST PLACE TO COMMIT A CRIME:

A "no gun zone".

"The right of self-defence never ceases. It is among
the most sacred, and alike necessary to nations and
to individuals..."

-James Monroe,

President of the United States, 1818.

Smith & Wesson: One of the best life assurance
companies in the world.

<http://www.bennsci.com>

Yellowstone National Park pictures.

<http://www.nsfed.net>

Nottawa-Sherman Fire/Rescue

<http://www.appletreequilts.com>

Machine quilting services & more.