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BB3939

05-20-2004, 11:15 AM

I was passively listening to the radio news this morning when I heard about fire department personnel being told to take their cell phones with them to communicate because the city's new digital radio system was not reliable. I believe it was Philadelphia. It was a short story, perhaps in combination with the 9/11 NYC commission story, and by the time I was actively listening the story was over. Just a couple of lines. Anyone else hear this or know anything about it.

nmfire

05-20-2004, 01:20 PM

Philidelphia had a major radio system failure twice now on the POLICE digital trunking system. It seems whenever a dispatcher tries to send the trunking system the command to talk to everyone, the system rolled over and died. It is supposed to go into a failsafe mode (called "failsoft") but that arrangement more or less didn't work out. They were dead in the water for long periods of time. Not good. I'm not aware of a problem with the fire department's system, I think they are on a seperate system.

The city of Philadelphia's relatively new \$52 million Motorola Astro radio system went completely off the air for 45 to 60 minutes Tuesday night, leaving a night shift of about 600 patrol officers without their electronic lifeline to headquarters, FOP officials said today.

The failure came as waves of officers were responding to three repeated calls for help from police at a location in Germantown, where an officer was being attacked.

"We had a break in service within our police communication system," said a steamed FOP President Bob Eddis.

Speaking at a press conference at FOP headquarters, the normally reserved Eddis said it was good fortune that a police officer or someone else who needed help wasn't hurt during the period. He also said he was aggravated that police brass downtown did not yet know what caused Tuesday's problem or a similar instance about two months ago.

On each occasion, he said, no viable backup system was in place.

"Our worst nightmare was experienced last night," said Eddis, who previously has limited his criticism of the administration of Police Commissioner Sylvester M. Johnson. "There was a time that the radio went completely dead."

At a press conference at headquarters this afternoon, Deputy Police Commissioner Charles Brennan, head of the department's Science and Technology section, confirmed the breakdown, which he said began around 9:05 p.m. He attributed the crash to the influx of police cars from across the city being dispatched to the Germantown case.

"In order to talk to all the officers in the entire city, police radio uses a command in the radio system which . . . permits us to talk to all the officers on the street at the same time," said Brennan.

But invoking that command caused a series of glitches that forced the system into backup, causing more than half the frequencies to crash, he said.

Thus, he said, dispatchers "couldn't get out to the people on the street and the people on the street couldn't talk to the radio consoles [dispatchers]," he said. "We still don't know why this happened."

After the blackout, there were sporadic problems with the radio system for another two-hour period, said Eddis.

During an emergency meeting this morning at headquarters with the brass, Eddis said he was encouraged that officials approved a contingency plan. Under the new plan, should a similar situation arise, officers will immediately report to their districts to be deployed.

But, said Eddis: "The question we're asking today is whether there is any guarantee that what happened last

night won't happen again today, and the answer was no. They have not been able to identify yet what the problem is."

The blackouts come in the wake of another technical problem with the 800-megahertz digital trunked system, which went online here in December 2002, that left the portable radio sets with batteries that could not be recharged. Now, supplies of new batteries, originally expected by the department at the end of the summer, will be available in the next week or so, said Eddis.

After another breakdown two months ago, Eddis said he had been concerned that the problem was not being corrected.

Eddis said he was fearful for the safety of officers operating without an effective radio communication system.

Brennan said that in both failures, the problem was traced to the radio command that permits dispatchers to talk to police citywide.

"We know that it happens when a certain command is invoked and as long as we don't invoke that, it doesn't happen. So, we're not going to use that command until we're sure again that everything is fine."

stcommodore

05-20-2004, 02:10 PM

We use the same type of radios in Bucks as they do in Philly I think. If something happens with the cops they always have there nextels, while it isn't the best its something. Also, as long as the FD knows where to go they can get along fine for a short duration since there were no raidos when this show started.

Dalmatian90

05-20-2004, 02:28 PM

No digital system is appropriate for emergency public safety communications.
No trunked system is appropriate for emergency public safety communications.

None.

You're risking too much on far to automated systems, and spending way too much money better spent elsewhere.

Keep them simple -- to simplex, and repeaterized systems. FDNY, although I'm sure it's an extreme example that gets overloaded, operates on something like 5 main frequencies.

We don't need a whole lot of channels to support dispatching, mobile-to-fire alarm, and tactical needs. We just need them to be rock-solid reliable.

Even when the Fail-soft works, you're then left with a bunch of people lacking radio discipline trying to use too few frequencies for your Fire & Police tactical needs, dispatching needs, administrative needs, covert needs, and in some places having to share that with Public Works, School Buses, etc. People just got used to the technology working, and they can't quite cope with having to "share" now.

If you want more channels for administrative stuff, fine, put the administrative stuff on a digital trunk system (or just buy them Nextels and use their digital trunk system instead.) I have a Nextel (actually, 2 -- work, and my not-charged-since-January Fire Company issued one) and yes Nextel goes down for me a couple times a year.

oldman21220

05-20-2004, 02:43 PM

Basic, what a beautiful word.

cozmosis

05-20-2004, 10:47 PM

Originally posted by stcommodore

Also, as long as the FD knows where to go they can get along fine for a short duration since there were no raidos when this show started.

I don't think that's an acceptable attitude. If an FD is having trouble with their radio system -- digital or otherwise -- it needs to be addressed quickly. Granted, the FD will be happy to "improvise, adapt and overcome," but just because radios weren't around "when this show started" doesn't mean they are essential

tools now.

stcommodore

05-21-2004, 12:34 AM

my idea was that if it happened once we could survive, but your right if its commom no doubt it should be fixed. But I've not heard of that being the case.

hwoods

05-21-2004, 12:41 AM

All these years, I thought I was all alone in my intense dislike of Trunking and lately, Digital. Thanks Dal, I'll owe you a Milkbone for that, I couldn't have said it better.

kjohn23

05-21-2004, 12:55 AM

I don't know if it was Kerik or Guiliani but which ever it was put right Show me a radio that works 100% of the time. I definetly agree with the other basic is the way to go. All this high tech stuff is nice but sometimes we rely on it to much.

My 2 cents worth.:eek:

EFD840

05-21-2004, 08:06 AM

Originally posted by Dalmatian90

No digital system is appropriate for emergency public safety communications.

No trunked system is appropriate for emergency public safety communications.

None.

Amen, Amen, Amen.

stcommodore

05-21-2004, 11:14 AM

It was the former FDNY cheif that said there wasn't a radio two and a half years ago that was perfect and is still not one today.

ffexpCP

05-22-2004, 04:18 PM

Can someone explain the operation of the failsoft system? Does it just switch to simplex?

nmfire

05-22-2004, 07:21 PM

Originally posted by ffexpCP

Can someone explain the operation of the failsoft system? Does it just switch to simplex?

Basicly, each trunking site (ie-tower) switches to a conventional repeater mode. The field units (mobiles and portables) are also supposed to automaticly switch to that conventional repeater mode's frequency (it's all pre-programmed). You end up with everyone that was on say 7 talkgroups lumped onto one conventional repeater. It will be a cluster-f__k but it's better than nothing.

In philly, it seems the failsoft was not setup correctly and it spiraled into the twilight zone.

LFD368

05-22-2004, 09:18 PM

I have noticed a lot of firefighters share the same opinion in regards to trunked and/or digital radio systems. But what will happen when the FCC mandates ALL wireless spectrum users (including ourselves) to be digital?

WTFD10

05-22-2004, 09:52 PM

NMfire can expound on this but it seems to me that the amount of repeaters required for 800 mhz digital radios to work reliably in buildings, etc. is usually way more expensive than any entity is willing to pay.

The problems start when they go to the vendor and say "We can't afford that system the way you designed it, what can we get for this amount of money?"

Upgrading their current system is usually not a viable option because the equipment, etc. is usually not made anymore.

So we end up with a "crappy" radio system that isn't reliable.

nmfire

05-23-2004, 02:24 AM

Originally posted by WTFD10

The problems start when they go to the vendor and say "We can't afford that system the way you designed it, what can we get for this amount of money?"

Upgrading their current system is usually not a viable option because the equipment, etc. is usually not made anymore.

So we end up with a "crappy" radio system that isn't reliable.

You got it. It takes a huge amount of infrastructure to make 800Mhz portable radios talk-back coverage out in the open complete. In-building portable coverage takes even more. The more infrastructure you need, the higher the cost.

Motorola comes out and says "this is what you need for 95% portable radio coverage and it costs \$10 million. This 95% coverage is *sometimes* accurate but usually it is less than that. The municipality then lets the idiots who write the checks nit-pick it down. Cut out this and that to make it cost less. So now you end up with 95% mobile coverage and pathetic portable coverage. When they embellish this save-the-word radio system to the public and "little people", they say "it has 95% coverage" which is very good. They just don't tell you that is with a 40 watt mobile radio and a gain antenna on the roof of a truck. Forget trying to talk in to it with a portable unless you are really close to a site.

Then the system gets installed which usually gets delayed due to some moron tech not knowing what they are doing or it costing more than expected.

Then they turn it on and force everyone onto the new system and prey. Of course, it never works up to what anyone has been led to believe because of the aforementioned moron motorola techs screwing it all up and the inevitable less-than-predicted coverage. It malfunctions every other week requiring a \$150/hr service call.

Oh yea, the radios cost \$5,000 each and will probably have only half the features installed they are capable of making the whole thing a waste.

Oh, and this new save-the-word radio system is not compatible with ANY surrounding departments. Yea, P25 is a standard for digital trunking that anyone can use. But the problem is NOT EVERYONE IS USING IT and NOBODY CAN AFFORD IT so it is pointless. In utopia, everyone would have P25 radios and we can live in interoperability heaven. But it don't work like that in reality. It sounds good coming from the Mother /\ marketing department though and well know it has nothing to do with what will actually work. It is all about justifying some big-wig's existence.

NFPA prohibits the use of a trunking talk-group for interior / tactical operations. It needs to be a simplex unit-to-unit channel. This is the most simple thing to do ever. But this feature is inevitably never programmed into the radios because it isn't high tech and expensive.

Give me my UHF conventional repeater any day. The whole repeater and associated parts costs \$2,000. Each radio is ~\$1,000 at most. I can get 4 or 5 of each for what one digital trunking radio costs.

bummer

05-23-2004, 01:34 PM

We should be thinking of making our current systems work for us during mutual aid.

85% or more of the fire departments in the nation use VHF radio systems. Shouldn't our solutions center around making that sytem work for us?

It can!! One VHF channel for dispatching all departments that can use point-to-point transmit and receive.

Multiple fireground frequencies that can be reused by other communities because they are low power.

Plan for the future includes narrowband frequencies when technology changes.

Problem: Solved/ see "www.mabasradio.org" advocacy statements. Let me know if you have a better plan, and what it is.

38fireresq

05-23-2004, 03:08 PM

Our dispatch is a mutual aid service and there are 75 towns dispatched by them in two states. Its all a large simplex repeater system consisting of 5 dispatch frequencies, 5-6 tactical channels which are for portables and station to trucks/portable communications, and all 75 depts have access to these frequencies so mutual aid is always available by radio. We use the tac channels and the dispatch can monitor and if any mayday comes in they broadcast emergency tones on their frequencies and can clear all traffic. It works really well. Except the depts have to determine which freqs they want for water supply, ops, etc... on scene. We have run into problems with depts who are dispatched on the low band freqs but they are all switching to high band so that will not be an issue for long.

Dalmatian90

05-23-2004, 09:41 PM

But what will happen when the FCC mandates ALL wireless spectrum users (including ourselves) to be digital?

Ain't happening anytime soon, and if the FCC was so egotistical to do so, you team up with the Hams, Police, and other interested parties to raise holy hell with NTIA -- National Telecommunications & Infrastructure Administration which is the little-known federal agency that's above the FCC -- and then with Congress.

NOW, the FCC is requiring bandwidth narrowing, and narrowing the bandwidth does require more sophisticated radios that are "digital" i.e. computer controlled inside to create that narrow signal.

But there's a *huge* difference between a radio using digital technology to create a signal (that's fine) and digital transmitting. I don't know if NMFire could explain that better.

nmfire

05-24-2004, 12:44 AM

Digital modulation is what this discussion is refering too. This is taking the transmit audio and turning it into 1's and 0's, then then transmitting the data. The receiving radio decodes the data into audio again.

Dal, your using the word "digital" to describe a radio that uses electronics to tune the frequency instead of crystals. The less confusing and more conventional term is 'synthisised'. Yea, it is digital but thats just not the term for it. As you can see, today it would make it even more confusing since digital would refer to modulation.

Dalmatian90

05-24-2004, 11:12 AM

Dang it NM, I *knew* those terms ;)

Yes -- I think the poster who was concerned about the FCC forcing everyone to "digital" radios was confusing synthesized radios (needed to meet bandwidth narrowing) with the demon digital modulation used in some of these new trunk systems (and Nextels and most cell phones these days...)

WTFD10

05-24-2004, 11:18 AM

NM or Dal, I haven't been following the bandwidth narrowing too closely. Will this effect all users? My department currently uses our own UHF repeater system with a licensed frequency of 464.750/469.750. Will we need to change the .750 to .7505 or something similar in the near future?

nmfire

05-24-2004, 02:04 PM

Ok, todays lesson class will be on the second evil of public safety radio... NARROW BANDING.

Up until now, your UHF and VHF channels were spaced 25Khz apart. So a list looked like this:

460.000
460.025
460.050
460.075
460.100
460.125
460.150
460.175
460.200
460.225
Etc, etc, etc.

The signal your radio transmits actually takes up more space than that single frequency. It uses 5Khz of bandwidth above and below your given frequency. Lets say it is 460.125. When you transmit, your signal occupies 5Khz above and below that. So your signal in reality is going from 460.120 - 460.130 (yep, 460.125 is right in the middle). This is why the licensed channels go in 25Khz steps. Each channel actually takes up 10Khz (5Khz on each side) and you need a little buffer in between. So whats the problem? There is no more room. We are all tripping over eachother on the radio because all of the 25Khz channels are being used up.

The solution... Narrow band! Yay Narrowband frequencies take up less space than good old wide band. Transmitter and receiver specs are changed to make it happen (this is why older wideband only radios can't do this). What's different? Basicly, it is all cut in half.

The frequencies are spaced 12.5Khz aprat instead of 25Khz. They look like this:

460.000
460.0125
460.0250
460.0375
460.0500
460.0625
460.0750
460.0875
460.1000
460.1125
460.125
460.1375
460.150
Etc, etc, etc

Notice you now have twice as many channels as before since you have the new ones stuck in between the old ones. but what about the bandwith?

A narrow band frequency only occupyes 2.5Khz in each direction instead of 5Khz. So, each channel takes up less space therefore allowing more channels to exist.

The good part... more available channels. This does not come without a sacrifice though. There are few issues.

1. It needs to be carefully coordinated so you don't stick a new 12.5Khz user next to an existing 25Khz user causing bleedover and interference. I've seen this happen and it is a pain in the ass. Once EVERYONE is using narrow band, there will be no problem but until then, the mix will casue issues on occasion.

2. Audio quality. On wideband, you have a total of 10Khz (5 above and 5 below) to modulate your audio. With narrowband, you only have half that (2.5 above and 2.5 below). Less space to modulate your audio and it just isn't as nice. It also doesn't have the punch it used to have and may be subject to fading out at a slightly shorter distance than wideband would. Some people on the other hand don't even notice a difference. You may hear of features designed to overcome this called "compandering". Motorola calls it the "HEAR" system. Kenwood and Vertex just call it compandering. Basicly, it compresses you audio on transmit and decompresses it on receive in such a way that the less audio is lost peticularly at a distance. Poblem is you can't mix manufacturers and you can't mix compandered and non-compandered radios. It is all one brand

and all on or all off. This makes mutual aid communications difficult if you neighbors are blessed with the exact same radios you are.

3. Available equipment. Everyone with older but rock solid radios is out of luck. They don't don't do narrow band because it didn't exist when they were made. The oldest Narrowband capable radio we have is a Kenwood TK-830G and it is from around 1996 I think. Spectras, maxtracs, MT1000, MT500, Maratracs, all of those.... forget it. This is often the single biggest hangup in licensing a new narrow band frequency. You basicly need to buy all new stuff. No buying a used Maxtrac for \$150.00. You have to buy a new radio for \$500+

The FCC set mandated dates for when manufacturers have to cease producing wideband radios, when commercial users must cease using wideband, and when public safety must cease using wideband. I don't remember what the years were off hand though. The whole thing is up in the air now anyway because everyone is complaining about the deadlines. With the cost of new equipment, it is not easy.

By the way, this does not include low band. That is a world unto itself. If your in VHF, god help you because that band is an uncoordinated mess.

My fingers are getting sore.... :D

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