

# Everything You Ever Thought Was Right About Firefighter Communications Is Probably **WRONG!**



**Total Communications Solutions for Firefighters!**

## Want to know why? See inside!



## We've been thinking outside the box,

for longer than most people have been alive, and we're still doing it! While the rest of the communications industry keeps doing things more or less the same way they did in the 70's; we have taken the contrarian approach of putting YOUR needs ahead of a desire to beat competition and increase profits by selling products and technology that simply adds to your cost of purchase and maintenance.

We acknowledge that if you plan to use federal grant money that you have to adhere to certain standards, mostly vague, rarely enforced, and totally impractical for fire departments. With that being said, if you apply for federal grant money and spend it on equipment that does not meet federal standards (Notably [SAFECOM](#) and the [2014 AFG Guidance](#)), you could be in a lot of trouble. Don't take the risk, follow the rules, but at the same time, look for opportunities to get more value for your money by applying innovation to your planning. Note: If you are reading a paper copy of this document, you will notice certain words are underlined in blue. This means these words refer you to a web site with additional information. To access these other sites, please go to <http://info4u.us/outofbox.pdf> where you can read this material on line and click on the desired links while you are on line.

Now, to make a point. Our understanding is that Federal grant money can only be spent on equipment that is TAA compliant. If you don't know what this means, check out a recent [Blog](#) on the subject. And, if your grant request includes base stations, mobiles, or portables must be [P25](#) open standard digital capable AND in compliance with State Interoperability Plans. Some states, like Mississippi, are easy. That's because Mississippi has a statewide plan that is properly administrated. Alabama is a little different. The [Alabama plan](#) calls for a P25 700 MHz statewide network, but we haven't quite gotten around to building it. In the meantime, Alabama has historically allowed "local needs" to trump both Federal requirements as well as compliance with the State plan.

Neither Federal standards or State standards specify anything but P25 - Not Analog, Astro, or MotoTRBO, not IDAS, NEXEDGE, not TETRA, or anything else other than P25, PERIOD. So, if you are going to include radios in your grant application, they must be [P25](#) and if you are going to buy P25, please consider purchasing an American made product that costs less than imports and has the lowest cost of ownership of ANY P25 radio. Check out the [Relm Wireless](#) product offerings before you purchase any P25 product. This can save you a lot of money, both now, and down the road.

Having said what we have said thus far, we should explain that there are a lot of wireless products that can address specific needs. When those needs are properly explained in your grant application, the reviewers will generally look favorably on narratives that simply state what you need, why it is needed, what it will cost, how you will keep it operational, and the benefits associated with the project.



## What's your problem?

- 1) Lost ability for portables to talk back when system was narrow banded.  
You are not the only one! Click [here](#) for the story summarized by one user.
- 2) Radios cost too much (\$2,000 + being the low end of the P25 Phase 2 portables. Mobiles are around \$500 additional, or more). Repeaters can easily top \$30,000 for a single site. Trunked sites will generally be in the \$150,000 range and that does not include a tower, antenna, transmission line, building, or installation.
- 3) Volunteers don't want to wear a big heavy radio. Pagers are smaller, but costly (Around \$400 each on average) and have limited functionality.
- 4) I never know who is coming to the fire. I need better incident status reporting and command capability.
- 5) My department is on UHF. The police department is on VHF (or vice versa). We can't coordinate activities without wearing two radios.
- 6) Some of my best firefighters live in areas where radio (or pager) coverage is poor. I need a way to communicate with people in poor signal coverage areas without investing in multiple repeaters or secondary receiver systems.
- 7) We have no equipment suitable for confined space or aerial ladder use.
- 8) We are not in compliance with NFPA or OSHA hearing protection requirements relating to siren and pump operating noise.
- 9) We can't communicate with neighboring agencies using 700/800 MHz systems.
- 10) We think our local communications system should be capable of providing additional functionality to improve response time and better serve the citizens of our community.

We have listed just a few of the more common requirements of fire departments. We could go on and on with a list of needs as long as a Santa wish list. Many of them have to do with better ISO radios (such as being able to confirm that emergency dispatch messages are transmitted from both dispatch and an associated repeater). This can not only earn a better ISO rating but potentially reduce or eliminate litigation expense.

The real problem is that your communications equipment supplier is primarily focused on selling products and services, not addressing your real needs. As a case in point, you would not believe some of the "solutions" proposed by equipment suppliers to address correcting the problem of lost range associated with narrow banding, but that is a subject for another day.

# Simple Solutions for Serious Situations

Let's take a look at some of the "solutions" commonly offered by two-way radio manufacturers to an all too common problem.

**Problem 1** - From a rural volunteer fire department which has lost dispatch and portable talk-back coverage in parts of their fire district as a result of narrow banding.

**Solution A** - Replace everything you have and get on the trunked 800 MHz system. With a fire station radio (\$3,000), four vehicles (\$2,750 each), and twenty five radios for volunteer firefighters (\$2,200 each), that comes to only **\$69,000**. You can put it on a municipal purchase plan and pay just \$1,750 per month for five years. Maintenance is extra, but it shouldn't be much. Batteries are \$140 each, but they last a long time...

**Solution B** - Add a vehicle repeater in your "always respond" vehicles. That will let your portables talk back in poor coverage areas where mobiles have coverage. Of course, you may have to get new portables because vehicular repeaters don't work very well when the mobile and the portable are in the same band (i.e. VHF-VHF). They work much better if you can cross band mobiles and portables (i.e. UHF-VHF). You don't have to replace all your portables, just "officer radios". We figure two vehicular repeaters at around \$2,000 each and four new portables at \$600 each should do the job. As far as the dispatch problem is concerned, we think the best solution would be to add another repeater in your area. That shouldn't cost more than \$35,000 including a tower, FCC licensing, and installation. If we have competition, we can offer a sub-standard alternative for around \$20,000. If you do the job right, your total cost will be only **\$41,000**.

**Solution C** - Replace everything with commercial tier (MotoTRBO or NEXEDGE) digital radios. Digital radios give you back the range you lost when you narrow banded plus they have some other nice features as well. Figure about \$600 each for a portable or mobile, around \$5,000 to replace an existing analog repeater, and a new control station at dispatch for about \$1,000. So, for four vehicles, 25 portables, a new repeater, and a control station radio at dispatch, you can figure around **\$23,000**.

**Solution D** - Put in a satellite receiver station connected by a low powered UHF link in weak portable talk-back areas. The cost will average around \$7,500 at the main repeater site and a similar cost per additional site assuming there is an existing tower with building and power. This significantly improves portable talk-back capability in remote areas. The cost to serve a single department - \$15,000. To solve the dispatch problem, install a site repeater (vehicular repeater with AC power supply and antenna system) at the fire station. Cost will be around \$7,500 including FCC license, installation, and reprogramming of all radios and pagers to operate on the new local area dispatch frequency. Total cost assuming four vehicles and 25 pagers or portable radios - **\$22,500**.

**Our Solution** - As you may have noted, there are TWO problems related to narrow banding - Dispatch to pager/radios, and portable talk-back from remote areas. We have a common solution for both issues. It is called a [BlueBox](#). This device is exclusively offered by Falcon Wireless and it can be configured to address a number of different issues as you will see on the next page.



The BlueBox is compatible with virtually all mobile radios, either analog or digital. At the left, we see the BlueBox sitting on top of a [Hytera DMR](#) analog/digital mobile radio, and on the right, a BlueBox used with an ICOM P25 mobile radio and AC power supply. Actually, the BlueBox can be mounted anywhere within 18 inches of the associated mobile.

The point is that in a base station configuration, the BlueBox can be used in a fire station to extend the range of a distant dispatch station by picking up the audio from the associated radio (analog or digital, conventional or trunked, VHF, UHF, or 700/800 MHz) and extend that capability via an internal VHF or UHF analog transceiver within the BlueBox. This requires a single VHF or UHF frequency used for local area communications. This solves the problem of poor dispatch communications to pagers or radios for fire departments as shown below.

At the bottom right, we see how this works. Dispatch sends a page which is received on the fire station radio and retransmitted to pagers. Portable and mobile radios can talk back to dispatch using the reverse process whereby the BlueBox is used to receive and in turn talk to dispatch through the associated mobile radio



You may recall that we are dealing with TWO problems - Getting dispatch calls out to pagers/radios within the local fire district and improving communications between portables and dispatch. A single BlueBox Base at the fire station solves BOTH problems for less than a thousand dollars for those departments that have a radio at the station. If no radio is available at the station, the cost of an AC powered mobile would be added. See [Info4u.us/BlueBox4u.pdf](http://Info4u.us/BlueBox4u.pdf) for more information.

As you will note, the BlueBox with custom radio cable is \$699. Add \$150 for an AC power supply plus the cost of the radio of your choice. In our example, we have used a 700/800 MHz \$2,995 trunked radio for use on the MSWIN system (a statewide system used in Mississippi). You would need to change frequencies on your pagers, portables, and mobiles. We assume this to be \$25 each. We will assume four vehicle radios and twenty five pager/radios at \$25 each for a solution total of only \$4,699. That's not bad when you compare it to the other "solutions" ranging in cost from \$22,500 to \$69,000! One thing we didn't mention is a fire station antenna system. If you don't already have a base station antenna system at the fire station, we can provide a package including a mast, antenna, and cable kit for \$1,000 additional. You can install it yourself. FCC licensing, if required, adds \$600.

And speaking of things additional, for \$500 more, we can add a smart phone email/text broadcaster option. Every paging call can be sent to designated cell phones (Requires Internet connection or hot spot monthly charge of \$15 monthly). Note:. With a total cost of only **\$6,699**, including a new P25 mobile/base radio, this is the RIGHT solution! Call us at 800.489.2611 for more information.

## More Problems and Solutions.....

**Problem 2** - I know that sooner or later, I am going to have to upgrade to digital. Which digital system is best and when should I make the change?

**Simple Answer** - Digital Mobile Radio (DMR), similar to the technology used by MotoTRBO is the best in the overall consideration of cost versus benefit. It is not the right choice if you intend to apply for federal grant funding, but with P25 costs being roughly four times (or more) the cost of DMR, it is the right decision for many users. [Hytera](#), the second largest communications manufacturer in the world, is our personal preference for DMR radios. Information on our Top Choice analog and DMR Portables is available by clicking [here](#). As to the question of when to start the upgrade to digital, there is only one answer - NOW. You can start by replacing your existing [Repeater](#) or with individual [Mobile Radios](#). In some cases, there is no real justification to move from analog to digital. For those in this category, we have included several of our Top Choice analog mobiles and repeaters, and even a NXDN (IDAS & NEXEDGE) selection. If you are considering P25 radios, click [here](#). We'll be glad to assist in helping you develop the right plan for your specific situation.

**Problem 3** - My guys don't want to wear a big heavy portable radio. What do I do?

**Simple Answer** - Don't give them a radio. Give them a pager! There are four basic types of pagers with the most common being "Monitor" pagers ([Minitor VI](#) and [WatchDog](#) being the normally preferred analog models), Digital text display pagers are the smallest and least expensive (but not ISO approved), ["Talk-Back" pagers](#) which have become very popular in the past twenty years, and Two-Way digital text pagers (we'll be talking more about these later) which ARE approved by ISO.

**Problem 4** - Wait a minute, are you saying our guys don't need radios?

**Simple Answer** - What I am saying is that they don't need radios UNTIL THEY ARRIVE AT THE SCENE (with the possible exception of the Chief and a few officers). Let's say that you have a 30 member volunteer fire department. Of those, you can reasonably assume half of them are available when needed, and half that number will actually make the run. RARELY will more than a half dozen be involved at the scene. The answer is to assign pagers for alerting and keep radios at the station for pickup and use when needed. You'll cut the number of radios to purchase and maintain in half. You will double the chances of your guys having a pager with them that is charged and in operating condition.

**Problem 5** - So you're saying the radios should be at the station?

**Simple Answer** - Absolutely! Put the radios on the same rack as the turnout gear. They don't take that home with them do they? They don't need a thousand channels or the ability to talk statewide. They need to talk where they are, to the incident commander and other on-scene personnel. A rack of six radios with spare batteries, dual muff headsets and a six unit charger is **\$3,600 or less** for top quality MIL-SPEC radios!



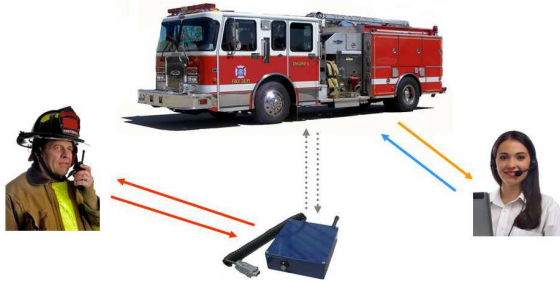
**Problem 6** - So what's the deal with the headsets?

**Simple Answer** - Actually it's a VERY big deal! Sirens and pumps exceed NFPA and OSHA safety standards. That means possible violations, fines, lawsuits, and loss of hearing by your firefighters if they don't have hearing protection. A typical headset installation will involve three headsets per vehicle - two in the cab and one at the pump. Wired units will cost around \$3,500, wireless units closer to \$5,000. So what do you think the better choice would be? A \$5,000 three unit wireless headset system with a range of around a thousand feet, or a system with six wireless headsets with a headset-to-headset range of up to a mile for \$3,600?



**Problem 7** - Concerned about the range of our wireless headsets?

**Solution** - You don't have to be! By installing a [BlueBox-VX](#) range extender in your primary response vehicle (Either EMS or Fire response vehicle), you can have the range of the associated mobile from your wireless headsets. The cost is only \$695 plus the associated mobile. The BlueBox just plugs into the accessory connector of most popular 2-way radios including Hytera, ICOM, Kenwood, Motorola, TecNet, and Vertex).



**Problem 8** - What do I do about Aerial Ladder & Confined Space Communications?

**Solution** - Wireless headsets are great for providing hearing protection and better audio (both transmitted and received), but they still require activation of a transmit talk button by the user. That's not easy when you have both hands full. Even handling a hose is a two handed job. Rescue is a two handed job. Ladder climbing is a two handed job. As a matter of fact, just about everything related to fire and rescue is a two handed job. So, what we really need is a HANDS FREE wireless intercom.



Please note that there is a difference in a wireless intercom and a radio. A RADIO must be P25 capable. This does NOT apply to Wireless Headsets or Pagers! Ever watch College or NFL football? Have you noticed the coaches wearing a headset with a microphone that they sometimes have flipped up? Do you ever see them pushing a button to talk to their staff? Of course not! That's because they talk hands free! Their MICROPHONE is on whenever it is at or near lip level. When flipped up, they can still hear, but they are not transmitting. These units are interference free and cannot be monitored. Better yet, multiple users can talk at the same time! Seems like an ideal solution for fireground communications doesn't it?

**Problem 9** - I'll bet those hands free headsets are expensive!

**Solution** - That depends on your perspective! You could use a [P25 radio](#) at a cost of around \$2,500 with a headset, or an analog radio like our [CS100](#) with a headset for around \$400, or an offering by companies like [Cobalt](#) or [Firecom](#), or you could choose the Multi-Voice-Radio with headset for \$1,000. The P25 radios and the CS100 require push to talk, and the Cobalt or Firecom systems will cost about the same, yet none of them offers group simultaneous communications. Neither Cobalt or Firecom can match the range of the [MVR system](#) nor the simplicity of set up and operation. Clearly, the MVR system is the best choice for any application where hands free operation would be of benefit!

**Problem 10** - I'm not sure that I am in full compliance with ISO requirements

**Solution** - The answer is that you probably are not! Two of the most common issues are (1) the ability to GUARANTEE that all calls sent by dispatch can be verified and (2) that all calls are recorded in such a manner that they can be retrieved later to review times, dates, and conversations. Many feel that this is the responsibility of 911. To some extent it is, but VERY few have the ability to guarantee message delivery, and even the use of very expensive recording equipment does not always produce the necessary information required.



In the event of delays in responding, injury, and/or litigation; the responsibility for proper records is YOUR responsibility. There are two relatively inexpensive devices to provide assurance that you comply with ISO requirements and that you have done due diligence for litigation avoidance. The first device is called an [InstalertR](#), a simple and effective radio transmission monitor priced at just \$1,495. The second is the [TeleCorder](#), a simple and inexpensive recorder used in conjunction with our [2TR9](#) station house monitor. The price for the complete package is just \$1,400.

**Problem 11** - I think I may have overlooked something. What is it?

**Solution** - The answer is that, thus far, we have not addressed COMMUNITY needs!



The fact is that a fire department is PART of a community that should be working together, not one of several competing entities. The police department, the utility board, schools, government offices, churches, hospitals, business, and neighborhoods should all be part of a single operating unit, committed and concerned with the needs of each other.

Instead of addressing singular needs or separating functions into separate segments, events, or situations; the focus should be on notification, response, and revitalization whether it is a fire, flood, tornado, or a single individual needing assistance. Modern technology should be applied to address the need to protect people, property, and places. That is why we have developed a program called [NeighborNet](#).



You can get the whole NeighborNet story by clicking [here](#). In summary, the idea is to provide the infrastructure to serve the community of interest. For smaller cities Up to 5000 population, the cost is \$125,000 which can be paid for with general fund money, bonds, government extended pay plans, or by federal funding with local matching share ranging from 5 to 25%. In some cases, user equipment may also be included (Call us for details at 205.854.2611). Larger cities of up to 25,000 population will have an infrastructure cost of \$250,000 while cities (up to 500,000) or rural counties will typically have a cost of \$375,000.

County fire associations can work together in submitting either local or regional grants. In general, a three site system will serve the typical rural county. For now, let us just say that this solution addresses multiple needs with practical and affordable solutions. Take a few minutes to read the reference material. Your time should be well invested. The main point to remember is that this system qualifies for AFG funding for the 2015 program with the application period expected in early November.

**Problem 12** - I am not comfortable with the AFG application preparation process.

**Solution** - You SHOULD be uncomfortable! Very few of us are capable of analyzing the grant requirements, preparing the request for funding in a logical and understandable format, administering, or closing the grant. This should be done by someone skilled in such activities - not a grant writer (they only do part of the job), not a grant administrator (too much temptation to fulfill self interest), not a member of the fire department (few have the necessary skills), and CERTAINLY not a vendor! The right choice is an attorney with knowledge of the requirements and an interest in assisting you. We know such an attorney. His rates are reasonable and he has a desire to become the go to guy for fire departments. You may also want to consider a local paralegal. Paperwork is what they are all about! Give us a call at 205.854.2611 for more information.

## Let's Recap

Here are our original ten questions with comments following in **red**.

- 1) Lost ability for portables to talk back when system was narrow banded.  
You are not the only one! Click [here](#) for the story summarized by one user.  
**See Our Solution at the bottom of Page 4.**
- 2) Radios cost too much (\$2,000 + being the low end of the [P25 Phase 2](#) portables. Mobiles are around \$500 additional, or more). Repeaters can easily top \$30,000 for a single site. Trunked sites will generally be in the \$150,000 range and that does not include a tower, antenna, transmission line, building, or installation.  
**See Problem 3 Solutions 2 - 6 on Page 5.**
- 3) Volunteers don't want to wear a big heavy radio. Pagers are smaller, but costly (Around \$400 each on average) and have limited functionality.  
**See Problem 3 Simple Solution on Page 5.**
- 4) I never know who is coming to the fire. I need better incident status reporting and command capability.  
**See Problem 11 Simple Solution on Page 8.**

- 5) My department is on UHF. The police department is on VHF (or vice versa).  
We can't coordinate activities without wearing two radios.  
**See Page 5, Paragraph 4.**
- 6) Some of my best firefighters live in areas where radio (or pager) coverage is poor.  
I need a way to communicate with people in poor signal coverage areas without investing in multiple repeaters or secondary receiver systems.  
**See Page 5, in particular, last paragraph.**
- 7) We have no equipment suitable for confined space or aerial ladder use.  
**See Problem 8 Simple Solution and Problem 9 Simple Solution.**
- 8) We are not in compliance with NFPA or OSHA hearing protection requirements relating to siren and pump operating noise.  
**See Problem 6 Simple Solution on Page 8.**
- 9) We can't communicate with neighboring agencies using 700/800 MHz systems.  
**See [Info4u.us/BlueBox4u.pdf](http://Info4u.us/BlueBox4u.pdf)**
- 10) We think our local communications system should be capable of providing additional functionality to improve response time and better serve the citizens of our community.  
**See Problem 11 Solution on pages 8 and 9.**

Thanks for allowing us to share our ideas. We look forward to serving you!

The Falcon Team  
*At your service!*

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