

# FalconDirect Communications System Planner



We are often asked to provide pricing information for setting up a 2-way radio communications system for private fleet use. Since we primarily serve those who serve others, these requests most often come from county or municipal fleet operators which include fire & rescue, law enforcement, and school transportation users. This planner has been prepared to assist those who are considering 2-way radio for the first time or those who already have systems that are interested in adding or upgrading. We hope you find this information useful.

## Equipment Pricing

Let's address the most important part right up front – the price! To keep things simple, we are going to use only one number - \$289. That's all you have to remember as virtually every component of the system will be based on this number. We will cover this in more detail a little later.

## System Components

The components of the typical 2-way radio system will normally include an FCC license, a centrally located repeater station, antenna system, one or more fixed office control stations, vehicular radios (or mobiles), portables (or handhelds), installation, training, and maintenance. We will address each of these components in the following paragraphs.

## FCC Licensing

You cannot operate a public safety radio system without an FCC license. Most agencies will choose VHF which is the preferred choice in most areas of the USA. UHF is very popular in some areas. If in doubt, check with your local EMA, fire department, police department, road department, school transportation department, and sheriff's office. The idea is to choose a radio system that can be compatible with other public safety users in times of emergency. The typical cost for an FCC repeater license is \$710. Additional information on FCC licensing is available at [www.info4u.us/FCC\\_Licensing\\_Services.pdf](http://www.info4u.us/FCC_Licensing_Services.pdf).

## System Types

In addition to selecting the operating band, you also will need to choose whether your system will operate using an analog or digital operating system. Analog systems can operate at either wide band (25 kHz) or narrow band (12.5 kHz) through 2018. There are three different types of digital systems – MotoTRBO, the least expensive, NXDN slightly more expensive, but much more flexible, and P25 which is required if a grant has been awarded for communications through the Department of Homeland Security. Additional information is available at [www.info4u.us/PathwayPS.pdf](http://www.info4u.us/PathwayPS.pdf). For most users, analog is still the technology of choice, primarily from the consideration of compatibility with other users as well as cost (Analog is considerably less expensive than any of the digital systems).

## Equipment Brands

The big names in public safety communications equipment are HYT, ICOM, Maxon, Midland, Motorola, Ritron, and TEKK. We've got them all, but for the purpose of keeping things simple, we will provide equipment pricing primarily based on the use of Maxon mobile and portables, ICOM for the repeater and Ritron for office stations. Additional information on other equipment types is available at [www.falcondirect.com](http://www.falcondirect.com).

## Equipment Selection

We will start with a repeater station since this is the heart of the radio system. The repeater allows fixed stations, mobiles, and portables to communicate with each other over extended distances that would not be possible without the use of a booster or repeater station. Additional information on repeaters and the functions they provide is available at [www.falcondirect.com/repeaters](http://www.falcondirect.com/repeaters).



### FR5000/6000 Series Repeater

Our personal choice for a repeater is the ICOM model FR5000 (VHF) or FR6000 (UHF), both rated at 50 watts, the optimum power for the average user and in most case, the maximum powered allowed by the FCC. This station can operate on both 25 and 12.5 kHz spacing in the analog mode as well as 25, 12.5, and 6.25 kHz digital modes which allows operation BEYOND 2018. Price is as follows:

Cabinet with crossover cabling	-	\$289
Power supply	-	289
Transmit RF module	-	289
Receive RF module	-	289
Duplexer	-	289
Control assembly	-	289
Setup, shipping & 5 year warranty	-	<u>289</u>
Total Repeater Price	-	\$2,023

Product specifications are available at [www.info4u.us/FR5000.pdf](http://www.info4u.us/FR5000.pdf). The Motorola XPR8300 (MotoTRBO) is available for \$2,795. A product brochure is available at [www.falcondirect.com/mototrbo/MotoTrboBrochure.pdf](http://www.falcondirect.com/mototrbo/MotoTrboBrochure.pdf). The Midland P25 100 watt repeater is \$7,115.25 (See <http://falconinfo.blogspot.com/2009/08/incredible-pricing-on-p25-repeater.html>).



### BaseMaster Station Antenna

You will need a base station antenna for use with your repeater. We offer the BaseMaster Series in both VHF and UHF versions for the same price. Additional information is available on our Blog page at [www.info4u.us/BaseMaster.pdf](http://www.info4u.us/BaseMaster.pdf).

Your price for either VHF or UHF - \$289

Other antennas are available at [www.falcondirect.com/repeaters/antennas](http://www.falcondirect.com/repeaters/antennas)

### Transmission Line Kit



A 150' line kit with connectors is available for just \$289.

A side mount bracket for attaching the antenna to an existing tower and a lightning arrestor is available for just \$289.



### Fixed Office Station

The Ritron Jobcom fixed office station is ideal for use in administrative offices, dispatch centers, maintenance shops or anywhere else where fixed use is desired. Everything included!

Your choice for either VHF or UHF with paging capability - \$289

Additional information is available at [www.usa-radio1.com/prices/basestations](http://www.usa-radio1.com/prices/basestations)



### **SM5000 Series Mobile by Maxon**

The Maxon SM5000 offers more features, functionality, and reliability than any other mobile radio anywhere near its price range. Available in either VHF (SM5102) or UHF (SM5402); these radios have 208 channel capability and 50 watts of power in VHF or 45 watts in UHF and can operate on standard or narrow band channel spacing. Detailed specifications are available at [www.info4u.us/sm5000.pdf](http://www.info4u.us/sm5000.pdf). Prices are as follows:

VHF or UHF mobile with paging capability - \$289

Options for Maxon mobile includes PC programming kit for \$59, base station kit with AC power supply and desk microphone for \$289 and roof top antenna with mount kit for \$64 (See <http://falconinfo.blogspot.com/2008/12/new-antennas-have-10-year-warranty.html> for additional information).

The ICOM F5061 VHF or F6061 Series mobile radios are optionally available at \$578. These mobiles can be upgraded to full NXDN digital capability by the addition of a digital plug in board. This would be an excellent choice for users who want a mobile that can be used beyond 2018. Additional information is available at [www.info4u.us/F5061.pdf](http://www.info4u.us/F5061.pdf). These radios are also capable of operating in the LTR or digital trunking mode. The Motorola XPR4550 is also available at the \$805. Detailed specifications are available on line at <http://topchoiceradios.com/XPR4550.aspx>.



### **SP7000 Series Portable by Maxon**

The Maxon SP7000 offers more features, functionality, and reliability than any other mobile radio anywhere near its price range. Available in either VHF (SP7102) or UHF (SP4102); these radios have 255 channel capability and 5 watts of power in VHF or 4 watts in UHF and can operate on both standard and narrow band channels. Both radios have an internal scrambler for compliance with HIPAA regulations. Detailed specifications are available at [www.info4u.us/sp7000.pdf](http://www.info4u.us/sp7000.pdf). Prices are as follows:

VHF or UHF portable with paging capability - \$289

Options for Maxon portable include a PC programming kit for \$59, speaker-microphone for \$59 and spare battery for \$59.

The ICOM F3161 VHF or F4161 UHF portable radios are optionally available at \$478. These mobiles can be upgraded to full NXDN digital capability by the addition of a digital plug in board. This would be an excellent choice for users who want a portable that can be used beyond 2018. Additional information is available at [www.info4u.us/F3161.pdf](http://www.info4u.us/F3161.pdf). These radios are also capable of operating in the LTR or digital trunking mode. The Motorola XPR6550 is also available for \$1,035. Specifications are available at <http://topchoiceradios.com/XPR6550.aspx>.

## Installation Services

For budgetary purposes, we are assuming that you have, or have access to a structure to which an antenna can be mounted at 100' or more above ground. This might be an existing tower, water tank, or even a tall building. We have based our antenna and transmission line costs based on this assumption. We have further assumed coverage throughout a typical US county in flat to rolling terrain. In some cases, a higher antenna structure, better antenna, or more transmission line may be required. If desired, we can erect a tower of any desired height on a site with electrical power and suitable space for guying the tower (assume space extending from the tower in all directions equal to the height of the tower). This can be discussed after we know more about your individual requirements.

For installation of the antenna and transmission line on an existing structure, assume a half day of on-site work at \$289 plus a half day of travel time within 100 miles of Birmingham, AL. For each additional 100 miles, add \$289. For overnight trips beyond 100 miles, add \$289 for overnight lodging. If you wish for us to furnish and erect a tower, assume \$289 per each 10' erected up to 180 feet.

For installation of mobiles, assume a trip charge of \$289 plus \$289 for the installation of two mobiles (assume four mobiles per day per installer) within 100 miles of Birmingham, AL. Add \$289 for each additional 100 miles. Overnight stays add \$289 per night. For large fleet users, we can train those with mechanical skills to do their own installations. We will work with your personnel in the installation and training associated with the installation of your first two mobiles as well as making recommendations for any special equipment that you may not already possess (Cost rarely exceeds \$289)

## Post Sale Services

All of the equipment quoted is covered by a 2 year factory warranty with the exception of the repeater station which is covered by a five year warranty. We will work with you to develop a cost efficient maintenance program. In the meantime, we invite you to visit [www.ultracareplus.com](http://www.ultracareplus.com).

## Optional Equipment

We recommend the purchase of at least one portable vehicle tracking system for enhanced administrative control. Additional information is available on our SlapNGo system at [www.info4u.us/BusTrak.pdf](http://www.info4u.us/BusTrak.pdf). We also offer very affordable bus camera systems. See [www.info4u.us/BusCam.pdf](http://www.info4u.us/BusCam.pdf) for more information. Those involved in church or school administration might also check out [www.info4u.us/710.pdf](http://www.info4u.us/710.pdf).

## Summary

Let's total up a typical 20 unit portable system with two fixed stations, two mobile radios installed, and an FCC licensed repeater station assuming an existing antenna structure within 100 miles of Birmingham, AL as follows:

1 – FCC License	-	\$ 710	Long term financing is available with terms of up to five years. For budgetary use, use a factor of .025 to determine monthly rate. (i.e. \$11,820 would equate to sixty monthly payments of approximately \$295 per mo.
1 – Repeater	-	2,023	
1 – Antenna with line kit	-	867	
2 – Fixed station units @ \$289 each	-	578	
20 - portable radio units @ \$289 each	-	5,780	
2 – Mobile radios @ \$289 each	-	578	
2 – Mobile antennas @ \$64 each	-	128	
Installation of complete system	-	<u>1,156</u>	
TOTAL		\$11,820	