



Twin Eagle Consulting

Industrial Wireless Solutions

Why Cheap is so Expensive When Choosing Communications Equipment

In the past 40 years, I've seen a lot of changes in the telecom industry and so have you. Touch tone phones were just coming out when I got out of college. There were no cell phones, so companies communicated via Low band radios for office base to mobile, and mobile to mobile talking. There were even some FCC mandated protocols to make sure we were all talking nice to each other.

Long distance calls were very expensive, so you kept it short to save money. The good news was that gasoline was around \$.37 a gallon and you could buy a new home for \$20,000. I had just started my career and was surprised to find out how expensive the microwave radios were that I was servicing for my little natural gas company in Wyoming. A fully redundant 600 channel analog microwave system could be as much as \$100,000 per link. This included an adequate tower, space diversity and a top of the line Lenkurt or Granger multiplex.

Thankfully, things have changed for the better, except for home and gasoline prices. So why the title "why is cheap so expensive"? In the improvement of technology, we have a chip mentality. A single electronic microchip can now do the work that used to take many electronic parts to do. That dropped the cost to make things like cell phones, stereos, televisions and of course, commercial and industrial data radios less expensive. Low labor costs overseas also dropped electronic costs, but that's another topic for another day.

If microchips are that good, then why shouldn't you just go buy the cheapest commercial data radio out there to save money? It's really based on what you want your user experience to be. Today there are companies that build quality industrial based radios that work in noisy environments. These software defined radios use proprietary modulation and software protocols to keep them dependable and secure. The Low cost throw away commercial grade radio vendors don't even try to do what the higher priced industrial vendors do. They can't afford to do that detailed development and design; their main customers are WISP's (wireless internet service providers) who need to purchase their radios at rock bottom prices. The cheaper subscriber mounted on a home for internet access needs to be priced low enough to compete with the cable company down the street.

So why can't you use the cheap WISP radios in the field you might ask? Well you can, there's nothing stopping you. You can even purchase 2 radios for each endpoint just to have a spare in case the original dies. Just throw the bad radio away. You'd still be way ahead on your budget.

Now comes the expensive part. You purchased a few hundred WISP radios and started the install. After having installed several of the radios, you realize that the performance gets worse the more you install. It may be interference from your competitor, or it might even be self-interference due to the large amount of radios installed in close proximity to each other. You change channels and that may help for a while, but it really never becomes good enough to satisfy what you need it to be.

You may even bring in a consultant to see what's wrong. Then you hear that the commercial grade WISP radio installed uses a common WIFI chip as its radio; The same one every WIFI radio in the world uses. So, what can you do to fix this problem? Nothing, there isn't a proprietary protocol to protect you. The radio network is as good as it will ever be due to the WISP characteristics installed that make the radio cheaper to produce and sell. Sometimes the WISP commercial grade radios work fine, and you save a lot of money. Usually this is where no other company is using the 2.4 GHz and 5.8 GHz bands. If a mesh radio technology comes in, then your certain to have multiple interference problems in a short amount of time for sure.

You can now either live with the performance, or you will need to forklift it out and start over. This is why cheap is sometimes so expensive. So, ask yourself, am I ok with a cheap radio network that may have issues later on, or would I rather spend more money to engineer and install an industrial grade network that the producer of the radio will support in case of issues?

I now appreciate the high-priced radios my little natural gas company installed all those years ago, because my call outs on weekends and evenings rarely happened. Reliability can be expensive, but it still allows for a good night's sleep.

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