Who's Minding The Store:
Watt? No Meters?

AN ARTICLE
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Congratulations!
You spent over $375,000.00 on a new antenna system with a three station combiner that will be owned by you, operated by you and money will be paid to you for the use of input ports two and three. Wow, what a deal to make your tower profitable. This is a real coup, and your boss man, General Mangler and even the owner will be so pleased. You think that you did everything right. The tower is great, and the best of vendors were selected to provide the components. You even had a say in who the installing crew was, and the vendor of the Combiner came down to sweep the whole shootin match and swear on his breakfast of biscuits and possum that everything is up to snuff.

What could possibly go wrong?

Time passes and your company collects piles of printed presidents and just when you think that things are dandy several years down the road, your port two and three tenants are squawking something about no range and lots of static. You did not notice this since your station is automated, you don't listen to the format, and no one answers your phones. Ooops. What could possibly be wrong? The transmitter is happy, there are no V.S.W.R. alarms. The remote control is saying that you are making power, and for some reason you think, so is everyone else to some degree. There is clearly a rat in the kitchen but you just don't have the vision of what it could be.

Let us review what you have. There is this combiner system, It was tuned up and running cool. The antenna swept great, past tense.

There have been no storms, tornado's or other signs of demise to trip your trigger. Things should be wonderful in your life but from the mounting phone calls, your life is beginning to stink. What are you missing? Common sense kicks in like the app on your phone and you drive to the transmitter site to be greeted by a room full of coolness, a strange smell, humming transmitters and no apparent sign of trouble. After fifteen or twenty minutes you make way to leave the building and when you step out of the door, you can't help but notice the small smoldering, nearly extinguished grass fire on the back side of the building.

So many things rocket through your now damaged mind. Fire, through inspirational does not belong at your transmitter site, and the possibilities of generation sources race through your over taxed brain cell. There is no one here. I am the only one here, and the gate to the compound was locked. There is no lightning. The list goes on and on until you are narrowly missed by a flaming piece of plastic that has fallen from on high.

This can't be right. Fire does not typically come from the top down,,,, uh oh.

It is now that you realize that if your antenna is on fire or the line is on fire, you do not see this issue. Why not?

When you designed your money making scheme to pay the tower expenses, a small but important list of items was nixed by the owner, and wanting to keep your job, you did call his daughter ugly. Not being a transmitter type of guy, he didn't see the need for the extra Watt Meter or monitoring package. He said that you would be fine without it since you have a Watt meter in the transmitter, right? Wrong! The Watt Meter in the transmitter is watching the input to your constant impedance combiner input that has a really nifty dummy load on the opposite port to catch little evil things that might make their way backward through the combiner. You are running a quarter million dollars worth of antenna without a Watt Meter, Watcher, or any other type of reverse and forward power metering on it. After you put out the grass fire you run inside and start killing transmitters only to notice that the client boxes are already dead. Your next move is to put your hand foolishly on to the dummy loads on the combiner inputs and while the first two are cool as a Coke on ice, the third dummy is still on fire and now so is your hand.

Now that the site is down, you remember that there is a directional coupler installed on the main trunk line so you grab your Spectrum Analyzer and set it up for a forward power measurement. You sheepishly hit run on your transmitter and a reading is obtained. You quick like a bunny move the test cable to the reflected port and the reading only goes down by 3.2dB. Whoa Sea Biscuit,,, antennas should have a Return Loss of hopefully greater than 20dB. You check your chickens and sure enough you have a reading of 3.2dB. A quick calculation says that this number divided by 2 roughly equals the insertion loss of the main trunk line to the antenna and what is left of your now mushy mind says that the flaming ball of poo that nearly hit you was a hanger part of some kind that has departed the aircraft in flight, and your antenna system is on fire and you could lose your job over this.

I NEED A TOWER CREW:

Your phone wont' stop ringing, you quickly learn to hate your once favorite ring tone, and the one call that you have to take is the General Mangler who is driving with the owner in your direction. As luck would have it, your tower crew is just hanging around the house and they pop over for a climb to find things that no Chief Engineer ever wants to see. Molten BB's of copper sitting on an insulator and the accompanying length of outer conductor with blotchy black and orange spots. Though you wish it was your kid with the measles, this is going to turn in to a fight for your job, intertwined with a chance to try not to call the Mangler and Owner stupid.

WHO'S MINDING THE STORE:

This is the dangerous part where you try to walk the fine line of calling your superiors stupid and cheap while trying to explain that this is not your fault and yup, they are stupid and cheap. Good luck with this.

Initially there is a lot of yelling and finger pointing both verbally and literally. You explain to them that what apparently is a fire upstairs has blown out three reject loads, attempted to, if not succeeded in damaging three transmitters and took out two power dividers along with a bunch of rigid line.

You haven't even gotten to answering their question of why did it do that for which there is no apparent answer other than the guys working on the tower lights seem to have shoved a pieces of rigid out of alignment which caused it to arc internally, and since the twins cheap and stupid insured that there was no metering on the main antenna trunk line to see the failure, three transmitters kept pumping 27,000 Watts a piece in to a welding experiment. Ouch, it is still your fault, but the yelling stopped while they bat their deer in the headlights look of bewilderment at you.

SO MANY GREAT CHOICES:
With so many great choices for RF power and V.S.W.R. monitoring, the original decision to save the $3,000.00 to $6,000.00 and skimp on the monitoring system turned out to be pretty (go ahead and say it) stupid. A single decision to be either cheap or stupid will set three stations back three weeks of running at a thousand Watts each thanks to your very creative Line Sweeper, Tower Crew, their well equipped work truck along with some ingenuity. While not having to spend three weeks waiting for parts totally off the air, neither you, nor unfortunately the tenants had a say in the lack of monitoring equipment for which they hold your people ultimately responsible for their damages.

There are so many ways to monitor your power. You could even do it the super cheap way with a pair of detectors along with appropriate attenuators. Just wire the detectors directly to the analog input of your el-cheapo remote control to get linear, offset, and sort of calibrated readings that could have set off your electronic mistress and warned you way in advance of the impending doom. I get it that you are not about to tell the General Mangler that this could have been detoured for the lack of a couple of hundred bucks, but going forward, keep this from happening as an entry in your book of "Don't Let This Happen To You" and make the suggestion.

Metering does not have to be fancy or cost a lot of money. Take advantage of the already installed directional port, add a few appropriate attenuators and install some detectors, or if you have slug capable sections, install sniffers with the power handling ability, build some small potentiometer settable filter boxes and wire these cheap gems to your remote control. You might get to keep your job or contract and be the hero instead of the other way to go. Weigh the odds. Spend $23,487.00 on parts, Tower Crew and Line Sweeper or $433.38 on do it yourself parts for a cool power monitoring system. It is your choice.