



Shulins' Solutions



sUAS Inspections

Dramatically New Perspective



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About Shulins' Solutions

Shulins' Solutions provides unique monitor, control and protection solutions for transmission sites, drone-based tower inspections and a full range of consulting services based on years of practical experience on the ground building and operating broadcast facilities. Shulins Solutions solves problems with an attention to detail that only comes from firsthand experience in the field. All of our products and services come from the point of view of the user, and are crafted with the passion of a lifelong broadcaster.

Shulins' Solutions is built on three pillars:

Stellar Eclipse broadcast site monitoring platform provides a systems approach to monitoring and protection of RF systems from simple to complex featuring the exclusive VSWR Sentinel protection technology.

sUAS Drone based tower structure visual and infra-red surveys provide an indispensable tool to diagnose the health of RF systems and tower structures without the risk of climbing the towers.

Broadcast Technology Consulting

to meet the demands of broadcasters specializing in remote control solutions, studio design and construction, antenna protection systems and ratings metrics.

The entire Shulins' Solutions team of experienced broadcast professionals stand ready to help you tackle even the most challenging problems. Let us put our experience, knowledge and passion to work for you.

Meet Paul Shulins

Paul founded Shulins' Solutions based on his passion for broadcasting and bringing products and services to market that go beyond great specs and cool features to cover all the challenges familiar to a chief engineer in the trenches. Paul's been there, done that and got the tee shirt!

Paul served as Vice President and Chief Technology Officer for Burk Technology and was the Director of Technical Operations for Greater Media's Boston, Massachusetts five FM Radio Stations for twenty-nine years. He has been a Chief Engineer for more than 30 years – chances are good Paul has seen what you are seeing.

Paul has long lead technical innovation, sometimes even being on the "bleeding edge" with many firsts, including one of the first major market studio consolidations in the late 90's and early HD Radio® systems from the top of Boston's Prudential Center. Over the years Shulins has designed and constructed many custom, on-air program playback systems and technical facility monitoring and control systems to address real world challenges that you just couldn't solve with off the shelf products.

Paul is passionate about industry education; chances are you have read something he has written, he is a frequent contributor to many industry publications, authored several chapters in the 11th edition of the NAB engineering handbook and is a regular presenter at industry, NAB, IEEE and SBE events.

Paul earned a Bachelor of Arts degree from the University of New Hampshire System with majors in physics, chemistry and natural sciences. He is a lifetime certified member of SBE and currently serves as Vice President of the IEEE Broadcast Technology Society.



In his spare time (what's that?) Paul is a private pilot, skier, photographer, and is a published astronomer who remotely collects deep sky images through his Arizona observatory.

sUAS Drone Visuals



Since drones or small Unmanned Aircraft Systems (sUAS) have taken to the skies, we now have the opportunity to approach telecommunications tower maintenance from a dramatically new perspective. Rapid communication has reduced the size of our world and at the same time dramatically increased the number of telecommunication towers worldwide to over 4 million. In the United States, a major mobile carrier alone is installing, repairing, or inspecting any of their 65,000 towers on a daily basis, placing a strain on the availability of tower crews, especially when you need to deploy those certified to work on tall broadcast structures.

Shulins Solutions has the technology to conduct efficient, safe tower inspections while cutting costs and producing quality data. We bring a unique combination of extensive broadcast experience, many years as a licensed pilot coupled with a major investment in sUAS equipment and specialized training to provide the most comprehensive unmanned tower inspections. Inspecting broadcast and cell tower sites, light towers/poles, bridges, power lines, and other hard to access structures has long been facilitated by tower climbers, bucket trucks, and binoculars. Our innovative sUAS drone technology is simplifying and improving the speed of the inspection process while also reducing costs and improved safety. Let our certified remote pilots help complete the inspection.

Increased flexibility simplifies tower maintenance and RF system trouble shooting

- Inspections can be scheduled and performed in a wide variety of meteorological conditions – don't be held hostage by the weather
- Schedule work on your timetable - sUAS inspections are much easier to schedule than a tower crew.
- Gain many different perspectives: The sUAS can capture the tower, antenna, and transmission line details from any angle, including above the tower.
- Infrared images can be obtained that will allow the owner/operator to see areas of heating that are inefficient and could be the early warning sign of potential failures down the road.

Our innovated technology reduces your operating costs

- sUAS inspections are always less expensive than hiring a tower crew.
- Eliminate temporary structures or specialty equipment rental. Savings as a result of not needing to build scaffolding or other temporary, one-use infrastructure to support a manual inspection.
- Reduced downtime. For operations like broadcast stations, which need to be shut off before an inspection can be performed, every second of downtime means a loss of revenue. Using a drone to make turnarounds more efficient can mean big savings for companies.
- Reduced liability insurance. By significantly reducing the amount of time personnel is placed in dangerous situations companies can reduce their corresponding insurance costs.

sUAS inspections increase safety and eliminate risk

- Eliminate risk for injury from climbing or a fall like with a tower crew.
- No RF Exposure risk. Stations stay on the air at full power, eliminating the need to be concerned about RF exposure to a climber.
- Increased safety through increased inspections. Given the relatively low cost of drone inspections, many companies are using them to perform inspections more regularly, which means that potential problems can be surfaced and addressed more quickly.
- No need for the inspector to be put into potentially dangerous situations.

Clear Documentation

- When compared to ground-based inspections, drones produce a much higher quality of visual information. It is essential to record many pieces of information on a tower inspection, such as model and serial numbers of antennas – avoid un-authorized "stowaways" on your tower.
- Capture the overall condition of the tower, which includes brackets and hardware. Rust, corrosion, thread count, and other factors are critical to note. This information can then be translated into reports, plans of action, and client documentation.
- Precise GPS positioning information combined with exact visual data at the image pixel level makes it possible to compare recent observations with historical data to identify specific areas that may be experiencing deterioration.
- Detailed documentation from a sUAS inspections can precisely target an area that needs attention, increasing the efficiency of tower climber once they need to access the structure to make repairs – they know exactly where the issue is.

sUAS Based Tower Inspections Increase Safety & Efficiency

Tower climbing is a small, highly qualified niche of roughly 10,000 workers and is considered one of the most dangerous jobs in the United States. Since 2013, the U.S. Occupational and Safety Health Administration (OSHA) reports that telecommunication tower accidents have resulted in 19 climber deaths.

Telecommunications towers are in constant need of attention, putting climbers at risk time and time again. Utilizing drones to complete tower inspections minimizes climber risk. sUAS drones can fly numerous times, taking several looks at towers, while pilots and climbers are safely grounded. Tower climbers will continue to remain a necessity for tower repair, however with sUAS technology, climbers will be aware of the area in need of repair prior to leaving the ground, making climbs less frequently to complete efficient work.

sUAS drone tower inspections are streamlined requiring minimal personnel hours and our experienced pilots using cutting edge equipment can perform timely, necessary inspections at any location. Telecommunications and Broadcast operators gain expertise in a cost-effective manner, accessing knowledge and technology to keep towers functioning without breaking the budget. Flights are performed in a small area surrounding the tower, as such pilots have no need to fly drones beyond the visual line of sight or into restricted airspace. Utilizing sUAS drones for telecommunications tower inspections provides a simple, affordable solution with prompt results.



Close up inspection of a side mount UHF TV Antenna

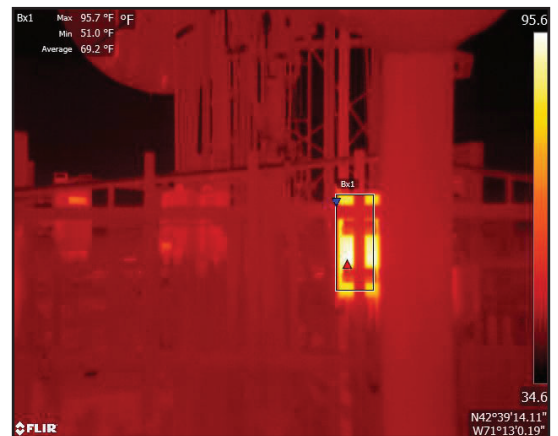
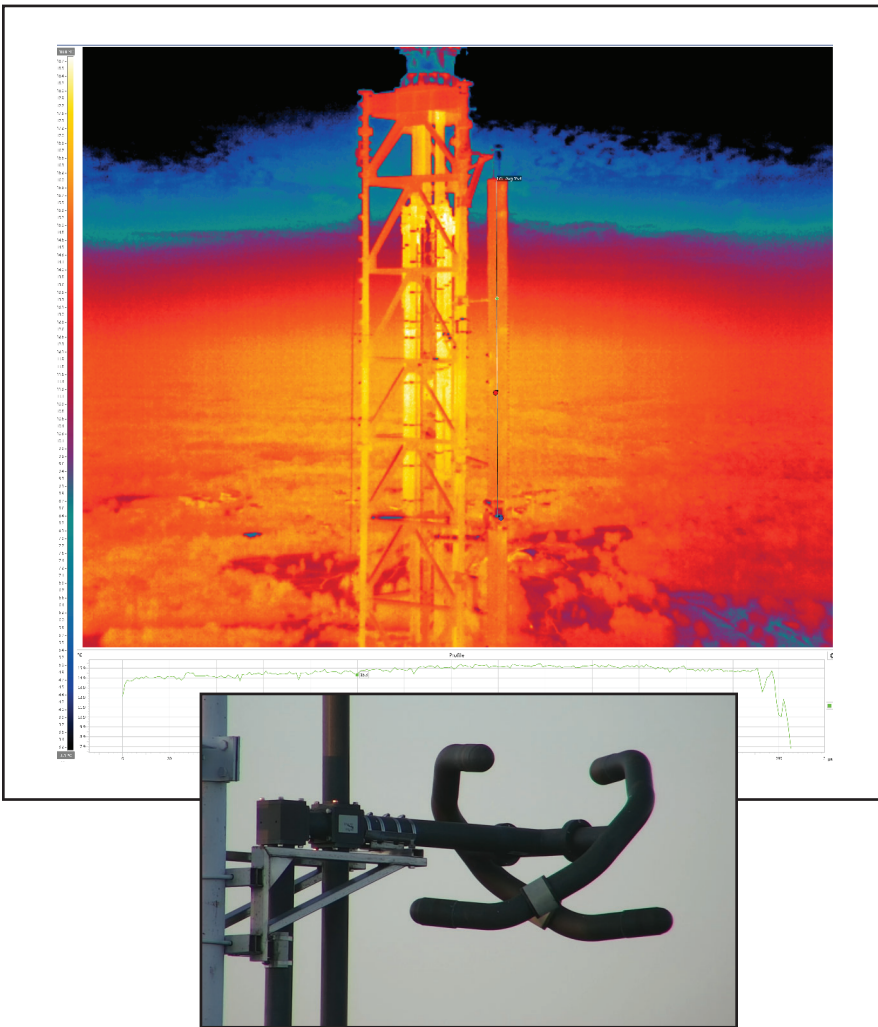


Examining the flange bolts at 1,000 feet above the ground

Beyond typical maintenance, nature can inflict damage on telecommunications towers. Storms producing strong winds, fierce rain, below freezing conditions, or lightning strikes are cause for unanticipated tower repair. Drones provide a safe method to inspect towers for damage after severe weather without risking a climber. Telecommunications towers are often frequented by birds. Birds build nests on towers however, without inspection it is difficult to determine if the nests are causing damage. Drone inspections are an excellent method to get a closer look at the location of birds' nests to determine whether there may be an issue or whether the birds can remain in place without damaging the tower.



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Our Investment In Technology Pays Dividends For You.

High resolution, 4K drone video footage gives a clear view of the status of telecommunications towers. Zoomed-in images allow close inspection while pilots stay safely grounded. Drones also provide thermal imagery with the use of FLIR cameras, a method used to identify potential performance issues in areas where unexpected electromagnetic radiation in the infrared band is detected.

Using photogrammetry software, drone footage creates a digital model of each telecommunication tower. Inspection reports are generated from digital models and can be utilized to monitor the status of each tower. Digital models are an excellent method of monitoring tower corrosion.

Thermo-Diagnostics To Discover Any Potential Issues With RF Systems And Prevent Costly Failures

Thermal imaging cameras on Shulins' Solutions sUAS drones can detect abnormal temperatures in electric utilities and RF systems, and pinpoint the location of the breakdown. Whether you believe you already have a problem at hand, or you just need a routine check-up, it's better to be safe than sorry, and broke. Defects can cause a serious dent in your budget, but affordable sUAS drone thermal imaging can help you prevent serious damage.

Faulty RF and electric systems can create dangerous situations and lead to costly damage. With Shulins' Solutions sUAS drones, you can safely detect temperature shifts without shutting down systems. Reach inaccessible areas with ease and get aerial inspection footage with a thermal camera increasing your system reliability and lower your costs.



A unique perspective only possible with sUAS



Close up of the joining section of a top mounted UHF TV antenna

Professional Aerial Imagery by Expert Pilots

Shulins' Solutions brings only highly trained, insured, and seasoned FAA Certified part 107 licensed pilots to the front lines. By using high end equipment, and leveraging expert pilots who are armed with the proper training both in visual and infra-red photography, we are able to safely capture the needed imagery, and then put our skill set to work on the ground to interpret the data in the form of an easy to read report. We work closely with the FAA using our network of airspace consultants to obtain any required airspace permissions or waivers that may be required. We deliver the entire package with just one phone call.



Complex power divider network on FM Antenna

Protect Your Vertical Infrastructure Investment

Tower structures and the RF systems they support are expensive, complex, exposed to the elements, and difficult to access when certain components are located thousands of feet in the air. Repairs are always expensive both from a parts and labor standpoint and possible lost air-time. Because you already have a significant investment in your transmission system, it makes good sense to use our cost-effective sUAS inspections services to proactively identify potential issues and maximize the life of your asset. Put the power of Shulins' Solutions sUAS tower inspections to work for you today and enjoy a ROI you can take to the bank. Your infrastructure is worth protecting and we have both the experience and the technology to help!

CONTACT US TODAY!

Contact Shulins' Solutions today for broadcaster-centric solutions for your transmission site protection and monitoring, sUAS drone-based tower inspections and a full range of consulting services based on years of practical experience on the ground building and operating broadcast facilities. Let our team of experts help you craft the right solutions to solve your broadcast challenges.

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