

# Fire Agencies Bridging Critical Communication Gaps

A Whitepaper Outlining CalFire/Butte County Fire  
Department's Use of Satellite-to-WiFi/Cellular  
Communications on the Fire Line

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# Butte Lightning Complex - SatCom1 Deployment

Deployment Date: 17 August 2020 to 30 August 2020

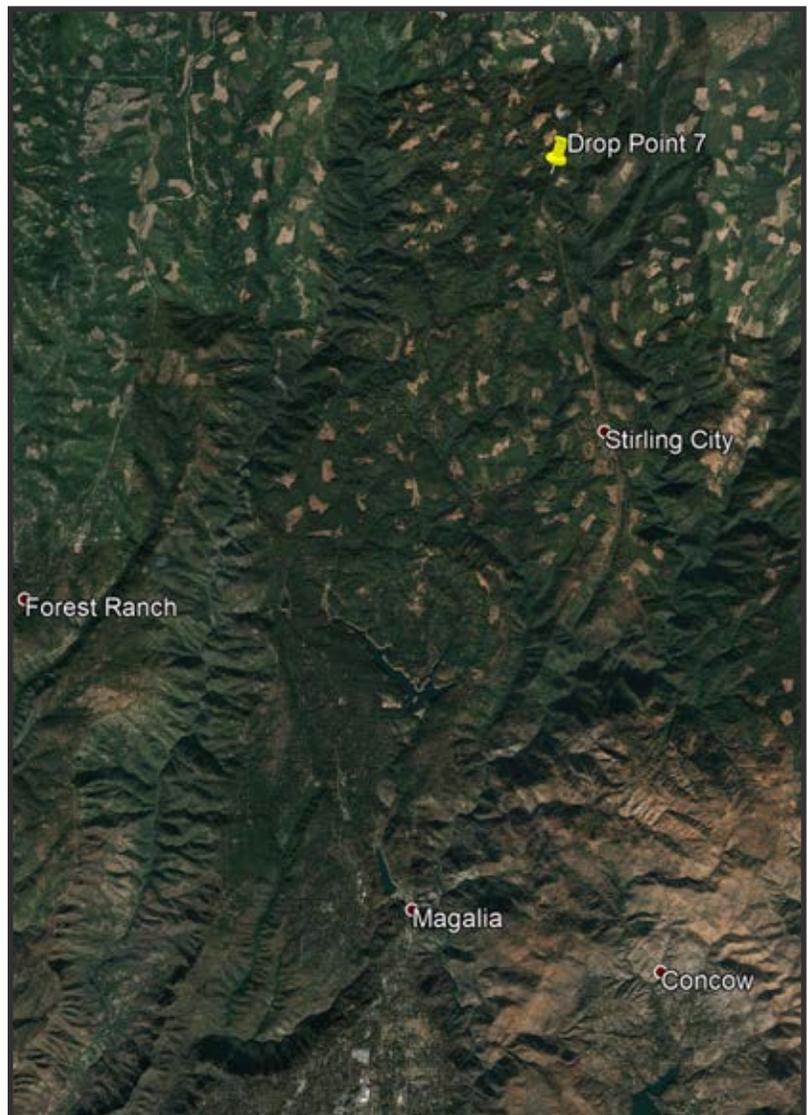
**Owner:** Butte County Fire Department - Oroville, Ca

- **Equipment Designator:** BTC SatCom1
- **Equipment Specification:** SatRunner CRD™ Wi-Fi | First Generation Model (Formerly Star-Runner)

## Deployment Locations

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1. **Forest Ranch**
2. **Stirling City**
3. **Drop Point 7**



# Overview

During August 17-18, a series of dry lightning storms transited Butte County, setting numerous remote fires summarized as the Butte Lightning Complex. Areas with no Cellular or Wi-Fi coverage and power outages were widespread. Since Emergency Managers could not communicate via Cellular or Internet from the ICPs and fire areas, SatComm1 (the SatRunner CRD owned by CalFire/Butte County) was deployed to the North Complex ICP at Station 23 in Forest Ranch. It was then relocated to Station 13, Stirling City, and finally right to the most troublesome fire at Drop Point 7.

The ability to have Internet and Cellular Service right at the fire line is a new reality for CalFire and their mutual/auto aid agencies. It was well-received by Division, Branch, and Command Team Fire Managers. The convenience and ability to download IAPs and GIS information, including Avenza Maps, was extremely valuable and contributed significantly to Firefighter Safety. There were always a few trucks parked near SatComm1 with managers on the phone or doing paperwork on their tablets and laptops. The unit finally demobilized on 8/30. The only maintenance need was a generator oil change, and the unit was ready for further deployment.



# Observations & Lessons Learned

Numerous comments and observations were made by fire line and Command Team Managers about the SatRunner CRD™:

- Having Cellular and Internet connectivity right at the fire line is a game changer. An enormous amount of time was saved by not having to drive hours to make a Cellular call, check email, get IAPs and maps, place an order or fill out documents on the web/cloud.
- Trying to handle complex or detailed traffic over spotty and impacted command radio channels is always a problem. The SatRunner CRD completely eliminated this problem.
- Some Fire personnel showed up at the fire without IAPs and maps. Having the ability to download them at the fire onto Cellular phones and tablets is a significant safety benefit. The Avenza Map App was widely used, and incoming units who did not have the App were able to download it along with the map packs to use this powerful tool.
- Logistics is particularly communication heavy, and Logistics personnel were extremely pleased with the convenience of Cellular service and email/web access at the fire.
- Several managers asked if a SatRunner CRD could be deployed at each fire or possibly at each Branch within a major fire. The answer is yes - if requested.
- The cost of rental is minimal for CalFire compared to the value. Satellite data usage for the 14-day deployment was 5 GB, at a total satellite data cost of \$375.
- Satellite supplied Internet speed was 26 Mbps throughout the deployment. As a comparison, the average Internet speed of a DSL system is 6 Mbps.
- SatCom1 allowed all commercial cellular users access to Wi-Fi calling, regardless of their carrier.
- SatCom1 set-up and break-down time was less than 10 minutes by a single person.
- The generator uses 2.5 gallons of gas a day and carries 7 gallons onboard. Logistics supply trucks carried a gas can and topped off the auto-feed auxiliary tank each time they delivered supplies to the drop point. If deployed remotely, Engines and Water Tenders could all contribute a bit of straight gas to sustain operations.

# History



During the catastrophic 2018 Paradise “Camp Fire,” the Butte County Sheriff deployed his Rescue 42 SatRunner CRD™ satellite-supplied Wi-Fi and Cellular hotspot. A Search & Rescue 4WD vehicle transported the unit suspended on the trailer hitch over downed power lines, off-road, and through the fire lines directly into the heart of the fire where communications were desperately needed. All commercial network services were burned out, and radio communications were too congested, spotty, or non-existent. The SatRunner CRD allowed Fire Management and Law Enforcement personnel to use their Cellular phones, laptops, and tablets, to pass Rescue and Fire traffic rapidly and reliably. Having Cellular and Internet connectivity right at the incident significantly increased the effectiveness of Fire Managers, Law Enforcement Managers, and Tactical Dispatchers.

This was the only Cellular and Internet service available on the entire Camp Fire until AT&T and Verizon managed to get large deployable COWs (Cell-On-Wheels) trucks into the area. However, these trucks only delivered service to the lower part of the fire. The SatRunner CRD stayed in service for weeks on the fire line, supplying communication to the Camp Fire's upper end.

After learning that Fire Managers greatly benefited from this new technology, CalFire/ Butte County Fire acquired a SatRunner CRD for the Butte County Fire Department. It is designated “SatCom1”.

# SatRunner CRD™ SatCom1 Technology

The SatRunner CRD is a rapidly deployable communications system that is all inclusive with onboard HTS High-Throughput ViaSat® satellite system, Cradlepoint router, generator with spare fuel, battery/UPS, and optional Cellular radio. It uses an innovative scissor lift system that allows a single operator to deploy a SatRunner CRD by themselves on any standard trailer hitch. SatRunner CRD is not a trailer. It rides in the hitch off the ground like a cargo carrier, allowing 4WD vehicles to deliver the unit right where communications are needed. It can also be delivered by helicopter. Depending on the version, SatRunner CRD provides either Wi-Fi only or Wi-Fi + Cellular service. A CRD for FirstNet® Cellular service is available from AT&T. All brands of Cellular phones (including FirstNet) can make and receive Cellular calls and texts on the Wi-Fi system by activating their free Wi-Fi Calling feature. Laptops and tablets can access the Wi-Fi for email, web, and cloud or app access.



Butte County Sheriff's SatRunner CRD deployed at the Camp Fire.

# Future Technology



A key piece of technology to consider for SatCom1 is RoIP, or Radio over IP. This technology for radio traffic is equivalent to what VoIP does for telephone traffic – moves it over the Internet. By installing a radio and a device called a "RoIP gateway" on the SatRunner CRD, personnel in a remote location would be able to communicate back to their Command Center by radio from their apparatus radio or HT using the SatRunner CRD satellite and Internet instead of having to depend on radio repeaters. No matter how remote the incident, units at the scene have clear radio communications back to the world without establishing repeaters. Multiple radios can be added to the SatRunner CRD, either permanently or temporarily, to provide multiple agency radios and frequencies.





**Tactical On-Vehicle Short-Term Deployment**



**Standard On-Ground Long Deployment**

Note that the masthead LTE High-Gain antenna array is only for the Cell-On-Wheels version. The Wi-Fi only version does not have a mast-head antenna array.

Addendum: On 9/7/20, SatCom1 deployed again in front of the North Complex/Bear Fire blowout to Station 51 (Feather Falls). On 9/22/20 an additional SatRunner CRD™ was contracted directly from Rescue 42 to provide Cellular along with Wi-Fi. Both units are expected to remain deployed for the foreseeable future.



# We Are Internet Connectivity. Anytime. Anywhere.

## Futher Information

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