

Portable RMS Gateway Station

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My goal for this kit is to have a portable Winlink Radio Mail Server (RMS) gateway station that can be set up on the edge of a disaster zone to provide Winlink connectivity for users inside the zone or just to provide connectivity for remote areas.

Initially I built the kit using a Raspberry Pi 3B, TNC-Pi9k6 and Adafruit 3.5" monitor. However, this configuration proved to be unreliable and intermittent, probably due to the inadequate Raspberry Pi processing capability. The small monitor was also very difficult to see. So I decided to upgrade the kit using a Windows mini-PC, Masters Communications DRA-45 digital adapter, and 7" monitor.



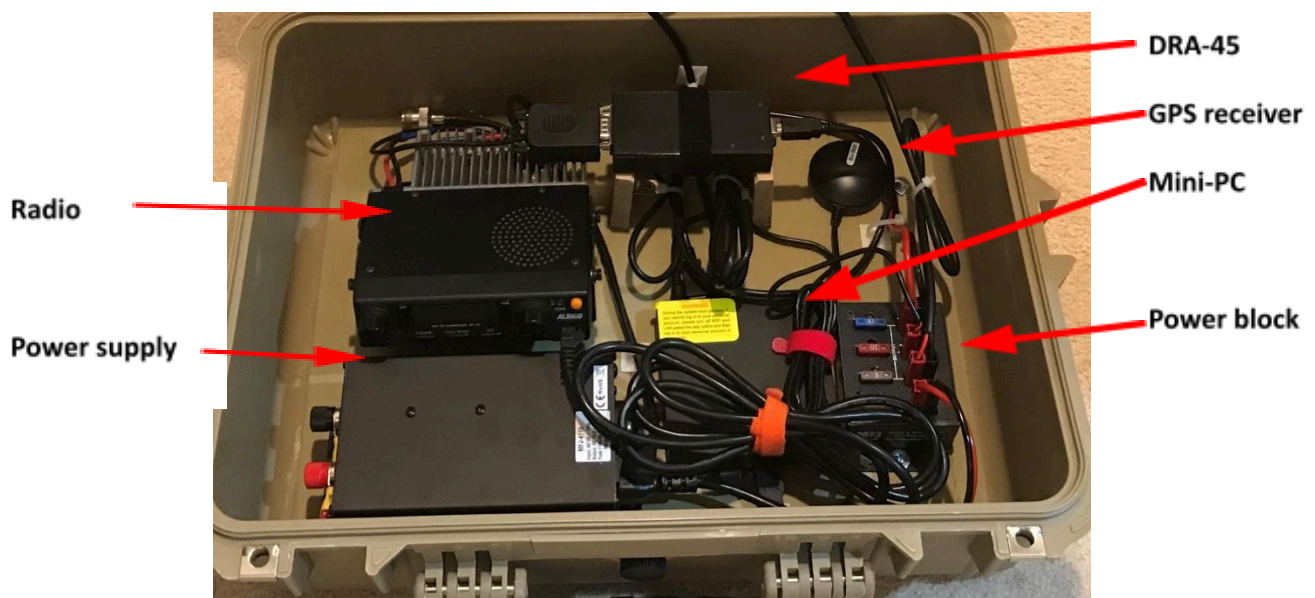
The kit is powered using an MFJ-4115 12 VDC power supply (15 amp), with power routed through an MFJ-1104 fused power distribution block. I did not include a battery because it is intended to be set up on the edge of the disaster zone where there is both electric power and Internet access available. However, the power supply can be unplugged from the power distribution block and an external battery plugged into its place, and I have a separate LiFePO₄ battery box.

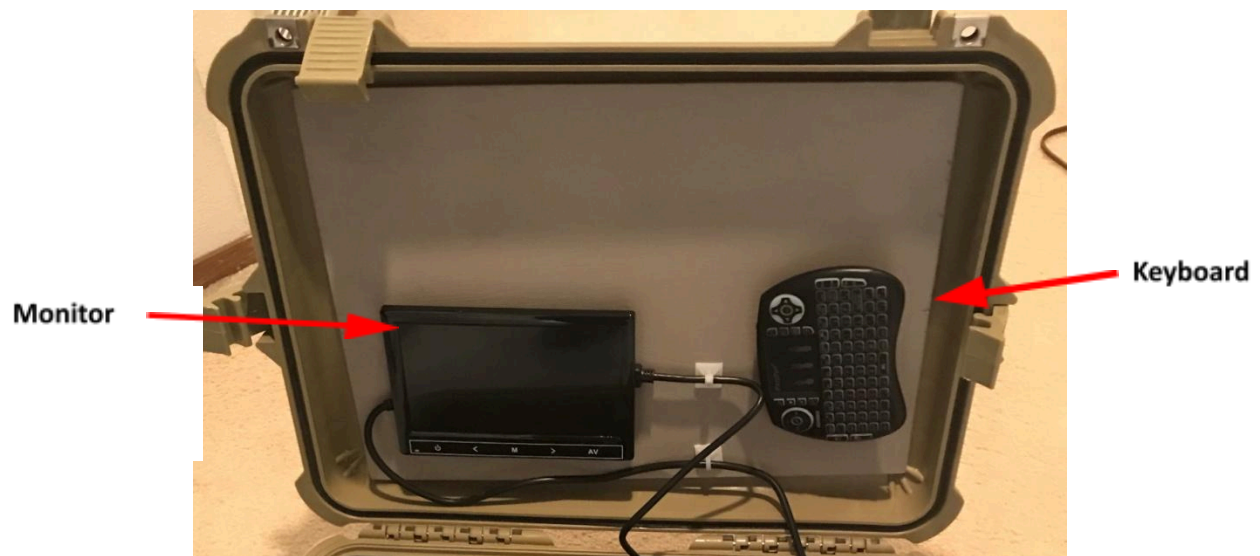
For the radio I used an Alinco DR-140, which is an older 2m radio that does not have a data port. It was given to me for this project by another Snohomish County ACS member. (Thank you, Ron Sparrow.) Since there is no need for a microphone, it is connected to the DRA-45 via the mic and speaker jacks. I had to build the cable.

It has a Beelink T4 Pro mini-PC, which has a Celeron N3350 CPU, 4 GB RAM, 64 GB hard drive, Bluetooth and WiFi, has four USB-A ports, two HDMI jacks and an RJ45 jack for Ethernet connection. It has Windows 10 plus Winlink Express, RMS Packet, UZ7HO Soundmodem and VARA-FM software loaded. The PC is connected to the radio via a Masters Communications DRA-45. It is also connected to a 7" monitor that is mounted onto the top of the case. There is a small wireless keyboard with touchpad mouse also attached to the top of the case with Velcro patches for easy removal. There is also a GPS receiver connected to the mini-PC.

The kit is housed in an Apache case. Because I didn't want to unnecessarily impact the water tight integrity of the case, the components are screwed onto a two sheets of 1/8 inch plywood that are secured to the bottom and lid with strips of 2 inch wide heavy duty Velcro.

This RMS gateway station can operate as either a Packet or VARA-FM RMS gateway and also as a VARA-FM digipeater. It can connect to the internet either via WiFi or CAT5 cable. When deployed it operates as KG7WFQ-10 on 145.030 MHz.





The original kit included a small magmount antenna. I decided not to include it in the new kit. I expect to use it with one of my vertical antennas and masts/tripods.

The outside dimensions of the case are 20½" W x 16" D x 7½" H and the complete kit weighs 18 pounds.

Here is the bill of materials. Prices are what I paid for them in 2020, but I'm sure they have increased significantly since then.

<u>Item</u>	<u>Vendor</u>	<u>Price</u>
Apache 4800 case	Harbor Freight	\$ 60.76
MFJ-4115 12 VDC power supply	Amazon	\$ 99.34
MFJ-1104 DC power distribution block	Ham Radio Outlet	\$ 60.72
Alinco DR-140 mono band 2 meter FM transceiver	Donated	N/A
Beelink T4 Pro mini-PC	Amazon	\$105.07
Masters Communications DRA-45	Masters Communications	\$107.50
GlobalSat BU-353-S4 USB GPS receiver	Amazon	\$ 35.91
Aishichen 7" monitor	Amazon	\$ 47.55
iPazzPort Mini Wireless Keyboard with Touchpad	Amazon	\$ 16.56
Plywood, ½" x 24" x 48"	Home Depot	\$ 14.88
Miscellaneous (Velcro, paint, screws, cables, etc.)	Various	~\$100.00
Total		~\$650.00