N8XJK Super Booster

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INTRODUCTION

Thank you for choosing the N8XJK Super Booster from West Mountain Radio and congratulations on finding the solution to your low voltage problems for mobile, portable, or emergency power operation!

This product is designed to boost your battery voltage to a level optimum for transmit allowing the maximum use of a battery's energy. There is an RF sensor that may optionally be used to detect when you are transmitting so the booster is only used when needed. The booster also has connections that may be used to connect multiple units in parallel for increased current flow. The minimum input voltage and the Booster output voltage are adjustable.

Many radios on the market today do not tolerate low voltage conditions. This Booster was designed to supply a constant voltage to the radio regardless of the battery voltage. The Booster is a switching power supply that regulates the output voltage to the attached radio. The increased voltage prevents distortion commonly seen on modern mobile radios. It also maintains transmit power and allows longer operation from a battery.

The Booster was designed so that the boosted voltage is added to the battery voltage. This means that only the difference between the input and output voltage is converted by the internal Switch Mode Power Supply. Because of this configuration most of the losses only apply to the boosted voltage. This means that real world efficiency is above 90%.

The unique design of the Booster allows battery voltage to be present at the output of the supply even when the supply is disabled or in stand by mode. No transfer relays are required. The Booster does not boost voltage when battery voltage is above the regulator set point. If there is enough voltage it does not do anything.

The Booster allows a user to maintain any output voltage greater than battery voltage, up to 15 volts. The Boost function can be enabled manually via a front panel switch, via the RF detect input attached to the antenna lead of the transmitter or using the optional remote. This allows the Booster to supply boosted voltage only when transmitting.

In bypass (disable mode), the battery voltage is passed to the attached radio with no regulation. In this mode, the filter stage of the supply is still in-circuit and will act to filter the battery voltage to the radio. This can help to reduce noise induced into the power circuit from other attached electronic devices such as chargers, Alternators, Ignition systems.

West Mountain Radio also sells separately a Remote Monitor/Control unit.

OPERATION IN CRITICAL SITUATIONS

The Super Booster was designed to aid communications from less than optimal power sources and it is not intended for critical life support applications. West Mountain Radio and its agents cannot be held responsible for failure of the Boost Regulator in life or death situations or in situations where property loss or damage may occur. It is the responsibility of the operator of the boost regulator to ensure that the failure of the boost regulator will not result in loss of life or property damage.

FEATURES

The Super Booster allows the following:

- Maintain any output voltage greater than battery voltage up to 15 volts.
- Enable boost manually or with the RF detect input only when transmitting.
- Battery voltage is present at the output with the supply turned off!
- Boost voltages up to 40 Amps Input.
- Boosters can be connected in parallel to increase the current (80A, 120A...).
- Protect the battery with the low battery voltage shutoff feature.

INSTALLATION & SET-UP

1. Install the Super Booster between the power source and the radio. If using a RIGrunner, connect the output side of the Booster to the DCIN of the RIGrunner and the input side of the Booster to the DC power source. If using a PWRgate, connect the input side of the Booster to the output of the PWRgate. It is recommended to place the Booster into bypass mode when the PWRgate is running from the PSU. Enable the Booster when running from the PWRgate battery during such times as a power blackout.

   DO NOT install between the battery and PWRgate.
   DO NOT use the Booster to charge batteries.

   AVOID using a ground return that is part of a vehicle chassis ground. The input leads should be attached directly to the battery or power source.

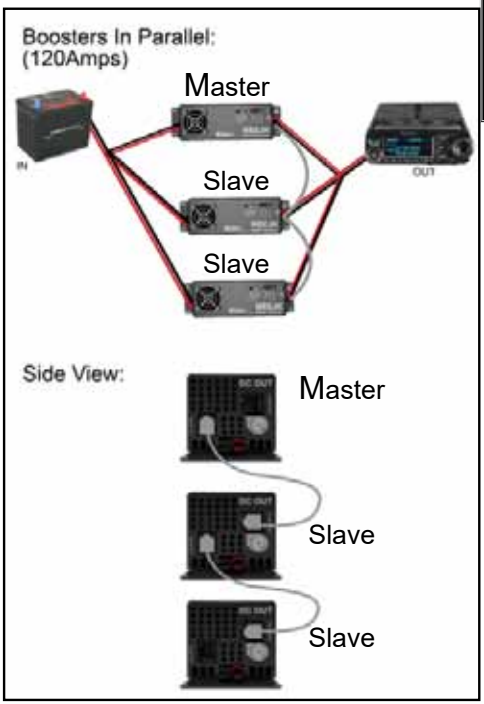
   NOTE:
   The unit comes fitted with Powerpole® connectors for easy installation to the power system. Input (power source) connects on the left side of the case. Output (load) connects on the right side of the case. Make sure to only connect the RED lead to POSITIVE, and the BLACK lead to NEGATIVE. Visit the West Mountain Radio web site for a large variety of cables with Powerpole® connectors.

2. Install the unit in a cool, dry, ventilated location. For example the engine compartment would be a bad location due to heat. When operating at 40A continuous the unit should be in an area with an ambient temperature of under 110ºF. Note that when used continuously at the higher currents the bottom center of the enclosure can get hot enough to burn skin. For this reason we recommend the enclosure be fastened down using the mounting holes on the flanges. It is acceptable to mount to wood since the heat will not be so great as to burn the wood. Some plastics will melt. Metals are a good pick but remember that the opposite side of the metal may still be hot enough to burn skin. Do not block the ventilation holes on the booster. The booster will shut down if it gets too hot.

DO NOT install the unit in an area with flammable gases or liquids
WARNING: Please read the above paragraph

3. **Using the RF sensor:** Connect an RF-connector in-line with the antenna feed and run a short thin coax (any gauge) to the BNC connector on the Booster. Contact West Mountain Radio if the transmitter is over 200W for help coupling the RF to the Booster.

Figure 1



4. **Boosters in parallel:** See Figure 1 for the correct configuration.

   A. Both the inputs and outputs should be connected in parallel. The cables to each booster should be tied using a high current connection. For example a good pick is to use ring terminals to a terminal block or simple bolts. Make sure all connectors used on the single wire are rated for the high current you will be using.

   B. The master of the first booster needs to be connected to the slave connector of the second unit using common phone cables. Repeat for each additional booster.

C. To select the desired mode of operation, use the mode switch on the master unit. The mode switch must always be set to the DISABLE position on the slave unit(s). Note: In normal operation, the green ENABLED LED will not light on the slave unit(s).

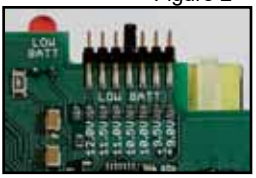
D. If a Booster Remote is used, it must be connected to the Master unit.

E. If the RF ENABLED function is used, it is only necessary to make an RF connection to the Master unit.

5. **Using the Remote:** Connect it using CAT-3 or better Ethernet cable. The remote comes with a 6-feet cable. Longer cables may also be used. The remote has a magnet that may be stuck to the back of the plastic enclosure to allow mounting directly to a metal surface.

6. The booster has an internal jumper to select the minimum battery voltage. From the factory it is set to 10.5V. This is the minimum voltage manufactures specify for lead acid batteries. See Figure 2. If this needs to be changed, remove the enclosure screws, remove the fuse from input end and carefully lift up the end on the input side and slide over the BNC connector to open the case. Disconnect the fan wires attached to the top and bottom. Watch a short video for specific instructions: www.westmountainradio.com/bbda

Figure 2



7. **Fuse:** The ATC type fuse on the input side of the booster is used to protect the battery from excessive current. The booster includes a 40A fuse. The fuse may be changed to a lower value if desired for protection of other system components downstream. Be aware the output current will be less while boosting. For example if the battery is 11V and the boost is set to 13.8V, then a 40A input is around 29A output.

OPERATION

1. Off Delay Adjust: This RF off delay trim pot adjusts how long the booster remains on after the transmission stops.

2. Mode switch:

   DISABLE will shut the unit off and the battery voltage is passed through to the output as-is.

   ENABLE will turn the booster to be continuously on.

   RF ENABLE will turn the booster on only when RF is detected. If the remote is being used set the switch to DISABLE and use the remote to turn the unit on. If this switch is set to ENABLE or RF ENABLE the remote will not be able to turn the unit off.

3. LEDs:
   Green - Booster is boosting
   Yellow - Unit is too hot and Booster was disabled
   Red - Battery voltage is too low, Booster is disabled

4. Output Voltage Adjust: Trim pot that is factory adjusted for 13.8V. Most radios can tolerate up to 15V and transmit more efficiently with higher voltages. Most radios should not be used for transmit below 11.7V. Connect a volt meter to the output of the Booster when adjusting. If using very long cable to the radio , take account for voltage drop, then put the meter near the radio and adjust to the maximum voltage the radio can tolerate while in receive mode.

BOOSTER REMOTE OPERATION

The remote has a single push button that may be used as follows:

State	Action	Result
Unit OFF	Single button press	Unit turns ON
Unit ON, not boosting	Single button press	Boosting begins
Unit ON, boosting	Single button press	Boosting stops

Unit ON	Hold button down for 2 seconds	Unit shuts OFF
Unit ON	Three quick button presses	Display shows minimum battery voltage and maximum output voltage for several seconds
Display shows min/max	Hold down button for 2 seconds	Min/Max is reset

SPECIFICATIONS

Limits:

Minimum input voltage:	9VDC
Maximum input voltage:	15VDC
Minimum output voltage:	9VDC
Maximum output voltage:	15VDC
Maximum current:	40A Input (per unit)
RF Voltage maximum	100Vp-p (200W)

Current Consumption:

Power Off	1.5mA
Standby	24.4mA
Enabled Booster	40mA
Low Battery/Overtemp	39mA
RF Enable:	
RF detect threshold	3.3Vp-p typical. (0.22W)
RF “Turn On” delay	2ms typical
RF “Turn Off” delay range	2-500ms typical

Low Battery Lockout:

Jumper Selectable	9V, 9.5V, 10V, 10.5V, 11V, 11.5V, 12V
Voltage drop when booster off:	0.76V at 20A load
Efficiency:	Around 90%

Temperature:

Maximum ambient temperature (before shutdown):
32A continuous Output 110ºF

Maximum case temperature (before shutdown):

Sides	115ºF
Bottom center	139ºF
Internal	162ºF

Output Ripple:

Load = 20A (100W xmit) 4.2mV RMS, 12mVp-p
Load = 3A (receive) 3.5mV RMS, 10mVp-p

Connectors:	Anderson Powerpole®, 45A
Size:	8.0" x 2.3" x 2.2"
Weight:	0. lbs
Mounting Holes:	Four - 0.175 d, #8 hardware

	Order Sku#
Powerpole® Extension Cable, 3 ft. 12AWG 30A Powerpole® to Powerpole® connectors	**#58531-1082**
Powerpole® Extension Cable, 6 ft. 12AWG 30A Powerpole® to Powerpole® connectors	**#58531-1083**
Powerpole® Extension Cable, 10 ft. 12AWG 30A Powerpole® to Powerpole® connectors	**#58531-1084**
Powerpole® to Batt Ring Term Cable, 6ft. with 30A Fuse	**#58257-1068**
Powerpole® to Batt Ring Term Cable, 6ft. with 50A Fuse	**#58257-1533**
Powerpole® to 1/4" Ring Term Cable, 3ft.	**#58531-1079**
Powerpole® to 1/4" Ring Term Cable, 6ft.	**#58531-1080**
Powerpole® to 1/4" Ring Term Cable, 10ft.	**#58531-1081**
15A. Powerpole® Connector-12 Pair	**#58257-1093**
30A. Powerpole® Connector-12 Pair	**#58257-1095**
45A. Powerpole® Connector-12 Pair	**#58257-1099**
PWRcrimp Crimp Tool	**#58568-1049**
Mounting Magnet	**#58515-1785**

To purchase or view other accessories available, call or go online at:
www.westmountainradio.com/shop

N8XJK Super Booster & Booster Remote Warranty

N8XJK Super Booster & Booster Remote is warranted against failure due to defects in workmanship or materials for one year after the date of purchase from West Mountain Radio. Warranty does not cover damage caused by abuse, accident, misuse, improper or abnormal usage, failure to follow instructions, improper installation, alteration, lightning, or other incidence of excessive voltage or current. If failure occurs within this period, return the *N8XJK Super Booster & Booster Remote* or accessory to West Mountain Radio at your shipping expense. The device or accessory will be repaired or replaced, at our option, without charge, and returned to you at our shipping expense. Repaired or replaced items are warranted for the remainder of the original warranty period. You will be charged for repair or replacement of the *N8XJK Super Booster & Booster Remote* or accessory made after the expiration of the warranty period.

West Mountain Radio shall have no liability or responsibility to customer or any other person or entity with respect to any liability, loss, or damage caused directly or indirectly by use or performance of the products or arising out of any breach of this warranty, including, but not limited to, any damages resulting from inconvenience, loss of time, data, property, revenue, or profit, or any indirect, special incidental, or consequential damages, even if West Mountain Radio has been advised of such damages.

Except as provided herein, West Mountain Radio makes no express warranties and any implied warranties, including fitness for a particular purpose, are limited in duration to the stated duration provided herein.

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