

SDN Base Station Radio Guide

Magnet Mount Antenna Version

Updated 1/7/2011

Setup

1. Locate area near 12v power, clear of overhead obstructions, and sheltered from rain and water.
2. Open box, and identify main components:
 - a. Radio
 - b. Mic
 - c. Power cables
 - d. Antenna cable "coax"
 - e. Antenna mag-mount base
 - f. Antenna whip
3. Use screw connector to connect antenna cable into back of radio
4. Make sure antenna is securely screwed into the base.
5. Place antenna mag base on a magnetic surface, the higher the better. A car roof is ideal. Place it where it won't be within 6 feet of people during operation. Run the coax so that it won't trip anyone or get in the way.
6. Verify continuous secure connection between antenna and back of radio.
7. Plug the mic into the front of the radio.
8. Plug power cable into 12v outlet.
9. Turn on radio. It should beep and the display should light up.

Cautions

- DON'T allow people to touch the antenna or get within 6 feet of it while transmitting.
- DON'T transmit without an antenna connected. Continuous operation without an antenna connected could damage the radio.
- DON'T plug/unplug antenna connections while the radio is powered.

Operation

Another guide will cover specific procedures for using the radio. However, basic operation is covered here:

- Press the channel up/down buttons to select the channel.
- Press and hold the mic button to transmit. Wait a moment for the radio to begin transmitting, then speak.
- While speaking, hold the mic a couple of inches and to the side of your mouth. Don't speak directly into it, this will cause "breath noise" in your transmission.

- Don't transmit for an extended period (keep it under 30 seconds).
- Release the mic button when done transmitting.

Troubleshooting

- If the radio does not turn on => verify the power connection is plugged in, the socket is live (turn on the vehicle ignition?), and that the radio fuse is ok.
- If the radio turns on, but won't receive => make sure it is tuned to the right channel, and that the antenna is connected.
- If someone far away can't receive transmissions, but people nearby are able to receive transmissions => check the antenna connections, and be sure that the power socket is able to supply enough power: try a different power source (different vehicle, or a direct 12V battery supply).

Tear Down

1. Turn off the radio
2. Unplug the power cables, and roll up the cables.
3. Disconnect the antenna cable. Leave the short connection into the back of the radio.
4. Remove the mag mount from its position. Coil the antenna cable, and stow the cable and antenna in the box. The antenna may be bowed to fit in the box, but should not be bent sharply.
5. Close the box, being careful to not catch any cables in the box lid.
- 6.

SDN Base Station Radio Guide

Drive-On Base Antenna Version

Updated 2/5/2013

Setup

1. Locate area near 12v power, clear of overhead obstructions, and sheltered from rain and water.
2. Open box, and identify main components:
 - a. Radio
 - b. Mic
 - c. Power cables
3. Identify antenna mast and parts:
 - a. Drive-on base and tube
 - b. "Flagpole" antenna mast
 - c. White base antenna, mounting assembly, ground plane rods
 - d. Antenna coax, should already be attached to the antenna.
4. Assemble antenna base
 - a. Place drive-on base on flat hard ground, just behind or just in front of a vehicle tire. The Short metal tube should already be screwed into the base.
 - b. With appropriate safety precautions and spotters, have the vehicle driver move the vehicle to place the tire onto the flat part of the antenna base.
5. Mount the mast
 - a. Place the "flagpole" mast into the base. Do not extend it at this time.
 - b. Check that the mount and ground is firm...wiggle the flagpole.
6. Mount the antenna.
 - a. Place the antenna mounting tube onto the flapole, and insert the locking pin.
 - b. Attach the ground plane rods by screwing them into the 3 threaded holes in the base of the antenna. They don't have to go all the way in, just far enough to hold. To do this step, you may need to raise the flagpole section high enough to not hit the vehicle.
7. Raise the flagpole
 - a. **DANGER: CHECK FOR OVERHEAD OBSTRUCTIONS.**
 - b. **ALSO GET A HELPER TO CHECK FOR OVERHEAD OBSTRUCTIONS, INCLUDING POWER LINES!**
 - c. Once the area is certified clear, raise the mast section by section. Be sure to lock in each set of pins as it is raised. The orange marker lines will help you align the pins and holes.
 - d. Feed out the cable as the antenna is raised, making one or two turns around the mast in a spiral.

- e. With tape, twine, rope, flagging tape, or other non-metallic material, loosely attach the coax to the bottom of the mast.
8. Run the coax to the base radio, avoiding areas where people will step on it or drive on it. A vehicle driving on the cable will likely permanently damage the cable. **DO NOT USE A CABLE THAT HAS BEEN DRIVEN ON.** It could be shorted out, and damage the radio when used.
9. Use screw connector to connect antenna cable into back of radio
10. Verify continuous secure connection between antenna and back of radio.
11. Plug the mic into the front of the radio.
12. Plug power cable into 12v outlet.
13. Turn on radio. It should beep and the display should light up.

Cautions

- DON'T allow people to touch the antenna or get within 6 feet of it while transmitting.
- DON'T transmit without an antenna connected. Continuous operation without an antenna connected could damage the radio.
- DON'T plug/unplug antenna connections while the radio is powered.

Operation

Another guide will cover specific procedures for using the radio. However, basic operation is covered here:

- Press the channel up/down buttons to select the channel.
- Press and hold the mic button to transmit. Wait a moment for the radio to begin transmitting, then speak.
- While speaking, hold the mic a couple of inches and to the side of your mouth. Don't speak directly into it, this will cause "breath noise" in your transmission.
- Don't transmit for an extended period (keep it under 30 seconds).
- Release the mic button when done transmitting.

Troubleshooting

- If the radio does not turn on => verify the power connection is plugged in, the socket is live (turn on the vehicle ignition?), and that the radio fuse is ok.
- If the radio turns on, but won't receive => make sure it is tuned to the right channel, and that the antenna is connected.
- If someone far away can't receive transmissions, but people nearby are able to receive transmissions => check the antenna connections, and be sure that the power socket is able to supply enough power: try a different power source (different vehicle, or a direct 12V battery supply).

Tear Down

1. Turn off the radio

2. Unplug the power cables, and roll up the cables.
3. Disconnect the antenna cable. Leave the short connection into the back of the radio.
4. Reverse the steps to tear down the antenna. While lowering the antenna, be very careful to watch out for the ground plane rods. A hard hat and safety glasses is recommended.
5. Close the box, being careful to not catch any cables in the box lid.

SDN Repeater Guide

Tripod Base Version

Updated 7/26/2013

Setup

2. Locate flat, high area, clear of overhead obstructions and as far from trees and tall brush as possible.
3. Needed components:
 - a. Orange Repeater Box
 - b. Black tripod, optional
 - c. White base antenna, mounting assembly (pipe and pin), 3 ground-plane rods
 - d. Antenna coax, should already be attached to the antenna.
3. Open orange box, and identify main components:
 - d. Radios (attached together)
 - e. Mic
 - f. Power cables (attached to battery)
 - g. Duplexer (flat black box with 3 silver radio connectors marked HIGH, LOW, and ANTENNA). CAUTION, FRAGILE. Treat gently to prevent knocking it out of tune.
14. Assemble tripod antenna base
 - a. Find a flat firm area to place it on. Soft sand, mud, or gravel is more likely to allow the base to tip over.
 - b. Loosen the knob in the middle, and push the leg assembly down. The legs will spread outwards. Push the knob about halfway down the tube. Too short, and the tripod spread will be narrow, and more likely to fall. Too wide, and the bottom of the tripod tube will hit the ground and make it unstable.
 - c. Stake the tripod with stakes and rope through the eye hooks at the ends of the legs if there is any chance of high winds (>30 mph).
15. Mount the antenna.
 - a. Place the antenna mounting tube onto the top of the tripod tube, and insert the locking pin.
 - b. Attach the ground plane rods by screwing them into the 3 threaded holes in the base of the antenna. They don't have to go all the way in, just far enough to hold securely.
16. Raise the tripod center sections.
 - a. DANGER: CHECK FOR OVERHEAD OBSTRUCTIONS.
 - b. ALSO GET A HELPER TO CHECK FOR OVERHEAD OBSTRUCTIONS, INCLUDING POWER LINES!
 - c. Once the area is certified clear, raise the pole section by section. Be sure to lock in each set of pins as it is raised.

- d. Feed out the cable as the antenna is raised.
 - e. With tape, twine, rope, flagging tape, or other non-metallic material, loosely attach the coax to the bottom of the tripod base.
17. Put the repeater box flat at the base of the tripod (not handle facing up like a suitcase).
 18. Run the coax to the repeater box, avoiding areas where people will step on it or drive on it. A vehicle driving on the cable will likely permanently damage the cable. **DO NOT USE A CABLE THAT HAS BEEN DRIVEN ON.** It could be shorted out, and damage the radio when used.
 19. Use screw connector to connect antenna cable into the ANTENNA connector on the duplexer.
 20. The duplexer should already be connected via TWO coax sections to the radio. If not, connect as follows:
 - a. For using VTAC 33, connect RX to LOW and TX to HIGH
 - b. Or, for using VTAC 36, connect RX to HIGH and TX to LOW
 - c. In general, connect the HIGH duplexer connector to the higher frequency radio, whether it is the TX or RX unit and the LOW duplexer connector to the lower frequency radio, whether it is the TX or RX unit.
 - d. Reference frequency guide for Bank 2
 - i. Chan 1 - VTAC33 RX : 151.1375 / 136.5 TX : 159.4725
 - ii. Chan 2 - VTAC36 RX : 159.4725 / 136.5 TX : 151.1375
 21. Verify continuous secure connection between antenna and back of duplexer, and from both connectors on duplexer to both radios.
 22. Plug the mic into the front of the TX radio.
 23. Connect each power cable from the radios into the power cables from the battery.
 24. Turn on both radios. Each should beep and the display should light up.
 25. Make sure the radios are both in bank 2: If so, the light under #1 on the display should be lit. To toggle between banks, press P0.
 26. Tune to the appropriate repeater channels on BOTH radios using the UP/DOWN buttons. Chan 1 for VTAC33, or Chan 2 for VTAC36. Be sure the duplexer-to-radio connections are appropriate for the channel you're using (step 9, above).

Testing

Once the repeater is set up, test its operation:

1. Turn the TX radio's volume down, and turn the RX radio's volume to around 2/3rd.
2. Tune your SDN hand-held radio to VTAC33 (or whichever channel the incident comm plan specifies).
3. Transmit using your SDN radio "SDN Hand-Held to Repeater Test". You should hear your voice coming from the repeater radio in the orange box.
4. Transmit using the TX radio and mic in the orange box: "SDN Repeater to Hand-Held Test". You should hear your voice coming from your hand-held radio.
5. Have someone else at a distance tune their SDN hand-held radio to VTAC33. Transmit to them with your SDN radio on VTAC33. You should be able to hear each other.

Final Checks

- Turn down the volume on the RX radio.
- Close the lid on the orange box carefully, leaving a gap for the antenna coax coming out. Tuck everything else back inside. Don't latch the lid.

Cautions

- DON'T allow people to touch the antenna or get within 6 feet of it while transmitting.
- DON'T transmit without an antenna connected. Continuous operation without an antenna connected could damage the radio.
- DON'T plug/unplug antenna connections while the radio is powered.

Operation

- Press the channel up/down buttons to select the channel.
- Press and hold the mic button to transmit. Wait a moment for the radio to begin transmitting, then speak.
- While speaking, hold the mic a couple of inches and to the side of your mouth. Don't speak directly into it, this will cause "breath noise" in your transmission.
- Don't transmit for an extended period (keep it under 30 seconds).
- Release the mic button when done transmitting.

Troubleshooting

- If the radio does not turn on => verify the power connection is plugged in, the battery is charged, and that the radio fuse is ok.
- If the radio turns on, but won't receive => make sure it is tuned to the right channel, and that the antenna is connected.
- If someone far away can't receive transmissions, but people nearby are able to receive transmissions
 - => check the antenna connections, and be sure that the power socket is able to supply enough power: try a different power source (different battery, or a direct 12V battery supply).
 - => check that the duplexer to radio connections aren't switched.

Tear Down

1. Turn off the radios
2. Unplug the power cables
3. Disconnect the antenna cable to duplexer cable. Leave the short connections into the back of the radio.
4. Reverse the steps to tear down the antenna. While lowering the antenna, be very careful to watch out for the ground plane rods. A hard hat and safety glasses is recommended.
5. Close the box, being careful to not catch any cables in the box lid.