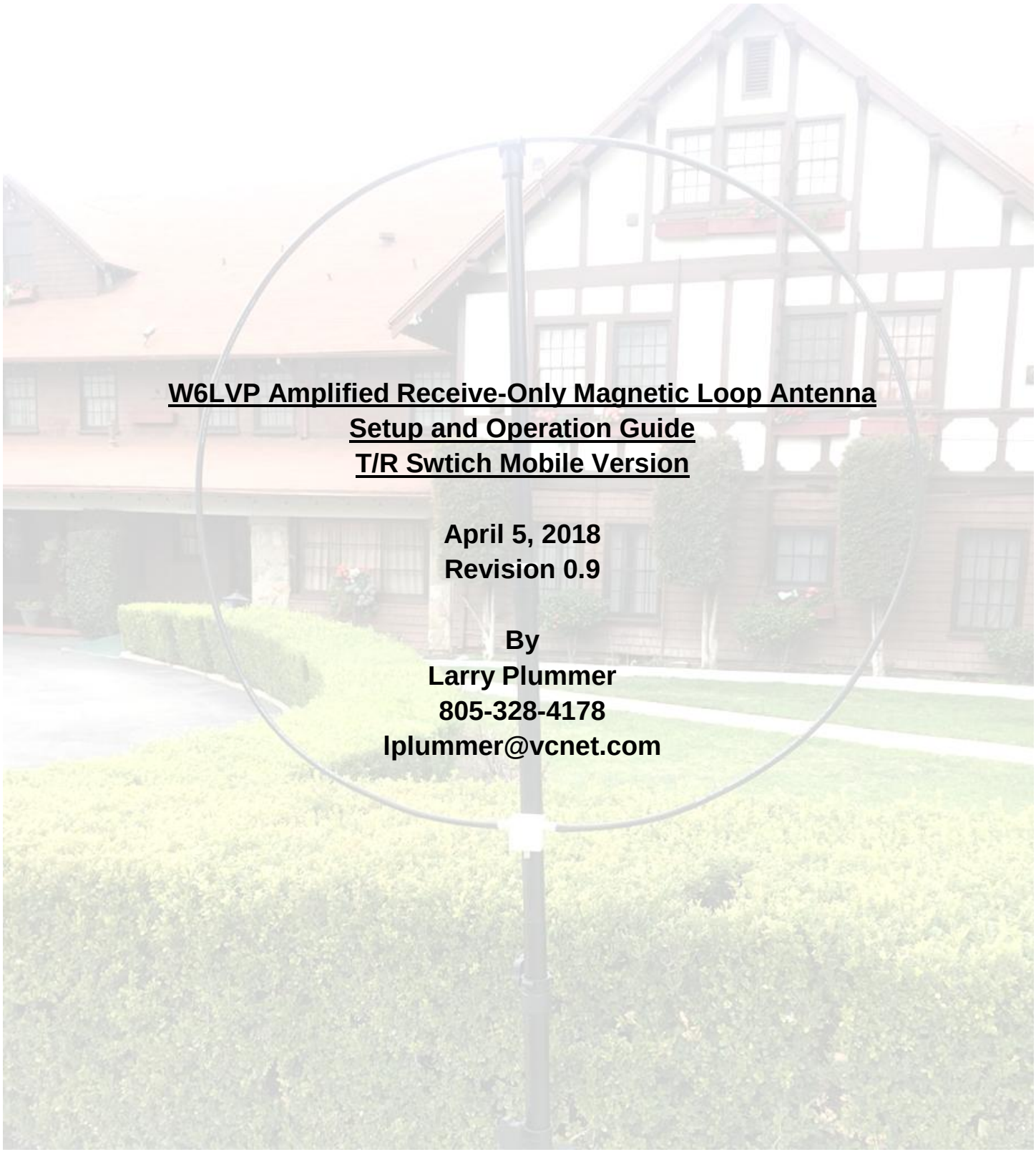

W6LVP Amplified Receive-Only Magnetic Loop Antenna
Setup and Operation Guide
T/R Swtich Mobile Version

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Setup and Operation Instructions

THE STAINLESS STEEL LOOP IS UNDER TENSION AND IF RELEASED FROM EITHER END IS A STRONG SPRING WANTING TO UNCOIL WHICH COULD CAUSE SIGNIFICANT INJURY – PARTICULARLY TO EYES. IF IT IS NESSESSARY TO RELEASE ONE OR BOTH ENDS OF THE STAINLESS STEEL ROD, BE EXTREMELY CAREFUL AND USE PROTECTIVE EYEWEAR.

THE MAGNETIC BASE USED TO ANCHOR THE LOOP TO A VEHICLE IS AN EXTREMELY STRONG MAGNET. WHEN THE MAGNET COMES TO WITHIN A FEW INCHES OF IRON OR STEEL, THERE IS A SIGNIFICANT AMOUNT OF FORCE CAUSING THE MAGNET AND IRON OR STEEL OBJECT TO MOVE TOGETHER QUICKLY AND FORCEFULLY. BE VERY CAREFUL THAT FINGERS ARE NOT BETWEEN THE MAGNET AND WHAT IT IS ATTRACTED TO.

EVEN THOUGH THE MAGNETIC BASE PROVIDES A STRONG MOUNTING ATTACHMENT, THERE COULD BE SITUATIONS WHERE BUMPS, VIBRATION, TREE BRANCHES, OR OTHER OVERHANGS WOULD DISLODGE THE ANTENNA FROM THE VEHICLE. NYLON ROPE OR SOME OTHER SECONDARY ATTACHMENT SHOULD BE USED FOR BACKUP SAFETY ATTACHMENT.

The antenna is shipped with both ends of the stainless steel loop mounted to the preamp. However, the set screws for the ends of the loop have been loosened slightly so that the loop can be positioned in the plane of the magnetic base for shipping.

Noting the spring tension risk above, rotate the loop to be perpendicular to the magnetic base. Using the 2 mm Allen wrench provided, tighten the four set screws on both ends of the loop. The set screws should be tight enough that the loop does not rotate from vertical due to air flow while driving but still will allow the loop to rotate in case of contact with an obstruction such as an overhang or tree branch.

Once the loop has been oriented vertically and the set screws tightened, the vehicle mounting location should be selected. It is best to provide as much separation between the transmit antenna and the receive loop as possible. If the transmit antenna is mounted to the rear of the vehicle, mounting the loop on the front of the roof is ideal.

In order to prevent damage to the vehicle paint, first clean the area where the magnetic mount will be located to remove any dirt or other debris that could act as an abrasive. Make sure that the magnet has not collected any metallic debris.

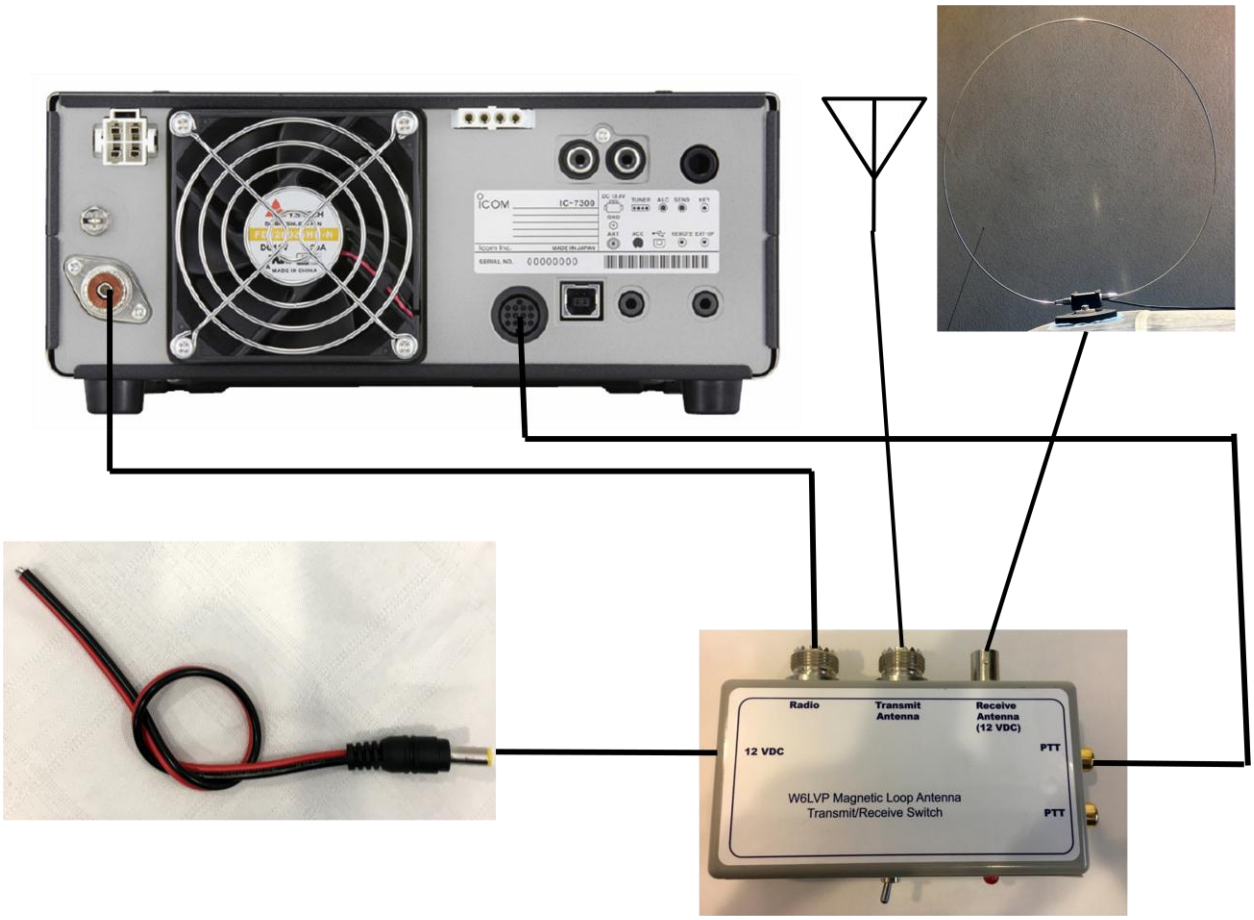
While being cautious about fingers, gently place the magnetic base at its desired location. The loop should be positioned such that the plane of the loop aligns with the vehicle.

If necessary to remove or reposition the antenna, the easiest way to get the magnet to release is to lever it up from the side where the preamp slightly overhangs the magnetic. Lift up on one side while preventing the magnet from moving which could scratch the surface of the vehicle. Again, keep fingers clear.

The T/R switch unit can be operated in one of three possible ways – (1) using a transceiver without a separate receive antenna input or (2) using a transceiver without a separate receive antenna input and with a transmit power amplifier or (3) with a separate receiver or with a transceiver with separate receive antenna input. Option three could also include a power amplifier.

Option #1) <u>Using the W6LVP mobile loop antenna with a transceiver without separate receive antenna input.</u>

When using the W6LVP mobile loop with a transceiver not having a separate receive antenna input and without a power amplifier, connect it as follows:



- Connect a short 50-ohm cable with PL-259 connectors between the transceiver antenna connector and the RADIO connector on the transmit/receive switch.
- Connect a short shielded audio cable with RCA plugs (or other connector appropriate for the transceiver) between the transceiver PTT output and either of the transmit/receive switch PTT jacks. Many Icom transceivers call this control signal "SEND" which is available on an RCA jack located on the back of the transceiver. Many Yaesu transceivers call this signal "Tx Gnd" which is available on an 8-pin mini-DIN

connector labeled CAT/LINEAR on the rear of the transceiver. Fully assembled control cables are available from eBay vendors. Search for “Yaesu keying cable.” Many Kenwood transceivers have a keying control signal available on a 7-pin DIN connector called REMOTE on the rear of the transceiver. Check the transceiver user manual for the specific pins. Fully assembled control cables are available from eBay vendors. Search for “Kenwood keying cable.”

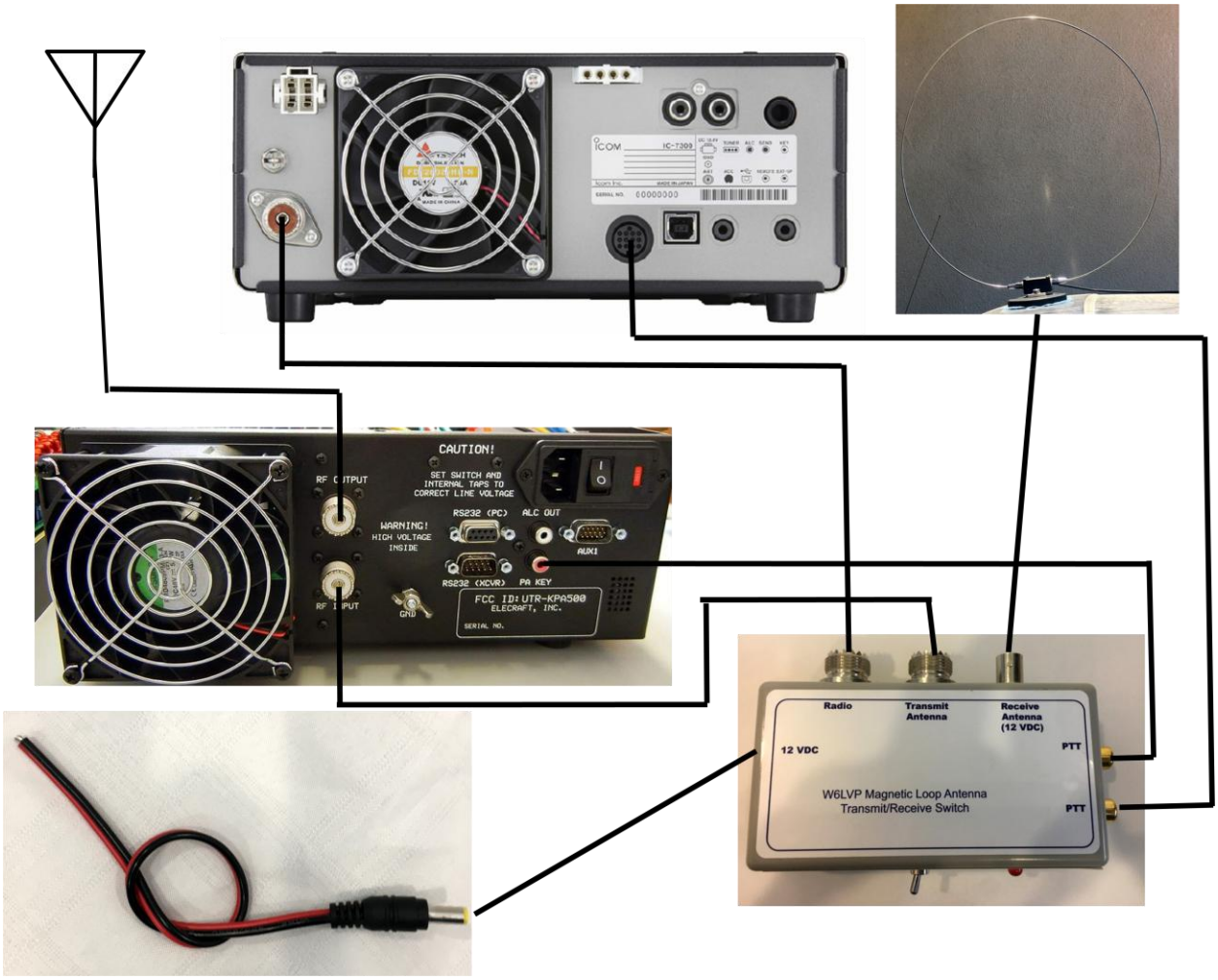
- Connect the transmit antenna coax cable from the transmit antenna to the TRANSMIT ANTENNA SO-239 connector on the transmit/receive switch.
- Using a 50-ohm coaxial cable with BNC connectors or other connectors and BNC adapters, connect the transmit/receive switch RECEIVE ANTENNA input to the loop amplifier output.
- Connect a 12 VDC power source either wired directly into vehicle power or using the supplied cigarette lighter adapter to the T/R switch. Turn the power switch to ON. After a short delay, the RECEIVE LED will illuminate. (Note the diagram above incorrectly shows an AC power supply.)
- Turning the transmit/receive switch power off or removing transmit/receive switch power will force the transceiver to directly connect to the transmit antenna and the receive loop antenna will not be used.
- The red LED on the front of the transmit/receive switch indicates that the switch is in receive mode. When PTT is activated causing transmit or when the power switch is turned off, lack of LED illumination indicates that the switch is in transmit mode.
- If you are using an antenna tuner, it should be placed between the Transmit/Receive Switch Transmit Antenna connector and transmit antenna.

Hint:

The power switch on the Transmit/Receive unit can be used to select your transmit antenna or the loop for receive. Power on with the RECEIVE LED illuminated indicates that your receive signal will come from the loop. Power off with the RECEIVE LED not illuminated indicates that your receive signal will come from your transmit antenna. It is not uncommon for one antenna or the other to have a better receive signal at a given time and on a specific band. You can use the power switch on the Transmit/Receive unit to quickly and easily select the better signal.

Options #2) <u>Using the W6LVP mag loop antenna with a transceiver without separate receive antenna input and with a separate high power amplifier.</u>

When using the W6LVP mobile loop with a transceiver not having a separate receive antenna input and with a high-power amplifier, connect the transmit/receive switch between the transceiver and power amplifier as follows:



- Connect a short 50-ohm cable with PL-259 connectors between the transceiver antenna connector and the RADIO connector on the transmit/receive switch.
- Connect a second short 50-ohm cable with PL-259 connectors between the transmit/receive switch TRANSMIT ANTENNA connection and the power amplifier input.
- Connect a short shielded audio cable with RCA plugs (or other connector appropriate for the transceiver) between the transceiver PTT output and either of the transmit/receive switch PTT jacks. Many Icom transceivers call this control signal “SEND” which is available on an RCA jack located on the back of the transceiver. Many

Yaesu transceivers call this signal “Tx Gnd” which is available on an 8-pin mini-DIN connector labeled CAT/LINEAR on the rear of the transceiver. Fully assembled control cables are available from eBay vendors. Search for “Yaesu keying cable.” Many Kenwood transceivers have a keying control signal available on a 7-pin DIN connector called REMOTE on the rear of the transceiver. Check the transceiver user manual for the specific pins. Fully assembled control cables are available from eBay vendors. Search for “Kenwood keying cable.”

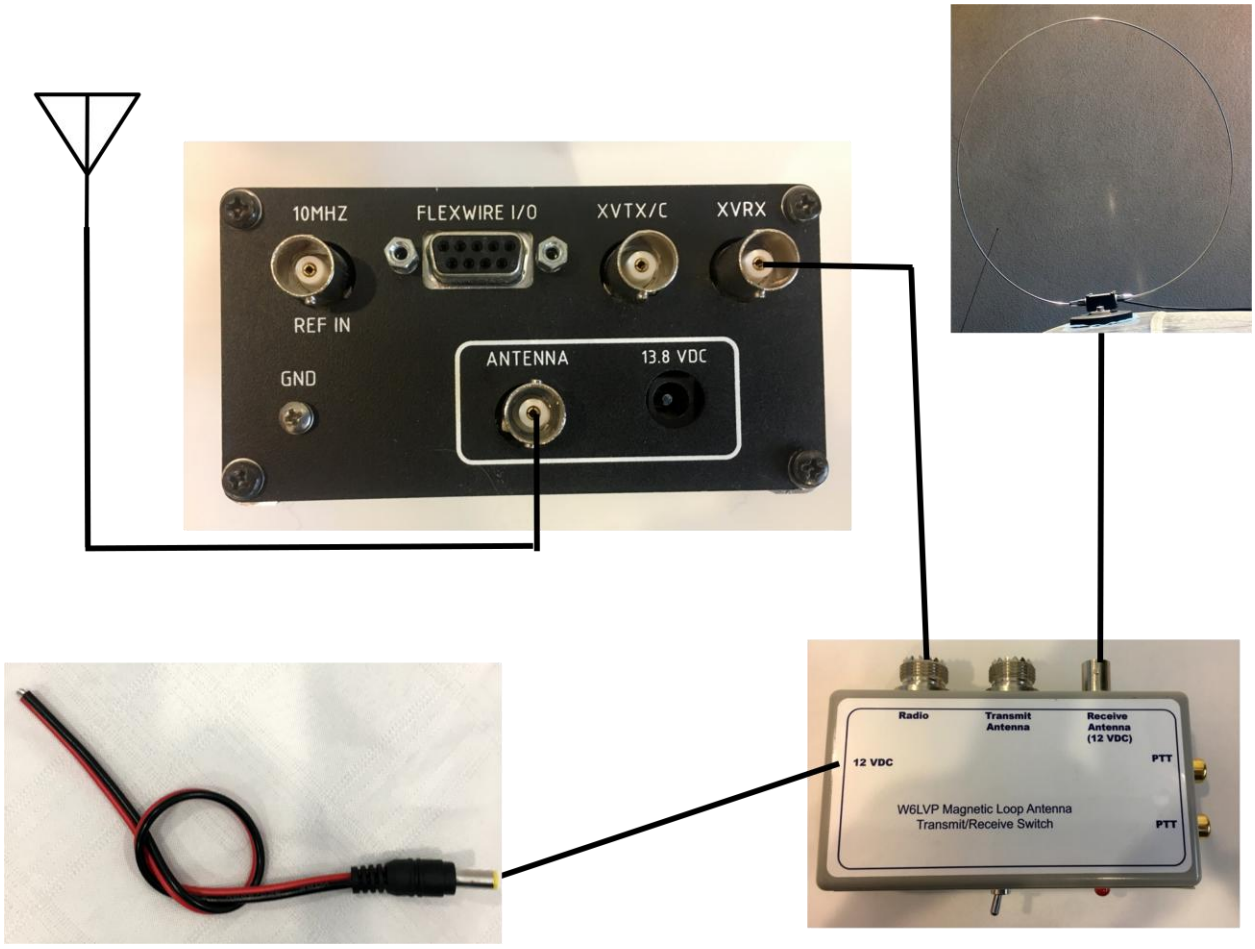
- Connect a short shielded audio cable with RCA plugs (or other connector appropriate for the power amplifier) between the other transmit/receive RCA jack and the power amplifier PTT input.
- Using a 50-ohm coaxial cable with BNC connectors or other connectors and BNC adapters, connect the transmit/receive switch RECEIVE ANTENNA input to the loop amplifier output. Although the loop preamp and the input to most radios are 50 ohms, my experiments indicate that quad shield RG-6 cable with F to BNC adapters is not only inexpensive but has good common mode rejection.
- Connect a 12 VDC power source either wired directly into vehicle power or using the supplied cigarette lighter adapter to the T/R switch. Turn the power switch to ON. After a short delay, the RECEIVE LED will illuminate. (Note the diagram above incorrectly shows an AC power supply.)
- Turning the transmit/receive switch power off or removing its power source will force the transceiver to directly connect to the power amplifier and the receive loop antenna will not be used.
- The red LED on the front of the transmit/receive switch indicates that the switch is in receive mode. When PTT is activated causing transmit or when the switch is turned off, lack of an LED illumination indicates that the switch is in transmit mode.
- If a lower power transceiver uses an intermediate exciter amplifier before a higher power amplifier, the transmit/receive switch should be placed between the transceiver and the lower power exciter. PTT should be obtained from the transceiver. Some exciter amplifiers have separate PTT input and output with timing to allow the power amplifier PTT keying to be properly timed. The transmit/receive switch should be controlled by transceiver PTT output.
- If you are using an antenna tuner, it should be placed between the power amplifier output connector and transmit antenna.

Hint:

The power switch on the Transmit/Receive unit can be used to select your transmit antenna or the loop for receive. Power on with the RECEIVE LED illuminated indicates that your receive signal will come from the loop. Power off with the RECEIVE LED not illuminated indicates that your receive signal will come from your transmit antenna. It is not uncommon for one antenna or the other to have a better receive signal at a given time on a specific band. You can use the power switch on the Transmit/Receive unit to quickly and easily select the better signal.

Option #3) <u>Using the W6LVP mag loop antenna with a transceiver with separate receive antenna input or with a receiver separate from the transceiver.</u>

When using the W6LVP mobile loop with a transceiver having a separate receive antenna input or with a receiver, connect it as follows:



- Connect a short 50-ohm cable with PL-259 connectors between the transceiver receive antenna connector or the receiver antenna connector and the RADIO connector on the transmit/receive switch.
- Using a 50-ohm coaxial cable with BNC connectors or other connectors and BNC adapters, connect the transmit/receive switch RECEIVE ANTENNA input to the loop amplifier output. Although the loop preamp and the input to most radios are 50 ohms, my experiments indicate that quad shield RG-6 cable with F to BNC adapters is not only inexpensive but has good common mode rejection.
- The transmit antenna connections are not used.
- Connect a 12 VDC power source either wired directly into vehicle power or using the supplied cigarette lighter adapter to the T/R switch. Turn the power switch to ON. After

a short delay, the RECEIVE LED will illuminate. (Note the diagram above incorrectly shows an AC power supply.)

- Turning the antenna switch power off or removing its power source will disable the receive loop antenna.
- In this configuration, the red LED is a power indicator.
- Transmit/Receive Switch PTT is not used.
- If you are using an antenna tuner, it should be placed between the transceiver transmit antenna connector and transmit antenna.

There is a unique operating situation when using the W6LVP Transmit/Receive switch with a separate receiver.

The W6LVP Transmit/Receive switch includes a circuit to protect the loop amplifier during transmit. Failure of a PTT signal to switch the transceiver output from the receive loop antenna to the transmit antenna during transmit could damage the loop amplifier. The protection circuit senses an RF signal on the RADIO connection and switches the transceiver from the receive loop to the transmit antenna if a PTT signal is not present.

If the receive loop is close to the transmit antenna or the transmit power level is high, the signal on the RADIO connection coming from the loop amplifier can be strong enough to activate the protection mechanism. This can be recognized by a flash or flicker of the RECEIVE LED.

Although this condition will not harm or damage either the loop amplifier or T/R switch, it can be addressed a couple of ways. One option that may not be practical in all cases is to position the loop antenna further away from the transmit antenna. Another option is to use the PTT signal from the transceiver to control the T/R switch and cause it to transition to transmit mode whenever the transceiver is transmitting. Each time the transceiver begins to transmit and asserts its PTT output, the T/R switch will shift to transmit mode and the LED will turn off until the transmission is ended and the PTT signal is removed. (See the other option sections for instructions on connecting the PTT control interface.)

TIPS

There is a short delay between the end of PTT assertion and when the transmit/receive switch returns to receive mode. The length of this delay is factory set but if necessary, the length of the delay can be adjusted. Remove the bottom cover of the Transmit/Receive switch and rotate the adjustment screw on the top of the trimpot clockwise to increase the delay time and counterclockwise to reduce it.

NEVER CONNECT THE TRANSMIT/RECEIVE SWITCH RECEIVE ANTENNA CONNECTOR (BNC) TO THE TRANSCEIVER ANTENNA OR RECEIVE ANTENNA CONNECTOR. THE CABLE FROM THE TRANSMIT/RECEIVE SWITCH TO THE LOOP IS USED FOR BOTH THE RECEIVED RF SIGNAL FROM THE LOOP AMPLFIER AND 12 VOLTS DC POWER FOR THE LOOP AMPLIFIER. THAT 12 VOLTS DC COULD DAMAGE THE INPUT TO A TRANSCEIVER OR RECEIVER.

NEVER CONNECT THE OUTPUT OF A TRANSCEIVER OR POWER AMPLIFIER TO THE MAGNETIC LOOP AMPLIFIER. THIS ANTENNA IS FOR RECEIVE ONLY.

Optionally, the transceiver should be configured for 20 milliseconds (typical default setting for many transceivers) or greater delay from transmit start (PTT active) to RF output. Although there is a built-in protection circuit in the transmit/receive switch, lack of PTT connection between the transceiver and transmit/receive switch could allow RF from the transceiver to damage the magnetic loop amplifier.

Warranty

All products manufactured by W6LVP are warranted to be free from defects in material and workmanship for a period of one (1) year from date of shipment. W6LVP's sole obligation under these warranties shall be to issue credit, repair or replace any item or part thereof which is proved to be other than as warranted; no allowance shall be made for any labor charges of Buyer for replacement of parts, adjustment or repairs, or any other work, unless such charges are authorized in advance by W6LVP. If W6LVP's products are claimed to be defective in material or workmanship, W6LVP shall, upon prompt notice thereof, issue shipping instructions for return to W6LVP (transportation-charges prepaid by Buyer). Every such claim for breach of these warranties shall be deemed to be waived by Buyer unless made in writing. The above warranties shall not extend to any products or parts thereof which have been subjected to any misuse or neglect, damaged by accident, rendered defective by reason of improper installation, damaged from severe weather including floods, or abnormal environmental conditions such as prolonged exposure to corrosives or power surges, or by the performance of repairs or alterations outside of our plant, and shall not apply to any goods or parts thereof furnished by Buyer or acquired from others at Buyer's specifications. In addition, W6LVP's warranties do not extend to other equipment and parts manufactured by others. The obligations under the foregoing warranties are limited to the precise terms thereof. These warranties provide exclusive remedies, expressly in lieu of all other remedies including claims for special or consequential damages.

SELLER NEITHER MAKES NOR ASSUMES ANY OTHER WARRANTY WHATSOEVER, WHETHER EXPRESS, STATUTORY, OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS, AND NO PERSON IS AUTHORIZED TO ASSUME FOR W6LVP ANY OBLIGATION OR LIABILITY NOT STRICTLY IN ACCORDANCE WITH THE FOREGOING.