

PreciseLOOP® Antennas

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Manual Tuned Magnetic Loop Antennas (MLA)

The HG-1 Deluxe, HG-1 Express and SOTA-1 are all manual tuned MLAs. They are designed for quick deployment. Except for feature differences they all set up the same. The process takes under five minutes. Always check www.preciserf.com for the latest version.

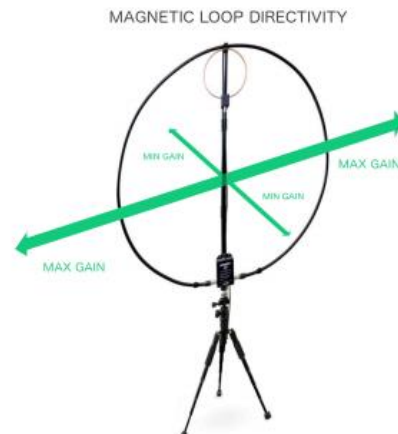
ASSEMBLY

1. Find a level surface that is clear of any obstructions within approximately a 15-foot radius. Use either the supplied tripod or use your own. Extend your tripod to a convenient height. The PreciseLOOP® will work well from two feet or higher above the ground. After approximately a 6-10 foot height little is gained in performance.
2. Assemble the antenna mast. It consists of three sections. The lower section contains the tuner, the center section connects the lower and the top section and the top section contains the induction loop. All it takes is slight pressure to fit the mast sections securely together. Attach the optional tripod adaptor to the antenna mast.
3. Attach the tuner to the lower mast section using the supplied bolts. Mount the mast to the tripod's standard 25 mm socket.
4. Spread the radiation loop and fit to the top of the mast. Make sure the induction loop is facing toward the front over the radiation loop. Securely attached PL239 connectors to the tuner inputs.
5. Connect the 12-foot, 50-ohm BNC cable, from the induction loop output the transceivers antenna input. Adjust the loop assembly for a symmetrical appearance.



TUNING

1. Tuning instructions are also printed on the tuning enclosure, refer to them as well.
2. Select the band you wish to use. Set the transceiver to SSB (this provides the loudest background noise).
3. Adjust the loop tuner for maximum received noise or signal (do not use a tuner). Rotate the loop in line with



the desired direction. Maximum gain is approximately +20dB over the minimum direction. (see illustration at right).

4. Transmit a low power (1 W) CW signal and adjust the loop tuner for minimum SWR. If needed, use a tuner or auto tuner to get the VSWR to minimum. This will take a little practice because an MLA has very sharp tuning characteristics.
5. You can make fine SWR adjustment by sliding the induction loop up or down about 1/4 inch.
6. Once you achieve an SWR of 2.0 or less, you're ready for a QSO.
7. Repeat these steps when QSY.

CAUTION: THE LOOP CONNECTORS ARE AT HIGH VOLTAGE WHEN TRANSMITTING. DO NOT EXCEED THE MAXIMUM POWER RATING.

HG-1 REMOTE TUNER

(Retrofit - replaces knob)

There are currently two remote tuning options. They are the HG-1 Remote option (retrofit replaces the knob) and HG-1 WR Remote Tuner Resonator. They both share a common HG-2 Controller. This controller provides unique indications of CCW & CW limits depending on the remote used. Each will be explained below.

THE HG-1 REMOTE TUNER (retrofit)



The HG-1 REMOTE TUNER is a compact, easy-to-use tuner for an MLA. It is designed specifically as a retrofit for the popular preciseRF HG-1 MLA. You can place your HG-1 MLA at a remote location, such as the top of your RV, away from obstructions, for better radiation efficiency and less interference. The controller features an efficient, low noise, pulse-width modulated, motor controller. The drive motor RPM RATE is adjustable over a very wide range. This allows for precise tuning and low SWR.

A custom designed current limiter detects the end of the tuning range and alerts the operator when the tuning limit is reached by a red LED limit indicator. In addition, a failsafe slip clutch mechanism protects the motor and tuning capacitor as well. Note: Always use a fresh 9V Battery or the optional power supply. Any supplied battery may be partially depleted.

While you may get a green power light indication (SBY), there may not be sufficient battery power to run the motor. We suggest for long term operation use the optional Universal Power Supply 9VDC available from preciseRF.

INSTALLING THE HG-1 MOTOR DRIVE ASSEMBLY.

1. Open the existing HG-1 manual tuner case. (Refer to the figure). Take care not to damage the tuning capacitor by setting the frequency to its lowest setting.
2. Remove the existing knob and pointer (save them for potential future use).
3. Remove the existing mounting screws securing the 6:1 reduction drive (save any spacers or nuts).
4. Remove the temporary nuts securing the two spacers attached to the HG-1 motor assembly.
5. Attach the HG-1 motor assembly to the capacitor shaft.
6. Using the supplied longer #4-40 screws, mount the HG-1 motor assembly to the 6:1 reduction drive.
7. Tighten the set-screws and reinstall the HG-1 manual tuner case back.



ADJUST THE TORQUES SENSOR AND REPLACING THE BATTERY

(Applies the HG-1 REMOTE TUNER retrofit only)

The red LED limit indicator illuminates when the capacitor has reached the CW and CCW position. Because there is some variation in 6:1 reduction drive torque, the sensor can be calibrated.

1. Refer to the figure. Open the back of the remote controller case by removing the four screws. Note the blue miniature potentiometer located on the interface board.
2. Set the RATE to MAX. While pressing the UP and Down buttons adjust the blue potentiometer such that the red LED limit indicator illuminates brightly when the capacitor reaches the CW and CCW ends. It is normal for the red LED limit indicator to flicker occasionally. (You may have to repeat this adjustment as the 6:1 reduction drive loosens over time).
3. The battery may also be replaced at this time. Battery life depend on type and use. Generally, it should last for an extended tuning session. Turn the remote off when not in use.
4. Replace the back cover of the remote controller being careful not to pinch any of the wires.



DEPLOYING THE HG-1 REMOTE TUNER

1. Make sure the HG-1 Magnetic Loop antenna is placed in an obstruction free area.
2. For better water protection, the HG-1 motor drive assembly may be mounted facing down.
3. Connect both ends of the supplied cable (common CAT6 Ethernet cable) to the motor assembly and controller.
4. Turn the HG-1 Remote Tuner on; the green SBY LED should illuminate.
5. Set the Rate control to its Max position.
6. While observing the motor assembly, push the red Up or green Down buttons. Note the motor turning CCW or CW depending on the button pushed. This is an indication that the system is correctly connected and everything is in order. If the red LED limit indicator comes on, that is also OK. It just means you have reached the limits of the tuning range.

TUNING WITH THE HG-2 CONTROLLER (HG-1 Remote Tuner Retrofit)

1. If possible, turn the receiver's AGC off or set it to slow; bypass any external or automatic antenna tuner and set the mode to SSB (it's has the loudest background noise).
2. Turn the HG-1 Remote Controller to SBY (on) and set the Rate control to Max. NOTE: Applies to HG-1 Remote only. There are NO limit switches on the Remote tuner. The HG-2 Controller samples the motor current to determine the rotation limits.
3. Using the red Up or green Down buttons, tune for a peak receive signal (use your ears or the S meter). The maximum peak will be brief, but obvious. You may have to momentarily push the Up or Down buttons to get close. (The red LED limit indicator lights if either the lower or upper limits are reached – slight flickering is normal).
4. Once you receive an obvious peak signal, reduce the RATE control. Note, while not marked on the controller, the usable range of the RATE control is from approximately the 10 o'clock position to the MAX position with the knob CW position indexed at MAX (see the figure at right). Then alternately tap the DOWN and UP buttons for minimum SWR (any SWR under 2.0 is works very well).
5. Note, when checking SWR, transmit a low power carrier. You should be able to achieve an SWR of 2:1 or better. In rare cases, you may want to use an external tuner to touch up the SWR.
6. Set the receiver to the desired mode and turn the HG-2 Remote Controller off.

When the capacitor reaches its CW or CCW limits, the red LED limit indicator turns on bright, indicating you have reached the end of capacitor rotation limits, thus alerting the operator to change tuning directions. (The silk-screened markings DO apply).



HG-1 WR REMOTE LOOP TUNED MLA Outdoor deployable

This remote is designed for harsher outdoor and fixed installations. It is a durable, easy-to-use, remote tuner upgrade to your existing HG-1 MLA using its radiation and induction loops and mast. It features end-of-cap travel limit switches for long life. It uses the new HG-2 universal controller. To maximize reliability found in the harsher environmental conditions outdoors, this remote tuner uses a lower RPM motor and no reduction gear. For this reason, there is a shallow learning curve to get used to remote tuning. SWR is as low as the manually tuned HD-1 which uses the identical tuning capacitor. We recommend, for convenient and quick tuning to lowest SWR, using an auto tuner, such as those found in the KX2 or similar transceivers.



TUNING THE HG-1 WR REMOTE WITH THE HG-2 CONTROLLER

1. Make sure the HG-1 MLA is placed in an obstruction free area. Connect both ends of the supplied cable (common CAT-6 cable) to the motor assembly and controller.
2. If possible, turn the receiver AGC off or set it to slow; bypass any external or automatic antenna tuner and set the mode to CW (it has the lowest controller QRM noise).
3. Note: Applies to HG-1 WR REMOTE LOOP TUNER. The HG-1 WR uses limit switches. Therefore, current sampling is used only to indicate the motor is powered on. CW and CCW limits are indicated when the red LED limit indicator extinguishes.
4. Turn the HG-2 Remote Controller to SBY (on) and set the RATE control to a mid-range setting. Once you receive an obvious peak signal, reduce the RATE control. Note, while not marked on the controller, the usable range of the RATE control is from approximately the 10 o'clock position to the MAX position with the knob CW position indexed at MAX (see the figure at right). Then alternately tap the DOWN and UP buttons for minimum SWR (any SWR under 2.0 is works very well).
5. Note, when checking SWR, transmit a low power carrier. You should be able to achieve an SWR of 3:1 or better. Once you achieve 3:1 or better, use an external or built-in auto tuner to touch up the SWR. You should easily achieve an SWR of 1:2 or better. Set the receiver to the desired mode and turn the HG-2 Remote Controller off.

The red LED limit indicator will stay on indicating the motor is powered during capacitor turning and turn off when reaching the CCW or CW limits, alerting the operator to change tuning direction (The silk-screened markings do not apply).



HG-1 WR 80M AND 60M OPERATION

The HG-1WR is capable for 60m and 80m operation. Because of performance optimization circuit boards with isolation jumpers are used to connect external the 60m and 80m resonators. These circuit boards are mounted on each side of the case. See figure below.

These boards are identical. On these boards there is a solder jumper labeled 60/80M JUMPER JP1. See figure at right:

These jumpers isolate the banana jack inputs and must be bridged. For 60/80-meter operation create a solder bridge on both boards. Heat the pads and apply sufficient solder to bridge the pads.

The Banana jacks are mounted on the top of the case and are water resistant. The external resonator can be inserted approximately 2/3 into the jacks and will fit securely. Tuning is done with the main resonating tuning capacitor as in 40-10-meter operation.

DIFFERENCES BETWEEN MANUAL AND REMOTE TUNING

When tuning manually the operator tunes for a peak receiver signal by rapidly turning a knob and listening for a peak receive signal after which he then makes small adjustments to fine tune and to achieve the lowest SWR. Because of AGC action, if you were to initially tune slowly, you might never notice the increased noise level indicating a peak signal. Tuning with a remote controller is different. The operator sets the tuning rate and then pushes either the up (red) or down (green) buttons to tune. Initially the tuning rate should be set fast to detect a peak, after which the tuning rate is lowered to fine tune for best SWR. This takes a little practice at first. The benefit is that your hand will not affect the tuning capacitor, and you can do this remotely without touching the MLA itself.



See: [Tuning the HG-1 WR Loop](https://www.youtube.com/watch?v=aGlsGHuvUzI&feature=youtu.be)) <https://www.youtube.com/watch?v=aGlsGHuvUzI&feature=youtu.be>