A WORD ABOUT TUNING NARROW BAND ANTENNAS WITH GRAPHING ANTENNA ANALYZERS.

Analyzers like the Rig Expert series sample only so many points when constructing a graph. 80 points in the case of the RigExpert series, when not being controlled by a PC. If you are sweeping say +/- 4MHz,a sample is taken every 100KHz. On an antenna with a 2.62:1 SWR bandwidth (-3dB points) of 16KHz, the dip may not be seen or will be quite shallow. Once you find the dip, center it, narrow the Range and resweep.
Typically, on 40M as an example. I do the final tuning with a sweep range of 40KHz. This will give a true indication of SWR.

TUNING SMALL LOOPS IN GENERAL

Once you have the SWR centered on your operating frequency, you may wish to make small adjustments in the coupling loop height to achieve even lower SWR. Use the same procedure as above– step away from the loop while making your adjustment.
The unique hybrid matching network makes height adjustments of the coupling loop less necessary than would be the case with a classic coupling loop.

One might ask why an azimuth motor control was not included. For almost all practical propagation elevation angles, a small transmitting loop is virtually omnidirectional. For close in man made noise sources, you may find that you can rotate the loop to minimize that noise source. Noise sources above or below the height of the loop will likely not be diminished much if at all.

SPECIFICATIONS

Coverage	6.9MHz– 29.4MHz
Polarity Low Angle:	Vertical
Polarity High Angle:	Horizontal
Loop Diameter	45”
Design Z:	50 Ohms
Power Handling:	15W SSB/CW 10W DIGITAL
Weight:	3 lb
Shipping Size	16 X 16 X 3”
Materials:	6061-T6 Aluminum, CPVC,
Hardware:	Stainless Steel
Connector:	Female gold/teflon BNC

LNR Precision

Asheboro, NC

www.LNRprecision.com

E-Mail: support@lnrprecision.com

SMALL RX/TX HF LOOP
MODEL REMOTE W4OP
40-10M STL

PARTS LIST

PART NO.	QTY	DESCRIPTION
SUBL1001	1	MAIN RADIATOR ASSEMBLY
SUBL1002	1	COUPLING LOOP ASSEMBLY
L1003	1	COUPLING LOOP THUMB SCREW
SUBL1004	1	3 PIECE SUPPORT MAST
L1005	1	TABLE/RAIL CLAMP
L1006	4	STABILIZER FOOT 1” x 8”
L1007	4	RED STABILIZER FOOT THUMB SCREW
L1008	1	HOOK&LOOP TIE WRAP 6”
SUBL1010	1	REMOTE MAIN TUNING UNIT
L1012	1	SMA CONTROL CABLE
SUBL1013	1	HANDHELD REMOTE
L1014	1	OWNER’S MANUAL

FIG. 1

ASSEMBLY

1. UNPACK THE SUBASSEMBLIES AND LOCATE THE TUNING BOX AND THREE PIECE SUPPORT MAST.

2. THE LOWEST MAST SECTION HAS A FEMALE 1/4-20 THREAD. FIRMLY SCREW THIS SECTION INTO THE TUNING BOX.

3. ASSEMBLE THE REMAINING TWO MAST SECTIONS ONTO THE LOWER PIECE IN ANY ORDER.

4. LOCATE THE COUPLING LOOP AND INSTALL IT ONTO THE UPPER TUBE. LOWER IT SO THAT THE TOP OF THE LOOP IS BELOW THE TOP OF THE UPPER TUBE AND LOCK IT IN PLACE BY TIGHTENING THE BLACK THUMBSCREW.

5. CAREFULLY EXPAND AND RESHAPE THE RADIATOR INTO A 4' DIAMETER CIRCLE. GRASP THE CABLE WITH BOTH HANDS ABOUT 10" APART AND STRIGHTEN A BIT– MOVE UP AND DOWN THE CABLE GRADUALLY INCREASING THE RADIUS.

6. LOCATE THE 4 BLACK STABILZING FEET, OR THE BLACK TABLE CLAMP. IF USING THE STABILIZER FEET, ATTACH THEM TO THE TUNING BOX WITH THE 4 RED THUMBSCREWS. LEAVE THE FEET A LITTLE LOOSE AT THIS TIME.

6. PLACE THE ENCLOSURE ON A LARGE FLAT SURFACE– FLOOR ETC. LAY THE MAIN RADIATOR ON THE FLOOR AND SCREW THE PL-259'S INTO THE SO-239'S BY JUST SEVERAL TURNS . **DO NOT TIGHTEN THE PL-259'S**. **MAKE CERTAIN THEY ARE FREE TO ROTATE**

THE RIGHT SIDE HAS TWO SO-239'S. THE FRONT FOR 40-12M AND THE REAR FOR 10M.

7. LIFT THE RADIATOR UPRIGHT AND PLUG IT INTO THE TOP OF THE UPPER TUBE. TIGHTEN THE PL-259'S AS TIGHTLY AS POSSIBLE. AS YOU TIGHTEN, MOVE THE AXIS OF THE CONNECTOR A BIT TO MAKE SURE IT IS ALIGNED WITH THE SOCKET AND CONTINUE TIGHTENING.

8. THE STABILIZER FEET CAN BE ARRANGED AS NEEDED. IT IS OFTEN EASIER TO GRASP THE RED THUMBSCREW AND ROTATE THE FEET. IF NOT USING THE STABILIZER FEET, ATTACH THE CLAMP NOW TO A TABLE OR RAILING TO SECURE THE ANTENNA.
IF USING THE CAMERA TRIPOD OPTION– SEE ITS INSTRUCTIONS.

9. A LOOP & HOOK TIE WRAP IS PROVIDED TO SECURE YOUR FEEDLINE TO THE SUPPORT TUBE. DEPLOY IT AT THE BASE OF THE SUPPORT TUBE

10. CONNECT THE CONTROL CABLE BETWEEN THE ANTENNA AND THE HANDHELD REMOTE.

TUNING
DO NOT ATTEMPT TO USE A SEPARATE TUNER. THE LOOP MUST BE TUNED VIA ITS RESONATING CAPACITOR

PLEASE NOTE: HIGH EFFICIENCY SMALL LOOPS ARE NARROW BANDED. SLOW TUNING IS REQUIRED. THE TRAVEL TIME FROM 40M TO 12M (DOWN STALL TO UP STALL) IS A LITTLE UNDER 3 MINUTES– EVEN SLOWER IN SLOW MODE. BE PATIENT WHEN TUNING.

1.DEPLOY THE LOOP AS HIGH AS POSSIBLE OFF OF THE GROUND TO REDUCE GROUND LOSSES.

2. THE TUNING CAPACITOR IS INITIALLY FULLY MESHED (BELOW 40M).

3. INITIAL TUNING MAY BE DONE BY TUNING THE VARIABLE CAPACITOR FOR MAXIMUM RECEIVER NOISE. FINAL TUNING IS BEST DONE WITH AN SWR METER OR ANTENNA ANALYZER. THE GRAPHING ANALYZERS MAKE QUICK WORK OF TUNING. ONE UNIQUE FEATURE OF THIS ANTENNA IS THE CAPABILITY OF PRECISION ADJUSTMENT OF THE COUPLING LOOP WITH RESPECT TO THE MAIN LOOP. THIS FEATURE ALLOWS FOR ADJUSTING THE SWR TO CLOSE TO 1:1 REGARDLESS OF THE MOUNTING LOCATION– I.E. PROXIMITY TO GROUND, BUILDINGS ETC.

4. TO TAKE ADVANTAGE OF THIS FEATURE, TUNE THE VARIABLE CAPACITOR TO YOUR OPERATING FREQUENCY. MEASURE THE SWR. RAISE OR LOWER THE COUPLING LOOP BY 1/4" AND REMEASURE THE SWR. SLIGHT RETUNING OF THE VARIABLE CAP WILL KEEP THE LOOP ON YOUR FREQUENCY. MAINTAIN THE COUPLING LOOP PARALLEL TO THE MAIN LOOP.

5. IF YOU LEAVE THE COUPLING LOOP ABOUT 1/2" ABOVE THE MAIN RADIATOR, YOU SHOULD BE ABLE TO ACHIEVE SWR ON ANY BAND UNDER 1.5:1.

6. INITIAL TUNING CAN BE DONE BY PRESSING THE TOP SWITCH TO THE **RIGHT (UP)** TO BEGIN RAISING THE FREQUENCY WHILE LISTENING FOR MAX RX NOISE. THERE WILL BE A VERY BRIEF LIGHT BURST FROM THE SELECTED UP OR DOWN LED. WHEN THE CAPACITOR REACHES A FULLY CLOSED (**DOWN**) OR FULLY OPEN (**UP**) STATE, THE CORRESPONDING LED WILL GLOW, ALERTING THE USER THAT NO FURTHER TRAVEL IN THAT DIRECTION IS POSSIBLE

7. FINE TUNING IS THEN DONE BY DEPRESSING THE **SLOW MOTION BUTTON** ALONG WITH THE **UP** AND **DOWN** BUTTONS
THERE WILL BE A BIT OF BACKLASH AS THE GEAR REDUCTION GEARS CATCH UP WHEN DIRECTION OF ROTATION IS REVERSED.

8. REMEMBER, THE NARROWER THE FREQUENCY COVERAGE FOR A GIVEN LOOP CIRCUMFERENCE, THE **MORE EFFICIENT** THE ANTENNA. ONE MANUFACTURER TOUTS HIS LOOP COVERING ALL OF 40M WITHOUT RETUNING.
ANALYSIS OF THAT ANTENNA REVEALED IT IS OVER 10DB BELOW THE W4OP LOOP ON 40M.

9. 10M IS COVERED BY SCREWING THE RIGHT SIDE OF THE RADIATOR INTO THE REAR CONNECTOR. ON THE 10 AND 12M BANDS THE ANTENNA IS NOT A SMALL TRANSMITTING LOOP BUT RATHER A CAPACITY LOADED CIRCULAR DIPOLE. RADIATION IS AT RIGHT ANGLES TO THE PLANE OF THE LOOP– JUST THE OPPOSITE OF THE SMALL TX/RX LOOP.

10. IF YOU WILL NOT BE USING THE HANDHELD FOR A WEEK OR MORE, REMOVE THE 9V BATTERY. THIS HANDHELD HAS THE UNIQUE FEATURE THAT EVEN AS THE BATTERY VOLTAGE DROPS, A CIRCUIT IN THE REMOTE MAINTAINS THE BATTERY AT A CONSTANT VOLTAGE UNTIL IT IS ALMOST FULLY DEPLETED. THIS CIRCUIT HAS A CONSTANT DRAIN ON THE BATTERY OF A MILLIAMP OR SO.

THE BATTERY COMPARTMENET LID MAY BE STIFF UPON FIRST USE. USE BOTH THUMBS EIHTER SIDE OF CENTER TO PUSH DOWN AND FORWARD.