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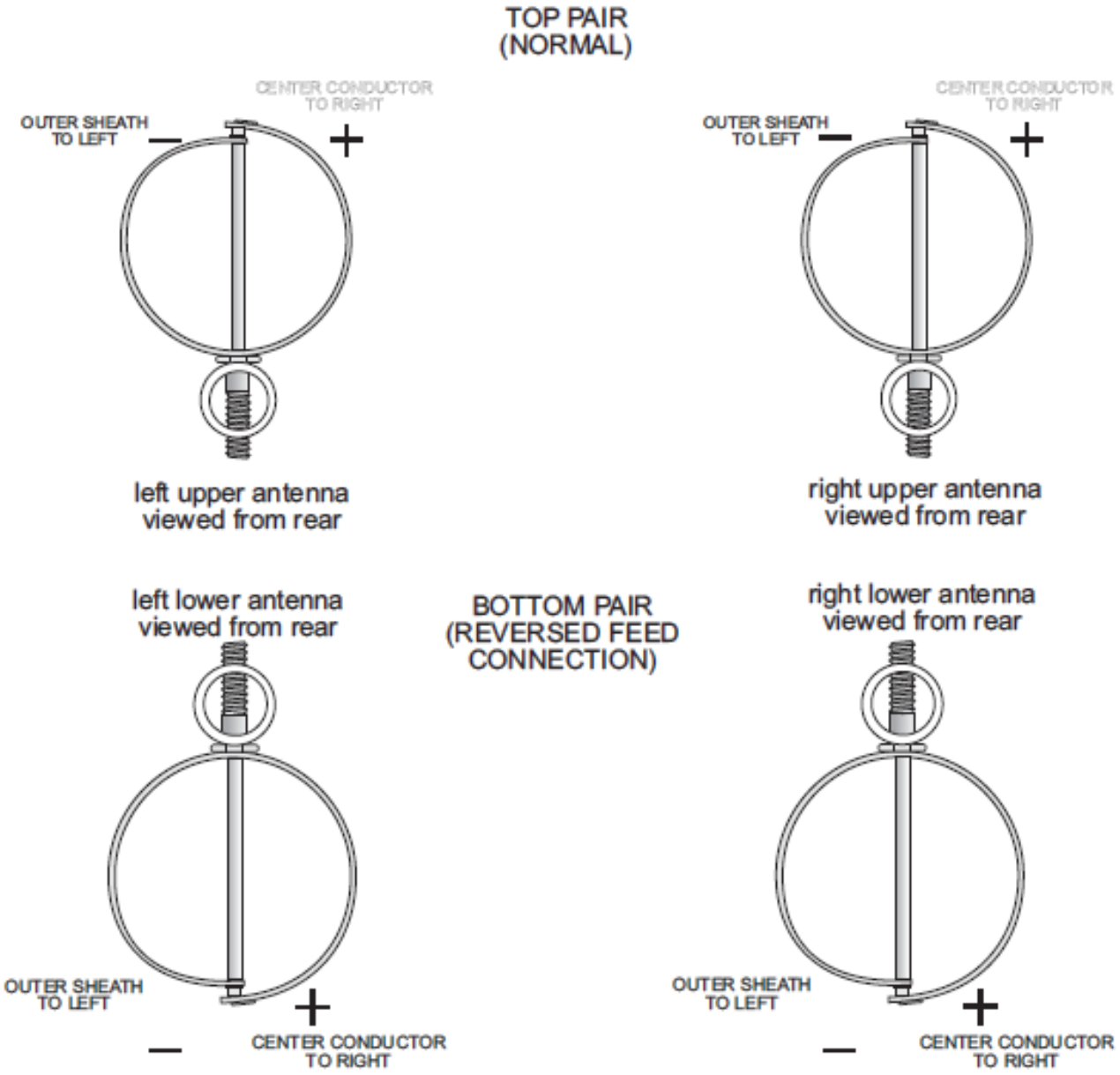
INSTRUCTIONS FOR STACKING LOOP YAGIS

Loop yagis can be stacked like any other antenna for increased gain. An increase of approx-imately 2.5 dB or greater, can be realized each time the array size is doubled. Antennas can be stacked vertically or horizontally, although we recommend stacking two antennas horizontally when space permits. Although this makes the horizontal pattern sharper, it makes the pattern cleaner in the vertical plane with a resulting improvement in signal to noise ratio. This improvement is possible because there will be no sizable side lobes looking at "hot" earth. Four antennas are normally mounted in a box or "H" configuration. To keep the mast out of the cylinder defined by the loops, it is recommended that the loop yagi be either mounted at the top of the mast, or on a side arm attached to the main mast. When stacking four antennas, the bottom two must be mounted with the loops down. To keep all four driven elements in phase, the bottom two antennas must have the driven element phase reversed. When ordering assembled antennas for an array, they will be supplied for proper phase. When building from a kit, rotate the driven element loops for the bottom antenna(s) around 180 degrees before soldering the ends of the loops to the copper coax. If the top antennas have the center conductor of the coaxial cable going “right“ as viewed from the rear of the antenna, then the bottom antennas should have the center conductor going "left" with the antenna viewed from the same direction. Then, when the bottom antennas are flipped over for mounting on the frame, all of the coaxial cable center conductors go in the same direction - - to the right in this case.

Stacking distance is measured from center of loop to center of loop, and stacking dimensions are listed on the antenna specification sheet. Phasing lines should be constructed of equal lengths of good low loss 50 ohm coaxial cable. Times Microwave LMR-400, Belden 9913, or FLEXI 4XL II is recommended for frequencies up to 1700 MHz (WEFAX). On 2.3 GHz and higher, we recommend short equal lengths of 0.141" semi rigid hardline. Also mount the power divider on an arm that extends back to a point near the driven elements. From this point a flexible low loss main coaxial cable (Andrew "SuperFlex" 1/2" Hardline or LMR-400F) may be employed to go from the power divider down the mast. All connections to the power divider should be sealed well with silicone RTV or equivalent. Remember that the power divider is used to maintain a 50 ohm impedance in the system, so that all connecting coaxial cables may be 50 ohm low loss variety of equal length. Benefits include lower loss and much wider bandwidth with good VSWR than that obtained with tuned lengths of 1/4 wave multiples of 75 ohm coax. Coaxial cable lengths need only be equal length. As all the lines are flat (i.e. 50 ohms), there is no need for tuning the lengths to any specific value. Making your own cables is simple if you are careful to measure and cut equal length cables. It is also important to accurately measure and trim the ends prior to attaching the connectors. Any errors here can introduce phase errors. Directive Systems can make the cables as well. All factory cables are phase matched. Accuracies of better than +/- 3 degrees are possible through the 3.4 GHz band.

PROPER PHASING CONNECTIONS FOR MULTIPLE LOOP YAGIS



NOTE:

The bottom pair of antennas are physically installed upside down when compared to the top pair. Note, as shown in the diagram above, that simply flipping an upper antenna upside down, will put the feed system out of phase. (The +, or positive side of the feed, loop will now be on the opposite side of the array and cancellation of signal will occur.)

To eliminate this situation in stacked or phased antenna arrays, the bottom pair of antennas will have the connections reversed where the brass loop connects to the copper coaxial cable feedpoint. The factory standard for a "normal" antenna is for the center conductor to connect to the right when viewed from behind (Reflector side) the driven element loop with the loop oriented above the aluminum support boom. A “reversed” (antenna will have the center conductor going to the left when viewed from the same position.

When the "reversed" antenna is flipped upside down, everything comes back in phase.