Coax Lengths Required
98-Foot DX Engineering 4-Square

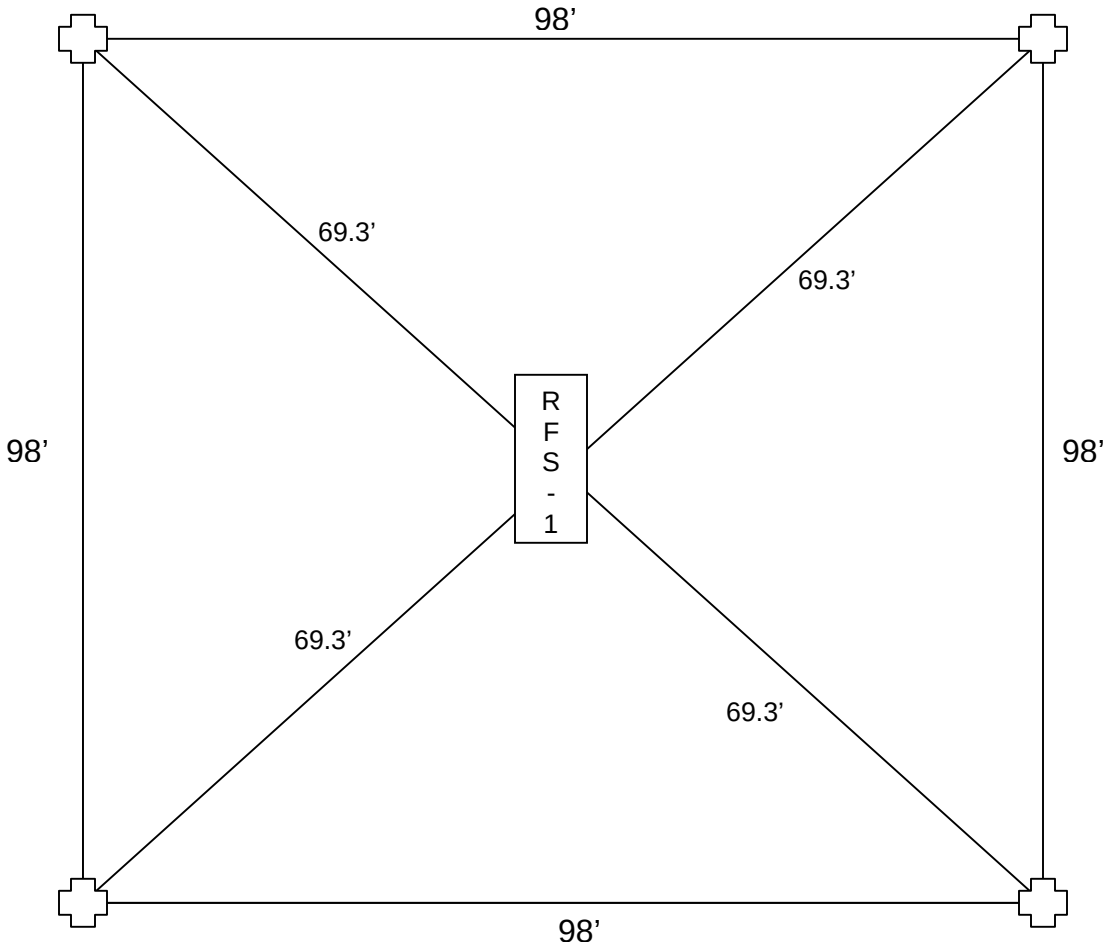
Jeff Maass K8ND

061231a

WHIP FEEDLINES

A length of RG-6 feedline must run from the central point, where the RFS-1 4-Square switch is mounted, to each of the four ARAV-1P active vertical antenna locations. These need only be long enough to reach the antennas, but MUST be the same length as each other, and should be cut from the same lot of feedline.

For a 98-foot square, the ½ of the diagonal length is 69.3' = SQRT(2*(98**2)) / 2. This is the bare minimum, so to allow for routing the feedline from the switch to the element, we'll make each of the four feedlines 100.0-feet long (30.7-feet slack).



DELAY LINES

The calculation of the Delay Line lengths is specified in the RFS-1 manual (http://www.dxengineering.com/pdf/RFS-1P.pdf), pages 15-17.

There are three Delay Lines required at the RFS-1 switch, DLY1, DLY2, and DLY3. The required lengths of these delay lines are determined by the physical dimensions of the 4-square. The length of these delay lines is ***critical*** to the proper operation of the array, and they ***must*** be cut from the same lot of feedline, with the proper characteristic Velocity Factor taken into account.

The Velocity Factor (VF) of the RG-6 feedline obtained from DX Engineering has a published nominal Velocity Factor of 0.85.
http://www.dxengineering.com/Parts.asp?ID=998&PLID=245&SecID=129&DeptID=12&PartNo=DXE%2DF6%2DSPL

On December 30,2006, Jim W8WTS measured our roll of CommScope F660BEF Flooded 75 Ohm Coaxial Cable, obtained in a 925-foot roll from DX Engineering, as having a velocity factor of 0.83, which agrees nicely with the DXE published nominal VF of 0.85.

We will use the measured VF = 0.83 for our delay line calculations.

The lengths of DLY1 and DLY2 are based on the calculated length of DLY3.

DLY3 = ((138.6' x 0.95) x 0.83) = 109.286 feet = 109 feet 3.43 inches

DLY1 = DLY2 = (DLY3 / 2) = 109.29 / 2 = 54.643 feet = 54-feet 7.72-inches

SUMMARY – REQUIRED FEEDLINES

# REQ'D	USE	LENGTH	NOTE	DRESS
Four (4)	Element Feedlines	100.0 feet	Each must be precisely same length.	
One (1)	DLY1	54.643 feet	Must be precise!	Coil/tape in 1.5 foot loop
One (1)	DLY2	54.643 feet	Must be precise!	Coil/tape in 1.5 foot loop
One (1)	DLY3	109.286 feet	Must be precise!	Coil/tape in 1.5 foot loop
		618.59 feet	**Total length Required**	

CONNECTORS

DX Engineering recommends using the watertight Thomas & Betts LRC Snap-N-Seal F-connectors (Part #DXE-SNS6-25), which must be applied with the proper compression tool (Part #DXE-SNS-CT1. Any F-connector should be OK for our use, but the Snap-N-Seal connectors might last a bit longer in the Curacao environment. We have spare Snap-N-Seal connectors and a compression tool at Signal Point.