Build a roll-up J-pole
“The other part of the story”

19TH ANNUAL

"Michigan Summer Family Outing"

JULY 7th & 8th 2017

Presented by Lee Hodges, KC8ITI

Files in N3go_jpole.zip

ARTICLE ON J-POLE ANTENNAS
JPOLE.HTM

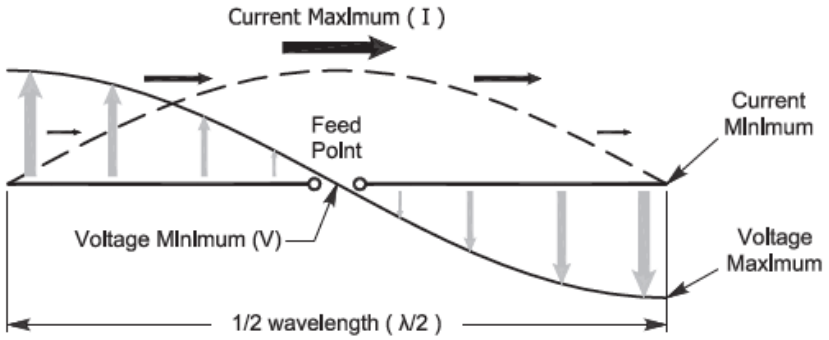
FIGURES USED IN THE HTM FILE:
FIG1.JPG FIG2.JPG FIG3A.JPG FIG3.JPG FIG4.JPG FIG5.JPG

BASIC PROGRAMS
JPOLES.BAS VELOCITY.BAS DELTA.BAS

BASIC INTERPRETER
GWBASIC.EXE

BATCH FILES TO RUN THE INTERPETER AND PROGRAMS
JPOLES.BAT
VELOCITY.BAT
DELTA.BAT

Voltage and Current distribution



Using Ohm's law, at the end point of a the dipole as the voltage increases and the current decrease the resistance tends towards infinity. Using the fomulas below we can compute the endpoint impedance.

Ws = Wiresize = 2 mm (12 AWG)
Hant = Height of antenna above ground = 20 meters
Pwr = Transmitter power = 100 watts
Freq = Frequency in Mhz
λ = 300/Frequency in Mhz

Rloss =0.0833 * SQRT(Freq) * λ/(Ws *SQRT(1 + λ /(4 * Hant)))

Zfeedpoint = (140+Rloss)/2

Zsurge = 276 * LOG(λ /(Ws /1000 * SQRT(1 + (λ / (4 * Hant)))))

Q = Zsurge \ Zfeedpoint

Efeedpoint = SQRT(Pwr * Zfeedpoint)

Ifeedpoint = Efeedpoint / Zfeedpoint

Eendpoint Q * Efeedpoint / 2

Zendpoint = (Eendpoint * Eendpoint)/ Pwr

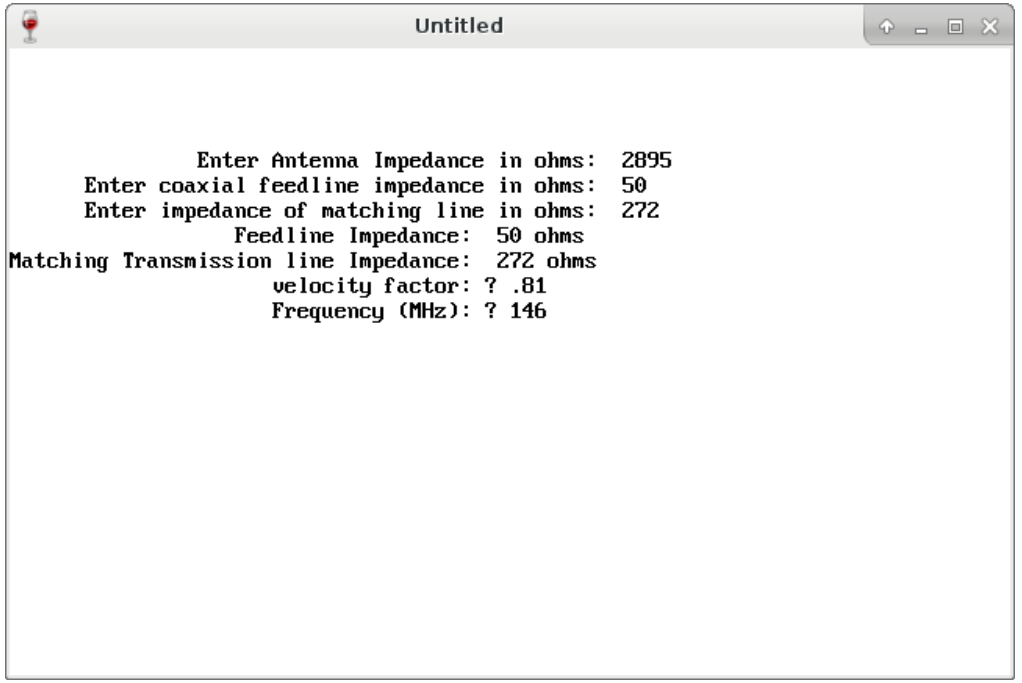
Voltage and Current distribution

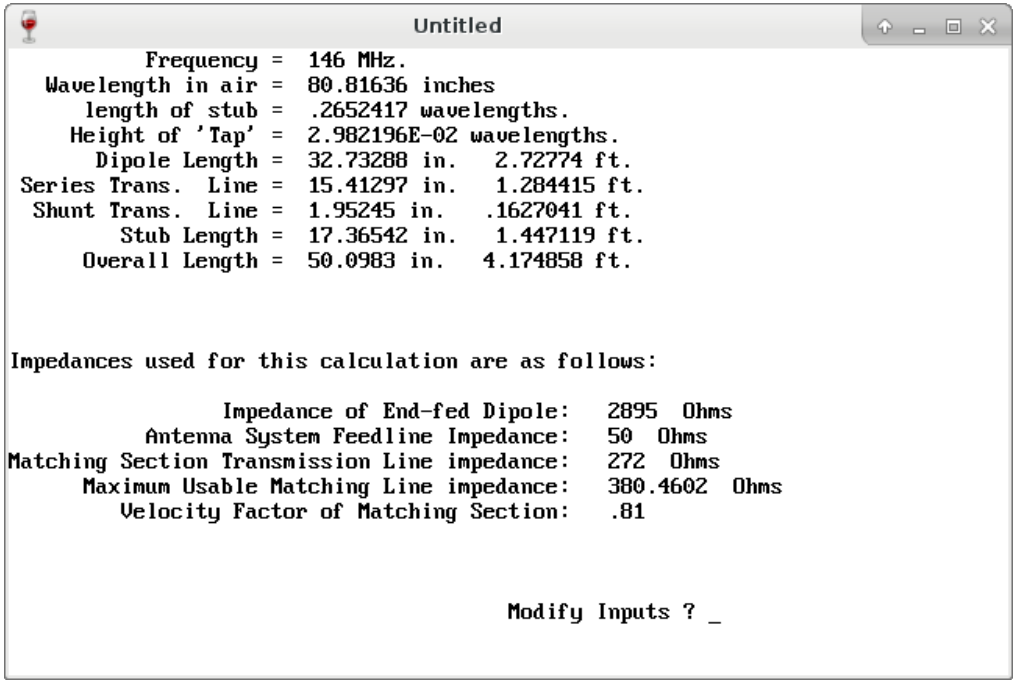
Using a spreadsheet with the formulas we can get some idea of the impedance that the quarter wave matching section must match for the Jpole to work correctly.

Freq	Wavelength	Rloss	Zfeed	Zsurge	Q	Efeed	Ifeed	Eend	Zend
144	2.083333	1.951355	70.975678	908.180797	12.795662	84.247064	1.186985	538.998486	2905.193676
145	2.068966	1.945151	70.972575	907.384299	12.784999	84.245223	1.187011	538.537540	2900.226817
146	2.054795	1.939005	70.969502	906.593067	12.774404	84.243399	1.187037	538.079588	2895.296434
147	2.040816	1.932917	70.966459	905.807033	12.763875	84.241592	1.187062	537.624592	2890.402024
148	2.027027	1.926886	70.963443	905.026128	12.753413	84.239802	1.187087	537.172514	2885.543098
wire mm	1.023700	AWG 18							
height M	6.000000	20 feet							
Power	100.000000	watts							

Computations from the Basic program

Execute JPOLES.BAS using your favorite BASIC interpreter or compiler. The information returned should give you all of the dimensions you need to construct a jpole antenna.





NOTE: Changed BASIC statement from:
440 DIPOLE=5606/F:REM ***** EQUATION A9 – A to
440 DIPOLE=5900 * V /F:REM ***** EQUATION A9 – A
And Changed spreadsheet cell E22 from =SUM(5606/E5) to =SUM(5900*E9/E5)