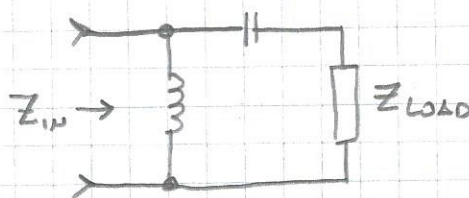
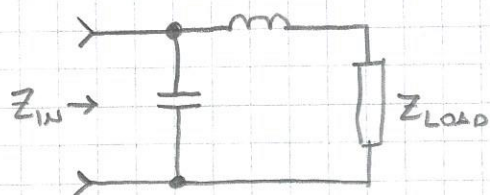
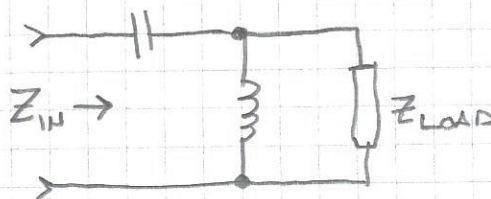
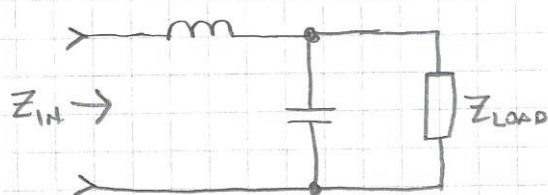


IMPEDANCE MATCHING w/ SMITH CHART

DESIGNING AN L-NETWORK

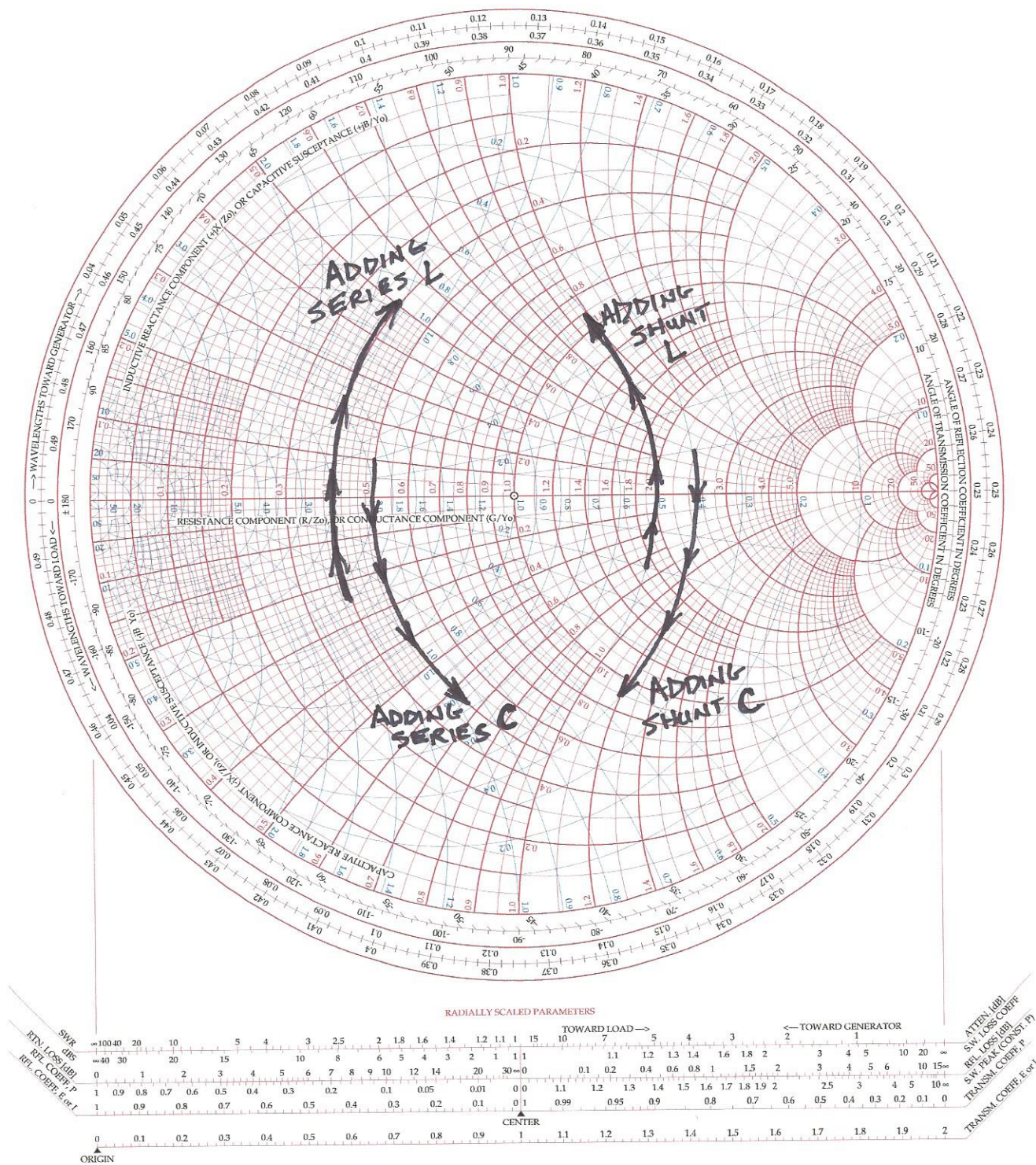


OR EVEN WITH ALL CAPACITORS
OR ALL INDUCTORS!

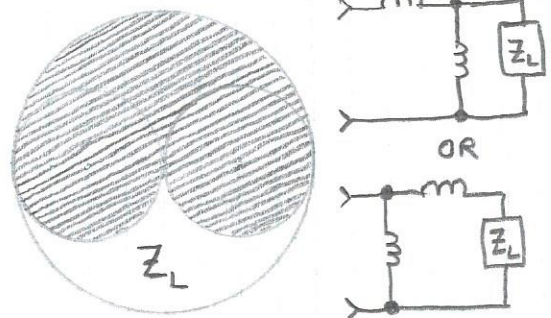
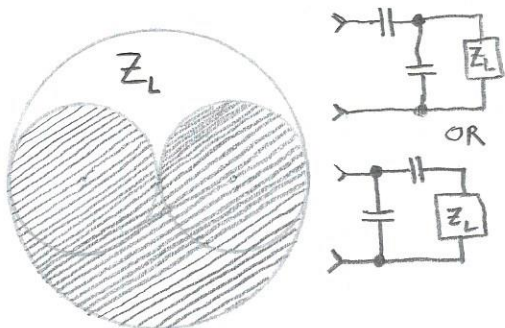
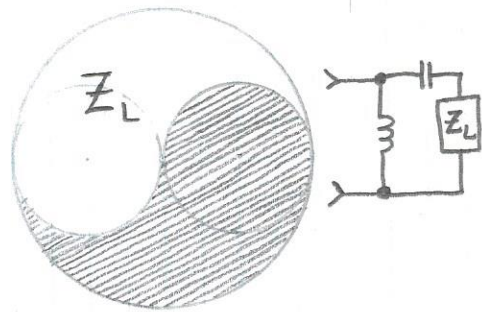
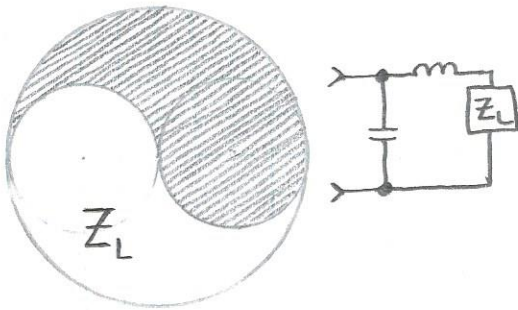
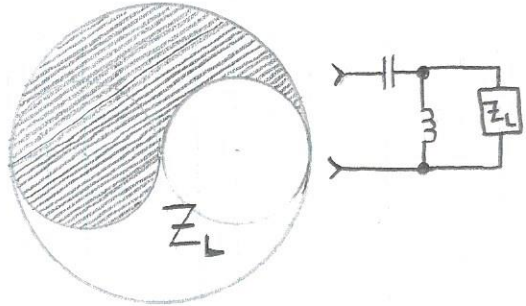
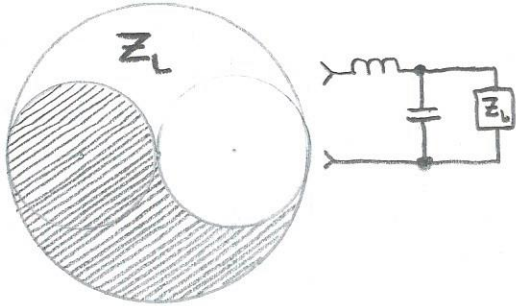
IMPEDANCE MATCHING: MOVING AROUND THE CHART...

W2AEW

- ADDING L OR C IN SERIES, ROTATE ON CONSTANT R CIRCLES
- ADDING L OR C IN PARALLEL, ROTATE ON CONSTANT G CIRCLES
- ADDING L ROTATES "UP" THRU REAL AXIS (ELEVATE UP) ↗ ↖
- ADDING C ROTATES "DOWN" THRU REAL AXIS (CRASH DOWN) ↘ ↙



L-NETWORKS TO MATCH VARIOUS Z_L



L-NETWORK DESIGN PROCESS

- PLOT Z_L
- ADD SERIES/SHUNT L/C FROM Z_L UNTIL HIT $R=1/G=|$ CIRCLE, RECORD $\Delta X / \Delta B$
- ADD SERIES/SHUNT L/C TO REACH CENTER, RECORD $\Delta X / \Delta B$
- COMPUTE L / C VALUES

$$X_C = \Delta X \cdot 50 \text{ OR } \frac{1}{\Delta B} \cdot 50$$

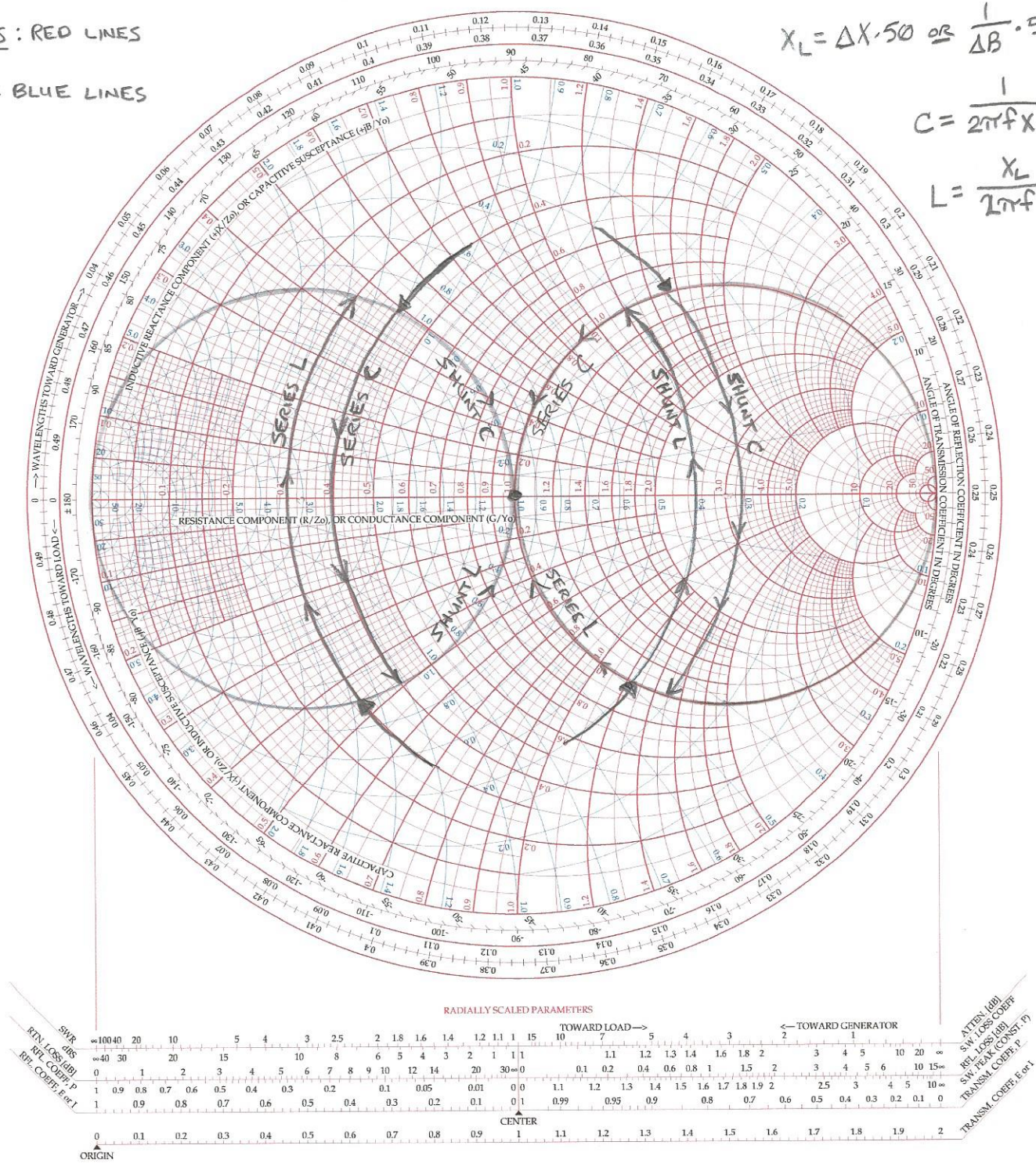
$$X_L = \Delta X \cdot 50 \text{ OR } \frac{1}{\Delta B} \cdot 50$$

$$C = \frac{1}{2\pi f X_C}$$

$$L = \frac{X_L}{2\pi f}$$

SERIES: RED LINES

SHUNT: BLUE LINES

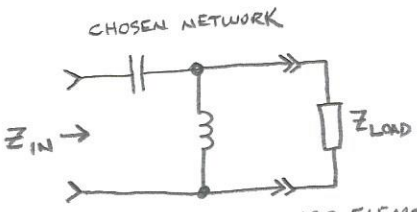


L-NETWORK MATCH EXAMPLE

FOR: $Z_{LOAD} = 33 - j51$

$f = 14.2 \text{ MHz}$

$$Z_L = \frac{Z_{LOAD}}{50} = 0.66 - j1.02$$



CHOSEN NETWORK

← ADD ELEMENTS IN THIS DIRECTION (THIS ORDER)

B_L - SUSCEPTANCE OF SHUNT $L = 0.69 + 0.5 = 1.19$ (NORMALIZED)

X_L - REACTANCE OF SHUNT $L = \frac{1}{1.19} \cdot 50 = 42 \Omega$

$$L = \frac{42}{2\pi f} = 471 \text{ nH}$$

$$X_C = (1.1)(50) = 55 \Omega$$

$$C = \frac{1}{2\pi f \cdot 55}$$

$$C = 204 \text{ pF}$$

