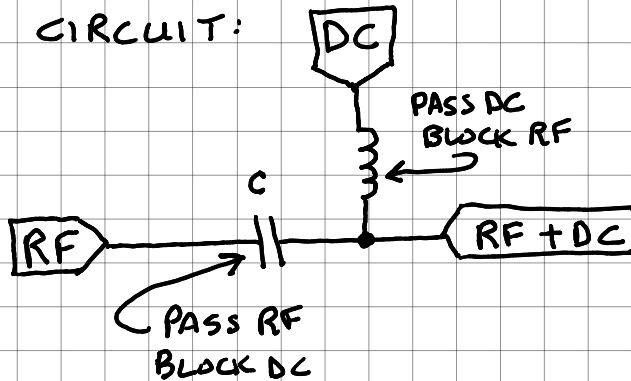


# BASICS OF BIAS-TEES

WZAEW

- ADD A DC / POWER SIGNAL TO AN RF LINE
  - PROVIDE POWER TO TRANSISTOR, PHOTODIODE, LNA, ETC.
  - CONTROL REMOTE RF HARDWARE
    - ANTENNA TUNER
    - COAXIAL SWITCH
    - AMPLIFIER
  - COUPLE LOW SPEED CONTROL & COMMUNICATIONS SIGNALS ONTO RF LINE
  - ADD DC-OFFSET TO HIGH SPEED SIGNAL

- BASIC CIRCUIT:



## RF PATH

- LOW FREQUENCY LIMIT:  $f_L = \frac{1}{2\pi C(R_L + R_S)}$

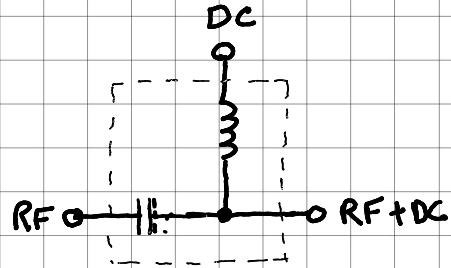
- HIGH FREQUENCY LIMIT:

- INDUCTOR PROPERTIES & PARASITICS
- CAPACITOR PROPERTIES & PARASITICS
- LAYOUT & MATERIALS

# BIAS TEE SPECS

W2AEW

- RF FREQUENCY RANGE  $\uparrow$  LOSS
  - CAPACITOR
  - LAYOUT
  - INDUCTOR PARASITICS
- DC VOLTAGE  $\uparrow$  CURRENT
  - INDUCTOR
  - CAPACITOR

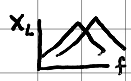


# PRACTICAL DETAILS

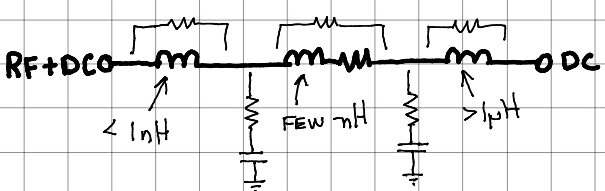
- CAPACITOR
  - SELF-RESONANT FREQUENCY
  - LOSS TANGENT / DISSIPATION FACTOR
- INDUCTOR (EVEN WORSE!)
  - PARASITIC CAPACITANCE
  - LOSS
  - CORE SATURATION
  - ETC.



DIFFICULT TO GET WIDE FREQ RANGE



FOR THESE REASONS, THE "INDUCTOR" IS USUALLY A SERIES OF SEVERAL INDUCTORS



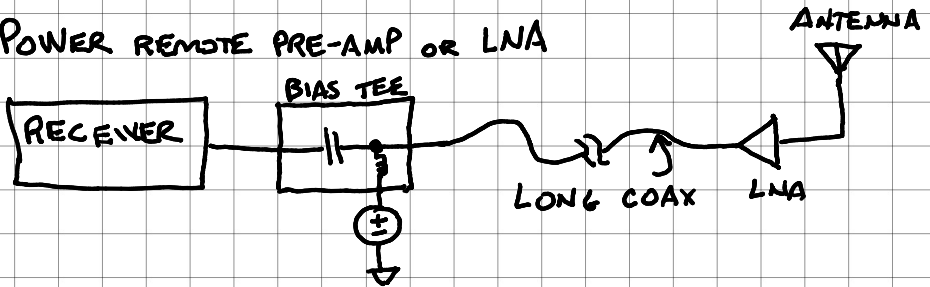
- BUT, THEN YOU CAN SETUP RESONANCES, ETC

SO, ADDITIONAL PARTS ADDED TO DE-Q THEM

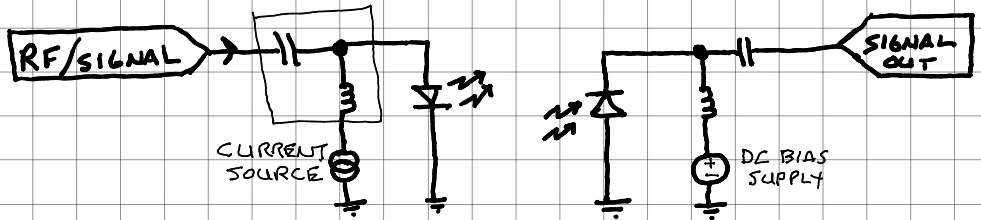
# APPLICATIONS

W2AEW

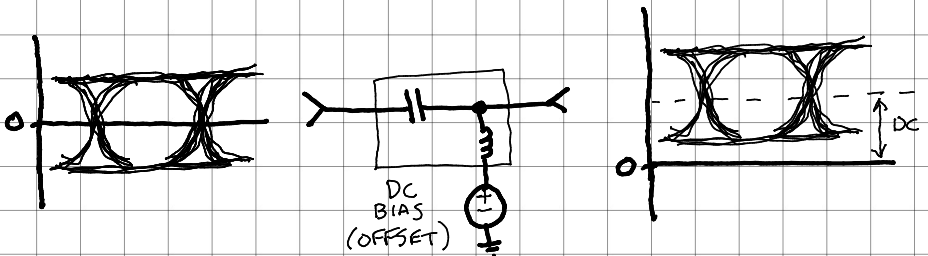
- POWER REMOTE PRE-AMP OR LNA



- BIAS LASER DIODE OR PHOTODIODE



- ADD DC OFFSET TO HIGH SPEED SERIAL SIGNAL

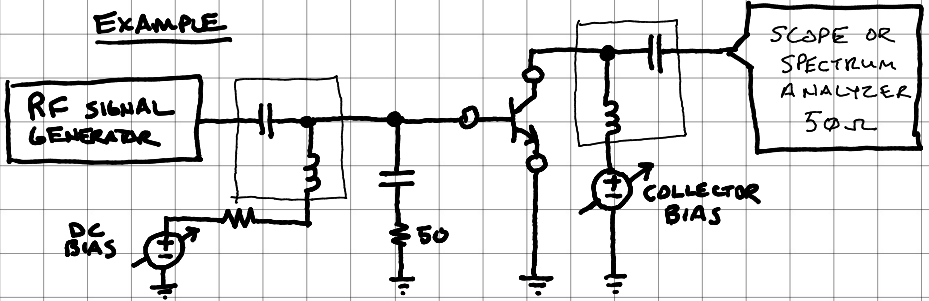


# APPLICATIONS

W2AEW

## - BIAS TRANSISTORS FOR SMALL SIGNAL RF APPLICATIONS

### EXAMPLE



## - ADD LOW SPEED / DC CONTROL SIGNAL TO RF PATH

### EXAMPLE ; REMOTE ANTENNA TUNE

