Instructions For
The Boonton Electronics Slide Rule

This Boonton Electronics Slide Rule is designed for rapid calculation of the reactance and either Q or dissipation factor of capacitors and inductors. It may also be used to find the resonating capacitance and inductance for a given frequency and for the design of filter networks.

EXAMPLE 1

Problem: To determine the Q of a capacitor at 1 Mc which measures,
C = 40 pf
G = 1.25 μmhos

Solution:
1. Set frequency to 1 Mc
2. Above 40 pf read: $X_c = 4000\ \Omega$
3. Set arrow to X_c (4000 Ω)
4. Above the shunt conductance value of 1.25 μmhos, read: D = 0.005

Q and D are reciprocal functions. The Q, therefore, can be found directly opposite D. Q = 200

Note: To facilitate conversion of D to Q, or vice versa, we recommend using one of the primary index lines (at 10 K μmhos/10 K ohms, for example) as a cursor

EXAMPLE 2

Problem: To determine the Q of an inductor at 20 Mc which measures,
L = 4 μh
$R_s = 20\ \Omega$

Solution:
1. Set frequency to 20 Mc
2. Under 4 μh read $X_L = 500\ \Omega$
3. Set arrow to X_L (500 Ω)
4. Under the series resistance value of 20 Ω, read Q = 25

The dissipation factor can be found directly above G. D = 0.04

EXAMPLE 3

Problem: The parameters of an inductor measured at 50 Mc on an admittance bridge are as follows:
C = – 20 pf
G = 250 μmhos
Find the reactance and Q

Solution: Because the loss of the coil is expressed in conductance, the reactance should be treated as that of a negative capacitance
1. Set the frequency to 50 Mc
2. Over 20 pf read $X_c = 160\ \Omega$ (this is numerically equal to the reactance of the coil)
3. Set the arrow to X_c (160 Ω)
4. Adjacent to the conductance value of 250 μmhos, read D = 0.04 and Q = 25

EXAMPLE 4

Problem: To determine the capacitance required to tune an inductor of 0.8 μh at 40 Mc

Solution:
1. Set frequency to 40 Mc
2. Note the reactance of a coil having 0.8 μh is 200 Ω
3. On the capacitance scale it can be seen that 200 Ω of capacitive reactance (X_c) corresponds to 20 pf at this frequency. Thus, 0.8 μh resonates with 20 pf at 40 Mc

CONSTANT K FILTERS

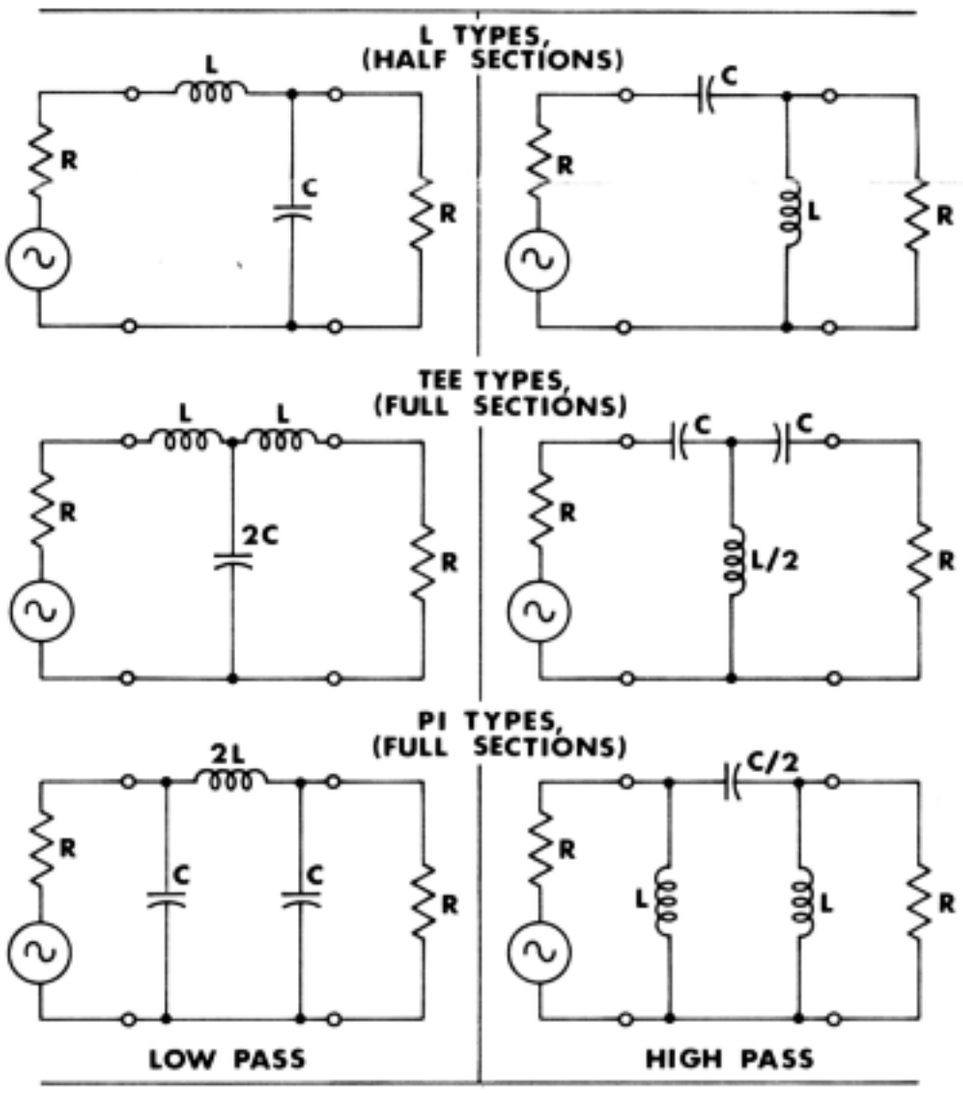
The calculation of Zobel filter parameters may also be made with the Boonton Electronics Slide Rule. The equations are simplified if the L type half section is considered as the basic symbolic configuration. Then, for either low pass or high pass filters,

$$L = \frac{R}{\omega_c}$$

$$C = \frac{1}{\omega_c R}$$

$$R = \sqrt{\frac{L}{C}}$$

where f_c = cut-off frequency
and $\omega_c = 2\pi f_c$



BOONTON ELECTRONICS CORPORATION
RF VOLTMETERS · CAPACITANCE BRIDGES · INDUCTANCE BRIDGES
RF ADMITTANCE BRIDGES · DC METERS · RF DISTORTION METERS
PARSIPPANY, N. J.

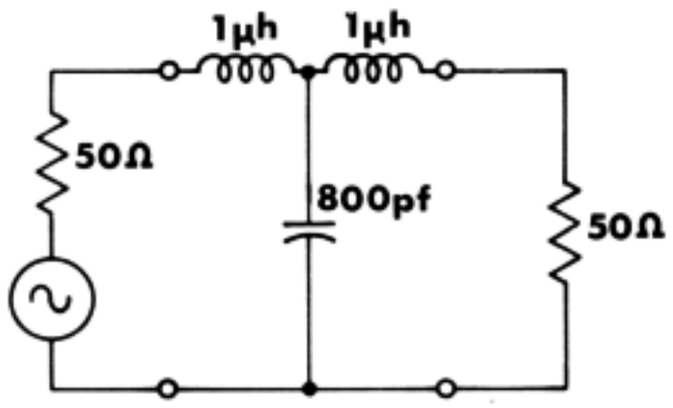
Digital File Copyright © 2025 StevenJohnson.com
Free download at StevenJohnson.com
May not be resold in any form.

EXAMPLE 5

Problem: To determine the values of L and C for a 50 Ω low pass Tee section with a cut-off frequency of 8 Mc.

Solution:

1. Set frequency to 8 Mc
2. Use the X_c and X_L scales for R
3. Find C = 400 pf opposite 50Ω (X_c)
4. Find L = 1 μh opposite 50Ω (X_L)



The impedance and cut-off frequency for a filter of known circuit parameters may be readily calculated. Using values for L and C for the half section, the capacitance is aligned opposite 1 Ω (X_c).

The square root of the value of X_L appearing opposite the inductance is the proper terminating and source resistance for the filter. The cut-off frequency may be found by placing either L or C opposite the value of the terminating resistance on the appropriate reactance scale.

EXAMPLE 6

Problem: To determine the impedance and cut-off frequency for a full section, Pi type, high pass filter with inductors of 0.8 μh and a capacitor of 40 pf. This value of C is half that of the basic half section. Therefore,

L = 0.8 μh
C = 80 pf

Solution:

1. Set 80 pf under 1 Ω on the X_c scale
2. Under 0.8 μh read $R^2 = 10$ KΩ on the X_L scale
3. $R = \sqrt{10{,}000} = 100\ \Omega$
4. Align 0.8 μh and 100 Ω on the X_L scale. (80 pf will be opposite 100 Ω on the X_c scale.)
5. Read the cut-off frequency. f_c = 20 Mc

With practice it will be evident that with knowledge of any two of the parameters (L, C, R, and f_c) the other two quantities may be found with the aid of the slide rule.

BOONTON ELECTRONICS CORPORATION

REPRESENTATIVES

NEW ENGLAND

George Gregory Associates
7 Erie Drive, Natick, Mass., 01762
Phone: 617-655-1330

9 S. Main Street, Cheshire, Conn., 06410
Phone: 203-272-5040

NEW YORK STATE

SBM Associates
177 Winton Rd. N., Rochester, N. Y., 14610
Phone: 716-654-8440; TWX: 716-235-6898

139 E. Main St., Elmsford, N. Y., 10523
Phone: 914-592-8850; Twx: 914-592-8672

138 Pickard Bldg., 5858 E. Molloy Rd.
Syracuse, N. Y. 13211
Phone: 315-454-9377

N. J.; MET. N. Y.; WESTCHESTER CO.; L. I.

NLR Associates
643 Eagle Rock Ave., West Orange, N. J., 07052
Phone: 201-731-0774

EASTERN PENNSYLVANIA

529 Shoemaker Rd., Philadelphia, Pa., 19117
Phone: 215-224-1663

DEL.; MD.; WASH. D. C.; N. VIRGINIA

Paddock-Joslow Co.
721 Ellsworth Dr.
Silver Spring, Md., 20910
Phone: 301-589-6554 & 301-588-7866

SOUTHEAST

James L. Highsmith & Co.
3733 Monroe Rd., P.O. Box 9367
Charlotte, N. C., 28205
Phone: 704-333-7743; Twx: 704-525-2622

Suite 101, Holiday Office Center
3332 S. Memorial Pky., P.O. Box 1525
Huntsville, Alabama, 35805
Phone: 205-881-3294

5003 Brook Rd., P.O. Box 9225
Richmond, Va., 23204
Phone: 703-266-2060

James L. Highsmith & Co. (Cont.)

4437 Edgewater Dr., P.O. Box 7835
Orlando, Florida, 32804
Phone: 305-293-5202; Twx: 305-275-0501

OHIO; WESTERN PA.; W. VA.; KY.

Dayton Associates, Inc.
1731 Philadelphia Drive, Dayton, Ohio, 45406
Phone: 513-223-9621

P.O. Box 7317, Cleveland, Ohio, 44129
Phone: 216-842-0460

MICHIGAN

19341 Trinity, Detroit, Michigan, 48200
Phone: 313-537-6460

MISSOURI; KANSAS; NEBRASKA

Engineering Services Co.
6717 Vernon Ave., St. Louis, Missouri 63130
Phone: 314-726-2233; Twx: 314-556-0173

7546 Troost, Kansas City, Missouri, 64131
Phone: 816-363-6000; Twx: 816-556-2347

ILLINOIS; INDIANA

Kenneth W. Meyers Co.
7256 W. Touhy Ave., Chicago, Ill., 60648
Phone: 312-774-6440; Twx: 312-265-1119

IOWA; WISC.; MINN.

Arthur Engineering Sales Co.
P.O. Box 2702, Milwaukee, Wisc., 53219
Phone: 414-425-5919; Twx: 414-721-5802

3264 N. Victoria Ave., St. Paul, Minn., 55112
Phone: 612-484-3277; Twx: 612-361-7901

Cedar Rapids, Iowa, 52400
Phone: Zenith 5919

TEX.; OKLA.; ARK.; LA.

Airep Engineering Company
P.O. Box 9555, Dallas, Texas, 75214
Phone: 214-824-3800

P.O. Box 36211, Houston, Texas, 77036
Phone: 713-494-2260

COLO.; UTAH; N. MEX.; S. E. IDAHO

Parrish Electronics, Inc.
2130 S. Albion, Denver, Colo., 80222
Phone: 303-756-9455; Twx: 303-292-3273

16 E. Stratford Ave.,
Salt Lake City, Utah, 84115
Phone: 801-487-7847; Twx: 801-521-2402

507 Wyoming Blvd., N.E.
Albuquerque, New Mexico, 87112
Phone: 505-268-6791; Twx: 505-243-8353

WASH.; OREGON

Harry Levinson Company
1211 E. Denny Way
Seattle, Wash., 98122
Phone: 206-323-5100; Twx: 206-998-1047

CALIFORNIA; ARIZONA; NEVADA

O'Halloran Associates
2546 W. Lincoln Ave., Anaheim, Calif., 92801
Phone: 714-534-5818

11636 Ventura Blvd., N. Hollywood, Calif., 91604
Phone: 213-877-0173; Twx: 910-499-2190

3921 E. Bayshore, Palo Alto, Calif., 94303
Phone: 415-326-1493; Twx: 415-969-9144

1251 Rosecrans St., San Diego , Calif., 92106
Phone: 714-224-2824; Twx: 714-276-3911

Tucson & Phoenix, Arizona
Phone: ENterprise 1200

CANADA

Mel Sales Ltd.
71 Crockford Blvd., Scarborough, Ont.
Phone: 416-755-9235; Twx: 610-492-1372

P.O. Box 1352, Station "O"
Montreal, Quebec
Phone: 514-627-4313; Twx: 610-422-3970

EXPORT

A. V. Marano & Co., Inc
276 Fifth Ave., New York 1, N. Y.
Phone: 212-686-5577