Analog Filters Using MATLAB — Corrections, version 2016-04-25

Replace in all MATLAB programs ( )with («) and (—) with (-)

Page 33,
Equation (2.18) ..cos(„(N+2k-1)/2N)
Note that $\sigma_p < 0$ for all poles and all of the coefficients in the denominator **have the same sign** in a stable analog filter.

Page 34 and 35
[GLP, ZLP, PLP] =

Page 42
Parameters have been changed to
[G, Z, R_ZEROS, P] = CH_II_POLES(Wc, Ws, Amax, Amin, N)

Page 44
left column: (2.21) be replaced with (2.27)

Page 45
Equation (2.44): the denominator for r_{pk} should read ...[(1/N)asinh(K)]

Page 47
Parameters have been changed to
[G, Z, R_ZEROS, P, Wsnew] = CA_POLES(Wc, Ws, Amax, Amin, N)

Page 56
line 11-13 in the MATLAB program should be

```
Att = MAG_2_ATT(H);
axis([0 8 0 100]), subplot('position', [0.1 0.4 0.88 0.5]);
PLOT_ATTENUATION_S(W, Att)
hold on
color = [0.7 0.7 0.7]; % Gray
V = axis;
patch([V(1) Wc Wc V(1)], [Amax Amax V(4) V(4)], color);
patch([wstep(1) wstep(1) wstep(2) wstep(2) V(2) V(2)], [0 Amin(1) Amin(1) Amin(2) Amin(2) 0], color);
```

Page 59
Eq(2.58) is only valid for allpole filters

Page 61
[GLP, ZLP, PLP] = BW_POLES(Omegac, Omegas, Amax, Amin, NLP)

Page 62
GLP = 1.592185381683073e+23

Page 67
line 7 should read LP-BS transformation

Page 69
and lowpass filters using the LP-BS transformation is

Page 69
[GLP, ZLP, R_ZEROSLP, PLP, Wsnew] = CA_POLES(Omegac, Omegas, Amax, Amin, NLP);

Page 72
add at the end of the program for Example 2.10
patch([Wc1 Wc2 Wc2 Wc1], [Amax Amax 100 100], color);

Page 75
Problem 2.24 $\omega = 2$ Mrad/s and $r_p = 10$ Mrad/s.
Problem 2.36 $\omega_{c2} = 15$ krad/s
Page 76
Problem 2.39
$\omega_{c1} = 2\pi\ 48.5$ rad/s $\omega_{c2} = 2\pi\ 51.5$ rad/s
$\omega_{s1} = 2\pi\ 49.5$ rad/s $\omega_{s2} = 2\pi\ 50.5$ rad/s

Page 81
$|C(s)|^2$ is proportional to the ratio

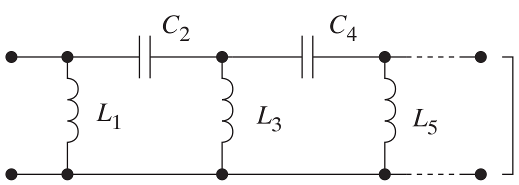
Page 95
line 14 replace Att with Anorm

Page 96
line 18 replace Att with Anorm
«
Page 97
line 4 change [....] to (....) and change N to Norder
move line 6 to after line 3
line 8 replace KI with K
line 12 replace Att with Anorm
Example 3.7 $A_{min} = 40$ dB

Page 98 should read
new line 9 Norder = 5; % We select a 5th-order filter
line 10 [G, Z, R_ZEROS, P, Wsnew] = CA_POLES(Wc, Ws, Amax, Amin, Norder);
line 12 [L, C, Rs, RL, Wo, K] = CA_LADDER(G, Z, R_ZEROS, P, Wc, Ws, Rs, RL, Ladder);
line 16 Anorm = MAG_2_ATT(2*H); % Normalize attenuation to 0 dB

Page 117
A useful program for this step is HURWITZ.

Page 152
Eq(3.63) replace all L□s with C□s and vise versa
Cauer II structure should be



Page 123
Example 3.20

Determine the element values in a sixth-order allpass filter built of cascaded bridged-T networks which equalizes the group delay of the ladder network in Example 2.4 when $R_s = R_L = 1000\ \Omega$.

The poles of the allpass filter were determined by the program in Example 2.11 ~~determined to~~

$s_{p1,2} = -7.576348 \pm j\,6.5452758$ krad/s
$s_{p3,4} = -7.350304 \pm j19.284823$ krad/s
$s_{p5,6} = -6.903609 \pm j32.393479$ krad/s

From Equation (3.67) we obtain the element values in the lattice structures. We get using: $1/RC_2 = -2\,Re\{s_p\}$ and $1/L_2C_2 = r_p^2$ and $R = 1$ kΩ. The Table have new values!

Bridged-T	L_1[mH]	L_2[mH]	C_1[nF]	C_2[nF]
1	65.99485	151.1616	151.1616	65.99485
2	68.0244	34.51403	34.51403	68.0244
3	72.42589	12.58637	12.58637	72.42589

Page 130
Problem 3.16 should read: Realize an LC ladder that meets the same specification as in Problem 3.15, but of Chebyshev I type.
Problem 3.20 should read
..... $\omega_{s1} = 11.6$ Mrad/s, and $\omega_{c2} = 311.6$ Mrad/s.

Page 131
3.26 .....terminated π ladder network with
Page 137
where the function tan($\omega\tau$) is periodic with period „.

Page 141
In Example 4.2. **τ = 0.25 ns**
and $\omega_c T = 2$„ 300 10^6 0.25 10^{-9} = 0.15 „ rad

$$|H(e^{j\omega T})|^2 = \frac{1}{1 + \left(\frac{\sin\left(\frac{\omega T}{2}\right)}{\alpha}\right)^{2N}}$$

where $\alpha = \varepsilon^{-\frac{1}{N}} \sin\left(\frac{\omega_c T}{2}\right)$ .....

with period „. The impedance...

Page 142
In Example 4.3. **τ = 0.25 ns**
and $\omega_c T = 2$„ 300 10^6 0.25 10^{-9} = 0.15 „ rad
Figure 4.10 The x-axis should be from 0 to „
The function RICHARDS_EQ has an error do not yiels a correct passband!

Page 143
Figure 4.11 The x-axis should be from 0 to „

Page 144

$$Z_1 = \frac{L_1 R_0}{\Omega_c} = 3.1147435\ \Omega$$

$$Z_2 = \frac{\Omega_c R_0}{C_2} = 0.160527\ \Omega \qquad Z_3 = \frac{L_3 R_0}{\Omega_c} = 3.1147435\ \Omega$$

Page 146
Example 4.5 change to a Chebyshev I filter

Page 146

line –7: $X = \dfrac{K}{1 - \left(\dfrac{K}{Y_0}\right)^2}$

Page 152
Problem 4.8
the relative 3-dB bandwidth

Page 152

Equation(5.74) simplifies for ideal amplifiers to $Z_{in} = Z_1 Z_3 Z_5/Z_2 Z_4$

Page 200

$$Q_{nominal} = \frac{-r_p}{2\sigma_p} = \frac{-\sqrt{(5\pi)^2 + (50\pi)^2}}{2 \cdot (-5\pi)} = 5.0249378$$

Page 201

$D(s) + \dfrac{E(s)}{A} =$

Page 201
Fig. 7.10 Tow-Thomas

Page 201
6.5.3.7 NF2 Sections

Page 205
where the amplifier has a positive gain of $K = (1 + R_8/R_7) > 1$. We shall later discu

Page 206
delete the line
a positive gain of $K = (1 + R_8/R_7) > 1$. We shall

Page 213
Spreads in passive elements are $\propto Q^2$.

Page 224
Table, second line

HP	0	V_{in}	V_{in}	$R_2 = R_1$

Page 237
7.3.2 Flicker Noise

Page 245
Fig. 7.14 Coupled form of type FLF

Page 260
Line 3, second column: example $k = 10^5$ [1/s].

Page 273
output wave is B_2, which corresponds to the output voltage V_{B2}.
Page 279
the marked minus signs across the nodes..

Page 279
Hence, the sign of V_7 is changed

Page 280
Figure 10.9 Interchange the inputs to the rightmost amplifier

Page 281
determined by comparing the circuits

Page 282
from the node that is

Page 289
10.1 .. leapfrog filter

Pages 309 and 310