

Appendix F

MATLAB programs

This Appendix contains additional MATLAB computer programs that were used in this text.

1) The MATLAB program to generate the matrix for the method of moments (3.67).

```
clear
m=input('What is the size of the matrix?...')
for i=1:m
    for j=1:m
        a(i,j)=NaN;
    end
end
for i=1:m
    for j=i:m
        if i==j
            a(i,j)=0;
            b(i)=i;
        elseif i<j & j<m
            a(i,j)=(j-b(i));
        elseif i<j & j==m
            a(i,j)=(j-b(i))/2;
        end
    end
end
for i=2:m
    for j=1:b(i)-1
        if j==1
            a(i,j)=(b(i)-j)/2;
        else
            a(i,j)=b(i)-j;
        end
    end
end
end
```

2) Program to construct a small Smith chart.

```

clear
function smith
%   You can customize the function by specifying the r=const and x=const
%   lines you want to draw at the beginning of the corresponding loops.
plot([-1 1],[0 0],'w')
axis equal
axis off
hold on

tr = 2*pi*(0:.01:1);
for r = [0 .2 .5 1 2 5] % specify the r=const lines you want to draw
    rr = 1/(r+1);
    cr = 1-rr;
    plot(cr+rr*cos(tr), rr*sin(tr),'w')
end
for x = [.2 .5 1 2 5] % specify the x=const lines you want to draw
    rx = 1/x;
    cx = rx
    tx = 2*atan(x)*(0:.01:1);
    plot(1-rx*sin(tx), cx~rx*cos(tx),'w')
    plot(1-rx*sin(tx),-cx+rx*cos(tx),'w')
end

%   Numerical values and comments can be added to the Smith chart
%   with the command GTEXT('string').

```