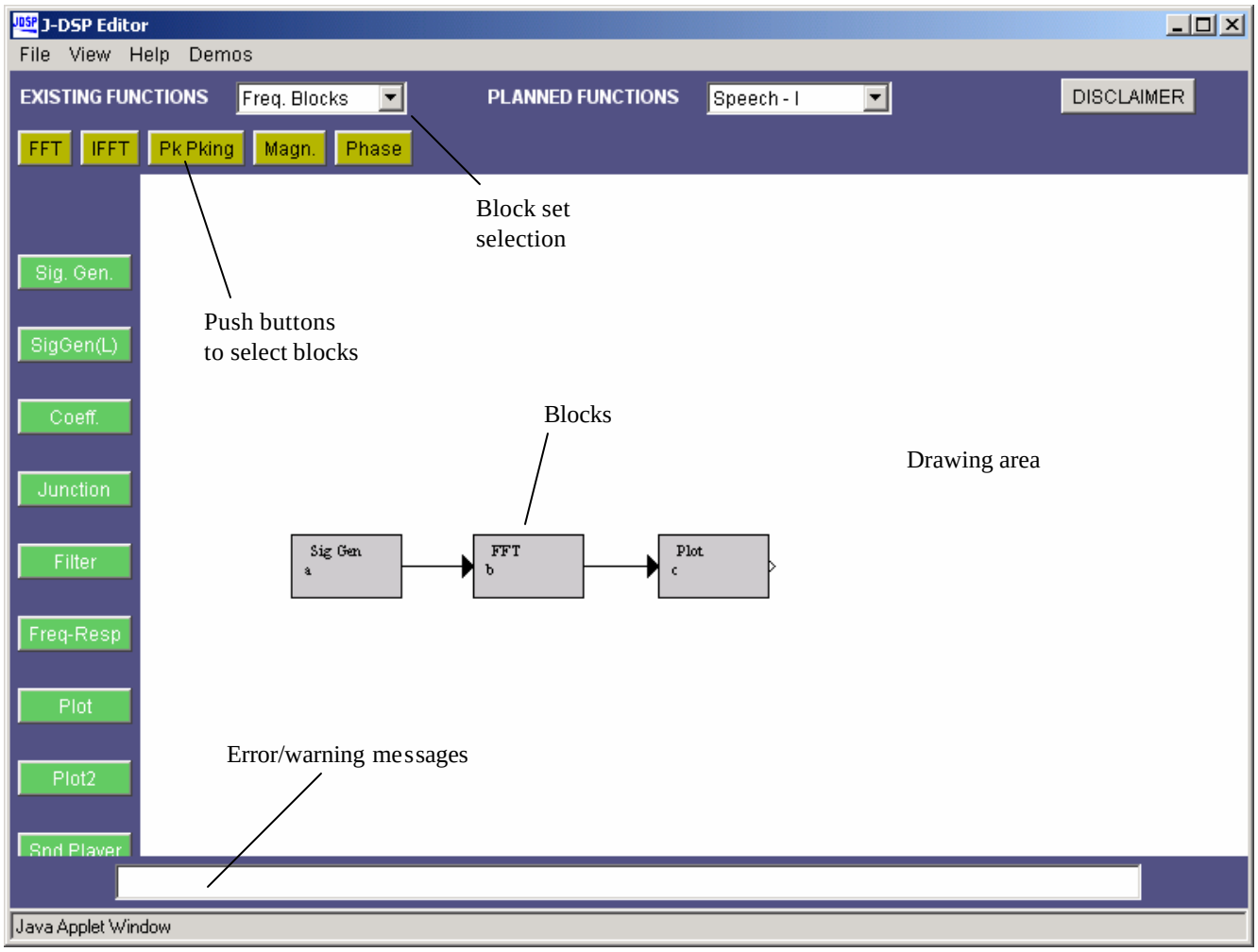
General Information on J-DSP

Please INSTALL the latest version of java from sun at http://java.sun.com

This section is similar to the one on page L1-1, but repeated here for convenience. J-DSP is an object-oriented Java™ tool, where J-DSP stands for Java Digital Signal Processing. J-DSP has been developed at Arizona State University (ASU) and is written as a platform-independent Java applet that resides either on a server or on a local hard-drive. It is accessible through the use of a web browser. J-DSP has a rich suite of signal processing functions that facilitate interactive on-line simulations of modern statistical signal and spectral analysis algorithms filter design tools, QMF banks, and state-of-the-art vocoders.

J-DSP provides a user-friendly environment through Java's graphical capabilities. Its highly intuitive graphical user interface (GUI) is easy to understand and use. All functions in J-DSP appear as graphical blocks that are divided into groups according to their functionality. Selecting and establishing individual blocks can be done by a drag-and-drop-process. Each block is linked to a signal processing function. The figure below shows the J-DSP editor environment. By connecting blocks together, a variety of DSP systems can be simulated. Signals at any point of a simulation can be examined through the appropriate blocks. Blocks can be edited through dialog windows, allowing the user to change the corresponding function's parameters to desired values and/or to view results. Blocks can easily be manipulated (i.e. edit, move, delete and connect) within the specified drawing area, using the mouse. System execution is dynamic, which means that any change at any point of a system will automatically take effect in all related blocks. Any number of block windows can be left open to enable viewing results at more than one point in the system.



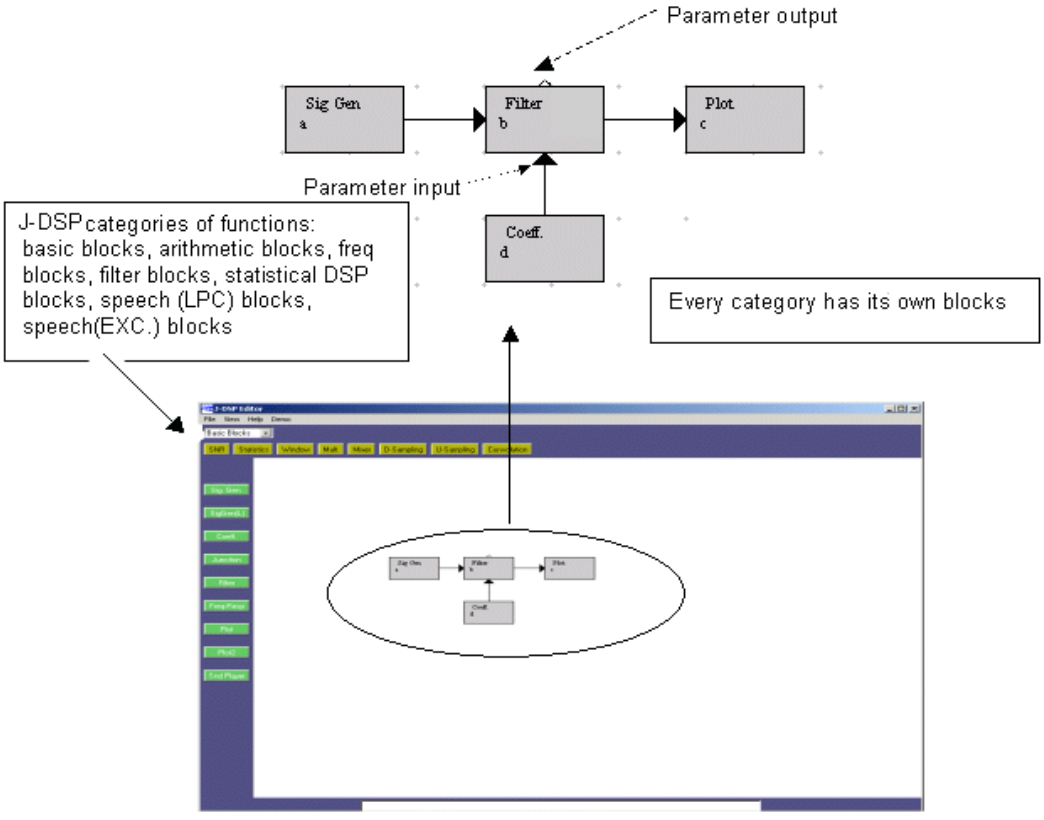
J-DSP Environment

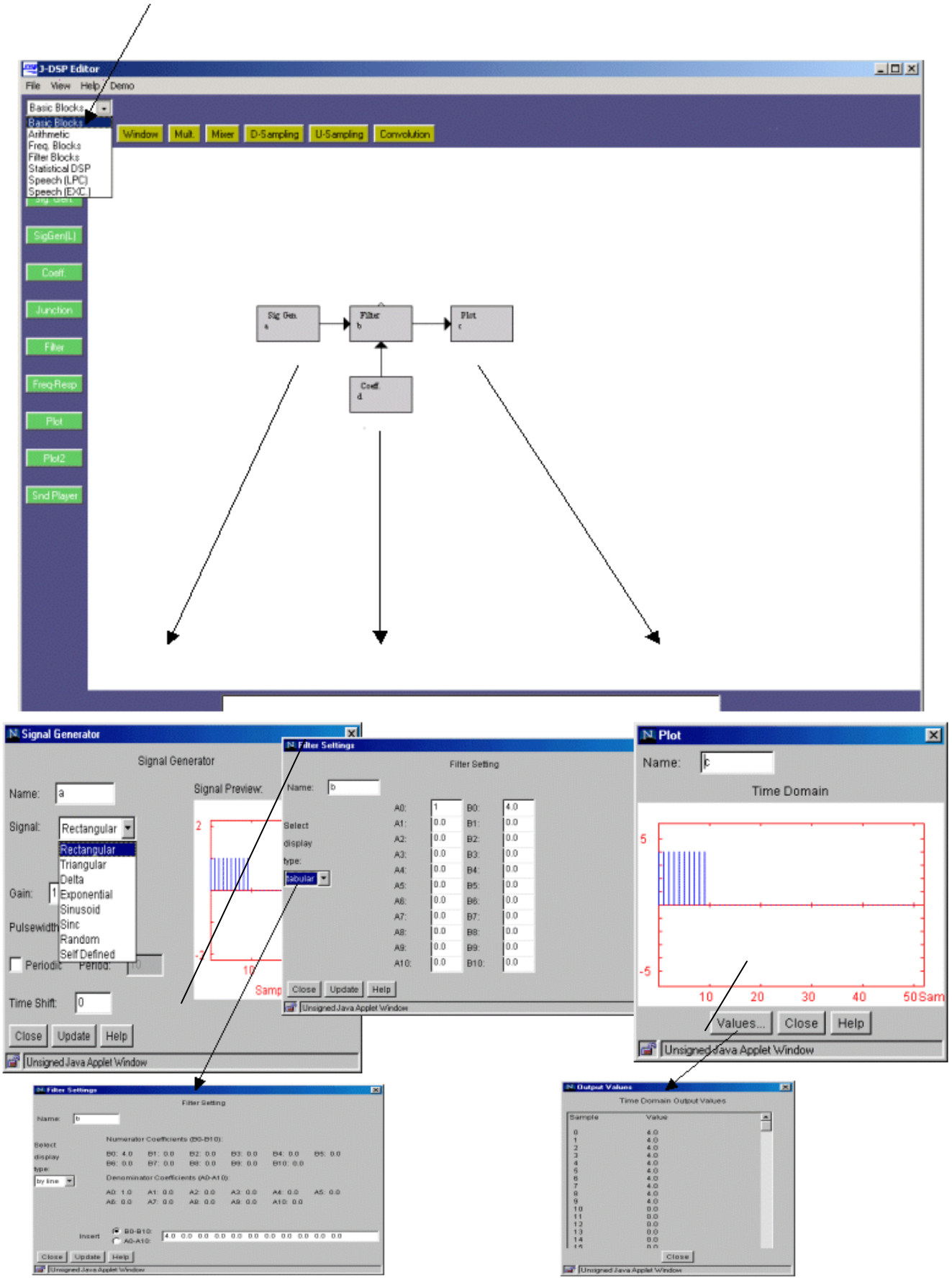
Working with J-DSP

The easiest way to explain some of the functions of J-DSP is to work through a simple example. Start J-DSP by accessing the link, http://jdsp.asu.edu/ and click on the "Start J-DSP" link, and press "start" in the subsequent page. It may take 30 seconds to download the program and a few more seconds to establish the first block but once the first block is established, the program should run quickly. There are two signal generators, ***Sig Gen*** for processing a single frame of the signal and ***Sig Gen (L)*** for frame-by-frame processing which is typically used in speech applications. Press the ***Sig Gen*** button on the left part of the window. Move the mouse to the center of the window and press the left mouse button. You have now created a signal generator box. Similarly, create a ***Filter*** and ***Plot*** blocks and note that blocks cannot be placed on top of one another. There are two plot blocks, i.e., ***Plot*** (single plot) and ***Plot2*** (two plots). For now, use ***Plot***.

Note that each block has signal input(s) designated by the little triangle(s) on the left and signal output(s) to the right. Some blocks carry parameter inputs and outputs at the bottom and top of the block respectively. For example, the ***Filter*** block has a coefficient input on the bottom and a coefficient output on the top. Parameter inputs facilitate functions like filter design, frequency response, LPC etc.

To select a block click one time to highlight. You can then move it by placing the mouse arrow over it, holding down the left mouse button and dragging the box to a new location. To delete a block, simply select it and press the "del" key on your keyboard. To link blocks, click once inside the small triangle on the right side of the signal generator box and while holding the mouse button down, drag the mouse arrow to the triangle on the left side of the filter box. Release the mouse button to create a connection between the two boxes. Always make the connections in the direction of the signal flow. The ***Coeff.*** block specifies the filter coefficients and it is connected to the filter's lower parameter input triangle. Now, connect the ***Filter*** block to the ***Plot*** block so that your editor window looks like the following:




J-DSP Editor
File View Help Demo
Basic Blocks
Arithmetic
Freq. Blocks
Filter Blocks
Statistical DSP
Speech (LPC)
Speech (EXC.)
Window
Mult.
Mixer
D-Sampling
U-Sampling
Convolution
SigGen(L)
Coeff.
Junction
Filter
Freq-Resp
Plot
Plot2
Snd Player
Sig. Gen.
a
Filter
b
Plot
c
Coeff.
d
Signal Generator
Signal Generator
Name:
a
Signal:
Rectangular
Triangular
Delta
Exponential
Sinusoid
Sinc
Random
Self Defined
Gain:
Pulsewidth:
Periodic
Period:
Time Shift:
0
Signal Preview:
Close
Update
Help
Unsigned Java Applet Window
Filter Settings
Filter Setting
Name:
b
Select display type:
Tabular
A0: 1
B0: 4.0
Close
Update
Help
Unsigned Java Applet Window
Plot
Name:
c
Time Domain
5
-5
10
20
30
40
50 Sam
Values...
Close
Help
Unsigned Java Applet Window
Filter Settings
Filter Setting
Name:
b
Numerator Coefficients (B0-B10):
Denominator Coefficients (A0-A10):
Insert
Close
Update
Help
Output Values
Time Domain Output Values
Sample
Value
Close
Unsigned Java Applet Window