COP-WIN/HRV/BP Version 6.02 Update

Overview

COP-WIN Version 6.02 adds software digital input filters to the COP-WIN data acquisition mode. This feature should be especially useful for users who are still using the Minnesota 304b impedance cardiograph or one of the early HIC-2000 models that did not have the digital filter board hardware option installed. This version update will also permit using a "USB to RS232" converter to interface the Tango BP monitor to computers (such as a laptop) that do not have a standard RS232 communications port.

Digital Input Filters

COP-WIN/HRV/BP offers the user the option to use input digital filter processing that has been implemented in software and is now an integral part of the program. These filter options allow users who are acquiring impedance data in electrically noisy environments to produce much "cleaner" waveforms. Four digital input filter options are available to the user and may be selected while using the real-time Scope Display mode. This permits easy viewing of the filters effects on the impedance signals and therefore optimal selection.

The filter options are:

No Filter: This setting eliminates all software filter processing of the input signals.

60 Hz Notch: this filter provides a five pole notch type signal stop band process with the maximum frequency rejection point set a 60Hz. This will benefit users in the USA and any other locations that have a 60Hz power line frequency.

50 Hz Notch: this filter provides a five pole notch type signal stop band process with the maximum frequency rejection point set a 50Hz. This will benefit users in the Europe and any other locations that have a 50Hz power line frequency.

40 Hz Low Pass: this five pole Butterworth filter provides a 0 to 40Hz band pass process that preserves the normal frequency band of interest for impedance cardiography. This filter should be used when interfering electrical noise is above 40Hz but is not being produced by the normal power line electrical fields.

25 Hz Low Pass: this five pole Butterworth filter provides a 0 to 25Hz band pass process that preserves most but not all of the normal frequency band of interest for impedance cardiography. Since the normal band of interest is from .1Hz to about 40Hz, a filter cutoff below 40Hz can cause some rounding of the R wave and smoothing of inflection point on DZ/DT wave. The 25Hz LP setting is also not recommended for users acquiring heart sounds. Therefore, this filter selection should only be used under the most severe noise conditions.

The selection of the input filter may be made at either of two points in the COP-WIN program. The recommended location is the Scope Signals display as the effects of the filter process can be seen on the impedance signals. The majority of users using HIC-2000/3000 models will not need additional filtering beyond that provided by the impedance cardiograph and BIT does not recommend adding additional filtering unless it is can be seen to be beneficial as in the case when the 60Hz or 50Hz Notch filter is needed to remove power line artifact.
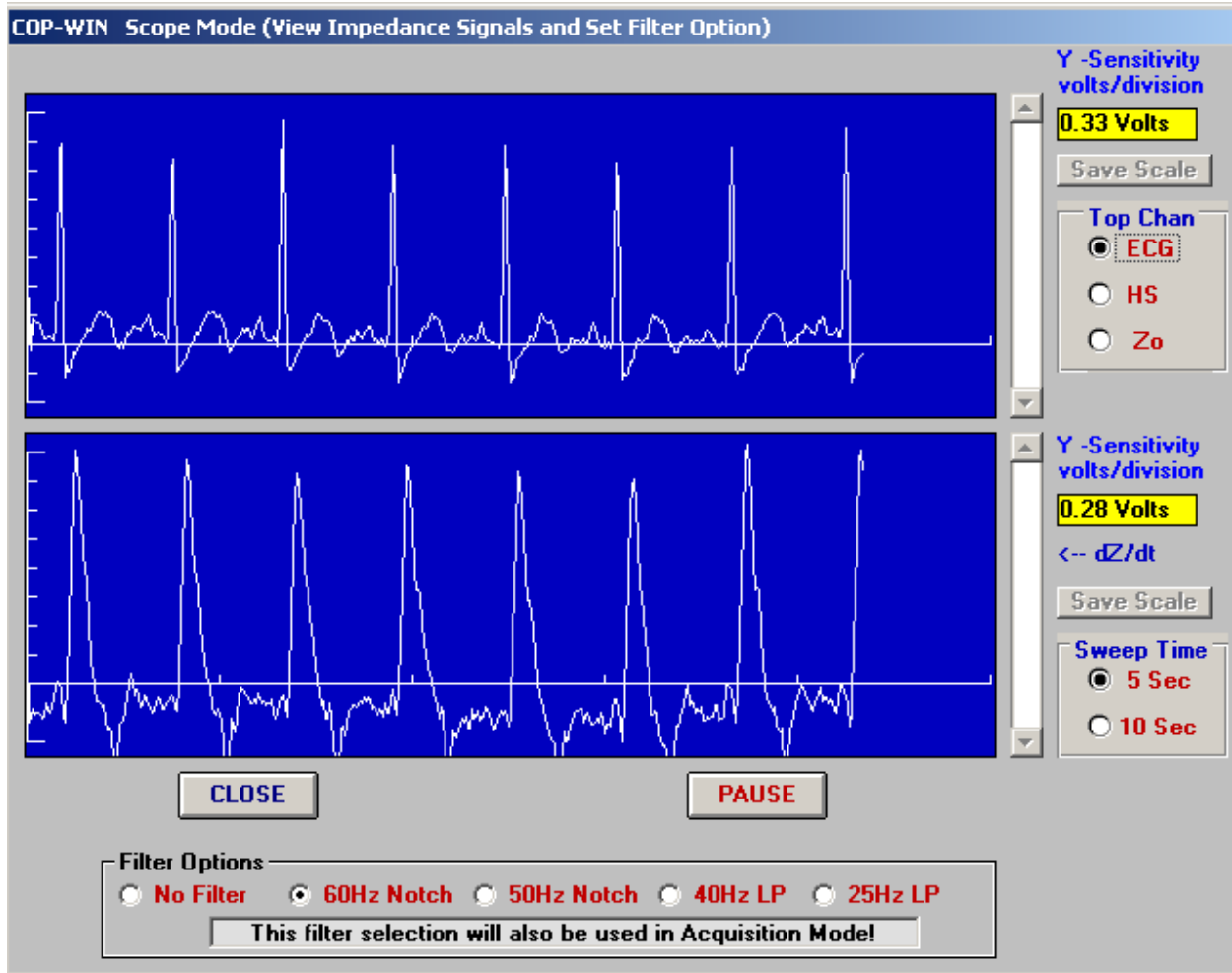

Any filter selection made in the Scope Signals display window will be automatically transferred to the Acquisition Setup display window. When the "EA and RRI Data Acquisition Setup" window is displayed the "Input-Digital-Filter-Setting" selection box appears just under the OK button. The selection shown in this box will always be the last filter setting selected as it is automatically retained by the program. If the user so chooses, the filter selection can also be changed using this selection box.
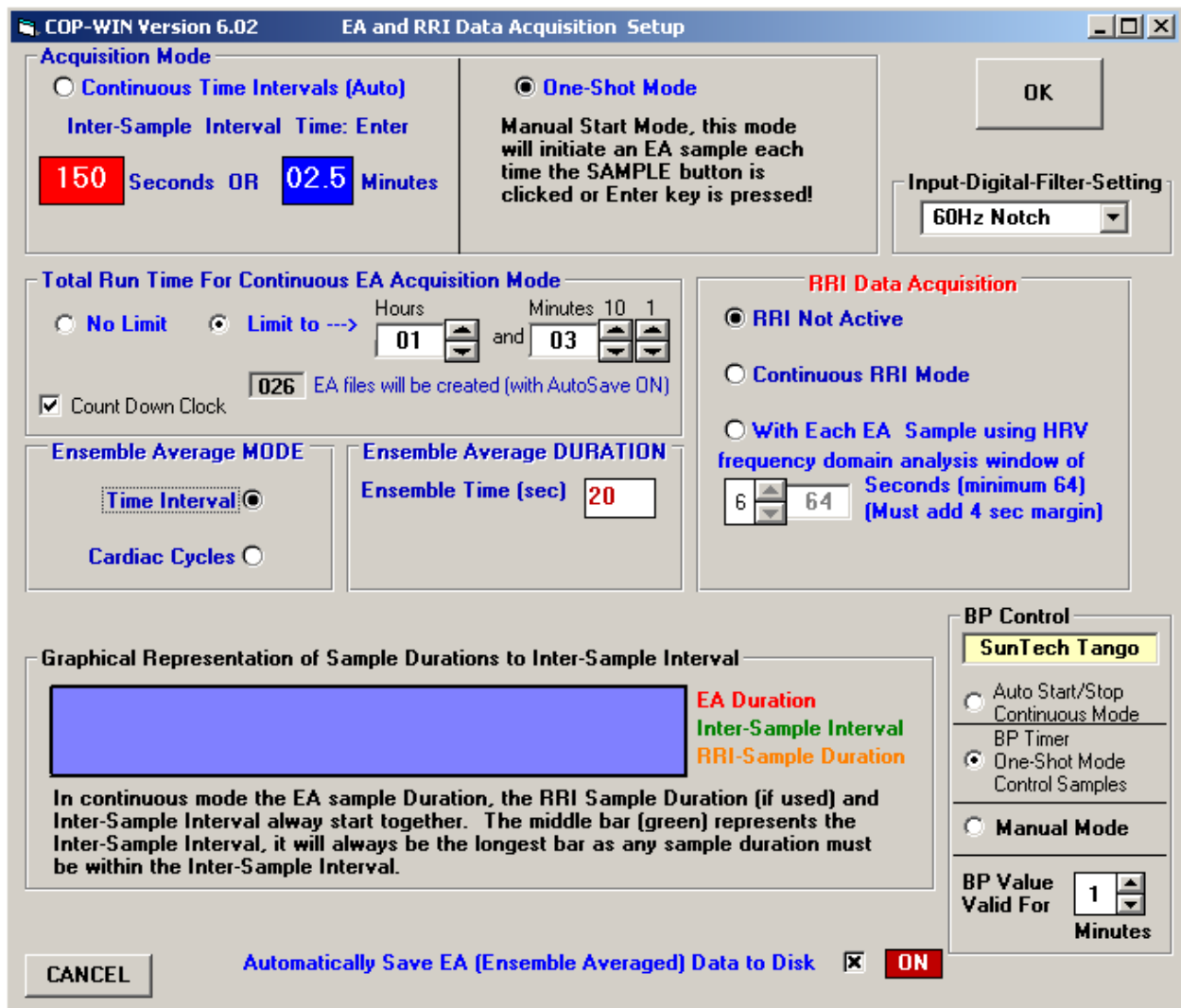
Note: Users of earlier versions of COP-WIN will note that the CANCEL button has been moved to the lower left corner of the Setup window.

While the filter setting cannot be directly changed while in the acquisition mode, the current
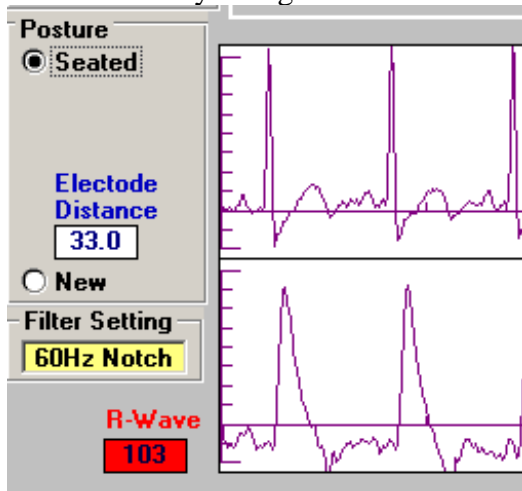
filter setting is displayed just above the instantaneous R-Wave & Heart Rate display.

The filter setting used during acquisition is also displayed in the EDIT mode. The display for this is in the upper right corner next to the Delete command button:
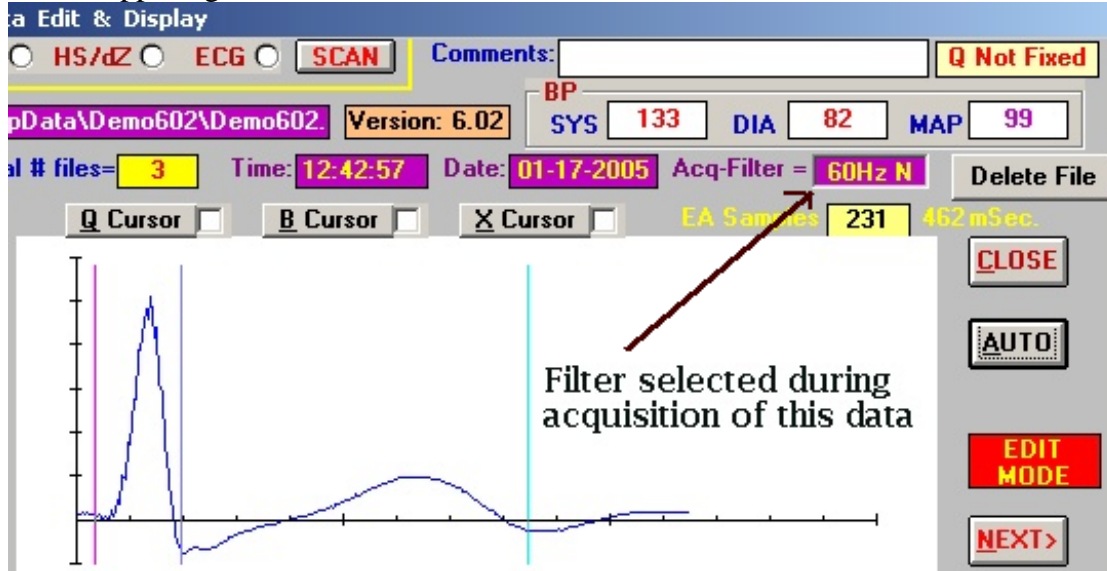
Post acquisition filtering will be available in the next COP-WIN update.

User Requested Modification

Version 6.02 has been modified slightly with respect to the availability of the "COP Edit" button during data acquisition. Previously, if the any RRI (HRV)data acquisition mode was selected in the Acquisition Setup window then the "COP Edit" button would not be visible at any time. At user request, we have modified the availability restriction to be only when RRI data is actually be acquired. As previously, the "COP Edit" button only appears after an EA average is acquired and the EA acquisition mode must be "One-Shot".

USB to RS232 Converter

Version 6.02 has been updated to permit the use of an USB to RS232 Converter for interfacing to the Tango BP monitor. These converters are normally required for notebook computers as most laptop type computers do not have standard RS232 ports. The USB to RS232 Converter usually installs as Com port #4 and COP-WIN/HRV has been modified to include BP data communication on both Com3 and Com4. More detailed information on using this option is included in the installation section for Version 6.02. (Installation section is not yet available, call BIT if you have questions!)