

**6500****VS****7000****Comparison for Clinicians**

The 7000 Hearing Aid Test System has greatly improved upon the user interface, testing capability, and computer interface of the 6500-CX. Here is a summary of those improvements:

|                            | <b>6500-CX</b>   | <b>7000</b>  |
|----------------------------|--|--|
| <b>User Interface</b>      | The 6500-CX used a fixed-key user interface. This created a limitation on the ability to add new commands and features to the analyzer, and created a certain amount of awkwardness to key presses.  | The 7000 has a soft function key approach, making the interface much more flexible and able to adapt to new testing requirements. The user interface is also very consistent from screen to screen, making the analyzer have a much better learning curve than the 6500-CX. You can also customize several of the navigation screens from the Opening screen, allowing the user to jump directly into a particular test screen. For instance, you can configure F4 to enter ANSI 96 and F5 to enter ANSI 03. |
| <b>Video Resolution</b>    | The 6500-CX has a non-standard low video resolution. As a result, part of the 6500-CX display is cut off when it is attached to a modern LCD monitor. The low screen resolution also limited the amount of data that could be presented on the screen.   | The 7000 has a much higher resolution display that easily connects to an LCD monitor. More data can be presented on the display at one time, and the screen display is much more readable and nicer to look at.  |
| <b>Menu Settings</b>       | The 6500-CX has a lot of different parameters available, but they are scattered through many different menus and require some awkward navigation to get at them. It is possible to change the default settings of many of these settings, but there is no indication of which settings are configurable and which ones aren't.   | The 7000 has a very clean interface for settings. Each test screen has a local menu that affects the current screen. Default settings are configurable in a separate Default Setup Menu in which it is very clear what is being saved when the default settings are changed.   |
| <b>Test Result Storage</b> | On the 6500-CX, ANSI and other automated test sequence results are only stored on the analyzer for as long as the user is in the screen. As soon as the screen is exited, the data is erased. For coupler multicurve (and some real-ear) measurements, the concept is the same. Once the screen is exited, unless the user specifically saved the response curve using the Multicurve feature, the data is lost. | On the 7000, data is stored on the analyzer until it is overwritten, the analyzer is reset, or the analyzer is powered off. Two sets of data is stored: one for the left ear and one for the right ear. This is a huge improvement and goes a long way towards making sure that test data is not lost unexpectedly.  |
| <b>RF Susceptibility</b>   | The 6500-CX does not conform to new strict IEC 60601-1 regulations.  | The newly designed 7000 M1950E coupler microphone and M707 probe microphone set have improved RF susceptibility shielding required by the IEC 60601-1 regulations. This makes testing less susceptible to noise from cell phones and other similar devices.  |

|                                       | <b>6500-CX</b>   | <b>7000</b>   |
|---------------------------------------|--|---|
| <b>Real-ear Measurements</b>          | The 6500-CX real-ear mode was built around the traditional insertion gain method of performing real-ear measurements. The remote keypad contained special keys designed for the unaided and aided response. As hearing aid technology advanced, and real-ear methods changed to meet the needs of the new technology, the 6500-CX user interface had to be adapted. The result was a user interface that was somewhat confusing, especially to the beginning user. | The 7000 real-ear mode is much more user friendly and expandable. The flexible function keys are used to control the operation of the analyzer, and the operation of the keys is very consistent from screen to screen. The real-ear software is also configured in such a way to make it very easy to add new test screens as technology advances.   |
| <b>Probe Microphone</b>               | The 6500-CX uses a probe microphone design with two distinct microphones that attach to a separate ear hook. The reference microphone sits above the ear on a wedge that is part of the ear hook.  | The 7000 has a newer design probe microphone that is lighter, easier to use, and more adjustable than the 6500-CX probe microphone system. The 7000 probe microphone is integrated into the ear hook. The ear hook is adjustable vertically by 1.5 inches and horizontally by $\pm 15$ degrees. The small reference microphone sits on top of a raised wedge above the ear. This wedge allows more room for the hearing aid than the older probe microphone design.   |
| <b>Visible Speech</b>                 | The 6500-CX has the ability to perform real-ear measurements using an external signal, but the measurement results are fairly simplistic. Is it only possible to obtain a real-time measurement of the signal. Both the Real-ear Insertion Gain and Real-ear SPL screens can be used for this purpose, but the analyzer must first be put into Spectrum Analysis mode.   | The 7000 has a special test screen devoted just for tests using live speech or other external signal. It is not necessary to put the analyzer into a special test mode. When in the Visible Speech screen, the setup is automatic. You just have to push the Start key.<br><br>Once the measurement has started, the analyzer displays the real-time response, the average response measured over the time of the test, and the minimum and maximum measurements per frequency. After the test has been completed, the real-time response is replaced with a colored region containing the standard deviation around the average response. In other words, the area containing the majority of the response to the speech signal is displayed. This information is displayed with the patient's HTLs, UCLs, real-ear target(s), and the long term average speech spectrum.<br><br>In software version 1.61, the Speech Intelligibility Index (SII) is calculated for each measurement and target curve. |
| <b>Improved Telecoil Measurements</b> | On the 6500-CX, telecoil measurements at levels other than 10 mA/m or 32 mA/m required an external box and a custom modification to the circuitry of the analyzer in order to use the box.   | On the 7000, Telecoil measurements can be performed at 1, 1.78, 3.16, 5.62, 10.0, 17.8, 31.6, 56.2, and 100 mA/m in the Coupler Multicurve screen, requiring no extra modifications or special accessories.   |

|                                       | <b>6500-CX</b>   | <b>7000</b>   |
|---------------------------------------|--|---|
| <b>Digital Speech</b>                 | On the 6500-CX, Digital Speech was treated as a special signal type that was only available in certain modes on the analyzer. In Coupler mode, there was a separate Digital Speech screen that was necessary to enter if you wanted to perform measurements using the Digital Speech signal. In Real-ear mode, it was necessary to enter the Real-ear SPL screen to perform Digital Speech measurements. It was not possible to perform Insertion Gain measurements using the Digital Speech signal. | On the 7000, Digital Speech is just another signal type such as Composite and Pure-tone. Digital Speech can be used in almost all real-ear and coupler measurements (some measurements call for a particular type of signal such as pure-tone). This makes Digital Speech very easy to use and incorporate into your testing process without the need for special operation of the analyzer. It also makes it easy to compare Digital Speech measurement results with measurements made with other signal types.  |
| <b>Measuring with Multiple Curves</b> | The 6500-CX was primarily designed to perform automated test sequences and single curve measurements made with pure-tone and composite signals. It is possible to compare measurement curves with other measurement curves, but it required the user to go to a special "Multiple Curve" test screen.  | On the 7000, it is assumed that the user will normally want to compare multiple measurements. In the Coupler Multicurve screen, it is possible to measure up to ten curves and display them simultaneously. In the Real-ear measurement screens, it is possible to measure and display up to five different measurements simultaneously. You can also turn on and off the display of each curve independently without deleting any measurements. This makes "multicurve" just a natural part of the user interface, requiring no additional effort on the part of the user. |
| <b>Improved Sound Chamber</b>         | The 6020 chamber used by the 6500-CX has a concave basket that creates some wear and tear on the microphone cords and microphone head.   | The 7020 chamber has a number of improvements. The basket is flat and has a larger working surface, making it easier to position hearing aids, and should also have a better long term affect on the wear and tear microphones. The sound and vibration isolation have also been improved. There is an optional "lifter" for easier opening of the chamber.   |
| <b>Updates Via Email</b>              | To perform a software upgrade on the 6500-CX analyzer, it was necessary to open the main module, extract one of the electronics boards, and replace an EPROM containing the software.  | Updates to the 7000 are much easier. You just need to connect the analyzer to a computer using a serial port, and install the 7000 upgrade program that we provide you via email or CD format. The upgrade program will download the latest software version onto the 7000 analyzer.  |
| <b>Internal Printing</b>              | The 6500-CX printer is 2 1/4 inches (6 cm) in width. To print a test screen, the analyzer divides the screen into top and bottom and prints each separately. The user then has to rearrange the pieces with the first piece above the second piece to reconstruct the screen.  | The 7000 printer is almost twice as wide as the 6500-CX paper at close to 4 1/4 inches (11 cm), allowing the full screen to be printed in one strip. This saves time, paper, money, and hassle.   |

|  | <b>6500-CX</b>   | <b>7000</b>   |
|--|--|---|
| <b>End of Support for the 6500-CX and IEC 2005</b> | The 6500-CX has been a workhorse for twenty years, and we have put a lot of time and effort into its continued development. However, all good things must eventually come to an end, and we are starting to have difficulty finding parts for the 6500-CX. The last analyzer was manufactured in 2004, and the analyzer was discontinued on January 1, 2005. We guarantee service for existing 6500-CX analyzers until January 1, 2010, and we will continue to repair analyzers after that date for as long as parts are available, but we are already starting to have difficulties finding all necessary parts. | <p>The ANSI S3.22-2003 automated test sequence was the final software upgrade for the 6500-CX. Although we had stopped development on the 6500 when this standard was ready for implementation, we added it to support all of our many customers.</p> <p>All future software upgrades will be for the 7000 analyzer and not the 6500-CX. This includes real-ear improvements, coupler multicurve, and automated test sequences such as ANSI, and IEC.</p> |

### **Computer Controls**

It is possible to connect both the 6500-CX and the 7000 to a computer and use FONIX programs such as the FONIX NOAH Module and WinCHAP to perform measurements from the computer and store test results into a database. However, the 7000 has more functionality than the 6500-CX. Here are the most important differences.

|  |  |  |
|--|--|--|
| <b>Real-ear Measurements with Digital Speech</b> | The 6500-CX has limited ability to perform real-ear measurements using the Digital Speech signal. These measurements are only possible in the Real-ear SPL screen. However, there are limited computer controls in this screen. It is possible to transfer real-ear measurements made with the Digital Speech signal on the 6500-CX to the computer, but it requires a work around that consists of several steps. | The 7000 does not have the limitations of the 6500-CX. Digital Speech is just a different source type for the 7000 analyzer, and it can be used with any Real-ear or Coupler Multicurve measurement. No workarounds are needed.  |
| <b>Audiogram Transfer</b>                        | On the 6500-CX, it is not possible to transfer the audiogram from the computer to the analyzer. Therefore, if you prefer to perform measurements from the front panel of your analyzer and only use the computer program to transfer the measurements and store them in a database, it is necessary to manually enter the audiogram into the analyzer.   | On the 7000, you can transfer the audiogram from the computer into the analyzer. If you are using the FONIX NOAH Module, the latest NOAH audiogram will automatically appear in the FONIX NOAH Module. It is possible to transfer this audiometric data for HTL, UCL, and bone for both ears into the analyzer with one click. This saves lots of time manually entering in data that is already stored in NOAH. |



**FRYE ELECTRONICS, INC.**

P.O. Box 23391 • Tigard, OR 97281-3391 • USA

(503) 620-2722 • (800) 547-8209

Fax: (503) 639-0128

www.frye.com • e-mail: sales@frye.com