

Instructions to use the NAL SRTn (BASTE) program

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Install BASTE software

- Download the software from <http://LSD.nal.gov.au> website
- Unzip the downloaded file to your computer's hard drive

Hardware setup

BASTE software requires a pair of headphones plugged into the computer. Preferably, the headphones should have a reasonably flat frequency response (from 20Hz to 10kHz) and good sensitivity (at least 110 dB SPL output level).

The headphones should be configured as the default Windows playback device. If the test sounds do not come out of the headphones, please use the following steps to select the headphones as the output device (assuming Windows 8 is in use):

- Right click on the volume icon (in the notification area) and select "Playback devices"
- Right click on the playback device icon corresponding to headphones and select "Set as Default Device"
- Play a test sound (music, Youtube clip ...) to see if the sound come out of the headphones
- Left click on the volume icon and increase volume to maximum level

The headphones must be worn on the correct ears. The BASTE software can be used to check that they are wired correctly as following:

- Run the program bin\BASTE.exe
- In "Config" tab, click "Start" button
- Click "Check" button to open up the left/right check window
- Click "Left ear" button and verify that a chirping sound is presented to the left ear ONLY
- Click "Right ear" button and verify that the same chirping sound is now presented to the right ear ONLY

If the sounds are reversed in the two ears despite the headphones apparently being placed "correctly" on the head then **always** put these headphones on the client the wrong way around.

Using the software

Start the program

- Ensure that the headphones are plugged in and Windows volume control is maximum
- Run the program bin\BASTE.exe
- In “Config” tab, click “Start” button

Prescribe hearing aid amplification

- Click to move to “Control” tab, the audiogram screen will appear
- Enter the client’s audiogram (click to add an audiogram point, double click to remove a point, use the bottom left button to switch between left/right ears)
- The minimum frequencies to enter is 500 Hz and 2000 Hz
- Click “NAL-RP” button to program the hearing aid simulator

Adjust the test sound level

- Click to move to “Test” tab, the test setup screen will appear
- Instruct the client that you want them to choose the speech level that is most comfortable for them to listen to, and you would like them to indicate if they would prefer it to be louder or softer.
- Click “Play” button to present a test speech sound
- If the client says the sound is too loud, click the 1 dB or 5 dB down arrow icons to reduce the sound level; if the client says the sound is too soft, click the 1 dB or 5 dB up arrow icons to increase the sound level
- Increase and decrease the volume until the client has indicated both “too loud” and “too soft” to see where the comfortable range is
- Click “Stop” when the loudness is in the middle of the comfortable range, at the most comfortable level
- If the selected test level is higher than -15dB, don’t do the test (see footnote ¹)

Measure SRTn70

- Enter the client number in “Client ID” box
- If the client has previously been tested with the same sentence lists, click “RAND” button next to “Sentence list” box to pick new random lists
- Ensure that the value in “Target % correct” box is 70
- Instruct the client: *“You will first hear eight people talking in the background. Just ignore them. Then you will hear a beep followed by a man saying a sentence. Please repeat back any words in the sentence that you hear. Even if you hear only part of the sentence, tell me what they were”.*
- Click “Measure” button to start the test, the test screen will appear and the babble will start
- Click “Next” button to present a sentence
- After the client repeats the sentence, count the number of correct morphemes (words or parts of words that are individually highlighted) and click on the corresponding score button (0, 1, 2, 3, ..., All) or click on the individual morphemes that are correct.
- Click “Next” button to present a new sentence and repeat the previous step
- The test will stop automatically when the standard error is small enough or all sentences are presented
- Write down the SRTn70 value reported
- If you would like to save the test results graph, click on the icon next to the graph to save results to an image file (PNG format)
- Click “Done” button to go back to the previous screen

¹ Normally, this test level should be below -15dB. If not, please check whether Windows volume control is maximum and hearing aid amplification was prescribed properly. If these checks do not help, please use more sensitive headphones.

Interpreting BASTE results for the client

The BASTE speech reception threshold in noise test indicates the signal-to-noise ratio (SNR) needed for the client to understand 70% of the words in a sentence in babble noise after amplification of the speech and noise according to the NAL-RP prescription. On the same test, young normal hearers need a SNR of -1.5 dB. Consequently, the SNR deficit likely to be experienced by a hearing aid wearer, with omnidirectional microphones, will be the client's SRT plus 1.5 dB. For close talkers, directional microphones should improve the SRT by 1 to 3 dB. Given this background, the following interpretation of the results seems reasonable. A more evidence-based version of this interpretation will be possible after the Large Scale Data experiment is complete and the results analysed.

SRT range	SRT deficit	Interpretation
< 2 dB	< 3.5 dB	After amplification with hearing aids that have directional microphones, the client should hear conversations in noise almost as well as normal hearers.
2 to 5 dB	3.5 to 6.5 dB	Even with directional microphones, the client will likely have difficulty hearing conversations whenever the noise level is loud enough to cause minor difficulties for people with normal hearing. More effective technology, in addition to the hearing aids, will make conversations in these situations easier for the hearing aid wearer. The most effective technology for this is a wireless remote microphone.
> 5 dB	> 6.5 dB	Even with directional microphones, the client will have substantial difficulty hearing conversations whenever the noise level is loud enough to start causing minor difficulties for people with normal hearing. More effective technology, in addition to the hearing aids, will be needed in such situations if conversations are to be possible. The most effective technology for this is a wireless remote microphone.