














Learning objectives

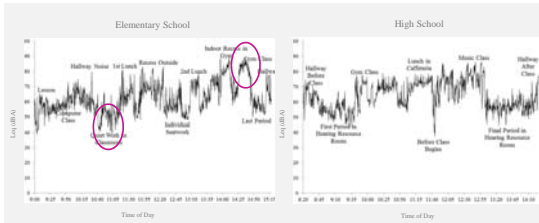
- ▶ **Discuss** the importance of acoustical accessibility in a classroom or other complex listening environments
- ▶ **Demonstrate** how to assemble and fit the Amigo Star on the ear and integrate with an FM transmitter
- ▶ **Explain** the practicalities and use of the Streamer Pro with a universal FM receiver for classroom use



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Classroom listening conditions

▶ Over the school day children are exposed to a broad range of noise levels from 40 dB to 90 dB.

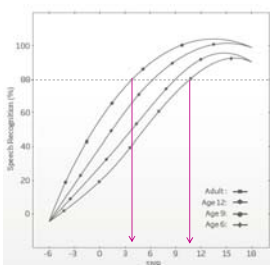


(Crukley et al. 2012)

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Classroom listening conditions

- ▶ Varying classroom noise results in an equally broad range of SNRs.
- ▶ Many studies have shown evidence of a correlation between age and performance in adverse listening conditions.



(Bradley & Sato, 2008, Klatt et al., 2010, Neuman et al., 2010)

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Normal hearing is not always enough

▶ To cope in complex listening environments children must handle multiple acoustic stimuli simultaneously

(Moore, 2012)

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Factors that compromise listening under complex acoustic conditions

Factor	Challenge	Reference
Brain immaturity	The late development of pre-frontal connections makes it challenging for children to employ attention control to relevant sound sources in distracting environments.	Hwang et al. 2010
Auditory inexperience	Children need a rich "auditory diet" to practice perceiving and processing sound to become good listeners.	Flexer 2011
Language unfamiliarity	Non-native listeners and second/third-language learners are compromised with respect to phoneme recognition and show poorer performance of speech understanding in noise.	Tabri et al. 2011

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Factors that compromise listening under complex acoustic conditions

Factor	Challenge	Reference
Unilateral or minimal hearing loss	Audibility and binaural hearing is a prerequisite for optimal spatial separation of competing sound sources in complex listening situations.	Rothpletz et al. 2012
Auditory processing difficulties	Poor auditory processing implies a reduced ability to interpret what is heard, despite having no identifiable peripheral auditory deficits. Highly variable presentation.	Ruggles et al. 2011
Cognitive or perceptual load	Considerable listening effort is required when listening at SNRs that are typical of the school classroom. As proven by a dual-task paradigm, the availability of cognitive resources impacts a child's ability to perform in noise.	Howard et al. 2010

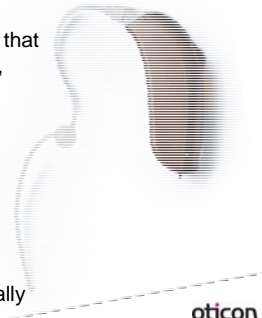


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What is Amigo Star?

Amigo Star

- ▶ Is an ear level FM receiver that is light weight, comfortable, and easy to wear
- ▶ Has no environmental microphone
- ▶ Will be used primarily by school aged children
- ▶ Will be ideally worn binaurally



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Research with similar devices

- ▶ Normal hearing individuals (Ruggles et al. 2011a and b) and children with mild, minimal and unilateral hearing loss
- ▶ Children with auditory processing disorders (Johnston et al. 2009)
- ▶ Children in degraded listening environments (Neuman et al. 2010)
- ▶ Youngest children in the school system (Neuman et al 2010),(Klatte et al. 2010)
- ▶ Non-native listening children (Tabri et al. 2011)
- ▶ Children with reading delays (Purdy et al. 2009)

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How does Amigo Star work?

- ▶ Amigo Star receives direct input from the FM transmitter worn by the teacher
- ▶ This improves the SNR, making it significantly easier to hear in challenging listening situations



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Who are the users?

- ▶ Students whose learning is negatively affected by poor signal to noise ratios commonly found in classrooms
- ▶ Amigo Star is primarily intended to be used in classrooms
- ▶ For students ages 5 -16 years, with core user group aged 7 -12 years
- ▶ Most users will be male



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Key Features

- ▶ **Comfortable:** designed to be comfortable and discreet with instantaneous listening benefits
- ▶ **Easy to handle:** customizable fit with Corda² thin tubes and domes, tamper-resistant battery door option, volume control with lock, channel seek button, and easy fitting verification
- ▶ **Reliable:** robust design, easy cleaning with inexpensive replacement parts



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Amigo Star key features




- Volume Control ✓
- LED ✓
- Channel seek button ✓
- Optional tamper resistant battery door ✓
- Corda² thin tube ✓
- Intelligent Sleep and Off modes ✓
- 312 battery ✓
- IP 57 dust and water resistant ✓

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Amigo Star

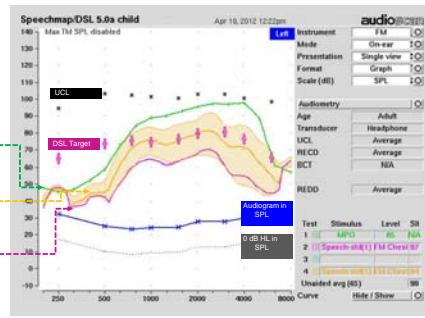
Volume Control



- ▶ Analog Volume Wheel
- ▶ Functions as an off at volume 1
- ▶ 14 dB range in 2 dB steps
- ▶ Can be disabled

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Volume control



Speechmap/DSL 5.0a child Apr 18, 2012 12:22pm

▶ MPO



▶ VC position 2½

▶ VC position 1

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LED

- ▶ Indicates FM signal is being received
- ▶ Indicates a fitting command has been received during programming
- ▶ Can be set to OFF if desired

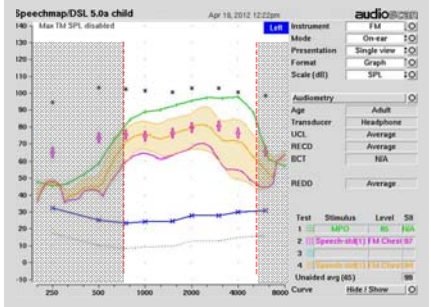

Corda² thin tube and dome

- ▶ Transparent almost invisible appearance
- ▶ Customizable
- ▶ Cost-Effective
- ▶ Easy to clean and replace



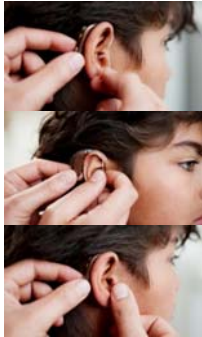


Corda² thin tube roll-off

- ▶ Corda² acts as a 750 Hz high-pass filter and a 6 kHz low-pass filter.
- ▶ 6 kHz low pass filter to ensure compatibility

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Fitting Amigo Star





- ▶ Starter kits come tubes
- ▶ Replacement tubes and domes can easily be ordered

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Channel seek button



- ▶ Intelligently finds FM channel
- ▶ Enables Amigo Star to be easily used with any FM transmitter
- ▶ Allows easy set up if child is changing classrooms
- ▶ Audible confirmation beeps
- ▶ Can be disabled



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Intelligent Sleep and Off modes

- ▶ Sleep mode after 60 seconds of no FM signal – 50% power
- ▶ After 90 minutes, Amigo Star will enter "Off mode" – 15% power
- ▶ Sleep and Off mode significantly extend battery life
- ▶ Enables weekly battery change



Tough construction

IP57


dust and water resistance

Dust (Foreign Bodies)	Water (Moisture)
0 Not protected	0 Not protected
1 Protected against solid foreign objects of 50 mm diameter and greater	1 Protected against vertically falling water drops
2 Protected against solid foreign objects of 12.5 mm diameter and greater	2 Protected against vertically falling water drops when enclosure is tilted up to 15°
3 Protected against solid foreign objects of 2.5 mm diameter and greater	3 Protected against water sprayed at an angle of up to 60° on either side of the vertical
4 Protected against solid foreign objects of 1.0 mm diameter and greater	4 Protected against water splashed against the component from any direction
✓ 5 Protected from the amount of dust that would interfere with normal operation	5 Protected against water projected in jets from any direction
6 Dust tight	6 Protected against water projected in powerful jets from any direction
	7 Protected against temporary immersion in water
	8 Protected against continuous immersion in water, or as specified by the user

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Transmitters

- ▶ Amigo T30/31
- ▶ T5 transmitter
- ▶ any FM transmitter



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Programming

- ▶ Amigo Star can be programmed with the Amigo T30/T31 Transmitter
- ▶ WRP wireless programmer



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6 Different Color Choices

Silver
Chroma Beige
Red
Blue
Chestnut Brown
Black

The slide displays six different color options for hearing aids, arranged in a circular pattern. The colors are Silver, Chroma Beige, Red, Blue, Chestnut Brown, and Black. Each color is accompanied by a small image of the hearing aid. The Oticon logo is located in the bottom right corner.

Web based support

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Getting started with Amigo Star

▶ Instructional videos

The slide shows a screenshot of the Amigo Star web-based support page. The page features a search bar and a list of instructional videos. The Oticon logo is in the bottom right corner.

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Getting started with Amigo Star

The slide shows a large empty box with a small icon in the center, representing a video player. The Oticon logo is in the bottom right corner.

Ordering Corda² tubes and domes for replacement

Tubes: \$7.50 for a package of 5
Domes: \$10 for a package of 10



FM verification videos



Real-ear FM verification with ear-level FM receiver
(that is not a hearing aid)




FM Verification of Amigo Star

- ▶ Frequency response is based on DSL pediatric targets
- ▶ Most children will not have a hearing loss: is verification still relevant?
- ▶ Ensure Amigo Star is not too loud or not too soft
- ▶ Leisha Eiten (Boystown Hospital) advised on procedural guidelines



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FM Verification: Ear level FM receiver



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Real-ear verification of Amigo Star



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Support Materials

- ▶ Getting Started
 - ▶ Amigo Star and T30/T31
 - ▶ Amigo Star and T5



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Streamer Pro with FM



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Streamer Pro with FM

The Bridge to Easier Learning



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Streamer Pro with FM:




- ▶ One universal FM receiver
- ▶ 8 hours of battery life with FM
- ▶ No battery drain on hearing aids
- ▶ Can be used with any transmitter on the 216 frequency band

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Streamer Pro with FM

Streamer Pro
compatible with:


- Oticon | **Alta**
- Oticon | **Agil**
- Oticon | **Intiga**
- Oticon | **Chili**
- Oticon | **Acto**
- Oticon | **Ino**




Oticon Sensei BTE and RITE





FM verification videos



Hearing aid with Streamer or Bluetooth gateway device



FM Verification: Hearing aid with Streamer Pro



Streamer Pro with Fm 46

Very important: set up information

- Place hearing instruments on the ears and Streamer neck loop over the head, and plug in the FM receiver
- Place the toggle switch in the **OO** position
- Turn on the Amigo transmitter. Give a short press to the AUX selector on the Streamer Pro
- The orange light will be on
- Press the channel seek button on the receiver

After verification: Place the Streamer in the protective skin. This provides increased protection if the Streamer is accidentally dropped.

A helpful reference guide

- This fitting guide runs through FM verification in a step-by-step procedure
- Part number: 110312
- Leisha Eiten was consulted for advice in putting the steps together

Further reading & resources

- FM verification for the 21st century. Perspectives on Hearing and Hearing Disorders in Childhood
Eiten, L., & Lewis, D. (2008). 18(1), 4-9
- www.pro.oticonusa.com/pediatrics/product-support/product-literature
- Amigo Star Whitepaper. A new ear-level FM-only receiver.
- Getting Started with Amigo Star and T30/T31 and T5 FM Transmitters
- YouTube Instructional Videos

