

FM Technology Throughout the Life Span

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Acknowledgements

- * Phonak
- * Students
 - * Caryn McLellan
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 - * Amanda Loveless
 - * Jennifer Stockwell
 - * Sarah Cain
- * Families that participate in Intensive Programs/Camps

Generally accepted use of Personal FM Systems in Educational Settings

There are many applications of FM Systems
outside of the classroom...for all ages!

So....

Over the years...we've used FM systems in
numerous ways outside the traditional
classroom and wanted to share
some of these with you!

Applications of Personal FM Systems

Noisy Environments

Recreational Activities

Sports

FM System Demonstration

* No FM

* FM+M

* FM Only



IN THE CAR



Benefit of FM the Young

- * Video Recordings made
 - * While parent spoke naturally during actual car ride

without FM

and

with FM



Update with Adaptive FM -

Same Family – about 1.5 years later

To illustrate advantage of the Adaptive FM,
background noise increased by adding music from
the radio

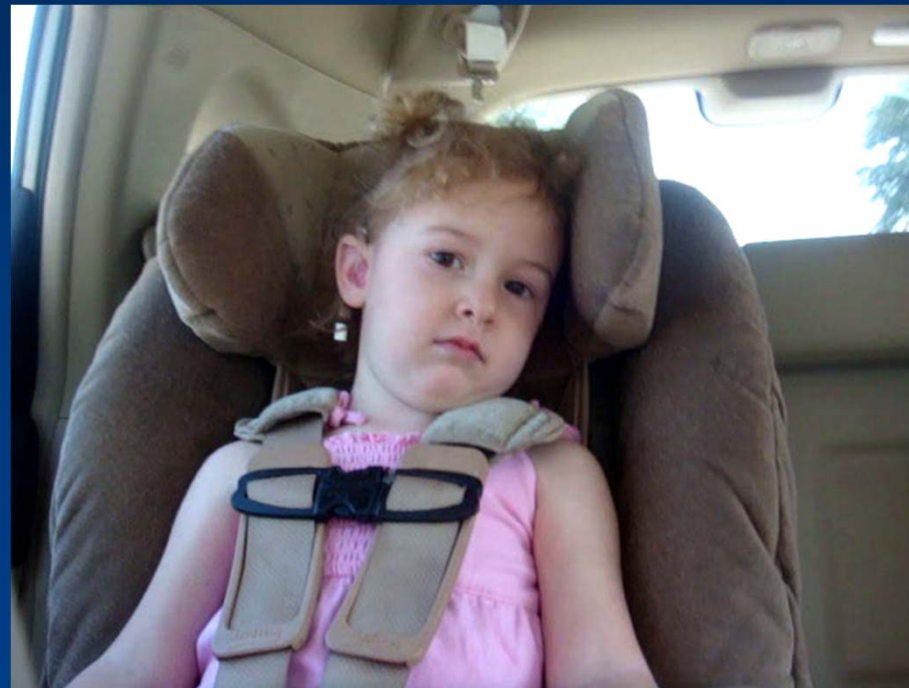
Comparison – NO FM

Smartlink (Traditional FM)

inspiro (Adaptive FM)

Update with Adaptive FM -

First.....riding in the car with
BACKGROUND MUSIC and **NO FM**



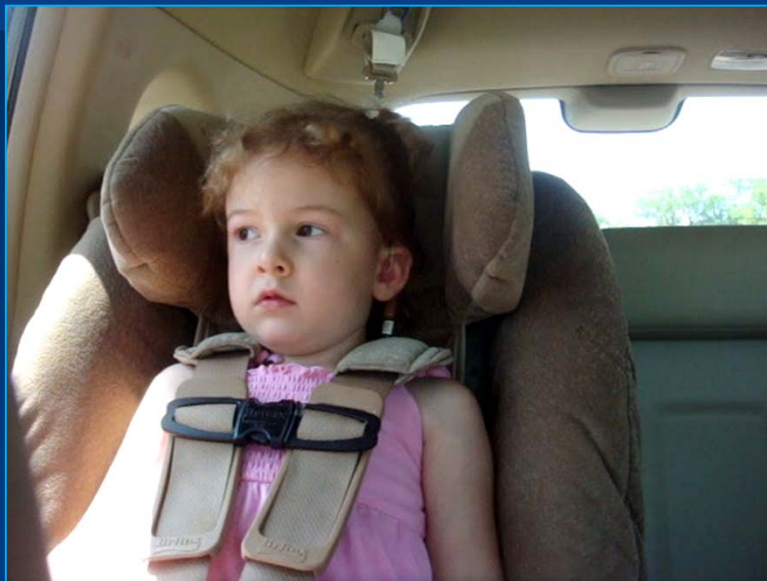
Update with Adaptive FM

* Car Ride with RADIO MUSIC while using

SmartLink

then

Inspiro

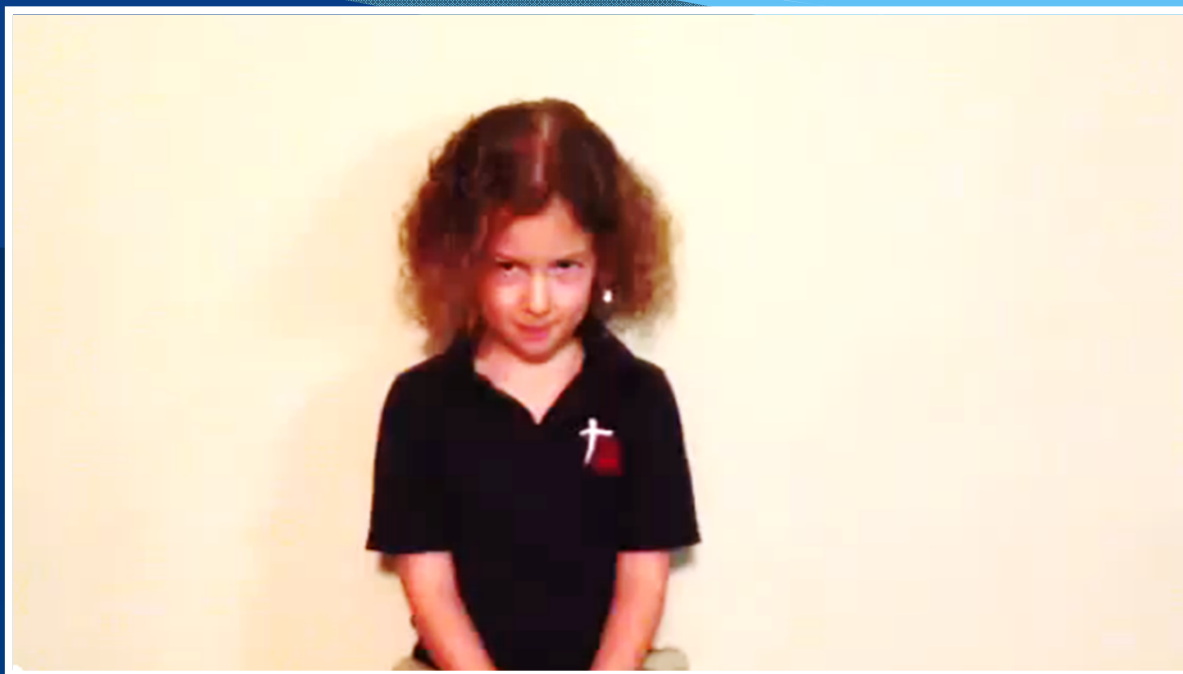


Mother's Comment Regarding FM use in Noisy Situations



Current Update

5 Years old – Kindergarten –
reads on 3rd grade level



<https://www.dropbox.com/s/4tij4mg5yr2fg9o/Video%20Nov%2029%2C%207%2017%2057%20PM.mov>

Benefits of Neckloops for the Young

Investigating the benefits of Neckloops for these reasons:

- no additional weight to the HA on tiny ears
- can place on carrier rather than on infant
- more cost effective

Possible concerns:

- loss of low frequencies
- pick up of stray electromagnetic energy
- strength of t-coil/quality of signal

T-Coil provides convenient access to Neckloop arrangement for infant seat

If you didn't program the HA and want to find out t-coil option, a quick way is to use a WATCH that has traditional clock face!!



If you put the HA on "T" setting and hold it on battery-powered, non-digital, watch, you can hear it TICK! Then you know there is a T-coil program and need to proceed to verification of the T-coil.

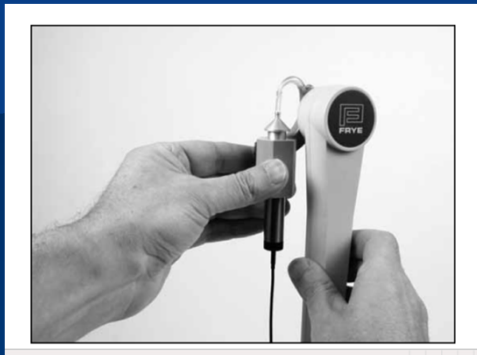
Neckloop Receiver in Infant Seat



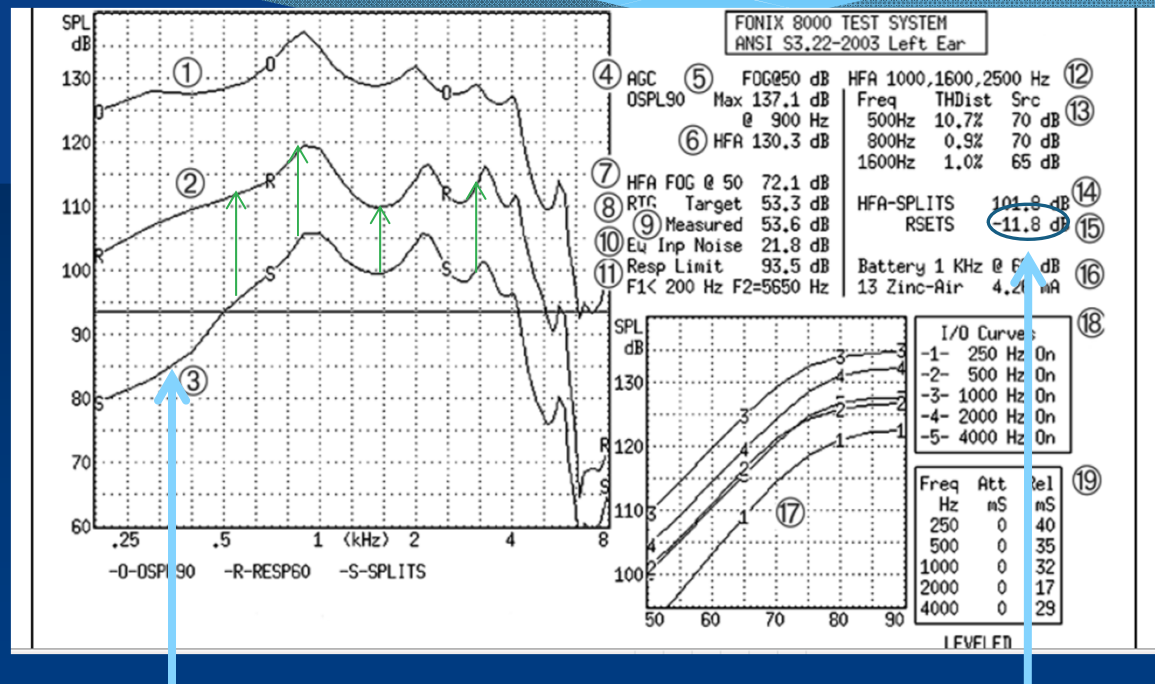
Neckloop can be placed in Stroller



T-Coil Verification Electroacoustically

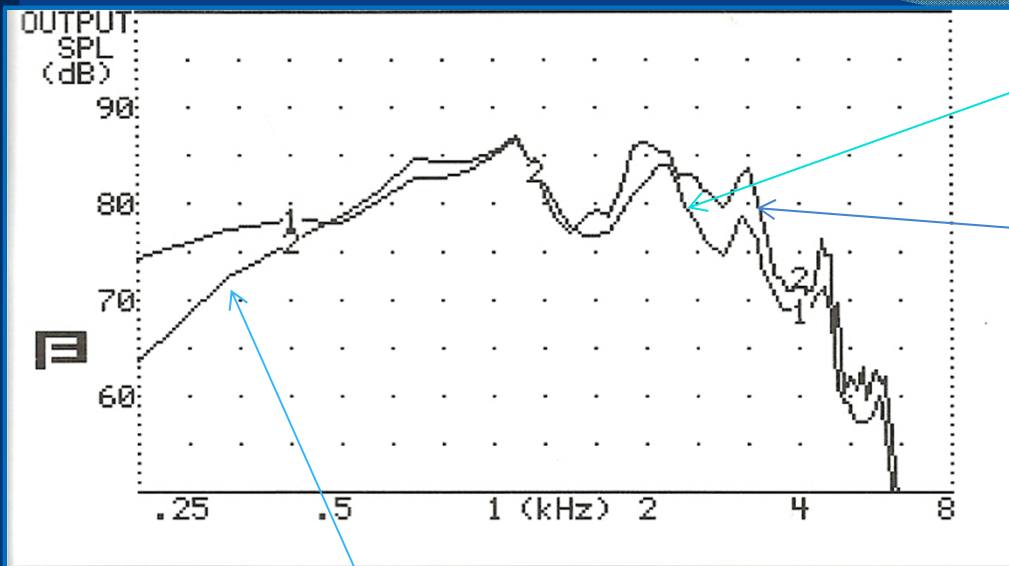


Use Telewand to deliver electromagnetic signal



ANSI S3.22 2003 specifies measurements of T-coil in hearing aids as part of routine electroacoustic analysis. The T-coil response will be compared to the microphone response....ideally they should match and RSETS=0.

Electroacoustic Verification



Curve 1: Hearing aid alone in the test box

Curve 2: FM transmitter mic in the test box, HA outside the box

Curves should match ± 5 dB

With t-coil expect to lose low frequencies

Electroacoustic Verification with T-coil Arrangements

- * There can be signal variation with orientation and distance of the T-coil in the aid from the electromagnetic field of the neckloop

(Thibodeau & McCaffrey, 1998)

- * Made electroacoustic measurements with neckloop taped in infant seat while moving HA into 4 positions

Electroacoustic Verification with T-coil Arrangements

TYPICAL USE



SIDE



ABOVE



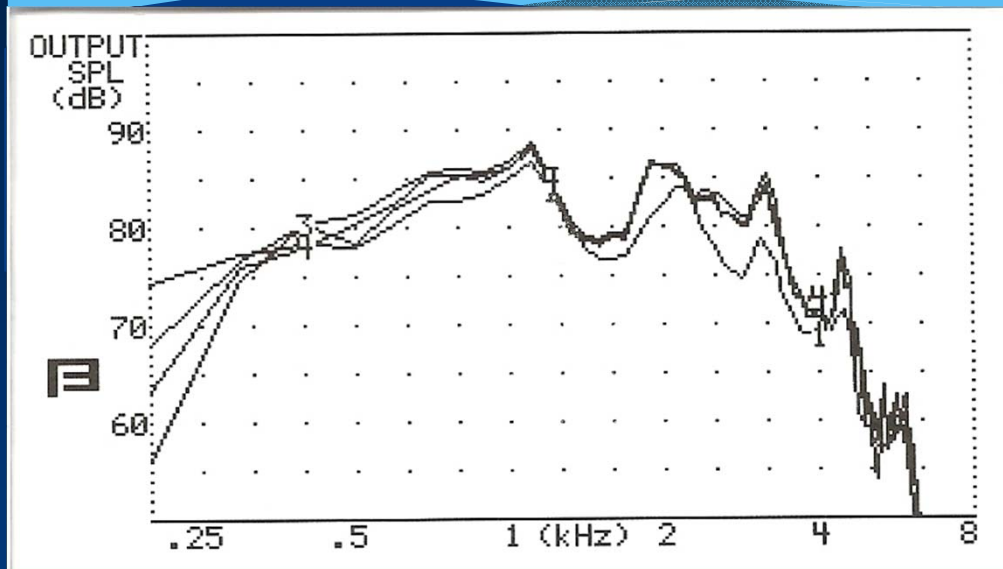
INFRONT



Output in the coupler measured when transmitter in the test box and HA set to "T" position is moved around the loop

Might expect signal variation as the HA moves further from the loop.

Electroacoustic Verification



Curve 1: TYPICAL USE

Curve 2: SIDE

Curve 3: ABOVE

Curve 4: IN FRONT

**Curves were surprisingly similar!
Slight increase in high
frequencies and expected low-
frequency variation;
Suggests a strong neckloop!**

Loops to Consider

Use with ANY manufacturers'
Hearing Aids set M+T



MyLink

Compatible with only with Phonak
hearing aids, Can use with cell phone
via Bluetooth Connection



ComPilot

RESTAURANTS



SIARC

Thibodeau & Cokely, 2003; Thibodeau & Alford, 2010)



SIARC

- Week Long Intensive Program
- Designed for Couples or Communication partners
- AuD Students paired with a couple
- Option to try NEW aids and SmartLink+ FM
- All students wear iLinks set for normal hearing



SIARC-Sample Schedule

	TUES	WED	THURS	FRI	SAT
9:00	Registration				
9:30	Lecture- Welcome	Lecture-Guest	Lecture-Guest	Play Eval	
10:00	Class 1	Class 1	Class 1	Class 1	Class 3
10:45	Break	Break	Break	Break	Break
11:00	Class 2	Class 2	Class 2	Class 2	Class 4
12:00	Lunch	Lunch	Lunch	Lunch	Group Evaluation
1:00	Research	Manufacturers	Lecture-Guest		
2:00	Class 3	Meyerson Tour	Class 3	Class 3	
2:45	Break	Break	Break	Break	
3:00	Class 4	Lecture-Guest	Class 4	Class 4	
4:00	Lab Tour	Open	Open	Open	
5:00	Dinner	Dinner	Bus to Theatre	Dinner	
6:00	Closure Program		Play-Musical		

SIARC-Sample Schedule

CLASSES

1 AUDIO CLASS	2 COMM STRATEGIES/ALD	3 AUDIO VISUAL TRAINING	4 COPING
Audiogram OAE Otoscopic Tympanometry HACK-Elec then Real Ear New Technology HINT-No HA or W/persHA HINT-New HA, FM	COMM RULES Audio/Sp Acoust/Simulate HL ALD's-Phone Tech/Strategies ALD-TV/Alerting/Public ADA	Seeing Hearing Speech CasperSent LACE Tracking	COSI Comm Breakdowns Stress Effects Changing Behavior

AALTA

Application of Advanced Listening Technology in Adults

(Thibodeau, 2007)

- * Use a Scale to Identify Possible Situations where Assistive Technology could be beneficial

(Thibodeau, 2004, 2007; 2008; Thibodeau & Alford, 2010)

- * A series of questions to cover all the areas

MARK ROSS has repeatedly told us to explore with EACH and EVERY patient

- * So just as you routinely complete an Audiogram for persons who seek hearing assistance...also complete a.....



NAME: _____ Date of Birth: _____ Person completing Telegram: _____

	T	E	L	E	G	R	A	M	
	Telephone	Employ-	Legislation	Entertain-	Groups	Recreation	Alarms	Members	
RATING									
1 No Difficulty									Live with Normal Hrg Adult
2									Live with Young Children
3 Some Difficulty									Live with Teenagers
4									Live with Adult with Hrg Loss
5 Great Difficulty									Live Alone
	C- Cell phone L-LandLine	J- Job S- School	P- Public Listening A- ADA	T-TV M-Movies	R- Religion P- Parties M-meetings	_____	S- Smoke D- Doorbell C- Clock	Check all that Apply	

Three Main Problems to Address: _____

Recommendations:

T _____ E _____ L _____ E _____ G _____ R _____ A _____ M _____

Interview Format

ADULT TELEGRAM Rating Scale Key

Topic	Question	Rating
T	Are you having difficulty with communication over the telephone ?	Difficulty 1=None, 2=Occasional, 3=Often, 4=Always, 5= Can't use the phone <i>Use "L" to designate Landline and "C" to designate Cellphone.</i>
E	Are you having any difficulty with communication in your employment or educational environment?	Difficulty 1=None, 2=Occasional, 3=Often, 4=Always, 5=Stopped working
L	Do you know about Legislation that provides assistance for you to hear in public places or in hotels when you travel?	Knowledge 1=Vast, 2=Considerable, 3=Some, 4=Limited, 5=None
E	Are you having difficulty with hearing during Entertainment activities that you enjoy such as television, movies, or concerts?	Difficulty 1=None, 2=Occasional, 3=Often, 4=Always, 5= Stopped Going
G	Are you having difficulty with communication in Group settings?	Difficulty 1=None, 2=Occasional, 3=Often, 4=Always, 5= Can't hear at all in groups
R	Are you having difficulty with hearing during Recreational activities such as sports, hunting, or sailing?	Difficulty 1=None, 2=Occasional, 3=Often, 4=Always, 5= Stopped the activity
A	Are you having difficulty hearing Alarms or Alerting signals such as the smoke alarm, alarm clock, or the doorbell?	Difficulty 1=None, 2=Occasional, 3=Often, 4=Always, 5= Can't hear alarm <i>Use "S" for Smoke Alarm, "D" for Doorbell, and "A" for Alarm Clock</i>
M	Are you communicating with Members of your family?	1=Live with Normal Hrg Adult, 2=Live with Young Children, 3=Live with Teenagers, 4=Live with Adult with Hrg Loss, 5=Live Alone <i>Check all that apply</i>

TELEGRAM Rating Scale Key

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M	Are you communicating with Members of your family?	1=Live with hrg adult, 2=Live with young children, 3=Live with teenagers, 4=Live with adult with hrg loss, 5=Live alone Check all that apply

TELEGRAM OUTCOMES

(Thibodeau, 2004, 2007; 2008; Thibodeau & Alford, 2010)

- * All AALTA participants noted improvement in all 7 categories
- * Some purchased other assistive devices prompted by the questions

NAME: _____ Date of Birth: _____ Person completing Telegram: _____

	T	E	L	E	G	R	A	M	
	<u>Telephone</u>	<u>Employment</u>	<u>Legislation</u>	<u>Entertainment</u>	<u>Groups</u>	<u>Recreation</u>	<u>Alarms</u>	<u>Members of House</u>	
1 No Difficulty									Live with Normal Hrg Adult
2	○ ↑	○ ↑					○ ↑		Live with Young Children
3 Some Difficulty	□ ↑	□ ↑	○ ↑	○ ↑	○ ↑	○ ↑	□ ↑		Live with Teenagers
4									Live with Adult with Hrg Loss
5 Great Difficulty									Live Alone
	C- Cell phone L- <u>LandLine</u> _____	J- Job S- School _____	P- Public Listening A- <u>ADA</u> _____	T- TV M- Movies _____	C - Church P - Parties M- meetings _____	_____ _____ _____	S- Smoke D- Doorbell C- Clock _____	Check all that Apply	

■ With Amplification □ Without Amplification

JOURNAL OUTCOMES

Wives more willing to wear mic after Group Dinner

Bluetooth very helpful for handsfree phone

Car and road noise less so could talk while on a trip

Used with ipod and worked great

New Listening Experiences-

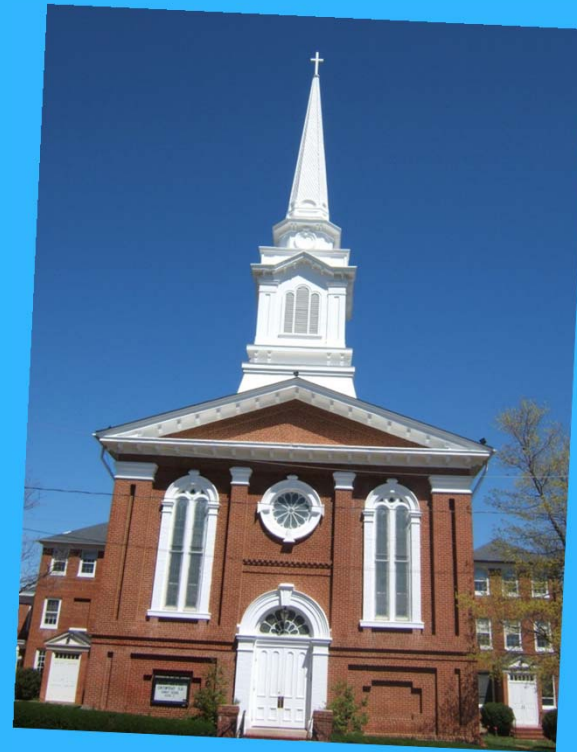
Enjoyed separate listening options

eg. During dinner wife listened to TV, while

husband listened to radio in truck in garage



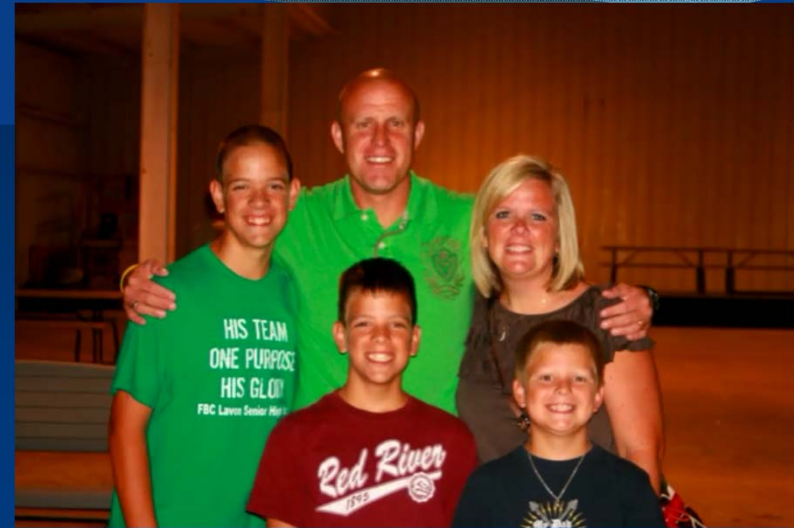
WORSHIP SERVICES



Teen with CI trying FM in Church

EMAIL from Mother:

“We did use it at church for the first time yesterday!! Justin works the computer for the words/sermon on the projector so I had him wear it because he's in the back of the church. There was good and bad because he was in the sound booth which I'm sure produced lots of the 'noise' he said he heard. BUT, we were on the front pew next to our pastor, and I had quickly just put it around his neck and said 'please wear this for Justin'. Bro Clint then said "Where is Justin?" Justin stood up in the control booth and waved to him. They both got a kick out of as did several teenage girls around us :-)”



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Sports

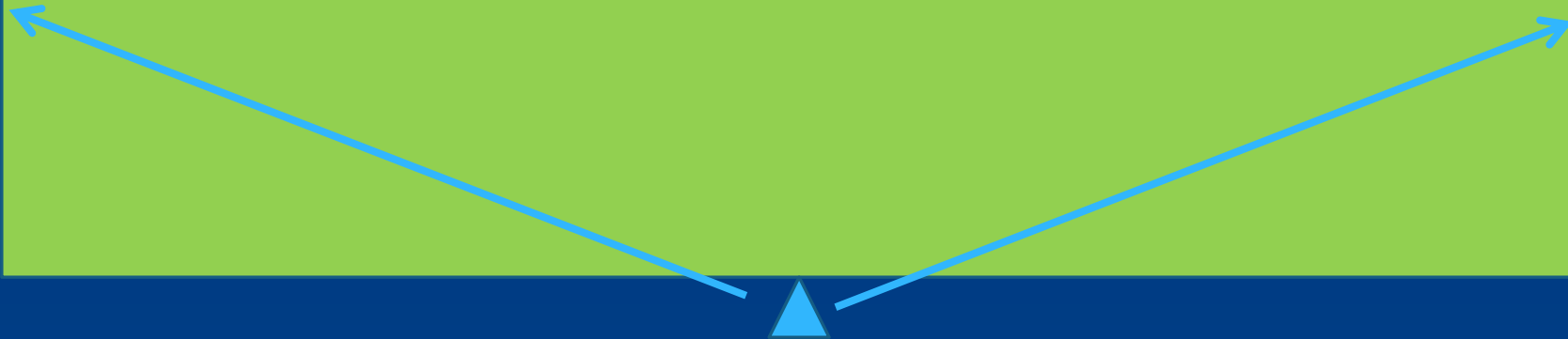
Marching Band



700 Member Band Covers Entire Field !

- * Battery Life also an issue with 7 am practice and performance at 9 pm that same night

Football Field



Loudspeaker interfaced with wide area transmitter

Camp CHAT



Camp CHAT



Camp CHAT

Collin County Courier

Fall 2009

Camp CHAT

By Desiree Hoverson



Special points of interest:

- Find out what camp CHAT is all about!
- Read what an exciting time Desiree had at camp for hearing impaired teens



Over the summer, I went to a camp for hearing impaired teenagers. The camp was called camp CHAT. My mom and dad went with me, it was exciting and a lot of fun. It was 3 days.

On the first day, we met in Richardson and ate dinner at the Callier center. We looked at different kinds of technology like clocks that vibrate, house phones, light sensors for the house, voice sensor for the phone. After that we watched a magician, magician George. He put fire in his mouth. He squirt something in his mouth and then put a match in his mouth. He put an egg in his hand and it ended up in someone else's hand, but it was creepy though. We took our own cars to the camp. At the camp, there was a bonfire and we had marshmallows and s'mores. It was messy and

all over my legs. I met many new people. I met a girl named Leslie. My mom, dad and me stayed in a nice cabin.

We did a lot of different activities. We got into Dr. Thibodeau car and tried out the Bluetooth. I called my

low the directions to find the "hider." I taught people how to play volleyball. We went through a obstacle course. We had to help each other to get to the other side. We could not talk and had to use an other way to communicate. We had to cross a log without falling off and pretended that there was "peanut butter." there was a pool, but we didn't swim. I wish we could have swim because it was hot.



Me with Francesca and Erin.

On the last day, we got up at 6:30 to eat breakfast. We got a lot of free stuff. I got a alarm clock.

I got all the kids e-mails addresses so I can communicate back and forth. I cant wait to go again next year. I plan on going. it was fun and thanks to Dr. Thibodeau and

grandma. We played different game. For example, we broke up into different groups and played "hide and seek" using smart link fm system. The hider will describe where she is by giving directions though the fm



grandma. We played different game. For example, we broke up into different groups and played "hide and seek" using smart link fm system. The hider will describe where she is by giving directions though the fm system and into an hearing aid. The "seekers" follow the directions to find the "hider." I



Horseback Riding



ROCK CLIMBING



Climbing with FM Systems



Climbing with FM Systems iSense and Smartlink



Climbing with FM Systems



Applications of Personal FM Systems

Noisy Environments

Recreational Activities

Sports

Are FM Systems allowed in HS Sports?



- * According to UIL regulations:
 - * Practice— Local issue
 - * Games— No, but....
- * Exceptions: players with a disability can request accommodations

Source: Dr. Mark Cousins Director of Athletics—Texas UIL

Team Sports



Football



Cheerleading



Cheer Coach wears the transmitter and watches from Press Box above the field. She'll tell Desi, who wears the receivers, what to say to the other girls to improve the routine!



For Moisture Issues during Sports

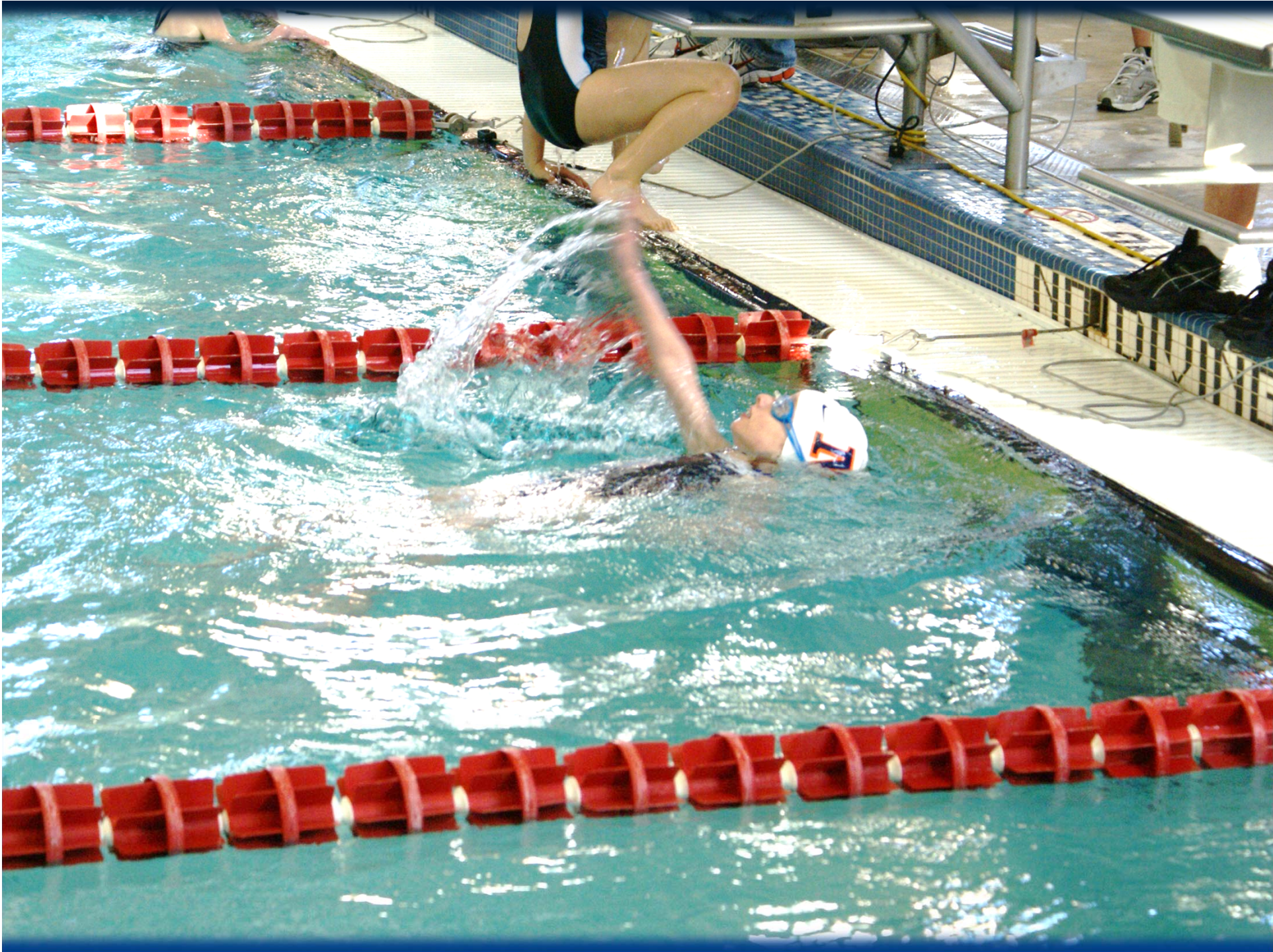
- * Wrap with saran wrap
- * Use roll on deodorant on skin behind ear
- * Use Neoprene cover to protect against moisture

<http://www.gearforears.com/>



SWIMMING





SUMMARY

There are many options for using FM Systems for ALL AGES outside of the classroom

Use of FM in Novel Ways requires Education for the Users

FM outside the classroom can help teens realize the benefits in a comfortable environment

Special applications may require special equipment...

Explore the Options!

THINK OUTSIDE THE CLASSROOM....
Like this fish
OUTSIDE THE BOWL!!!





Thank you!

EARRING CD

developed for the first ACCESS conference

Educational
Audiology
Resource for
Reducing
Interference in
Noisy
Groups

-ACCESS 2003-

Achieving Clear Communication Employing Sound Solutions

Edited by Linda M. Thibodeau

University of Texas at Dallas

Sponsored by Phonak Hearing Systems



This CD ROM contains three sets of Resources:

- Audio Demonstrations
- Assessment Inventories
- Implementation Tools
- CD Contributors

Simply click on the one you want to explore.