The Rotary Club of Whangarei

(Chartered 1925)

District 9910

Chronicle for 9 April 2014

Int President Ron Burton

President - Peter Mulhare, President Elect & Secretary- Gail Taylor, , Treasurer - Peter Bayne, Chronicle - Andrew Bax, Community – Andrew Bax, International - Roger Barber, Programme –Rex Morris, Almoner - George Wilson, Historian - Lloyd Morris, Website - Andrew Bax, Board Member – Bill Rossiter, Board Member – Frank Geddes, District Governor – Phil Ashton, Assistant Governor – Peter Smith

President Peter welcomed members and Guest Speaker Peter Ibbotson and Ken & Gwen Sinclair (Gails Mum & Dad)

Apologies :- Frank, Rae

One minute notices

- The Whangarei Club has asked that only Members use the car park outside Rotary meetings. You are welcome to join the Whangarei Club then you can take advantage of all their facilities.

- We have recieved 2 applicants for the Science Extravaganza. Mihi Shepherd & Jessica Fowler, both from WGHS

- We sent off $280 for 2 MUNA teams.

- Peter recieved an email form Lance Weller expaining that Channel North wants to run a promotion for Angel Flights and asked if we would be willing to participate as a major contributor. They have acknowleged us on their website http://angelflightnz.co.nz/

Guest Speaker – Peter Ibbitson spoke about Accoustics

Peter is an accoustics engineer based in Kerikeri

Peter demonstrated how sounds are transmitted and showed us an extensive power point on all aspects of noise along with varoius sounds at differnet frequencies.

A large part of their work is to design auditoriums that produce the best sound systems for all the audience to hear clearly.

Jobs included, reducing wind noise in sky scrapers to eliminating dead spots in conert halls.

The diagram right shows the correlation between decbel levels and actual loudness.

Each 10 db increased 10 times in loudness.

Sound	Decibel Level	Musical Dynamics	Number of Times Louder than Threshold
Threshold of Hearing	0		1
Normal Breathing	10		10
Leaves Rustling	20		100
Empty Theater	30	ppp	1,000
Mosquito Buzzing	40	pp	10,000
Quiet Restaurant	50	p	100,000
Normal Conversation	60	mp	1,000,000
Traffic	70	mf	10,000,000
Vacuum Cleaner	80	f	100,000,000
Truck Engine	90	ff	1,000,000,000
Subway Train	100	fff	10,000,000,000
Rock Band	110		100,000,000,000
Threshold of pain	120		1,000,000,000,000
Machine Gun	130		10,000,000,000,000
Jet Engine	140		100,000,000,000,000

The primary advantage of having *two* ears is the ability to identify the *direction* of the sound. Human listeners can detect the difference between two sound sources that are placed as little as three degrees apart, about the width of a person at 10 meters. This directional information is obtained in two separate ways. First, frequencies above about 1 kHz are strongly *shadowed* by the head. In other words, the ear nearest the sound receives a stronger signal than the ear on the opposite side of the head. The second clue to directionality is that the ear on the far side of the head hears the sound slightly *later* than the near ear, due to its greater distance from the source. Based on a typical head size (about 22 cm) and the speed of sound (about 340 meters per second), an angular discrimination of three degrees requires a timing precision of about 30 microseconds. Since this timing requires the volley principle, this clue to directionality is predominately used for sounds less than about 1 kHz.

Both these sources of directional information are greatly aided by the ability to turn the head and observe the change in the signals. An interesting sensation occurs when a listener is presented with exactly the same sounds to both ears, such as listening to monaural sound through headphones. The brain concludes that the sound is coming from the center of the listener's head!

While human hearing can determine the *direction* a sound is from, it does poorly in identifying the *distance* to the sound source. This is because there are few clues available in a sound wave that can provide this information. Human hearing weakly perceives that high frequency sounds are nearby, while low frequency sounds are distant. This is because sound waves dissipate their higher frequencies as they propagate long distances. Echo content is another weak clue to distance, providing a perception of the room size. For example, sounds in a large auditorium will contain echoes at about 100 millisecond intervals, while 10 milliseconds is typical for a small office. Some species have solved this ranging problem by using *active sonar*. For example, bats and dolphins produce clicks and squeaks that reflect from nearby objects. By measuring the interval between transmission and echo, these animals can locate objects with about 1 cm resolution. Experiments have shown that some humans, particularly the blind, can also use active echo localization to a small extent.

Peter had spent all afternoon presenting a seminar so we only got a snippet of his knowledge.

Duty Roster **(a.m – 11:30 for noon, p.m. – 5:30 for 6:00pm)**				
Lunch first, dinner second – 1st Wed lunch 2nd dinner etc Notify Club of apologies – 4387429 (by Tuesday)				
Duties	**16 Apr (am)**	**23 Apr (pm)**	**Hospital**	
Speaker	Lunch Forum	To be advised	Gail	
Host	None	None		
Thanks	None	None		
Reception	Everyone	Everyone		
Raffle	Frank	Frank		
Parting Thought	Frank	Frank		

Parting thought from Rex
"A *drunk man's words* are a sober man's thoughts."