

Welcome to Vibrationdata

Acoustics • Shock • Vibration • Signal Processing

April 2004 Newsletter

Howdy

Some friends and I recently visited the Phoenix Zoo. I brought my tape recorder, willing to record any animal sounds whatsoever.

The zoo is a rich acoustical landscape. Alas, few of these sounds come from the animals on display. Rather, the sound field is dominated by the laughter of excited children. Chirping sparrows and grackles are also well-represented throughout the zoo grounds, although not on formal display.

The Phoenix Zoo does have a number of exotic birds. The four species presented in this newsletter were kind enough to offer their songs for this project.

The Umbrella Cockatoo gave the most entertaining sounds, including whistles and the phrase "Hi, Sam." I hope that you enjoy these articles and the accompanying audio files.

Sincerely,



Tom Irvine
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Feature Article



Bird Sounds page 2

Each image in this newsletter was taken at the Phoenix Zoo.



Golden Conure

The Golden Conure is a member of the parrot family. It is also known as the “Queen of Bavaria’s Conure.” It has two scientific names *Guaruba Guarouba* and *Aratinga Guarouba*. It is covered by brilliant golden-yellow plumage, except for the flight feathers, which are deep green. The beak is horn-colored and the eyes are a reddish brown. It uses its beak to pull its body when climbing on tree branches.

Golden Conures may grow up to 36 cm (14 inch). Their diet consists of insects, exotic fruits, flowers, buds, and cultured maize.

The habitat is the rainforest in northeastern Brazil. The Golden Conure is an endangered species due to hunting, loss of habitat, and illegal capture for the pet trade.

Golden Conures, like most parrots, travel in pairs or family groups, nesting in rainforest trees. Pairs rear three to four chicks each year. Both parents take turns feeding until the young are fully feathered and out of the nest in about 12 weeks. Furthermore, the Golden Conures can breed in captivity.

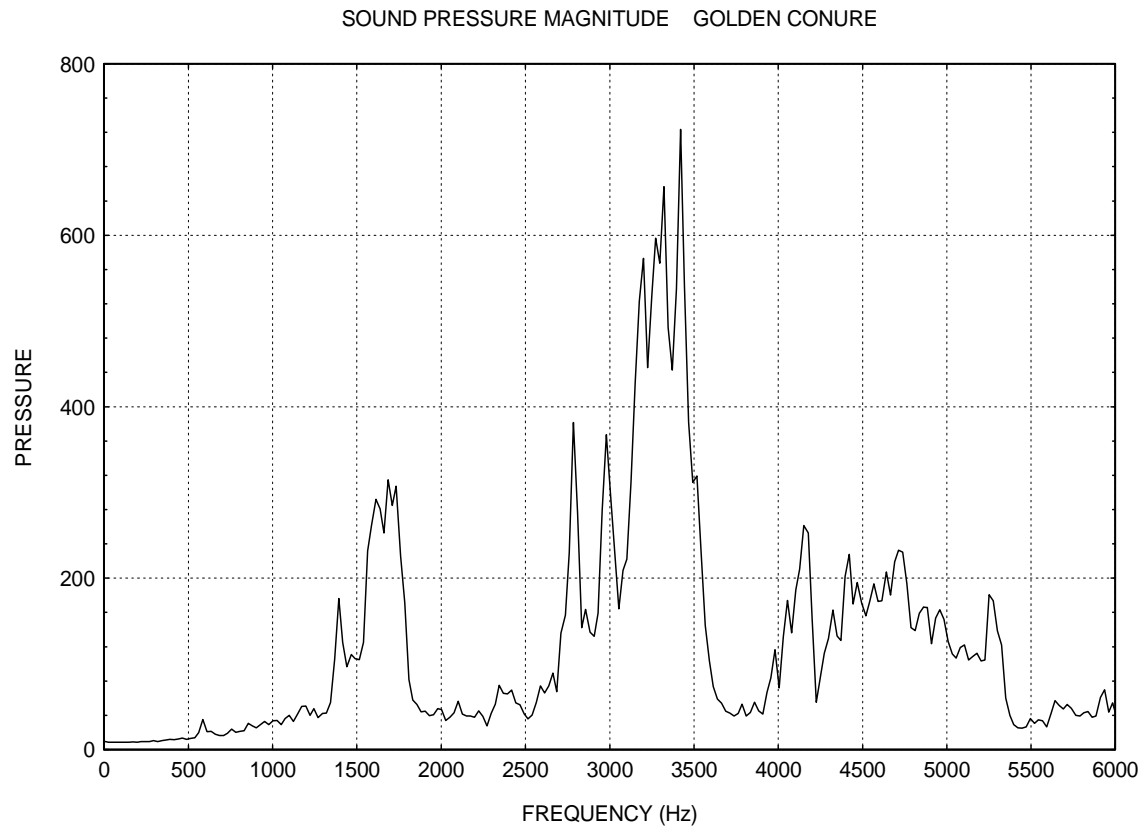


Figure 1.

The Golden Conure at the Phoenix Zoo made a playful squawking sound. The spectral function is shown in Figure 1. The amplitude has an arbitrary scale.

A cluster of peaks occurs from 1600 to 1700 Hz. Another cluster occurs about one octave higher, from 3100 to 3500 Hz.

The highest individual peak is at 3400 Hz.

The sound file is posted at:

<http://www.vibrationdata.com/conure.mp3>



Scarlet Macaw - *Ara Macao*

The Scarlet Macaw is a member of the parrot family.

Their habitat is tropical forests from east Mexico, through Central America, and down to Brazil. Their size is 90 cm (35 inch).

The coloration is scarlet red, yellow, and blue. The color pattern varies with habitat location. Scientists thus debate whether the Scarlet Macaw should be further classified into subspecies.

Scarlet Macaws excel at flying, reaching speeds up to 35 mph.

They live high in the upper branches of the trees to avoid predators, such as snakes.

Scarlet Macaws eat fruits, nuts, flowers, and nectar. Furthermore, they often eat unripe fruit and nuts that other animals avoid. The Macaws also eat clay from river banks. The reason is unclear. One hypothesis is that the clay helps them digest the chemicals found in the unripe fruit.

A pair of Scarlet Macaws raises one or two young each season in a tree cavity nest. The young birds often stay with their parents for up to two years.

Like other rainforest species, the Scarlet Macaw population is threatened by loss of habitat and illegal capture for the pet trade.

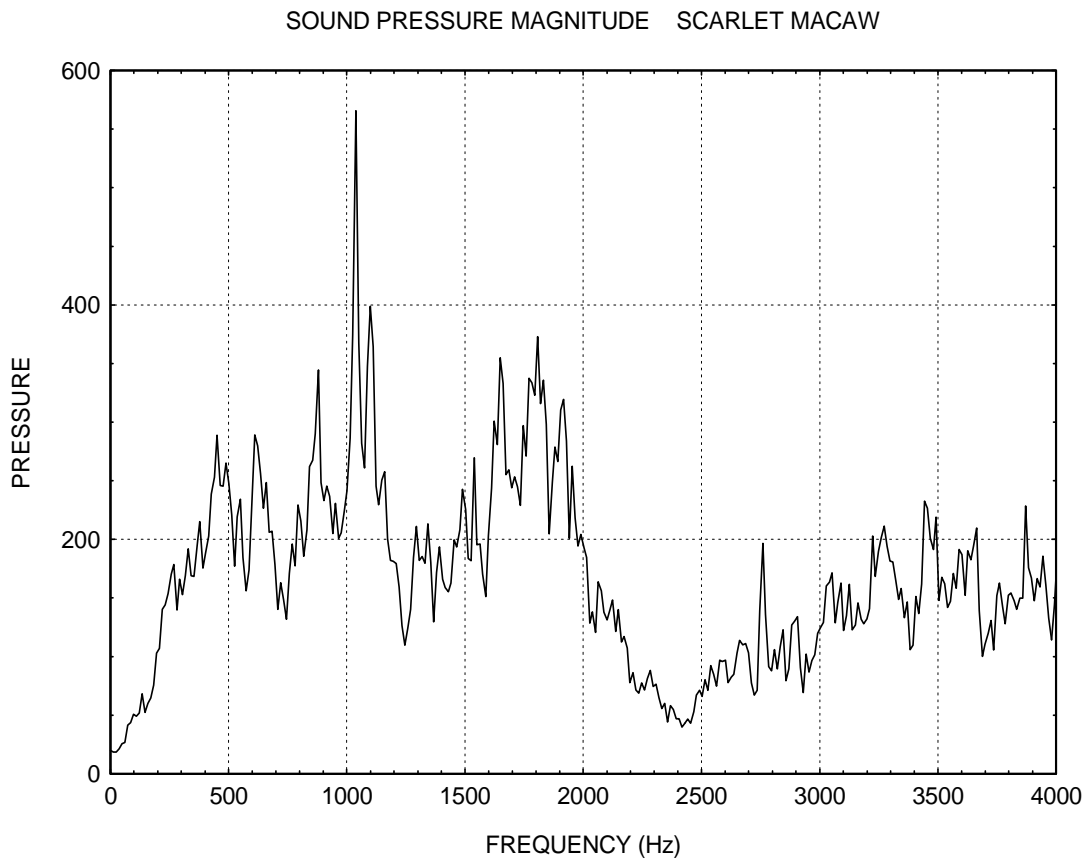


Figure 2.

As pets, Scarlet Macaws can be trained to mimic the human voice. The pair of Macaws at the Phoenix Zoo made a hoarse screeching sound, however.

The spectral function is shown in Figure 2. The highest spectral peak is at 1100 Hz.

The sound file is posted at:

<http://www.vibrationdata.com/macaw.mp3>

The file is edited so that several squawks occur in rapid succession.



Chilean Flamingo - *Phoenicopterus Chilensis*

The Chilean Flamingo lives in temperate regions of South America, in shallow salt marshes and brackish coastal lagoons. They are social, living in very large flocks which may number in the thousands. These flocks are capable of long distance migration

Their height is about 100 cm (40 inch).

Flamingos' strange-looking beaks allow them to strain small plants and animals from the water. The edges and inner parts of the beak are lined with short hairs called lamellae. Flamingos hold their beaks upside down in the water. Then they open their beaks to create a small gap. They swing their beak underwater, trapping small food particles in the lamellae. The fleshy tongue moves back and forth like a piston to aid this filtration process.

The flamingos' color is due to shrimp-like foods in its diet. The color would be a dull white without this diet of small crustaceans. Flamingos in zoos must be fed special supplements in order to maintain their orange-pink color.

Flocks perform courtship displays as a group, sometimes for several months, before pairs split off to begin nesting. Flamingos lay a single egg on top of a tall cone nest made from mud.

Chilean Flamingos are not endangered, unlike South American parrots.

Flamingos are generally very noisy birds. Nasal honking, grunting or howling are the most common vocalizations.

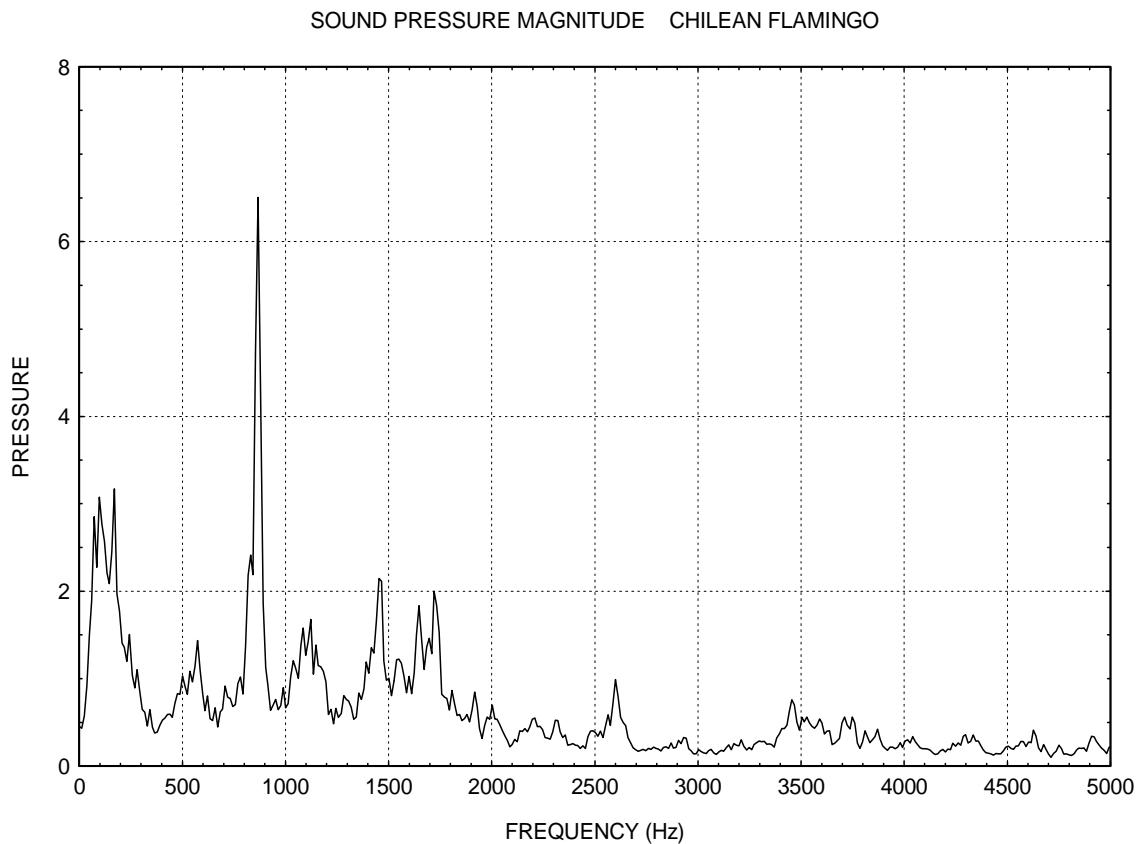


Figure 3.

The Chilean Flamingos at the Phoenix Zoo made a honking sound. This sound was part of some group behavior. The spectral function is shown in Figure 3. The amplitude has an arbitrary scale.

A cluster of peaks occurs from 70 to 160 Hz. The highest spectral peak is at 870 Hz.

The sound file is posted at:

<http://www.vibrationdata.com/flamingo.mp3>



Umbrella Cockatoo - *Cacatua Alba*

Umbrellas Cockatoos are native to Indonesia, in the Moluccan Islands of Batjan, Halmahera, Obi, Ternate, and Tidor.

They live in small groups or flocks, in forests and around farmland. Their diet consist of berries, fruits and nuts from the top of tall trees.

Their numbers have been reduced due to decline in habitat and trapping, but they are not yet endangered.

Their size is 40-45 cm (15-18 inch).

Umbrella Cockatoos usually lay two eggs witch are incubated by both parents for twenty-nine days.

They are a popular pet but require a great deal of attention.

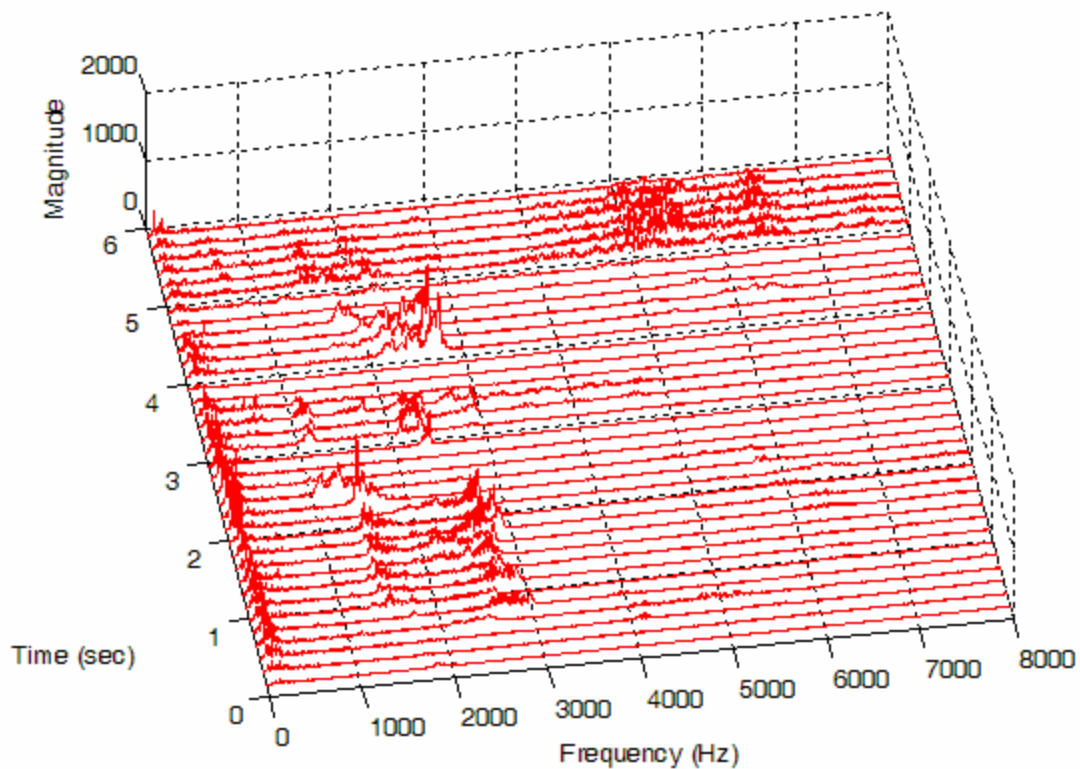


Figure 4. Sound Pressure Waterfall Plot, Umbrella Cockatoo

The Cockatoo's vocalization is represented as a waterfall plot in Figure 4 because it consists of four distinct parts. The four segments are summarized in the following table.

Segment	Sound Description	Time (sec)	Frequencies of Dominant Peaks (Hz)
1	Long Whistle	0 to 3	1450 and 2700
2	"Hi Sam"	3 to 4	1110, 1180, 2090, 2210 and 2920
3	Short Whistle	4 to 5	2620 and 2730
4	Staccato Chattering	5 to 6	650, 1480, 2040, 5081, 5320, 5550, 6440 and 7590

Note that the spectral peaks below 200 Hz are due to background noise.

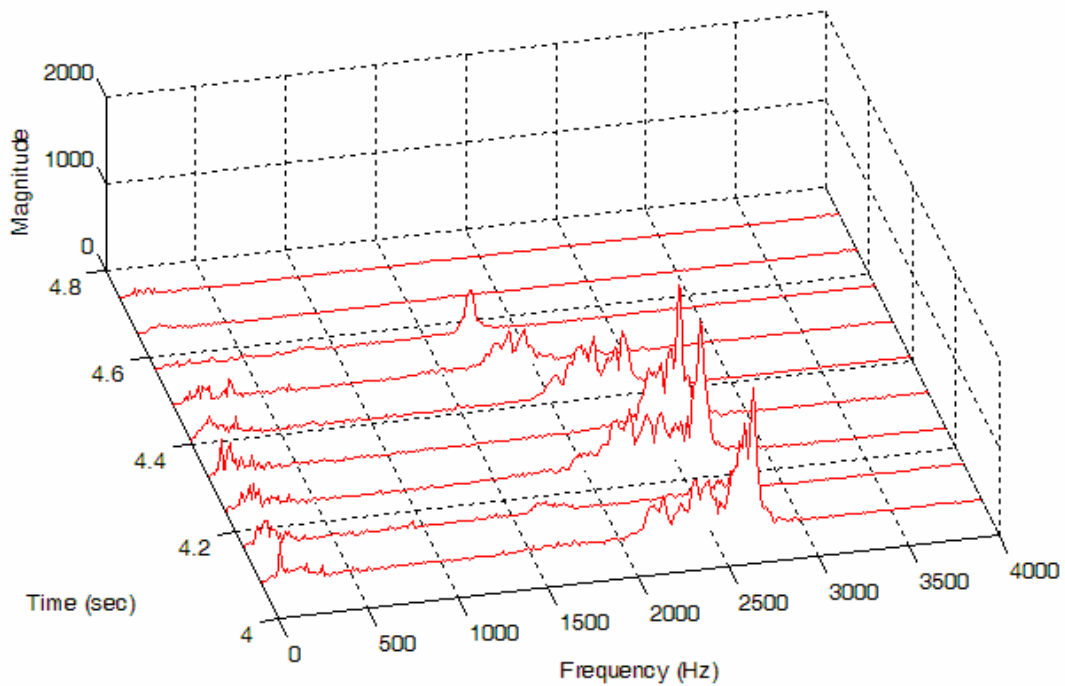


Figure 5. Sound Pressure Waterfall Plot, Umbrella Cockatoo, Short Whistle

Both the long and short whistles have pitch modulation, with a trailing decrease in frequency. The spectral curves in Figure 5 show how the peaks near 2700 Hz give way to lower frequency spectra, ending with a peak at 1750 Hz near the 4.6 second mark.

The sound file, including all four segments, is posted at:

<http://www.vibrationdata.com/cockatoo.mp3>