

# TSI (Teething ring Sound Instrument): A Design of the Sound Instrument for the Baby

## PURPOSE

- Children from birth to 3 years old in the sensory-motor stage, develop the faculty of recognition by interacting with the outside world. By playing with the TSI, various structures such as musical concept and causality are sensuously acquired. Use of the TSI also stimulates the development of sense organ and faculty of perception.
- In order to enable the baby to musical experience, the sucking motion from prenatal period, is utilized.

## BACKGROUND

The instruments foster the sense organ of the child by sounding

### ▶ Sound instruments

the Japanese traditional sound instrument, GaraGara, Poppen, are usually recognized as both musical instruments and toys. only a single sound can be enjoyed in elementary operation such as shaking or sucking

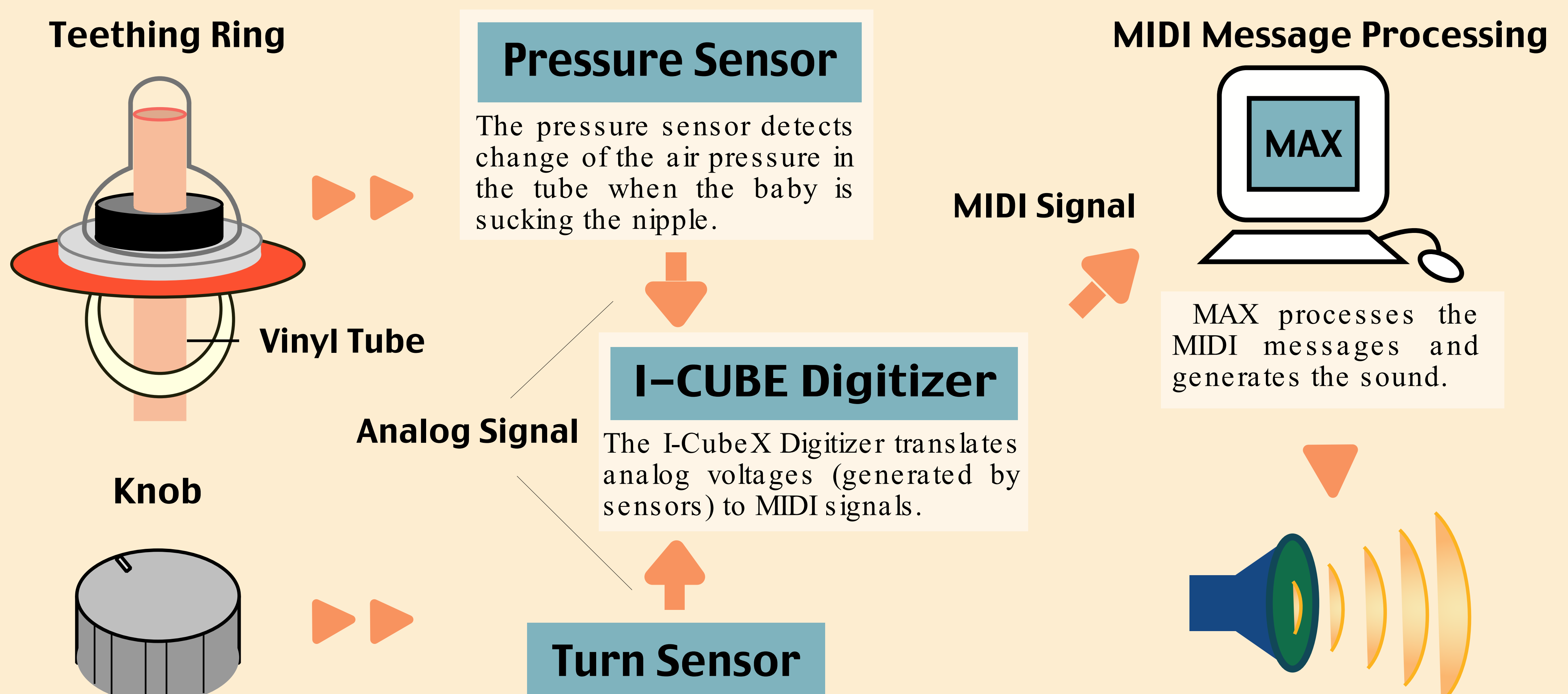
### ▶ Musical instruments

the musical expression of melodies, rhythm, and harmony, training is necessary, and the difficulty accompanies the musical performance for the baby with the immature knowledge or ability to play.

The TSI is designed as a new sound instrument for baby. It stimulates baby's faculty of perception, and brings musical experience to baby with underdeveloped sensory motor-control functions.

## SYSTEM

The TSI system consists of a teething ring, a knob, an I-CubeX Digitizer and a computer running MAX. By dividing the operation into the teething ring and the knob, the TSI encourages interaction between the parent and baby .



# APPLICATIONS

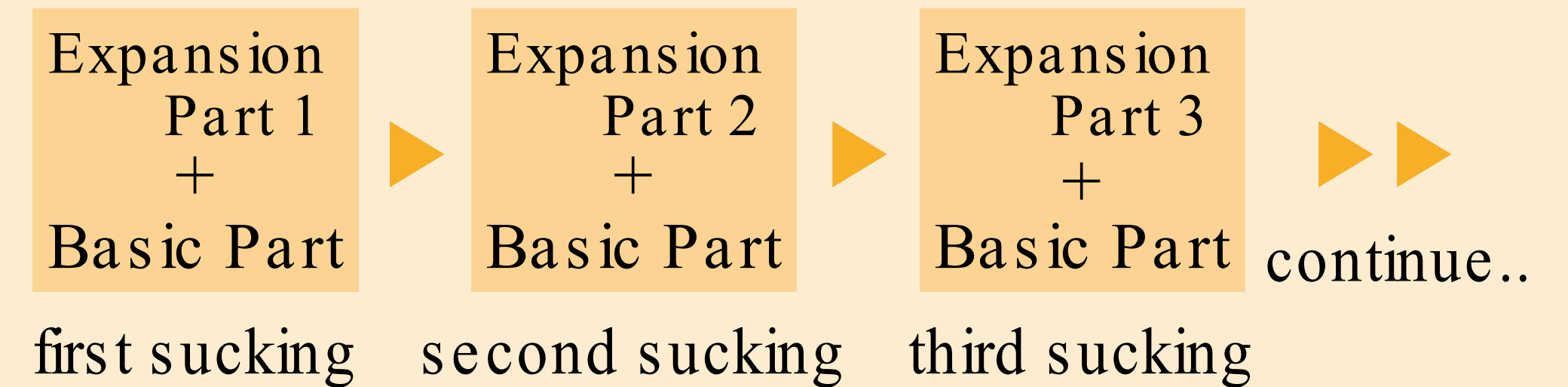
## HARMONIC

The target age is over 0-year-old.

Expansion Part 1  
Expansion Part 2  
Expansion Part 3  
Expansion Part 4  
Expansion Part 5  
Basic Part

This application consists of a "basic part" composed simple 3 note C-major chord and an "expansion part1~5" changes with every suck. Both pitches correspond to the change of the sucking pressure. When the teething ring is strongly sucked, a higher note rings.

### EXAMPLE



The target age is over 1-year-old.

## MELODIC

This application is when the baby begins to suck, a melody with the simple rhythm begins to sound and stops when the sucking motion is finished.

### MELODIC 1

Part 1  
Part 2  
Part 3

**MELODIC 1** consists of 3 parts. All parts ring when baby begin sucking.

### MELODIC 2

suc king star t → contin ue suc king

Part 1  
Part 2  
Part 3  
Part 4

**MELODIC 2** consists of 4 parts. First, part1 and part 2 ring and part 3 join afterward part 4. When all part ring, this melody is perfected.

## RHYTHMIC

The target age is over 1-year-old.

This application consists of 5 rhythm pattern. When the baby begins to suck, a rhythm pattern assigned by knob begins to sound and stops when the sucking motion is finished.

Tempo and level of all rhythm pattern correspond to the change of the sucking pressure. When the teething ring is strongly sucked, tempo becomes faster and louder notes ring.

patter n 1

patter n 2

patter n 3

patter n 4

patter n 5

Switch 5 rh ythm patter n by turning knob .

**Q** Why did the TSI design teething ring form ?

**A** The TSI is designed to bring music experience to baby with the movement of the baby's reflex sucking motion. Sucking motion urges development of a jaw, gives a stimulus to a brain and makes the foundation of development of language.

**Q** Why is an interaction important for baby ?

**A** Baby change undifferentiated structure of concepts (things, space, numbers, causality, etc.) to more differentiated and organized cognitive structure. By doing it baby accomplishes developmental change.

**Q** How was the target age of *HARMONIC* decided ?

**A** The change of the notes can be enjoyed even by the reflexive sucking motion. Therefore, this is ideal for use from the baby's initial stage of growth.

**Q** How was the target age of *MELODIC & RHYTHMIC* decided ?

**A** These application, are intended for the young, somewhat cultured child accustomed to a certain degree to Western tonal music. Over 1-year-old is the age to acquire the tonality schema so that the perception of a rhythm or a melody can be performed pertinently.

**Q** How about the future of the TSI ?

**A** We wish following things.

>The TSI helps baby's development of sense organs and faculty of perception.

>Babies of all over the world use the TSI.

>By playing with the TSI, babies enjoy the interaction with their parents, particularly father.