

V. Brinda and Dr.M.A. Bhageerathi (May 2022). A study on Design and Development of Harmonium and Its Types

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**A study on Design and Development of Harmonium and Its Types**

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### ABSTRACT

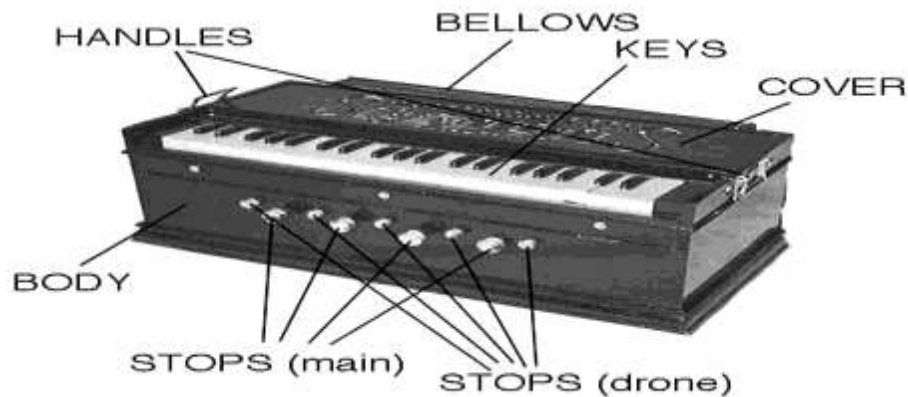
The sound a harmonium brings is unlike anything else in existence. When you hear it you feel you are being transported to another place and time. The keyboard comprises black and white keys. The white keys are for pure notes and the blacks ones are for soft ones. However, this is not applicable if the scale is changed. The main purpose of this paper to know basic components of harmonium and types of harmonium, history of harmonium those who want to learn in the beginning stage they can utilize this article and it helps to understand the famous players in India. The ever-changing music world has gone through some great inventions in the past that have changed the entire approach to different music techniques, and harmonium is one of them. Also known as reed organ, melodeon, or pump organ, harmonium history is commonly traced back to Indian origin, which is not true. Though most music historians associate harmonium with Indian origin, but this music tool belonged to Europe. It was used in the churches in Europe during the middle ages.

**KEY WORDS:** choice of harmonium, types of **Harmonium, famous harmonium players in India**

### Introduction

**The harmonium is a keyboard instrument with notes produced by air driven by hand or foot through metal reeds. It is a type of pump organ and is related to reed organs and melodeons. It is one of the most popular musical instruments in many parts of South Asia, especially in India.** Different components work together to produce sound or music from a harmonium. The main components are:

- Bellows: Permits airflow into the organ
- Keyboard: Takes input from musician to play different notes
- Main Stops: Directs airflow
- Drone Stops: (Optional) Maintain consistency of sound of a single note
- Scale Changer: Adjust key position and pitch



### History of harmonium

The origins of the harmonium may date back to mouth organs from Asia, which probably inspired the appearance of the free-reed organ sometime around 1770. The first patented harmonium was invented by a Frenchman, Alexandre Debain in 1842. It was pumped by two foot pedals and became popular in churches that could not afford organs and in private homes as well. Many different versions, both elaborate and simple, began to be popular through the nineteenth century. Harmoniums remained popular in homes into the twentieth century, when the electronic organ displaced them. Despite being a popular instrument widely used in India, the harmonium did not originate in India. But who invented the harmonium? This pump organ was patented in Paris by a French inventor named Alexandre Debain in 1842. However, the prototype of the harmonium can be traced to Christian Gottlieb Kratzenstein, a doctor, physicist, and engineer. He was very fascinated with musical instruments, especially the Chinese reed organ called a *sheng*, and the physics behind it.

In 1779, he won a prize awarded by the Academy of Science at St. Petersburg for an essay. The essay was about how instruments produce vowel sounds, and he compared it to the “human voice” of the organs. Along with the essay, he made an organ fitted with free reeds.



**Foot-pumped harmonium Orica 1980**

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**Basic choices are:**

**1) Portable Harmoniums**

Portable harmoniums fold up into a suitcase-like box  $\frac{1}{2}$  to  $\frac{2}{3}$  of their regular height. There is a handle in front so they can be carried with one hand like a suitcase. If you are traveling around a lot with your instrument this is an attractive option, since it's lot easier to carry a harmonium this way than by the two side handles of a regular harmonium. If you're not, then it's just another moving part. In general, you sacrifice no sound by getting a portable.

**2) Regular vs. Scale Change**

Scale change harmoniums have a mechanism that allows you to slide the keyboard up to four half steps left or right. So if you are used to always playing in B flat, and the song is in C, you just shift the keyboard up two half steps. This is not a feature you need if you can play easily in different keys, or if you will always be playing in the same key. On the other hand, some proficient keyboard players have told us they prefer to always play from B flat because of the way their hand sits on the keys in that position (harmonium keys being smaller than piano keys). Keep in mind that what most makers consider their best instrument is a three reed scale change model.

**3) Double Reed vs. Triple Reed**

Most harmoniums have two or three sets of reeds per note. See below for how these reeds can be voiced. Double reed instruments can be great, and all you need. A triple reed instrument will give you a fuller sound and more flexibility.

**4) Full Size or Smaller**

Most makers make some models that are slightly smaller and lighter than what is considered a normal size instrument. These are usually double reed, non scale-change harmoniums. Here you can see an example of this style. These instruments often suffice for one voice.



## Stops

Looking at the harmonium from the front there is a row of knobs, usually some larger than others. The large knobs are the stops. They open and close the air flow to the air chambers inside. (There is often some redundancy – a harmonium with 2 air chambers can have 4 stops) If you have a harmonium with 2 sets of reeds, and thus 2 air chambers, you can set your harmonium to play only one set of reeds if you desire some difference of sound texture. This is one reason some people prefer a triple reed harmonium. In reality, though, most people just keep all the stops out all the time.

## Drones

The smaller knobs in front are the drones. They play a fixed note drone when pulled out. Most harmoniums come with drones that are the black keys on the keyboard (C#, D#, F#, G#, A# or some combination thereof) We can customize the drones for you, for a small additional cost.

## Reeds

Inside each harmonium are two, three or four air chambers corresponding to the number of banks of reeds. Each air chamber isolates a bank or reeds. These banks of reeds are usually set in different voices or timbres, so when you play one note you are getting two voices on a two bank, and three voices on a three bank. With a coupler engaged the number of voices will double as the key an octave above (or below depending) is depressed automatically by the coupler mechanism. Generally, reeds come in 3 different voicings covering 3 different octaves: bass (B), male (M), and female (F). Bass reeds are the lowest, male reeds are an octave higher, and female reeds one more octave higher. A double reed instrument will usually be voiced B/M or M/F . A triple reed instrument can be voiced B/M/M, B/M/F or M/M/F. Different voicings produce harmoniums with different timbres and sustain. Bass reed requires more air, so a B/M/F instrument will have less sustained than a M/M/F

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instrument, but will be louder. Harmonium reeds are made of either copper or brass. Brass reeds have a louder, more penetrating sound. They are popular for kirtans and bhajans where often a number of people are singing vigorously. The brass sound helps penetrate these voices. Copper reeds tend to a warmer, softer sound and are often used in more expensive harmoniums geared towards ghazals and classical performances.

### Bellows

The bellows pump the air into the instrument. There is also an internal bellows which pushes the air up to sound the reeds. Bellows can be 2-fold, 3 fold, or 7-fold. Two and three fold bellows are attached at the bottom. Seven fold bellows can be attached on either side to allow for left or right hand pumping. The number of folds, by itself, does not determine the quality of the instrument. However, most fancy harmoniums have 7-fold bellows. Some people say that the 7-fold bellows allows for more control. Some bellows have a spring, which pushes them open after you have pumped in.

### Octave Coupler

This is a feature which adds an octave to the note you are playing. A mechanical key plays the note an octave up (occasionally the octave down) from the one you are playing. This is a nice feature which can add volume to your harmonium. It toggles on and off.

### Types of Harmonium

1. **Foldable Harmonium and Standing Models:** Folding harmonium is preferred because of the portability and easy to use features. But the standing harmonium comes with a stand and is perfect to perform while standing
2. **Compact Harmonium:** Harmonium is very small and easy to carry case. It is very compact and smaller than the standard harmonium but does not compromise in sound quality.
3. **Harmonium with Coupler:** This produces a melodious sound that includes the next lower octave to give a powerful sound together.
4. **22-microtone Harmonium:** Developed by VidyadharOke in which 22 microtones, very important to Indian classical music, can be played. It can be used for any raga.

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5. **Samvadini Harmonium:** The Samvadini harmonium was then advanced with a harp-like box which helped to render cut notes and increased speed.
6. **Scale Changer Harmonium:** This harmonium model enables a complete sound pattern and is very melodious with a full sound pattern. 42 keys and 5 adjustable drones make it stand out among all. You are more likely to use a coupler in this as well.

### **Standard or Fold-up**

- Harmonium – Standard model.
- Harmonium – Fold-up model.
- Harmonium – Suitcase model.
- Harmonium – Coupler Knob.
- Harmonium – Coupler Switch.
- Harmonium – Stops and Drones.
- Harmonium – Belows.
- Harmonium – Keyboard.

### **Standard or Fold-up**



### **Harmonium – Standard model**

Standard harmonium models usually have two handles on their sides. They are the classical model and probably most common world-wide.



### **Harmonium – Fold-up model**



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Some harmoniums fold up, which is a feature that makes the instrument easier to transport. There are two basic types of folding models, one type folds up into itself and the bellows board covers the top. An example is made by the Bina brand. These are a bit tricky to fold and unfold, but if you get used to them and you are traveling with your instrument, might be well worth it to have. This is the style of harmonium that kirtan singers such as Krishnadas and Jai Utthal use.



**Harmonium – Suitcase model**

The other style folds into itself and a separate lid cover the whole instrument. It is called a suitcase model. These are much easier to fold and unfold, and the detachable cover can be used as a stand to raise the instrument to a better playing height. However, they are often much pricier as they are most often found on harmoniums that are constructed out of heavier wood. And even though they are easier to fold up, they are heavier to carry if they are made with heavier wood.

**Coupler**



**Scale Changer**



### **Harmonium – Scale Changer**

Some harmoniums have what is called a key changer, or scale changer. This is a complex mechanism that allows you to shift the keyboard to the left or the right. This is a feature that many harmonium players will never use. It is only helpful if you have learned a chant or song in one key and you need to play it in a different one and don't know how, or don't have the time, to learn to play it in another key. Scale changers make a harmonium much more delicate for shipping or transporting on an airplane, so you probably don't want one if you plan on traveling with it or shipping it often. A scale changer adds to the price of a harmonium and it is important to consider whether you would even use it.

### **The famous Harmonium players in India**

R. K. Bijapure is called the father of Harmonium in India. He was famous for his harmonium playing in the Hindustani classical music tradition. He has achieved so many awards across the country, such as 'Karnataka Kala Tilak' by [Sangeet](#) Nritya Academy, 'Rajya Sangeet Vidvan' in Mysore, 'Mahamahopadhyay' by Akhil Bharatiya Gandharva Mahavidyalaya Mandal so on. Krishna Das is another famous Harmonium player of India. He has 14 albums to his name. Krishna Das originally visited India in 1970, where he trained under Guru Nee Karoli Baba and later Bhakti Yoga. Das has recorded several renditions of the religious hymn Hanuman Chalisa.

### **Conclusion**

The Indian harmonium is not the heavy and big pedal instrument of Europe, but has been reduced to a small portable box, which is approximately two feet by one foot and about nine to ten inches high, the back of which opens to act as the bellows. On the top is a keyboard like that of a piano, but with a much smaller range, usually of about three octaves. This is played by one hand, while the other works the bellows. It consists of a set of free reeds, whose length determines their pitch, activated by a wind supply from hand-operated compression bellows and controlled by a keyboard. The reed is responsible for the tone and pitch, whereas the air bellows, with all its attached valvular mechanisms, produce and control the passing air, and are responsible for the volume of the instrument.

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