

# **Chapter 2**

## **Classification of the Musical Instruments, Working Principle of String Instruments, Sizes, and Constructional Details of Sitar**

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#### 2.1 Classification of the Musical Instruments.

**T**he oldest detailed exposition of musical theory that has survived the ravages of time is found in the treatise entitled Natya Shastra<sup>1</sup>, written by Bharat.

In Chapter 28 to 33 he has given the description of classification of musical instruments. He has classified the instruments into **Tat, Sushir, Avnadya**, and **Ghan**.

The fifth category of electronic instruments, we can add looking at the development which has taken place in this field.

Depending upon the way the sound is produced it can be classified in today's age as follows.

#### String Instruments (Tantu Vadya - तंतू वाद्य)

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• <sup>1</sup> Acharya Brihaspati, Natyasastra chapter 28 page 67

**Percussion Instruments (Charma Vadya - चर्म वाध)**

**Wind Instruments (Sushir Vadhya - सुषिर वाध)**

**Solid Instruments (Ghan Vadhya - घन वाध)**

**Electronic Instruments (इलेक्ट्रॉनिक वाध)**

### **2.1.1 String Instruments (Tantu Vadya- तंतू वाध)**

The string instruments are the instruments which produce the sound because of the vibration of the string.

The origin of the string instrument is considered from the bow and arrow.

Whenever bow is pulled a sound is produced, which led to the development of Ektara, Tuntune and then to Tanpura.

They can be classified in to two categories.

a) **Instrument Providing Drone:** This instrument provides only the drone.

E.g. Tanpura. In tanpura a definite drone is produced when it is plucked.

This drone is used as a reference for singing or playing the music. But a melody can not be produced with help of such kind of instruments.

b) **Instrument Providing Melodious Music**

This type of the instruments are used to produce melodious music. e. g.

Sitar, Guitar, Rabab, Israj, Banjo, Sarangi, Dilruba, Violin etc.

The string instruments can be mainly classified into following two categories.

- **Plucked String Instruments (Tat - तत्)**

In this type of the instrument the sound is produced by plucking the string. As per example in Sitar the sound is produced by plucking the string with the help of mizrab.

The other examples of plucked string instruments are Guitar, Tanpura, Surbahar, Banjo, Veena, ektara etc.



**Fig. 2.1 String Instrument Rabab**

- **Bowed String Instruments (Vitat - वितत्)**

Here the string produces the sound when the string is bowed, or rubbed.

E.g. in Violin, Dilruba and other such kind of instrument, the **Bow**, or **Gaj** or something like that is rubbed on the string and the sound is produced because of the friction which is sustainable.

- **Struck String Instruments**

When the string is struck by something the string produces the sound. Santoor, Piano etc. are such kind of the instruments. They produce the sound when something is struck on their string.



**Fig. 2.2 String Instruments**

### **2.1.2 Percussion Instruments (Charma Vadya - चर्म वाद्य)**

These instruments are made up of the membrane and when stroke is made on it they produce the sound. Tabla, Dhol, Pakhawaj, Mridang, Bongo, Kongo etc. are the examples of such kind. Initially these instruments were used in accompanying vocal or instrumental music but now they are being played solely also.



**Fig. 2.3 Percussion Instruments**



### 2.1.3 Wind Instruments (Sushir Vadhya - सुषिर वाद्य)

In such kind of the instruments, the sound is produced because of the vibration of the air columns.

Flute, Harmonium Shankh, Trumpet, Shehenai, Mouth organ, Saxophone, Clarinet are the examples of such kind of instruments.



Fig 2.4 Wind Instruments

#### 2.1.4 Solid Instruments (Ghan Vadhya- घन वाद्य)

Here the sound is produced by hitting (Chot) something.

E.g. Jaltarang, Manjira, Kartal, Piano, Kashthtarang, Santoor etc.



**Santoor**



**Jaltarang**



**Bell**



**Piano**



**Manjira**



**Kartal**

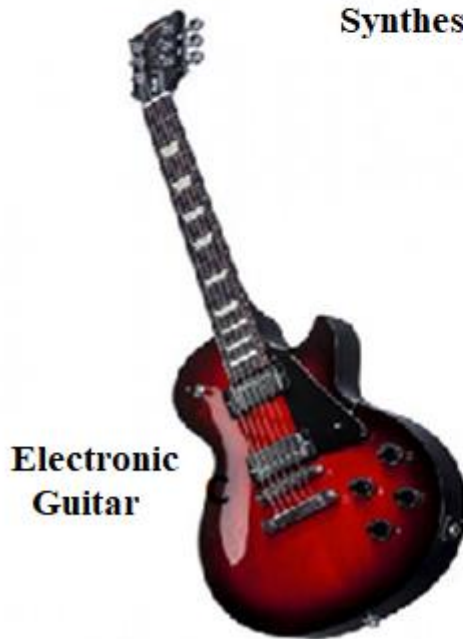
**Fig 2.5 Solid Instruments**

### 2.1.5 Electronic Instruments:

As the time passed, development in the field of electronics took place, and affected the instruments. This type of instruments enhance the capability of producing the sound with easy style of playing, amplification, storing, reproducing, processing etc. Synthesiser, Octopad, Electronic Guitar, Electric Sitar, Taalmala, Electronic tanpura, Zitar are the examples of the electronic instruments.



**Synthesiser**



**Electronic  
Guitar**



**Octopad**

**Fig. 2.6 Electronic Instruments**

## 2.2 Working Principle of Plucked String Instrument Tanpura<sup>2</sup>

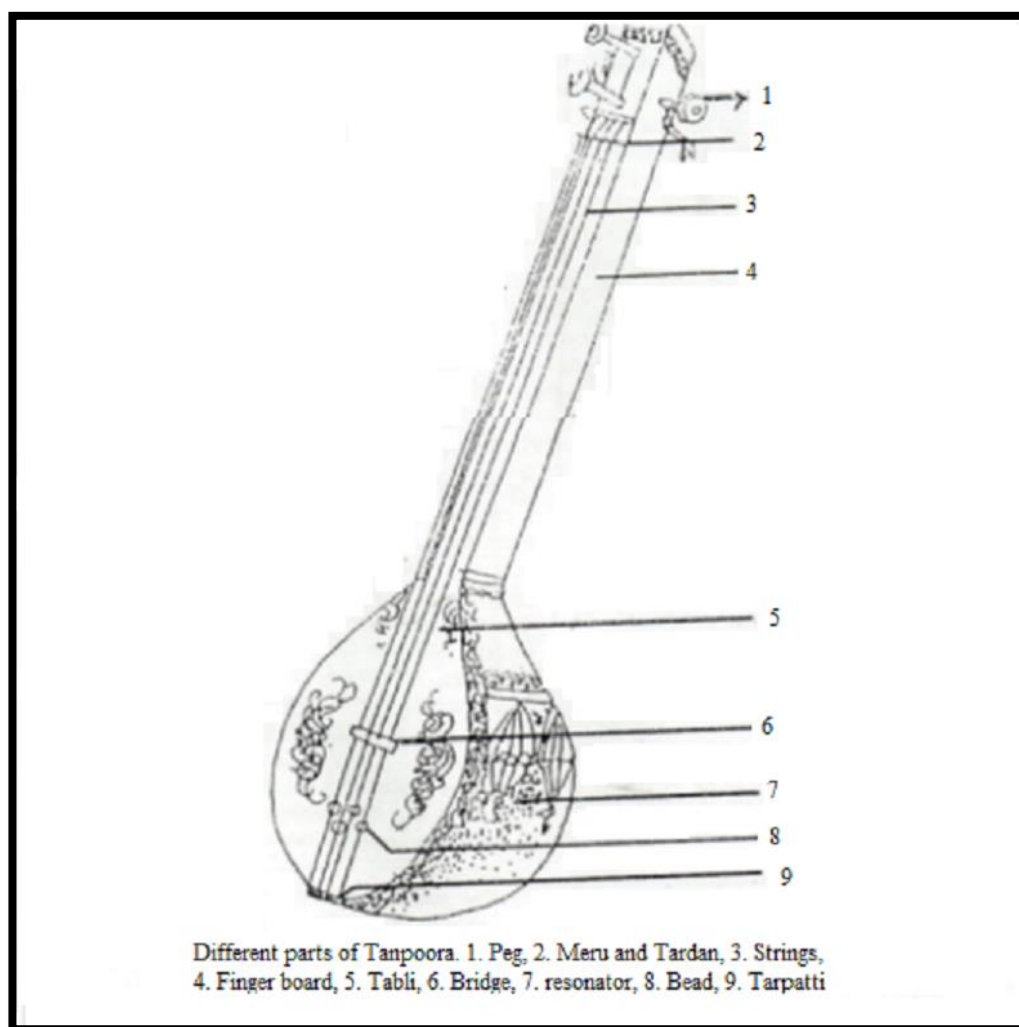
When the string of the bow is plucked, it produces the sound. So we can say that origin of the string instruments may be inspired from the bow and arrow. From above phenomena initially 'Ektara' and 'Tutune' were made. Amongst string instruments there are two categories:

- The instruments used to provide drone, e.g. Tanpura.
- The instruments used to produce Melody, e.g. Sitar, Guitar, Surbahar

The working principle of plucked string instrument can be studied by making a study of Tanpura, which is having the same working functions of Sitar and Surbahar. Construction wise Sitar is same as the Tanpura except the frets. So for simplicity we will study the working principle of Sitar by learning working principle of Tanpura.

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<sup>2</sup> Physics Education July-Sept 2004 Varsha A. Joshi, Page 83



**Fig. 2.7 Constructional Components of Tanpura<sup>3</sup>**

### **2.2.1 Working of Tanpura**

Tanpura is as shown in above figure.

The bigger part of it is known as the resonator which is made of the fruit '**Pumpkin**'. This fruit is available near Pandharpur in Maharashtra. Once it is ripen, it is allowed to dry up and hanged on the smoky fire and pulp is removed. It is then seasoned for years. Then it is cut in required shape and carving is also made on it. Then on the cut part 'Toon' wood is placed with the specific size and suitable shape called as 'Tabli'

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<sup>3</sup> Physics Education July-Sept 2004 Varsha A. Joshi, Page 84

and connected with vertical portion called as 'Dand'. Joint between dand and Tabli is Neck.

The bridge is placed on the Tabli made up of ivory, deer horn, or fibre. Nowadays ivory is banned by government of India so now mostly fibre or camel bone is used.

Tanpura is made up of the four strings. One end is connected to Tarpatti passing bid (Manka) then passing on the bridge, 'Taardan' and at the other end it is tied on the pegs.

First string is tuned to 'Pa'. Frequency of 'Lower Pa'  $\ll$  frequency of middle 'Sa'

Now if frequency is lower, then length has to be higher. But there is a limitation of the length. So thickness is increased. (As tension  $T$  cannot be lowered)

Here  $L$ = vibrating length.

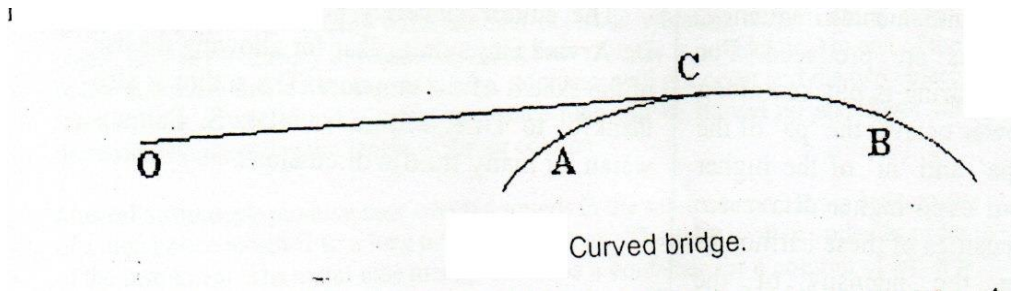
$T$ = Tension applied.

$m \propto$  Thickness of the metal

Second and third strings are tuned to 'Sa'. Since both strings are on the same frequency, when one is plucked the other string will pick up the vibrations, and it also starts vibrating.

The fourth string is tuned to 'Sa' (Kharaj)

We can not change the length, we can not change the tension, and also can not change the thickness. So alloy like brass is used appearing yellow.



**Fig.2.8 Curved Bridge<sup>4</sup>**

As per figure in stationary condition of the string is on  $\overline{OC}$ .

After plucking it is on  $\overline{OA}$ , and then touches to B also. Therefore length of the string changes and hence as per equation frequency also changes. Therefore notes of different frequencies are produced.

Here note that whenever string vibrates, it produces fundamental frequency, over tones, and harmonics.

Intensity of harmonics is  $\ll$  fundamental frequency. Algebraic sum of all above frequencies produce dome of Tanpura very rich. If Juari is of good quality, complex interaction of harmonics creates rich tone of the Tanpura. String also sustains vibrations for a longer period allowing harmonics to develop, and gives tremendous effect to tone and dome of Tanpura.

<sup>4</sup> Physics Education July-Sept 2004 Varsha A. Joshi, Page 85

### 2.2.2 The Features which characterise the String Instruments are<sup>5</sup>:

- **String**
- **Sound Box**
- **Means by which Strings are vibrated.**

#### 2.2.2.1 String

The musical note produced by string instrument is higher or lower depends on the rate at which it vibrates.

The length between Taardan and the point where string touches the bridge is called the **Effective Vibrating Length** defining the generated frequency.

Produced frequency is defined as,

$$f=n= (1/2l) \times \sqrt{T/m}$$

Where, **n** = frequency in Hz

**L** = effective length of the string in cm.

**T** = Tension

**m** = mass / unit

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• <sup>5</sup> The acoustics of the musical instruments Wilmer T. Bartholomew Prentice hall Inc.,  
Sixth edition, 1952



### **Vibrating frequency depends on**

- **Length of the string**
- **Thickness of the string**
- **Tension on the string.**

#### **2.2.2.1.1 Length of the String**

If two strings are taken, one of them is half in length and struck together for same period, shorter will produce note of twice the frequency as that of the first one. Similarly if third string is taken of one third length of first one, it will vibrate at thrice the frequency of first one and so on. Thus the frequency of the vibrating cord depends on the effective length of the string.

#### **2.2.2.1.2 Thickness of the String**

If two strings are taken one of them having double the thickness of the other, and if they are plucked together, then thin string will vibrate twice rapidly than the first one, producing double the frequency of that of the thick one. Similarly if string is taken of one third thickness of first one and set to vibrate it will produce three times the frequency of the first one.

#### **2.2.2.1.3 Weight**

This depends on the type of material used in the string. If two strings are of the same length and thickness and set to vibrate, produces different notes if they are made of the different metal, as their weights are different. Heavier will produce the **sound with lower frequency and deeper note. Heavier the string lower is the pitch.**

#### **2.2.2.1.4 Tension on the String**

A sound is produced by striking a metal string which is having sufficient tension. A sound is not produced if sufficient tension is not created in the string. If two strings are taken, one of them supporting 4 Lb and other with 1 Lb and if plucked, the 4 Lb string will vibrate twice as that of the other. Means more the weight, more is the tension and higher is the frequency produced.

#### **2.2.2.2 Sound Box**

The sound produced by the string instruments is very low and weak to be heard at a distance. If the sound produced need to carry higher power, it should be connected with the sound box.

Most civilized races used closed type of the sound box. The waves are communicated to concentrate and then they make their way out through the opening of the sound board. So sound board is considered as the central feature in the organism of all string instruments.

The volume and timbre of the instrument depends very much on the material, size, shape, and the way it is connected to the string.

In the Hindu temple the dome is constructed on the same principle, under which people recite the prayers to have louder concentrated voice.

### 2.2.2.3 Means by which Strings are Vibrated

Character of the tone is also governed by the means where string is set in vibration. If a string is plucked by finger or hammer, short sharp sound is produced. But if they are stroked by horse hair bow or wheel rubbed with resin, a sustainable sound is produced.

Depending on above parameters if we make vibration in all above,

For required frequency say 240 Hz, Length  $L \cong 1$  metre.

So in that case length of Dand will be 1.5 m.

Here we can see that frequency is inversely proportional to the length of the string.

Voice of female carries higher frequency than a man.

**Hence Male Tanpura is longer than Female tanpura.**

### 2.3 Complete Vadya (Sampurna Vadya - संपूर्णवाध)

The instrument which can produce the musical sound in the range of minimum three and half octave, ability to mimic various features of the human voice, and capacity of producing Gamak, Jamjama, Mind (Slur up to 5<sup>th</sup> degree) etc. is called a complete instrument.

We can see that even Harmonium, Jaltarang etc. are technically not complete instruments, they are used in classical music, with limited use.

The instrument which produces only 1 swara (note) like Damru, Kartal, Manjira, they are called **Undeveloped (अविकसित)** or **Incomplete Instruments (अपूर्ण)**, and are not useful for classical music. They are used in folk and light music.

The instrument which is producing more than one musical notes, but does not fulfil the requirement of a complete instrument is called **Semi Complete or Ardha Viksit Vadya (अर्धविकसित वाध)**

Dhol, Nagara, Drum, Jaltarang, Kashthatarang, etc. are the example of this type.

**It can be seen that Sitar is fulfilling all the requirement of becoming Complete Instrument and that's how it differs from the other Indian and Western string instruments.**

## 2.4 Sizes of Concurrent Sitar

Sitar is made from the wood of Teak or Toon, which is strong, light in the weight and deformation is less. Size of the Sitar also affects the timbre quality of the Sitar.

Depending on size it is called small, medium or big Sitar. The various physical dimensions are as follows.

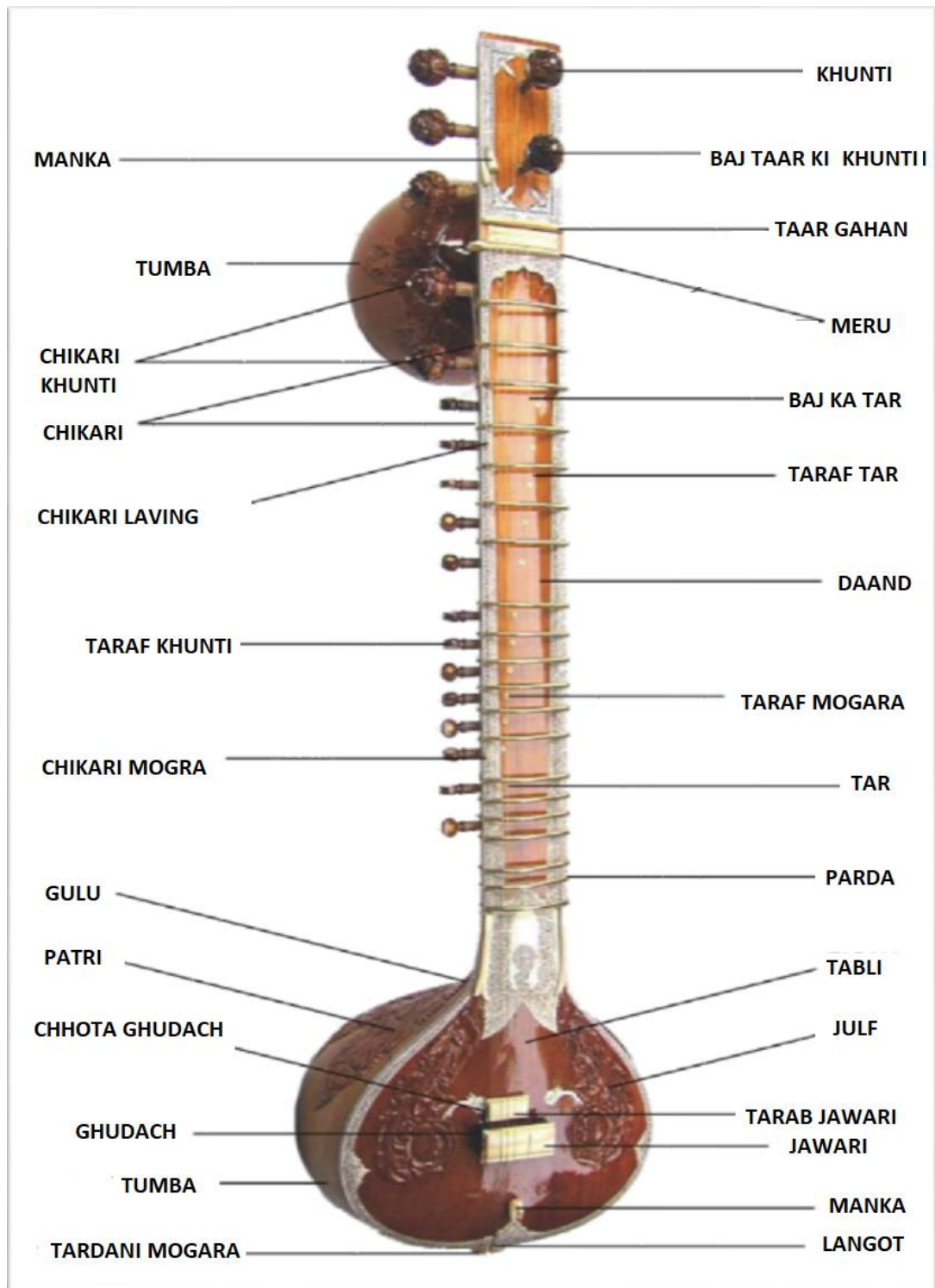
	Size of Sitar	Length of Dand (inch)	Width of dand (inch)	Tabli (inch)
1	<b>Small Sitar</b> <b>( Chhota)</b>	36"	3 "	10 "
2	<b>Medium</b> <b>(Manzola)</b>	42"	3 1/2 "	12"
3	<b>Big Sitar</b> <b>(Bada)</b>	54"	4"	15"

**Fig. 2.9 Table of Sizes of Sitar**

Sitar with larger length gives more sustaining sound, while with less length gives least sustaining sound .The Sitar with larger length is also known as **Surbahar**. We can consider Surbahar as a bass Sitar.

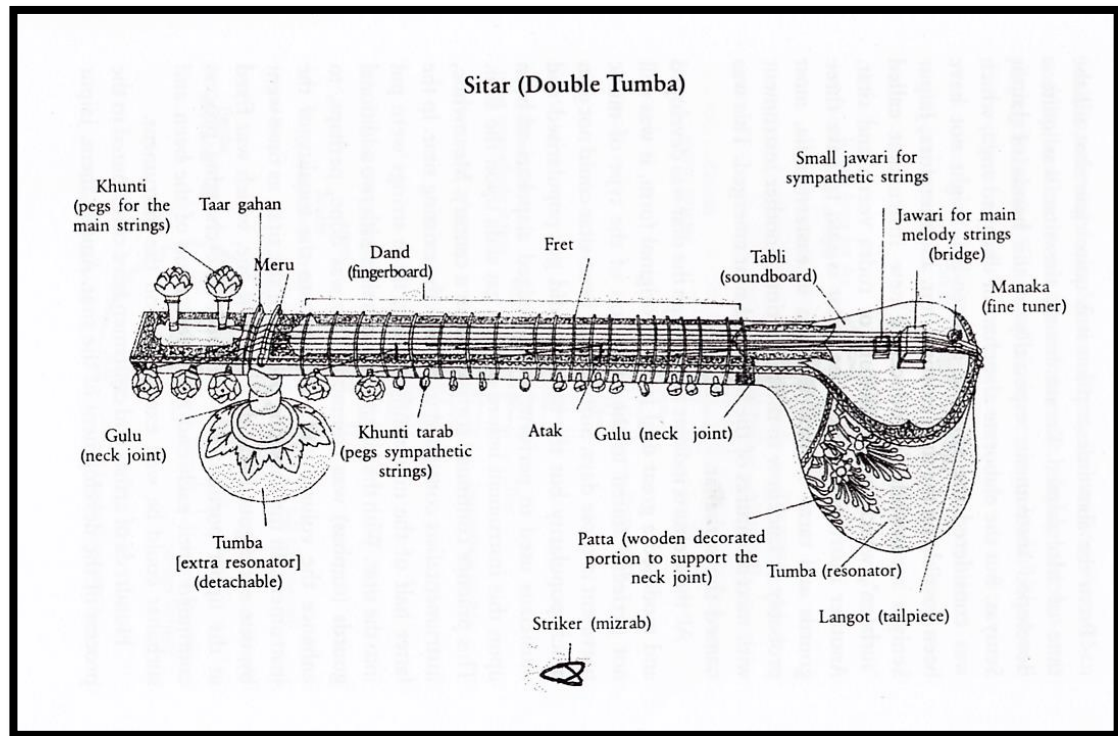
The Sitar has existed in various shapes and sizes in the past, as has been explained previously. Different number of frets and strings were in use simultaneously. Although this situation still persists, the Sitar used for concerts and for learners has become fairly standardized. An artist can customize his Sitar to some extent to suit his particular style of playing or he can adjust the timbre to his taste, but these are usually minor adjustments, such as changing the curvature of the bridge. The instrument is specifically termed as Chal Thaata or Tarafdaar Sitar, because it incorporates a set of sympathetically resonating wires (Tarab) under the frets and because the frets need to be repositioned for certain scale types.

## 2.5 Constructional Components of the Sitar



**Fig. 2.10 Anatomy of a Sitar with one Tumba<sup>6</sup>**

<sup>6</sup> [https://upload.wikimedia.org/wikipedia/commons/7/70/Sitar\\_parts.jpg](https://upload.wikimedia.org/wikipedia/commons/7/70/Sitar_parts.jpg)



**Fig. 2.11 Sitar with Double Tumba<sup>7</sup>**

<sup>7</sup> <https://www.india-instruments.com/encyclopedia-Sitar.html>



Below are the Constructional Components of the Sitar

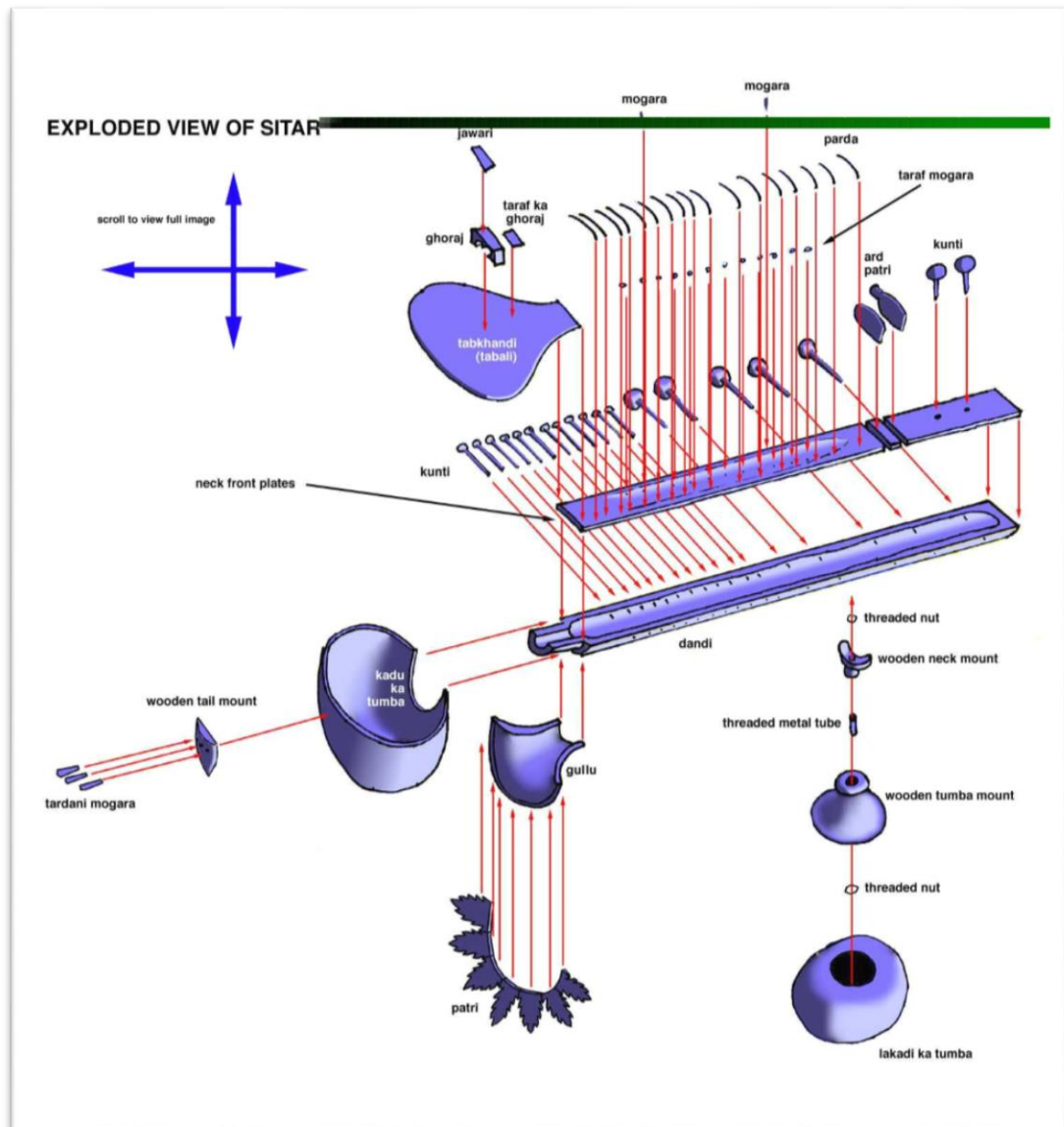


Fig.2.12 Constructional Components of the Sitar<sup>8</sup>

<sup>8</sup> [https://chandrakantha.com/articles/indian\\_music/Sitar/media/exploded\\_view.jpg](https://chandrakantha.com/articles/indian_music/Sitar/media/exploded_view.jpg) 4.03.18

### 2.5.1 Tumba (तुंबा) / Resonator / Gourd



**Fig. 2.13 Tumba**

At a first glance the biggest belly which is seen in Sitar is the Tumba also known as the **Resonator** in the English. It is made of pumpkin or some other resonant wood. The gourd is emptied from inside so that the sound gives the proper effect when the strings are pressed. The gourd is the main resonating chamber of the instrument.

In the case of Sitar there is not a great deal of air movement due to the vibrator alone and the sound produced is weak. This can be improved by coupling to the primary source of the sound a body which will resonate in sympathy and hence, by causing more air vibrations, produce an increased sound output.

Taking two instruments using strings as the vibrator, the Sitar and the piano we can see in a simplified manner how the resonators behave.

With the Sitar the strings are stretched across the bridge. When they vibrate they cause the air inside the body and the body itself to vibrate.

With the piano, the strings are stretched by a steel frame across two bridges, one being on the frame itself, and the other being on a sound board. When a string is struck by the hammer, the resultant vibrations are coupled to the sound board which in turn vibrates. There are many other examples which illustrate the basic idea of **sound re-inforcement by resonant body (Tumba)**.

It is seen that, with the voice, the cavity in the mouth, throat and nose form resonant system. With the xylophone the tubes are fitted near the vibrating bars so that the air columns in the tubes will resonate and ‘sound’ when the bars are struck.

### 2.5.2 Tabli (तबली) / Table



**Fig. 2.14 Tabli<sup>9</sup>**

In other word it is the sound bar of the Sitar. It is fourteen inches wide for medium sized Sitar. The thinness of the tabli is important, because it is the part where the bridge or Jawari is placed; the curve is a work of an art. It is slightly convex in shape in order to make it more resilient. Its

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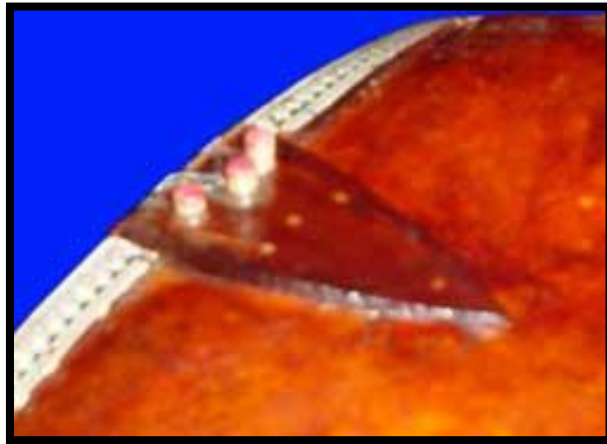
<sup>9</sup> Picture captured by researcher

thinness provides more resonance, but it should be thick enough to withstand the pressure of the strings. For giving ornamental effect it is decorated with fibre or ivory.

### 2.5.3 Galu (गलू) / Neck

From the picture it is seen that Gulu is the point where tabli and daand are joined together. The main structural function of the Galu is to provide a strong base through which the Daand may be indirectly joined to the gourd resonator.

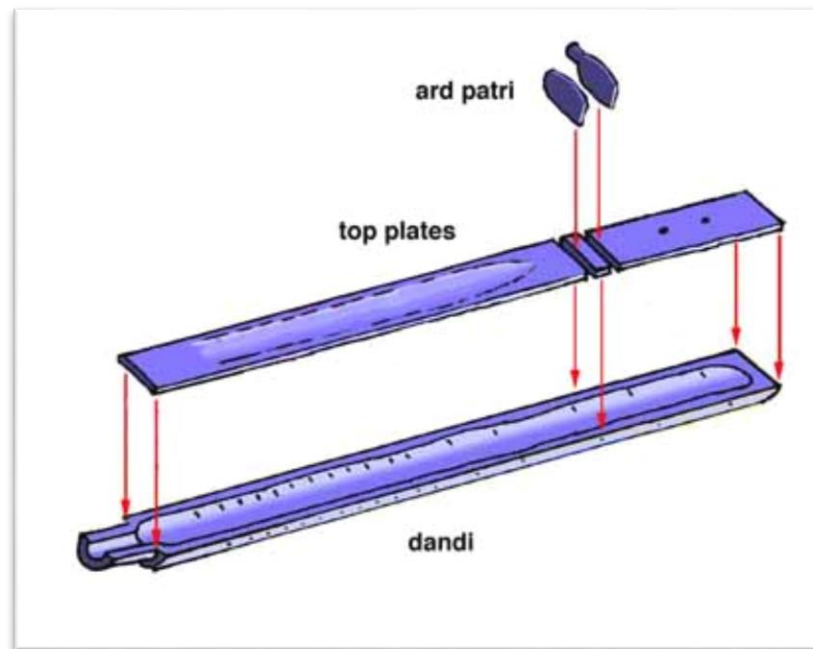
### 2.5.4 Langot (लंगोट) / Keel



**Fig. 2.15 Keel**

This is a small triangular piece of metal or sometimes fibre nail that works as an anchor to which all the strings are attached. It is set on the lower portion of the tumba, from which all the wires go to their destinations. Sitar can have two langots, one for attaching main strings and the other one to hold all sympathetic strings.

### 2.5.5 Daand (दांड) / Fret board



**Fig. 2.16 Daand**<sup>10</sup>

This is having the shape of a hollow pipe which is thirty four inches long and three inch wide. It is the neck of the instrument. Burma teak wood is best for making a daand, but some Sitar makers use Toon wood also. The back side of the daand is round in shape, to which a levelled wood piece is fitted. Then, the string holes are done on the upper part of the finger board to adjust tarabs and frets are fitted on it. This daand is very much sensitive to the moisture and tension applied on it. If care is not taken it may bend from the middle portion. More is the length of the daand more the no of musical notes that can be produced by Mindh on Sitar.<sup>11</sup>

<sup>10</sup> [https://chandrakantha.com/articles/indian\\_music/Sitar/Sitar\\_making.html](https://chandrakantha.com/articles/indian_music/Sitar/Sitar_making.html)

<sup>11</sup> Sitar Darpan by Ut. Bhikankhan Bannukhan Page 4

### 2.5.6 Bridge (ब्रिज) / Jawari / Ghudach (घुडच)



**Fig. 2.17 Bridge**

Bridge of the Sitar allows strings to pass from one side to other side. It is looking like a horse shoulder so sometimes known as Ghudach. It is a flat plate of ivory, over which the seven playing strings pass. The distance between langot and bridge is four inches. The bridge is three inches long and one inch wide. The upper portion of the Ghudach is known as the Jawari. The top part is fashioned from an antelope horn; the bottom from toon wood. In order to produce an even, rich sound, the Jawari must be filed to a precise curvature. The filing technique is a highly specialised craft and there are only a few Sitar makers in India who can produce a good quality Jawari.

### 2.5.7 Small bridge (छोटा ब्रिज)

This is a small piece of an antelope horn made into a one and a half by one inch bridge. The eleven tarabs are put on it. From the langot they pass through the daand holes.

### 2.5.8 Ati (अटी) / Pacisa

This is a flat piece that supports the five wires. Ati is located seven and a half inches from the end of the daand and is three-quarters of an inch high. Its main function is to keep the strings at the level of the bridge. Five small cuts are made in the ivory piece, so that the strings don't slip and remain in one place.

### 2.5.9 Taardan (तारदन) / Taargahan (तारगहन)

The Taargahan is fitted at a place called **Meru**, which is fashioned in the same shape as the Ati. Its width corresponds to the fingerboard. There are five main holes in it, through which the wires pass and then are tied to the pegs. The lower position of the holes in the Taar gahan ensures that the wires fit securely into the slots of the Taar gahan.

### 2.5.10 Laving (लविंग) / Darb / Mogra



**Fig. 2.18 Laving**

These are two small posts made of antelope horn or metal that is inserted vertically into the daand on the right side of the instrument. These posts



support the chikari strings and then are guided toward their respective Khunties.

#### 2.5.11 Parda (पर्दा) / Frets / Sarikas (सारिका)



**Fig. 2.19 Parda**

Until the nineteenth century there were sixteen frets on the Sitar, but with the passage of time, the Sitar acquired nineteen to twenty-one frets. Mostly they are made from steel or brass. Thickness of the frets is very important factor affecting the tonal quality of the Sitar. In the ancient period, the frets were called **Sarikas**. In middle ages, they came to be known as **Sundries (सुंदरी)**, and now we call them **Frets or Pardas**. When we press the string on the fret, a very resonating sound is produced of different scale on every fret. These frets are at a somewhat high level in the middle and are kept fitted on the fingerboard with silken thread or nylon string, so they are movable, thus allowing for perfect tuning. The best string for tying the frets is known as mang and is manufactured in Assam. All the strings pass on to these frets. The shape of the frets is one fourth of a half moon, or we could say flatly elliptical. The frets can be altered downward or upward to produce the required swaras of a particular scale. Some Sitar have one



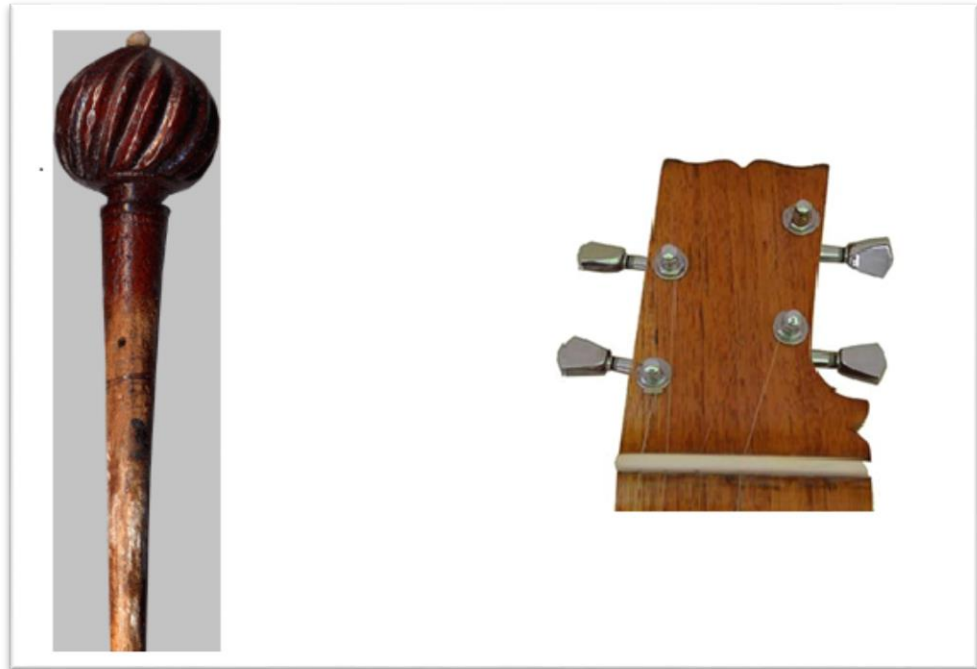
extra gourd at the end of the neck, where the pegs of main strings are fitted. It helps to enrich the sound of the swaras.

Frets are made with the specific curvature. This curvature depends on the style and maker of the Sitar. This curvature helps a Sitar player to produce the meendh.

The meendh is the ability to bend or pull the main strings for an extensive range of notes. Meendh provides the Sitar its vocal quality and gives the player a smooth transition from one note to another

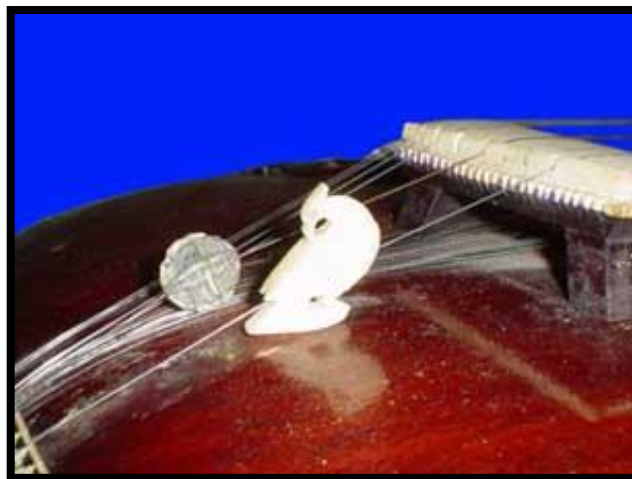
#### **2.5.12 Khunti (खंटी) / Pegs / Nuts**

A standardized Sitar has twenty to twenty-one pegs or Khunties made of rose wood, four for main string and three for chikaries and Madhya Shadaj. Seven are big pegs, and there are eleven to thirteen small pegs for the tarabs. The arrangement of tarabs allows them to be shifted so as to produce the required komal or tivra swar of any particular scale. But nowadays, the Sitar is found with five main strings, and thirteen tarabs. In zitar some of the khuntis are made of the metal and gear system offering anti slipping and fine tuning to the Sitar. In some modified Sitar traditional khuntis are replaced by metallic khuntis with the gear systems shown below.



**Fig.2.20 Traditional and Metallic Khunti**

#### **2.5.13 Manka (मणका) / Moti / Bead**



**Fig.2.21 Manka**

These oval or swan-shaped, small pieces of camel bone or fibre are pierced in all the four wires, namely Baaj ka taar and Jod ka taar, located between the ghurach and langot. The other two are put in Kharaj or Laraj ka taar and chikari wire located between the Pacisa and Khunti. These mankas can

be tightened or made loose accordingly to make the tuning of the required swara.

#### 2.5.14 Mizrab (मिज़राब) / Plectrum



**Fig.2.22 Mizrab**

It is a hard, triangular piece of wire made to resemble a fingernail. This word is derived from Persian, meaning "to beat." It is worn on the index finger of the right hand. In the ancient Granth Amarkosh<sup>12</sup>, it is described as 'Trikon' or three cornered, and in middle ages, it was called 'Nakhi'(नखी) or 'Nayika'(नायिका), and the same was given the name of 'Mizrab'. Before few decades making of mizrab was taught to the students, so that they can make and use a mizrab of their proper suitable size. In recent days readymade mizrabs are available in music shops. Type of the mizrab and style of striking the string plays an important role in producing the sound of Sitar.

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<sup>12</sup> Bhartiya Sageet Vadhya by Lal Mani Mishra

## 2.6 Style

As of today the Sitar are available mostly in 2 basic styles. The first and most used style is the Ravi Shankar style which is also known as Kharaj-Pancham type, which has 7 main strings. The other style is the Vilayat Khan Style which is called as Gandhar-Pancham style, it has 6 main strings.

Sometimes Sitar is classified by the craftsmanship. Kolkata and Miraj are the two major types of craftsmanship for Sitar.

## 2.7 Aesthetical / Ornamental effect

Most of the Sitaras are available in the various shades of the natural wood. They are mostly of the light brown, red wine, dark brown or black colour. Some of the prominent artist use Sitar of particular colour only.



**Fig. 2.23 Ornamental Work on Sitar**



**Fig. 2.24 Bin-Sitar, Wood, Gourd and Wire Strings<sup>13</sup>, Length 115.5cm, Possibly  
Pune, India, 1850-1890.**

<sup>13</sup> Museum no. IS.47-2002 © Victoria and Albert Museum, London



**Fig. 2.25 Antique Sitar with Ornamental Work of Ivory at ‘Music ‘N’ Arts’ Inside  
City Palace Jaipur<sup>14</sup>**



**Fig. 2.26 Antique 300 Years Old Sitar with Lacquer Work at ‘Music N Arts’ Inside  
City Palace Jaipur<sup>15</sup>**

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<sup>14</sup> Picture captured by Researcher

<sup>15</sup> Picture captured by Researcher





**Fig. 2.27 Antique Sitar with Ornamental Work at ‘Music N Arts’ Inside City Palace Jaipur<sup>16</sup>**

<sup>16</sup> Picture captured by Researcher

Some of the Sitar have the most beautiful ornamentation. The decorations are done with antelope horn on the tumba and tabli. The grape vines, doves, or a picture of Saraswati are carved upon the Tabli. Side decoration is done upon the corners of Tabli and fingerboard. The decoration of bone protects the places where the mizrab strokes could damage the wood.



## 2.8 Maintaining the Instrument<sup>17</sup>

The Sitar is a very delicate and fragile instrument. Great care is required to maintain it in a good condition. The old gurus worship the Veena or similar other instruments because they were of the opinion that Maa Saraswati is the Goddess of Sangeet who was also called Veena Vadini.

To maintain good working condition following things should be done:

1. For Jawari's long life, a small piece of paper should be kept on it, so that when we are not playing, dust particles will not gather on it. By doing this, we don't need to change the Jawari every month.
2. We use Mustard oil on the string to facilitate the smooth running of the fingers, but if excess oil is used, it is harmful and it reaches the bridge and spoil the voice of the Sitar. To save the bridge from being spoil, one should clean the oil from the strings with cotton or a piece of soft cloth after playing.
3. Most delicate part of the Sitar is the gourd among all other parts. If it is hit by something, it can break easily and the voice of the Sitar is spoiled, so the Sitar should be kept safely intact in a box before and after use. The Sitar should not be kept exposed for a long to the direct rays of the sun. A Sitar should not be stored near radiators, heaters air conditioners or windows
4. Do not subject the Sitar to drastic and abrupt temperature changes.
5. When we are not playing it the Sitar should be kept in a substantial cloth bag, which covers the entire instrument. It is also advisable to have a plastic bag made that will cover the cloth bag and keep out any moisture.

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<sup>17</sup> The journey of the Sitar in Indian Classical music by Dr. Swarn Lata page 49

6. The Sitar should be kept either lying on the floor (frets facing up) or propped in a corner (frets facing toward the corner)

Pt. Ravi Shankar has written in “My music My Life” about the care of the Sitar:

"The Sitar is such a finely made instrument that it needs a great care about each of its parts. Periodically, the tension of the string should be relaxed. The string should be loosened but not slacked. The Sitar should be kept clean and dust free. A clean cloth can be used for wiping the exposed surfaces of the instrument. A one inch wide paint brush with two or three inches of bristle is very convenient for dusting under the string and both the bridges”.