

A New and Practical Design for the Mridangam

BY ROHAN KRISHNAMURTHY

Carnatic music refers to the classical music of South India that originated nearly 3,000 years ago. This advanced system of classical music has evolved over the millennia and has numerous distinctive qualities to its credit. One particularly important characteristic is its equal emphasis on melody and rhythm. The results of this balance are evident from the system's remarkably complex rhythmic structure, deemed one of the world's most complex, as well as the wide range of sophisticated instruments commonly employed in the musical tradition (Ravikiran, 1996).

This article details a new design for the ancient Carnatic hand drum, the *mridangam*, which is hailed as one of the world's oldest and most advanced drums (Day, 1985). In recent times, *mridangam* maintenance has become an especially daunting issue for modern practitioners in and outside of India due to its ancient and artisan-centered construction. The newly proposed design is a convenient and affordable solution in this regard.

TRADITIONAL CONSTRUCTION

Figure 1 shows the primary parts of the *mridangam*: the tonal head (the *valanthalai*), which is tuned to a constant pitch; the bass head (the *thoppi*); and the central wooden shell (the *kattai*), to which the two heads are fastened by means of leather straps. For detailed descriptions of the *mridangam*'s traditional construction and tuning methods, refer to Bennett (1981), Pisharody (2003), and Ramamurthy (1987).

NEED FOR CHANGE

The past two to three decades have been marked by globalization in nearly all fields of human endeavor, including the sciences, business and economics, etc. Music, and specifically Carnatic music, is certainly no exception to this trend. One of the direct effects of the globalization of Carnatic music is a greater number of international performances, as well as a substantial number of performers residing

outside of India. As a result, instrument maintenance has become ever more challenging and is of the utmost concern to practitioners all over the globe.

Pitch maintenance and overall deterioration of the heads are the two most prominent problems faced by practitioners. These problems are largely exacerbated by the colder climates many players face outside of India, particularly in North America and Europe. Conventional methods of instrument maintenance require taking the instrument to a *mridangam* artisan for repair. This is, needless to say, unfeasible for practitioners outside of India, and to a large extent, outside of certain South Indian cities where *mridangam* artisans are readily accessible.



Figure 1. A traditionally constructed *mridangam*.

A NEW DESIGN

For any modification of an existing instrumental design to be successful and generally accepted, the design must be effective and economically viable. In the case of an ancient drum like the *mridangam*, which continues to extensively be made in its historic construction, the visual aesthetic of the drum must also be retained. Realizing that strap loosening and head deterioration could be solved without changing the actual head composition, but rather the fastening mechanism alone, the author has designed a new and practical fastening mechanism for the *mridangam*.

The following materials were used in this new design. Quantities are specified for one *mridangam*. All of these materials are readily available at any major hardware store.

- 32 3/16" X 2 1/2" eye bolts
- 96 10-24 hexagonal nuts
- 64 3/16" fender washers
- 3/8" nylon webbing
- Electric drill, 3/16" wrench, 3/16" ratchet

The following steps were developed for the construction:

1. A suitable *valanthalai* and *thoppi* were selected for a *kattai*. Beginning and ending with a knot, the nylon webbing was weaved through 16 eye bolts (see Figure 2) and corresponding apertures on the *valanthalai*. This step was repeated for the *thoppi*.

2. The *thoppi* was placed on the *kattai* with the eye bolts straightened and facing vertically downward. Appropriate locations on the *kattai* were marked for the 16 eye bolt anchor positions (five threads from the bottom of the eye bolt) and were drilled through. This step was repeated for the 16 *valanthalai* anchor positions on the other end of the *kattai*.

3. An eye bolt fitted with a fender washer was fully screwed into each of the 32 holes in the *kattai* (see Figure 3).

4. A fender washer and two nuts were



Figure 2. Nylon webbing weaved through eye bolt.

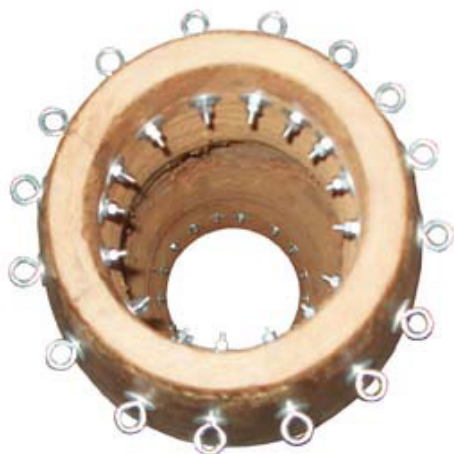


Figure 4. Top view of mridangam with fixed eye bolt anchors.



Figure 3. Side view of mridangam with eye bolt anchors.



Figure 5. Side view of fastened valanthalai.



Figure 6. The completed mridangam employing the new design.

applied to each of the 32 eye bolt anchors inside the kattai, thus firmly securing the anchors (see Figure 4).

5. The thoppi and valanthalai were placed on the kattai and aligned with the eye bolt anchors. A fender washer and nut were applied to each eye bolt.

6. Each eye bolt was gradually and uniformly tightened until the heads reached the required tension/pitch (see Figures 5 and 6).

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ADVANTAGES OF THE NEW DESIGN

The advantages of the new design over the traditional design are manifold. First, the design allows for easy head replacement in minutes, a task that would otherwise require the skill of a mridangam artisan. Second, the design allows for simple and elegant adjustment of pitch with a wrench, and moreover, allows for a remarkably greater pitch range (the standard pitch range for a mridangam is plus or minus one whole step): lower pitched instruments can be tuned from anywhere between C4 to F4, and similarly higher pitched instruments from E4 to B4 with ease. It was also observed that an intermediate-size kattai could be tuned anywhere from C4 to A-sharp 4, covering nearly the entire practical Carnatic pitch range. Thus, a mridangam employing the newly proposed design can serve the role of two or three traditionally designed instruments in terms of pitch.

From a financial perspective, the combined cost for the materials in the new design is a one-time investment of under \$40.00 (U.S.).

When compared to recent structural modifications, like the “mridangam with hooks,” the proposed design also has certain key advantages: (1) the nylon webbing applies force on a broader surface (from one aperture to the next) versus the hook, which applies force directly on one point of the head. As a result, the webbing applies more uniform force on the mridangam head and likely reduces overall head deterioration; (2) the mridangam with hooks requires specially prepared parts, specifically the uniquely shaped hooks, and hence cannot be easily constructed; (3) the proposed design retains the traditional elegance of the straps, creating the ideal blend between tradition and modern technology.

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Rohan Krishnamurthy has performed extensively in India and North America since the age of nine with leading Indian musicians. He received initial mridangam training in the U.S. from Dhamodaran Srinivasan and continued advanced study in India from maestro Guruvayur Dorai. Rohan has been invited to perform for nine consecutive years during the celebrated December Music Season in Chennai, India. He has collaborated in numerous cross-musical ventures with well-known symphony orchestras, jazz ensembles, etc., including a recent weeklong performance of “Echoes,” a concerto for mridangam and string orchestra by Dr. Elizabeth Start, where he was spotlighted with the Kalamazoo Symphony Orchestra during their Youth Concerts. Rohan has presented Indian percussion summer camps, workshops, academic lecture-demonstrations, and outreach events throughout the Midwest and is the recipient of several awards, including *USA Today’s* All-College Academic Second Team, Young Artist of India by Bharat Kalachar (Chennai, India), Prodigy in Performing Arts by the Indo-American Center in New York, and Artist Laureate by the Chicago Thyagaraja Utsavam. He maintains a website at www.rohanrhythm.com

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