
VI

THE

PERCUSSION:

DRUMS

The head of a drum is held in place by a hoop that presses it down tightly against the upper rim of the shell. In some drums this hoop forms a raised wooden or metal rim, while in others the hoop lies at or below the level of the head. The distinction is important because it is only on "rimless" drums that the most subtle techniques of finger-style playing (described below in the section on bongos) are possible, while on drums with raised rims there are a number of special "on the rim" playing techniques (discussed in the section on tomtoms).

The hoop is attached to the shell by a number of tension screws or turnbuckles, by means of which the tension on the head is adjusted. The tension must be adjusted evenly all around in order to get a good sound. This process of adjustment is delicate and time-consuming; it is therefore inadvisable to require a drum to change pitch during the course of a performance. Two important exceptions, the timpani and the rototoms, have mechanisms for rapid and accurate alteration of pitch. The upper limit of tension for any drum is the point beyond which there is danger of splitting the head. The lower limit is more vague: below the ordinary level of tension is a rather restricted zone in which the tone becomes tubby, the pitch vague and "scooping" on the attacks, and the dynamic range restricted. Below that, the head ceases to act like a membrane and becomes a sort of parchment thundersheet, producing a sound very much like that made by holding up a piece of paper and tapping it in the middle—but much louder (*pp*—*ff*). This interesting sound has been little exploited, if at all.

Drums are normally struck at a point about halfway between the edge and the center of the head. Playing nearer the edge produces a very "brittle" sound full of high partials, while playing exactly in the center produces a rather dull, unresonant thud with prominent fundamental—since most drum shells are much too small to reinforce the fundamental properly, a

center stroke will seem less strongly pitched than either a normal or edge stroke. It is important to realize that a change in striking position does not affect the *pitch* of the sound but only its tone color.

The various striking positions are indicated simply by writing "edge" or "center" above the line at the beginning of the affected passage; normal playing position is denoted with the all-purpose abbreviation "nat." or "ord." Where note-to-note changes are required the letters "C," "E," and "N" can be placed above the individual notes, but this practice must be explained to the player in the prefatory material. The word "rim" should not be used, since this indicates that the hoop rather than the head is to be struck. A useful special effect (particularly in rolls) is to move gradually from edge to center or vice versa.

Drums of all sorts except the specialized string-drum and tambourine can be easily and quickly muted or *muffled* with a surprisingly small piece of shammy or a somewhat larger piece of cloth. Either of these can be kept at hand, or even tied to the drum, so that it can be muted or unmuted in a tiny fraction of a second. The effect of muffling is to darken the tone, deaden the attack, and reduce the sense of pitch. Muting is indicated by the expression "muted," "muffled," or "con sord." written above the line, and is canceled with "mute off," "senza sord.," or "nat."

A more extreme kind of muffling can be obtained by damping with one hand while the sound is produced by a stick held in the other. This is most useful as a means of muting individual notes in an otherwise unmuted passage, and in such contexts should be notated as

an x above the note, thus: $\overset{x}{\uparrow}$. It must be remembered that when using hand-muffling the performer must play one-handed, though a stick can be held in the muting hand, ready to use immediately upon returning to normal play.

Hand-damping *after* a note has been played is an integral part of drum technique; it is used to cut off short notes before rests as well as staccato notes, etc. It normally needs no special notation beyond the usual signs of articulation.

Another form of muffling involves holding the stick firmly against the drumhead when playing, rather than letting it rebound. Notes played in this way have a "choked" or "dead"

quality. This effect should be notated as an x through the note stem, thus: $\overset{x}{\uparrow}$. Neither this nor the notation for hand-muffling is entirely standardized, so some explanation should be given when they are used. The advantage of stick-damping over hand-damping is that both hands are free to play, but stick-damped notes can be played no faster than eighth notes at $\text{♩} = 72$.

KETTLE DRUMS

TIMPANI

Generically, kettle drums are rimless, single-headed drums in which the shell is completely closed at the bottom. They have a clear, ringing tone and produce a very distinct pitch. The only drums of this type in general use are the **timpani**, large, low-pitched kettle drums whose range can be extended upward by the use of any of a variety of hard-to-find and imprecisely named smaller drums.

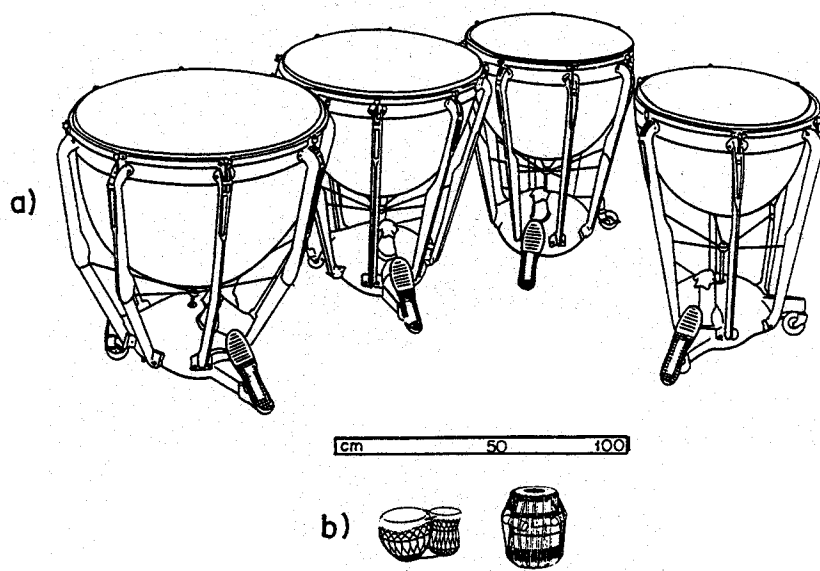


FIGURE 76. Kettle drums: (a) *timpani*; (b) *small kettle drums*.

Timpani (singular, *timpano*) are among the oldest and most respected of Western percussion instruments, and they remain among the most widely scored of all drums. In its usual form a timpano consists of a parabolic copper bowl (the shell, or **kettle**); sometimes with a small hole in the bottom; the head of the drum is stretched across the top of the kettle. The instrument is permanently attached to a stand (with wheels) that has a pivoting foot-pedal at its base. The pedal is used to adjust the pitch of the instrument by means of a system of rods running either inside the kettle or through the legs of the stand. As the toe-end of the pedal is depressed the pitch rises, and as the heel-end is depressed the pitch falls.* The range of pitches covered by the pedal is only about a fifth; the position of this fifth within the total range of notes available on timpani is determined by the size of the drum and the overall tension to which the head has been adjusted with the tensioning screws around the rim of the drum. Unusually large and small drums are needed for the extremes of the range, and notes below D_0 , because they cannot be obtained at optimum tension levels, tend to be less distinct in pitch than the rest of the range. A variety of experimental timpani are now manufactured with a pitch range of a full octave for each drum—the smallest of them can also reach the otherwise unavailable high d^1 . These drums have so far not proved very popular with percussionists because small gradations of pitch require great delicacy in adjusting the pedal.

Even on ordinary timpani the position of the pedal required for a given pitch depends on a number of factors, including the weather and how loudly the drum has been played for how long. Because of this uncertainty, the “feel” of the pedal is only an approximate guide to pitch. While a good timpanist can certainly bring the instrument roughly to pitch by feel alone, the intonation of the note will be much better if the player is given a few seconds to adjust the pitch aurally—by bending down to listen while tapping gently on the drum head—before being required to play it. The player does not need silence or even quiet in order to do

* On a few drums this pattern is reversed.


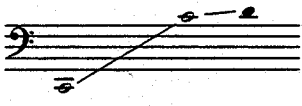
<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
timpani	timp. 	kettledrums	 loudest: <i>fff</i> softest: <i>ppp</i>	timpani sticks (hard, medium, soft, wooden)	standard	common

FIGURE 77. *Timpani—vital statistics.*

this; a trained percussionist can if necessary tune a drum in the midst of an orchestral tutti. It should be clear from all this that the most idiomatic use of the pedal is not as a producer of melodies on a single drum but merely as a tuning device.

Performance Characteristics

Timpani are commonly played in groups of four, particularly when they constitute the player's entire array. The pitches of the four drums should be chosen so that changes in the pitch of any one drum are as few and small as possible. If a part seems to require many and/or exaggerated changes in the pitches of individual drums, it may work better if recast for five or even six drums. On the other hand, four drums should not be demanded for a part that could easily be played on three or fewer. The number of timpani required for the part should be indicated in the list of instruments at the beginning of the score, and it is useful also to give there the range of pitches to be required of each drum. The initial tunings of all the drums should be given at the beginning of their part (see Fig. 78).

In the normal course of events changes in pitch occur rather infrequently. Each change should be indicated in a box above the staff in this fashion: $d^0 \rightarrow eb^0$. The exact pitches should be given, not just the pitch class, for $g \rightarrow c$ does not make it clear whether the pitch is to be raised or lowered. If several drums are to be changed during a single rest, the change-indications should be stacked vertically with that for the highest-pitched drum at the top, thus:

$$\begin{array}{l} f^0 \rightarrow f\sharp^0 \\ d^0 \rightarrow c^0 \\ G_0 \rightarrow Eb_0 \end{array}$$

The instruction to change the pitch should be given at the earliest spot in the music at which the change could be made. Whenever possible, changes should take place during rests, but if necessary they can be done while other drums are being played, as in this passage:



The image shows a musical staff in bass clef with a 2/4 time signature. Above the staff, a box contains the instruction $G_0 \rightarrow Ab_0$. The staff contains a sequence of notes: G₂, A₂, B₂, C₃, D₃, E₃, F₃, G₃, A₃, B₃, C₄, D₄, E₄, F₄, G₄, A₄, B₄, C₅, D₅, E₅, F₅, G₅, A₅, B₅, C₆, D₆, E₆, F₆, G₆, A₆, B₆, C₇, D₇, E₇, F₇, G₇, A₇, B₇, C₈, D₈, E₈, F₈, G₈, A₈, B₈, C₉, D₉, E₉, F₉, G₉, A₉, B₉, C₁₀, D₁₀, E₁₀, F₁₀, G₁₀, A₁₀, B₁₀, C₁₁, D₁₁, E₁₁, F₁₁, G₁₁, A₁₁, B₁₁, C₁₂, D₁₂, E₁₂, F₁₂, G₁₂, A₁₂, B₁₂, C₁₃, D₁₃, E₁₃, F₁₃, G₁₃, A₁₃, B₁₃, C₁₄, D₁₄, E₁₄, F₁₄, G₁₄, A₁₄, B₁₄, C₁₅, D₁₅, E₁₅, F₁₅, G₁₅, A₁₅, B₁₅, C₁₆, D₁₆, E₁₆, F₁₆, G₁₆, A₁₆, B₁₆, C₁₇, D₁₇, E₁₇, F₁₇, G₁₇, A₁₇, B₁₇, C₁₈, D₁₈, E₁₈, F₁₈, G₁₈, A₁₈, B₁₈, C₁₉, D₁₉, E₁₉, F₁₉, G₁₉, A₁₉, B₁₉, C₂₀, D₂₀, E₂₀, F₂₀, G₂₀, A₂₀, B₂₀, C₂₁, D₂₁, E₂₁, F₂₁, G₂₁, A₂₁, B₂₁, C₂₂, D₂₂, E₂₂, F₂₂, G₂₂, A₂₂, B₂₂, C₂₃, D₂₃, E₂₃, F₂₃, G₂₃, A₂₃, B₂₃, C₂₄, D₂₄, E₂₄, F₂₄, G₂₄, A₂₄, B₂₄, C₂₅, D₂₅, E₂₅, F₂₅, G₂₅, A₂₅, B₂₅, C₂₆, D₂₆, E₂₆, F₂₆, G₂₆, A₂₆, B₂₆, C₂₇, D₂₇, E₂₇, F₂₇, G₂₇, A₂₇, B₂₇, C₂₈, D₂₈, E₂₈, F₂₈, G₂₈, A₂₈, B₂₈, C₂₉, D₂₉, E₂₉, F₂₉, G₂₉, A₂₉, B₂₉, C₃₀, D₃₀, E₃₀, F₃₀, G₃₀, A₃₀, B₃₀, C₃₁, D₃₁, E₃₁, F₃₁, G₃₁, A₃₁, B₃₁, C₃₂, D₃₂, E₃₂, F₃₂, G₃₂, A₃₂, B₃₂, C₃₃, D₃₃, E₃₃, F₃₃, G₃₃, A₃₃, B₃₃, C₃₄, D₃₄, E₃₄, F₃₄, G₃₄, A₃₄, B₃₄, C₃₅, D₃₅, E₃₅, F₃₅, G₃₅, A₃₅, B₃₅, C₃₆, D₃₆, E₃₆, F₃₆, G₃₆, A₃₆, B₃₆, C₃₇, D₃₇, E₃₇, F₃₇, G₃₇, A₃₇, B₃₇, C₃₈, D₃₈, E₃₈, F₃₈, G₃₈, A₃₈, B₃₈, C₃₉, D₃₉, E₃₉, F₃₉, G₃₉, A₃₉, B₃₉, C₄₀, D₄₀, E₄₀, F₄₀, G₄₀, A₄₀, B₄₀, C₄₁, D₄₁, E₄₁, F₄₁, G₄₁, A₄₁, B₄₁, C₄₂, D₄₂, E₄₂, F₄₂, G₄₂, A₄₂, B₄₂, C₄₃, D₄₃, E₄₃, F₄₃, G₄₃, A₄₃, B₄₃, C₄₄, D₄₄, E₄₄, F₄₄, G₄₄, A₄₄, B₄₄, C₄₅, D₄₅, E₄₅, F₄₅, G₄₅, A₄₅, B₄₅, C₄₆, D₄₆, E₄₆, F₄₆, G₄₆, A₄₆, B₄₆, C₄₇, D₄₇, E₄₇, F₄₇, G₄₇, A₄₇, B₄₇, C₄₈, D₄₈, E₄₈, F₄₈, G₄₈, A₄₈, B₄₈, C₄₉, D₄₉, E₄₉, F₄₉, G₄₉, A₄₉, B₄₉, C₅₀, D₅₀, E₅₀, F₅₀, G₅₀, A₅₀, B₅₀, C₅₁, D₅₁, E₅₁, F₅₁, G₅₁, A₅₁, B₅₁, C₅₂, D₅₂, E₅₂, F₅₂, G₅₂, A₅₂, B₅₂, C₅₃, D₅₃, E₅₃, F₅₃, G₅₃, A₅₃, B₅₃, C₅₄, D₅₄, E₅₄, F₅₄, G₅₄, A₅₄, B₅₄, C₅₅, D₅₅, E₅₅, F₅₅, G₅₅, A₅₅, B₅₅, C₅₆, D₅₆, E₅₆, F₅₆, G₅₆, A₅₆, B₅₆, C₅₇, D₅₇, E₅₇, F₅₇, G₅₇, A₅₇, B₅₇, C₅₈, D₅₈, E₅₈, F₅₈, G₅₈, A₅₈, B₅₈, C₅₉, D₅₉, E₅₉, F₅₉, G₅₉, A₅₉, B₅₉, C₆₀, D₆₀, E₆₀, F₆₀, G₆₀, A₆₀, B₆₀, C₆₁, D₆₁, E₆₁, F₆₁, G₆₁, A₆₁, B₆₁, C₆₂, D₆₂, E₆₂, F₆₂, G₆₂, A₆₂, B₆₂, C₆₃, D₆₃, E₆₃, F₆₃, G₆₃, A₆₃, B₆₃, C₆₄, D₆₄, E₆₄, F₆₄, G₆₄, A₆₄, B₆₄, C₆₅, D₆₅, E₆₅, F₆₅, G₆₅, A₆₅, B₆₅, C₆₆, D₆₆, E₆₆, F₆₆, G₆₆, A₆₆, B₆₆, C₆₇, D₆₇, E₆₇, F₆₇, G₆₇, A₆₇, B₆₇, C₆₈, D₆₈, E₆₈, F₆₈, G₆₈, A₆₈, B₆₈, C₆₉, D₆₉, E₆₉, F₆₉, G₆₉, A₆₉, B₆₉, C₇₀, D₇₀, E₇₀, F₇₀, G₇₀, A₇₀, B₇₀, C₇₁, D₇₁, E₇₁, F₇₁, G₇₁, A₇₁, B₇₁, C₇₂, D₇₂, E₇₂, F₇₂, G₇₂, A₇₂, B₇₂, C₇₃, D₇₃, E₇₃, F₇₃, G₇₃, A₇₃, B₇₃, C₇₄, D₇₄, E₇₄, F₇₄, G₇₄, A₇₄, B₇₄, C₇₅, D₇₅, E₇₅, F₇₅, G₇₅, A₇₅, B₇₅, C₇₆, D₇₆, E₇₆, F₇₆, G₇₆, A₇₆, B₇₆, C₇₇, D₇₇, E₇₇, F₇₇, G₇₇, A₇₇, B₇₇, C₇₈, D₇₈, E₇₈, F₇₈, G₇₈, A₇₈, B₇₈, C₇₉, D₇₉, E₇₉, F₇₉, G₇₉, A₇₉, B₇₉, C₈₀, D₈₀, E₈₀, F₈₀, G₈₀, A₈₀, B₈₀, C₈₁, D₈₁, E₈₁, F₈₁, G₈₁, A₈₁, B₈₁, C₈₂, D₈₂, E₈₂, F₈₂, G₈₂, A₈₂, B₈₂, C₈₃, D₈₃, E₈₃, F₈₃, G₈₃, A₈₃, B₈₃, C₈₄, D₈₄, E₈₄, F₈₄, G₈₄, A₈₄, B₈₄, C₈₅, D₈₅, E₈₅, F₈₅, G₈₅, A₈₅, B₈₅, C₈₆, D₈₆, E₈₆, F₈₆, G₈₆, A₈₆, B₈₆, C₈₇, D₈₇, E₈₇, F₈₇, G₈₇, A₈₇, B₈₇, C₈₈, D₈₈, E₈₈, F₈₈, G₈₈, A₈₈, B₈₈, C₈₉, D₈₉, E₈₉, F₈₉, G₈₉, A₈₉, B₈₉, C₉₀, D₉₀, E₉₀, F₉₀, G₉₀, A₉₀, B₉₀, C₉₁, D₉₁, E₉₁, F₉₁, G₉₁, A₉₁, B₉₁, C₉₂, D₉₂, E₉₂, F₉₂, G₉₂, A₉₂, B₉₂, C₉₃, D₉₃, E₉₃, F₉₃, G₉₃, A₉₃, B₉₃, C₉₄, D₉₄, E₉₄, F₉₄, G₉₄, A₉₄, B₉₄, C₉₅, D₉₅, E₉₅, F₉₅, G₉₅, A₉₅, B₉₅, C₉₆, D₉₆, E₉₆, F₉₆, G₉₆, A₉₆, B₉₆, C₉₇, D₉₇, E₉₇, F₉₇, G₉₇, A₉₇, B₉₇, C₉₈, D₉₈, E₉₈, F₉₈, G₉₈, A₉₈, B₉₈, C₉₉, D₉₉, E₉₉, F₉₉, G₉₉, A₉₉, B₉₉, C₁₀₀, D₁₀₀, E₁₀₀, F₁₀₀, G₁₀₀, A₁₀₀, B₁₀₀, C₁₀₁, D₁₀₁, E₁₀₁, F₁₀₁, G₁₀₁, A₁₀₁, B₁₀₁, C₁₀₂, D₁₀₂, E₁₀₂, F₁₀₂, G₁₀₂, A₁₀₂, B₁₀₂, C₁₀₃, D₁₀₃, E₁₀₃, F₁₀₃, G₁₀₃, A₁₀₃, B₁₀₃, C₁₀₄, D₁₀₄, E₁₀₄, F₁₀₄, G₁₀₄, A₁₀₄, B₁₀₄, C₁₀₅, D₁₀₅, E₁₀₅, F₁₀₅, G₁₀₅, A₁₀₅, B₁₀₅, C₁₀₆, D₁₀₆, E₁₀₆, F₁₀₆, G₁₀₆, A₁₀₆, B₁₀₆, C₁₀₇, D₁₀₇, E₁₀₇, F₁₀₇, G₁₀₇, A₁₀₇, B₁₀₇, C₁₀₈, D₁₀₈, E₁₀₈, F₁₀₈, G₁₀₈, A₁₀₈, B₁₀₈, C₁₀₉, D₁₀₉, E₁₀₉, F₁₀₉, G₁₀₉, A₁₀₉, B₁₀₉, C₁₁₀, D₁₁₀, E₁₁₀, F₁₁₀, G₁₁₀, A₁₁₀, B₁₁₀, C₁₁₁, D₁₁₁, E₁₁₁, F₁₁₁, G₁₁₁, A₁₁₁, B₁₁₁, C₁₁₂, D₁₁₂, E₁₁₂, F₁₁₂, G₁₁₂, A₁₁₂, B₁₁₂, C₁₁₃, D₁₁₃, E₁₁₃, F₁₁₃, G₁₁₃, A₁₁₃, B₁₁₃, C₁₁₄, D₁₁₄, 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C₁₃₈, D₁₃₈, E₁₃₈, F₁₃₈, G₁₃₈, A₁₃₈, B₁₃₈, C₁₃₉, D₁₃₉, E₁₃₉, F₁₃₉, G₁₃₉, A₁₃₉, B₁₃₉, C₁₄₀, D₁₄₀, E₁₄₀, F₁₄₀, G₁₄₀, A₁₄₀, B₁₄₀, C₁₄₁, D₁₄₁, E₁₄₁, F₁₄₁, G₁₄₁, A₁₄₁, B₁₄₁, C₁₄₂, D₁₄₂, E₁₄₂, F₁₄₂, G₁₄₂, A₁₄₂, B₁₄₂, C₁₄₃, D₁₄₃, E₁₄₃, F₁₄₃, G₁₄₃, A₁₄₃, B₁₄₃, C₁₄₄, D₁₄₄, E₁₄₄, F₁₄₄, G₁₄₄, A₁₄₄, B₁₄₄, C₁₄₅, D₁₄₅, E₁₄₅, F₁₄₅, G₁₄₅, A₁₄₅, B₁₄₅, C₁₄₆, D₁₄₆, E₁₄₆, F₁₄₆, G₁₄₆, A₁₄₆, B₁₄₆, C₁₄₇, D₁₄₇, E₁₄₇, F₁₄₇, G₁₄₇, A₁₄₇, B₁₄₇, C₁₄₈, D₁₄₈, E₁₄₈, F₁₄₈, G₁₄₈, A₁₄₈, B₁₄₈, C₁₄₉, D₁₄₉, E₁₄₉, F₁₄₉, G₁₄₉, A₁₄₉, B₁₄₉, C₁₅₀, D₁₅₀, E₁₅₀, F₁₅₀, G₁₅₀, A₁₅₀, B₁₅₀, C₁₅₁, D₁₅₁, E₁₅₁, F₁₅₁, G₁₅₁, A₁₅₁, B₁₅₁, C₁₅₂, D₁₅₂, E₁₅₂, F₁₅₂, G₁₅₂, A₁₅₂, B₁₅₂, C₁₅₃, D₁₅₃, E₁₅₃, F₁₅₃, G₁₅₃, A₁₅₃, B₁₅₃, C₁₅₄, D₁₅₄, E₁₅₄, F₁₅₄, G₁₅₄, A₁₅₄, B₁₅₄, C₁₅₅, D₁₅₅, E₁₅₅, F₁₅₅, G₁₅₅, A₁₅₅, B₁₅₅, C₁₅₆, D₁₅₆, E₁₅₆, F₁₅₆, G₁₅₆, A₁₅₆, B₁₅₆, C₁₅₇, D₁₅₇, E₁₅₇, F₁₅₇, G₁₅₇, A₁₅₇, B₁₅₇, C₁₅₈, D₁₅₈, E₁₅₈, F₁₅₈, G₁₅₈, A₁₅₈, B₁₅₈, C₁₅₉, D₁₅₉, E₁₅₉, F₁₅₉, G₁₅₉, A₁₅₉, B₁₅₉, C₁₆₀, D₁₆₀, E₁₆₀, F₁₆₀, G₁₆₀, A₁₆₀, B₁₆₀, C₁₆₁, D₁₆₁, E₁₆₁, F₁₆₁, G₁₆₁, A₁₆₁, B₁₆₁, C₁₆₂, D₁₆₂, E₁₆₂, F₁₆₂, G₁₆₂, A₁₆₂, B₁₆₂, C₁₆₃, D₁₆₃, E₁₆₃, F₁₆₃, G₁₆₃, A₁₆₃, B₁₆₃, C₁₆₄, D₁₆₄, E₁₆₄, F₁₆₄, G₁₆₄, A₁₆₄, B₁₆₄, C₁₆₅, D₁₆₅, E₁₆₅, F₁₆₅, G₁₆₅, A₁₆₅, B₁₆₅, C₁₆₆, D₁₆₆, E₁₆₆, F₁₆₆, G₁₆₆, A₁₆₆, B₁₆₆, C₁₆₇, D₁₆₇, E₁₆₇, F₁₆₇, G₁₆₇, A₁₆₇, B₁₆₇, C₁₆₈, D₁₆₈, E₁₆₈, F₁₆₈, G₁₆₈, A₁₆₈, B₁₆₈, C₁₆₉, D₁₆₉, E₁₆₉, F₁₆₉, G₁₆₉, A₁₆₉, B₁₆₉, C₁₇₀, D₁₇₀, E₁₇₀, F₁₇₀, G₁₇₀, A₁₇₀, B₁₇₀, C₁₇₁, D₁₇₁, E₁₇₁, F₁₇₁, G₁₇₁, A₁₇₁, B₁₇₁, C₁₇₂, D₁₇₂, E₁₇₂, F₁₇₂, G₁₇₂, A₁₇₂, B₁₇₂, C₁₇₃, D₁₇₃, E₁₇₃, F₁₇₃, G<

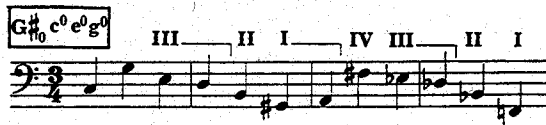


FIGURE 78. Notation used for frequent changes in the pitches of individual timpani.

Where changes must be made frequently, each new note should be supplied with a Roman numeral to indicate on which drum it is to be played, "I" always indicating the lowest drum. (Figure 78 shows how this is done.) Neither notation is necessary in places where the changes are obvious, as here:



The passage above also shows the timpani glissando, which is notated like any other true glissando (see p. 31). The glissando is, of course, produced with the pedal, and it must be remembered that following the glissando the drum will be at a new pitch unless the pedal is returned to its original position. Upward glissandos are generally the most effective, because the volume of the sound will remain roughly the same, or even increase, throughout the glissando. This happens because tightening the head with the pedal adds to the system energy that acts to counterbalance the normal decay of the sound. In descending glissandos the loosening of the head *subtracts* energy from the system, causing the sound to decay rather precipitously. In glissando rolls the volume level remains constant unless there is a deliberate crescendo or diminuendo. Whenever a drum must change pitch without an intervening rest in that drum, there will be some portamento effect between the notes unless the first note is hand-damped or allowed to die away completely. The combination of hand-damping and retuning can be performed as rapidly as quarter-notes at $\text{♩} = 72$; if damping is not desired, the portamento should be notated in the part. The prominence of the portamento—and the consequent need for damping—is reduced if the pitch change is only a half-step or so.

It takes about three seconds for a timpani note to die away completely. Since the decay is initially very rapid, even moderately fast notes (up to, say, eighth-notes at $\text{♩} = 144$) can be played clearly without damping, particularly if hard sticks are used. However, at very high speeds the drum sounds will overlap and interfere with each other, the result being a loss in the distinctness of pitch, particularly when the drums are tuned at narrow intervals. A passage such as



will sound very muddy: the *rhythm* will be clear enough, but the pitch will just seem vaguely turbulent, without even a distinct contour. If the notes are more widely separated, like this:



the differences in pitch among the drums will be clear, but the pitches themselves will still be obscured, and the passage could just as well be played on four drums of indefinite pitch. Of course, none of this applies to repeated notes, and a passage such as



will sound perfectly clear.


When not in use, timpani tend to vibrate sympathetically when a neighboring drum is played; this vibration, though not distinctly audible, does somewhat obscure the pitch of the adjacent drum, and for this reason it is desirable to use as few timpani as possible for any given part.

Like most other percussion instruments, timpani are normally played "hand-to-hand," that is, with alternating strokes of the right and left hands, and in the normal course of play one hand crosses over the other from time to time. If the number of drums is small, these cross-overs, even at high speed, will present no problem to the player. However, with five or more drums it is necessary to avoid passages like the following, which would require one hand to reach far over the other:



In practice such awkward cross-overs are often avoided by the use of **double beats**, i.e., two strokes in a row with the same hand. The passage above, for instance, would probably be performed RLRRLR, making it *possible* to play but still rather awkward, since double beats are much easier to perform as repeated notes on one drum. The passage would present no problems at all if its third note were d^0 instead of f^0 .

It is of course possible to play chords on the timpani simply by striking two drums at once. The chords will not sound very clear unless they consist of bare octaves or fifths; a good way to test in advance the sound of any timpani chord before committing it to paper is to play it on the piano an octave lower than written. For a ponderous and heavy *sforzando* it may be desired to have a single drum struck simultaneously with both sticks—this should be notated

with double stems, thus: . Finally, it is possible to play arpeggios and chords of up to four notes by playing with three or four sticks; this is done by holding two sticks between adjacent pairs of fingers. Such pairs of sticks can only be used on adjacent drums. Either of the two sticks can be kept out of the way simply by rotating the wrist.

A number of “advanced” techniques are contained in the following passage:



The first event here is a **double roll**, requiring pairs of sticks in each hand so that both notes will be hit on each stroke of the roll. The next note is also a double roll performed on two drums, initially tuned to the same pitch, that glissando outward while the roll is being played. Note that this maneuver leaves drum III (second from the right) *lower* in pitch than drum II (second from the left). There follow two notes played in the ordinary way, then a two-note chord that must be played with both hands since the drums producing it are not adjacent, then another ordinary note. Throughout these two beats the player must keep the wrists rotated so that only one stick in each hand will strike the drums. The next bar begins with an upward arpeggio requiring two left-hand sticks and one right-hand stick, followed by a downward arpeggio requiring two right-hand sticks and one left-hand stick. After that comes a simple trill played with single sticks from both hands (note that this is *not* the same as the double roll with which the passage began); and finally comes a four-note trill in which the left hand playing drums I and II alternates with the right hand playing drums III and IV. During this trill, drum III must glissando up to B₀, a unison with drum II.

This whole passage is much more exciting to look at than to hear—to get an idea of just how thick and dark it sounds in reality, try it on the piano, an octave down. Those who are interested in exploring further the limits of timpanic virtuosity should study Elliott Carter’s *Eight Pieces for Four Timpani*.

Sticks

In the absence of any special indications as to choice of sticks, timpanists will use felt timpani sticks, their hardness depending on the timpanist’s perception of the music. These felt sticks, plus the wooden timpani sticks, are normal for the timpani. For a very light, rattling sound, snare drum sticks or even the backs of vibraphone (or whatever) sticks may be used; the timpani cannot be played louder than *ff* with these sticks nor softer than *pp* with any wooden stick. It is also possible to use rubber-series mallets, not for any unique timbre but simply to enable the timpani to be played in conjunction with instruments for which felt sticks would be inappropriate. Again, these mallets are too light to drive the timpani any louder than *fortissimo*, and the unwound mallets (except for the very softest) cannot produce sounds below *pianissimo*. The large felt bass-drum and gong beaters will produce only a weak thud if applied to the timpani, and metal sticks are destructive to drum heads of all sorts. Wire brushes will make the drum speak (no louder than *forte*), but the characteristic slap or hiss of the brush is so much higher in pitch than the drum itself that the effect is of two different sounds. A switch will give a somewhat louder and more unified sound.

Because it has no rim, all the finger-style techniques discussed below under bongos are possible on timpani, but the size of the drum tends to make the various strokes all sound alike, and the width of the head means that either everything must be done very near the edge or the hand must be moved a considerable distance to differentiate between center and edge

strokes. Only the most vigorous stroke with the flat of four fingers together can produce even an ordinary *fortissimo* from a system this large.

Special Effects

A rare and not particularly useful effect on timpani (mentioned here for the sake of completeness) is to strike the shell of the instrument, producing a vaguely metallic, not particularly resonant "bonk." The pitch of this sound varies little, if at all, from drum to drum and is not affected by moving the pedal.

Much more intriguing is the use of a timpano as an auxiliary resonator for other instruments. This can be done with any idiophone that has a slow decay and whose resonance is not damped by resting it on the head of the drum—most notably, single cymbals (removed from the stand and rested upside down on the timpano), crotales, and bowl- or cup-shaped bells. The idiophone can be played in the usual fashion and sounds quite normal unless one moves the pedal of the drum while a note is sounding, in which case the timbre of the idiophone will swoop and wobble in a decidedly eerie fashion as the timpano reinforces a chain of pitches running up or down its harmonic spectrum. It is best to use only one instrument on each drumhead, because playing will cause the idiophone to move around a bit and if there were several on one drum they would jostle each other. It is also advisable to avoid the loudest dynamic levels, since a good *fff* whack may knock the cymbal or bell right off the drum. Since the instruments involved are generally light in weight, it is possible to play the timpano on which one of them is resting; the drum will sound somewhat muffled, however, and if it is played louder than *mezzo-forte* the idiophone may bounce or fall off.

It is also possible to use a timpano as an auxiliary resonator for some of the wind instruments—trumpets, flügelhorn, oboe, high clarinets, and soprano saxophone. The instrument must be aimed straight down at the drum, with its bell in close proximity to the drum head, and the drum must be tuned either to the pitch the instrument will play or to a lower octave of that pitch. The woodwinds can only perform this effect on notes that use the entire length of the instrument, i.e., on sax and oboe written $b\flat^0$, and on clarinets written e^0 and b^1 . Playing directly into the drum muffles the sound of the instrument, but it also makes the drumhead vibrate sympathetically, adding an odd humming sound to the overall timbre (if the drum is not tuned to the pitch produced by the wind instrument, the sympathetic vibrations do not occur). By moving the bell of the instrument around and tilting it in different directions, changes in the phase and apparent location of the sound can be brought about; these are heard as a puzzling or even disturbing "wobble" in the timbre.

SMALL KETTLE DRUMS

The music cultures of North Africa and Southwest Asia all possess kettle-type drums with clay, wood, or metal shells, mostly far smaller in size and higher in pitch than Western timpani, and these can be used to extend the range of clearly pitched drum notes up to at least f^2 . Most of these drums possess a refinement unknown in the West—the thickening or loading of the center of the drum head. This makes the partials of the head completely and truly harmonic; thus these drums have an even richer and clearer tone than the timpani. The clar-

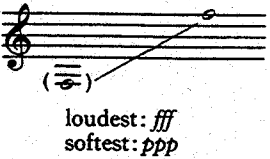
<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
small kettle drums	sm. ktdrs.	clay drums Arab drums		variable	exotic	rare

FIGURE 79. *Small kettle drums—vital statistics.*

ity of pitch helps to offset the fact that these small, sometimes even tiny, drums cannot sustain a tone longer than a second or two.

Unlike the timpani, small kettle drums have no built-in stands or foot pedals; most do not even have tension screws. They *can* be tuned (the exact method depending on their construction), but the process is as time-consuming as the hand-tuning of timpani, and composers should therefore limit themselves to one pitch per drum.

Unfortunately, no single, completely unambiguous name is in use for these drums. “Small kettle drums” is the best of the lot, but even this may lead to confusion in the range below c^1 , where percussionists may assume that small timpani are intended. The only way to be completely clear is to use a clumsy expression such as “small, kettle-type drums” or “small kettle drums (non-Western).” Of course, each drum has a very specific name in the culture that produced it, but Western composers can ill afford to be so specific, especially since these drums sound so much alike. Most commonly seen is the **tabla** from India, which has a range of about an octave located approximately in the middle of the range given in Figure 79.* The lower limit (f^0) given here for small kettle drums is more or less arbitrary but is justifiable in that *small* drums of lower pitch lack the ringing clarity of tone one looks for in drums of this type.

Small kettle drums must be played with lighter, harder sticks than the timpani—felt sticks (except perhaps in the lowest octave) are no good at all. The best all-purpose mallets are vibraphone sticks (i.e., hard, medium or soft, wound rubber-series mallets). Plastic sticks or (more delicately) snare sticks can be used to produce a brilliant clatter from the drums (at the expense of pitch definition), and it is only with such hard sticks that the *fff* can be attained. The various unwound rubber mallets can be used. These drums are ideal for finger-style playing (indeed, most of them are designed to be so played)—for details, see the section on bongos. A *ppp* can only be obtained with fingers or with very soft sticks.

The material of which the shell of the drum is made has no effect on its sound, and striking the shell will only produce a dry “clack.” Because of their small size and lack of resonance, small kettle drums cannot be used as auxiliary resonators.

* The tabla’s companion drum, the **banya**, is also a kettle drum but produces notes well down in the timpani range. Because of its small size it yields relatively indistinct pitches and has a tone quality like that of a dumbeg or Indian drum.

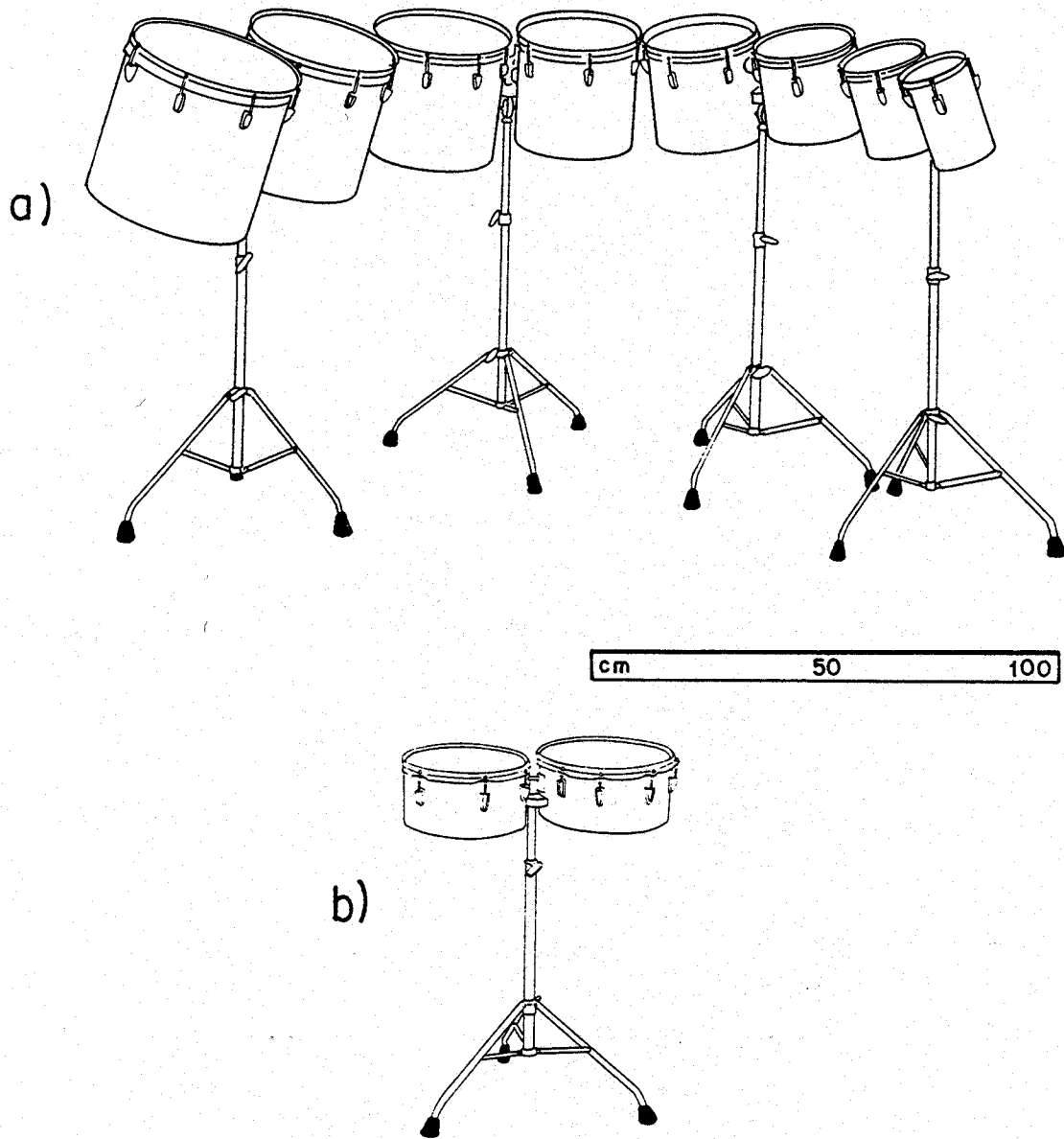


FIGURE 80. *Tomtoms: (a) tomtoms; (b) timbales.*

THE TOMTOM FAMILY

TOMTOMS

A tomtom is a drum that has a cylindrical wooden shell open at the bottom, with a single head and a raised rim. Typically the shell is deeper than it is wide, but this is not necessarily the case, particularly with large drums. The word "tomtom" was for a long time used as a catchall to denote any kind of nondescript drum, and its meaning is still not quite as precise


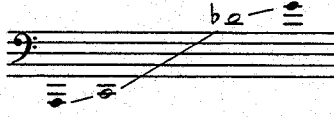
<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
tomtoms	toms. t.t. 	drums	 loudest: <i>fff</i> softest: <i>ppp</i>	variable	standard	ubiquitous

FIGURE 81. *Tomtoms—vital statistics.*

as could be desired. The term is widely used, for instance, to refer to all snareless double-headed drums except the bass drum; furthermore, percussionists will on even the slightest pretext substitute some other instrument for the tomtom. Not only double-headed drums of all sorts (including snare and field drums with snares relaxed) but bongos, rototoms, and timbales have been used in this way.

In fairness, it should be noted that the largest and smallest tomtoms are indeed only marginally different from drums of other sorts. The bongo has been so thoroughly hybridized with the tomtom that the only way definitively to separate small toms from bongos is by the presence or absence of the raised rim, and in a part that does not demand playing on the rim the substitution may be made without offense. In this regard it should be noted that the difference in *sound* between bongos and high tomtoms is entirely a matter of head tension: if the pitch of a high tomtom is raised above about db^1 , it will take on the characteristically bright, dry sound of a bongo. At the low end, the largest drums manufactured as tomtoms are capable of descending only to about C_0 . Lower notes (down to A_1) are available, but these must be obtained from converted bass drums. The conversion, accomplished by simply removing one head from the bass drum, is complete; a bass drum in this condition *is* a tomtom, no matter what it may have been manufactured to be. Look again at the definition of "tomtom" above; with the exception of timbales (discussed below) any drum bearing the characteristic features of cylindrical shell, single head, and raised rim is a tomtom and should be so called.

Tomtoms are rather weakly pitched and have traditionally been written for as unpitched instruments; nonetheless, pitch is there and can be demanded if desired. The drums are tuned by the usual apparatus of tension screws. Accurately changing the pitch of a given drum takes about half a minute, so one should call for a separate drum for each pitch required. Glissandos, bent notes, and the like *can* be produced on a tomtom by leaning heavily on the drum with an elbow or the heel of one hand, a procedure that both damps the sound heavily and raises the pitch any amount up to an octave for low or medium-pitched tomtoms (but progressively less for high drums; the very smallest tomtoms can only be forced up a fourth, and in no case higher than g^1). *Specific* pitches can be obtained in this way only if the player can hear the note at the end of a preceding glissando or has the opportunity to test it surreptitiously before actually playing it. The heavily damped timbre of these notes is so dramatically different from the normal sound of the drum that it is best that unraised pitches on the same or other tomtoms be hand-damped to ensure uniformity—otherwise the difference of pitch will be lost in the difference of timbre. It must always be remembered, in writing

this effect, that the player will have only one hand free to strike the tomtom or any other instrument.

The tone of the tomtom is full and rich. Large toms have timpani-like decays of up to two seconds; smaller ones have progressively shorter decay-times, down to less than half a second for the smallest. The distinctness of individual large drums is blurred in fast passages, just as with timpani. The weak pitch of a tomtom cannot stand up to any competition whatsoever, and in writing for the toms as pitched instruments it must constantly be kept in mind that the sense of pitch will be obliterated not only in low rapid passages and chords of all sorts (except perhaps bare octaves), but even in chords involving other instruments unless the tomtom pitch is doubled by some other, more clearly pitched instrument. Despite the obliteration of pitch, tomtom chords are perfectly effective as *sonorities*, and a combination of high and low drums is clearly heard as such even though the specific pitches are suppressed.

Tomtoms are medium-sized drums, on the average, and a single player can handle with ease a group of as many as eight. For three or fewer, the player will choose medium-sized instruments, and groups of six or more will generally span the entire range. Groups of four or five tend to be skewed toward either the high or the low end of the range, depending on the player's taste, unless the composer has specified "high tomtoms," "medium tomtoms," or the like. Finicky composers may wish to specify the exact pitches of all the drums in order to obtain precisely the desired sonority, even if the drums are then written for as unpitched instruments.

Particularly in large arrays, the smallest tomtoms are often arranged four-in-a-square or three-in-a-triangle rather than lined up in a row as larger drums usually must be. Within such compact groups, all four (or three) drums are equally accessible to both hands and as a result virtually anything may be written without fear that it will be awkward or impossible to play. For drums lined up in the ordinary way, one must pay attention to cross-overs and double beats, as with the timpani.

High tomtoms are normally played with vibraphone mallets, low ones with timpani sticks. For mid-range instruments and for sets of drums covering a broad range, medium or soft vibraphone sticks will be used as "hard sticks" and hard timpani mallets as "soft sticks." It is only with timpani or vibraphone sticks that the drums can be played *ppp*. The backs of snare sticks are the most generally useful wooden sticks; the fronts of snare sticks or plastic mallets provide a crisp, delicate sound for the high drums and wooden timpani sticks a powerful sound for the low drums. Unwound rubber-series mallets also work perfectly well. Wire brushes make a good effect on high or medium tomtoms; on low ones the sound is "divided" as for the timpani. Finger-style playing on drums with raised rims is more or less limited to the tips of the fingers and is most useful in assuring precision at very low dynamic levels.

Playing on the rim is an integral part of the technique of drums with raised rims. This is done with wooden sticks (in a pinch, with plastic mallets or even triangle beaters) and produces a very dry clicking sound, no louder than *ff*. Other kinds of sticks can be used with similar effect to play on the *shell* of the drum. This is one of the most common uses of the switch, for instance. A special effect, for which only wooden sticks are usable, is the **rim shot**. This is performed either by holding a stick horizontally so that it strikes both the rim and the center of the drum or, preferably, by placing a stick with one end on the rim and the other touching the drumhead and then striking that stick with another. Rim shots can be played as softly as *pianissimo*, but their main value lies at the other end of the dynamic scale,

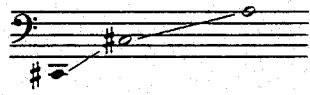
<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
timbales	timbs. tmbls.	(none)	 <p>loudest: <i>fff</i> softest: <i>ppp</i></p>	back of snare sticks	standard	usually available

FIGURE 82. *Timbales—vital statistics.*

a *ffff* “pow!” attainable in no other way. Rim shots are most effective on small or medium-sized drums but can be performed on even the largest drums.

TIMBALES

Timbales are a specialized variety of tomtom in which the shell is typically—at any rate ideally—made of metal rather than wood; also, unlike most tomtoms, timbales are wider than they are deep. These features serve to emphasize the bright, dry tone of the instrument, a brittle “pam” that is due almost entirely to the very high tension to which the head is usually raised. If the tension is reduced a tomtom-like sound will result, and notes below $c\sharp^0$ can only be obtained with this sacrifice of timbre. On the other hand, a medium tomtom can if necessary be made to stand in for a timbale simply by raising the tension. Indeed, some drums marketed as “timbales” are utterly indistinguishable from medium tomtoms. Despite their clangorous tone and rapid decay (less than half a second), timbales are no more weakly pitched than ordinary tomtoms and may be written for at specific pitches.

Timbales are made in only two sizes, equivalent to medium tomtoms, and are usually played in pairs. All the types of mallets used on medium tomtoms are also used on timbales, but normally (especially in the absence of any special indication) either reversed snare sticks or special “timbale sticks” of similar weight and diameter will be used; sometimes plastic mallets are substituted. Timbales can be played on the rim just like tomtoms, and the brilliant timbre makes rim shots very effective. Because the tension on the drum is so high, leaning on the drumhead can only raise the pitch about a major sixth.

DOUBLE-HEADED DRUMS

SNARE DRUMS

The most typically Western of all drums are those whose cylindrical shells have at both ends a head with a raised rim. One head is struck in the conventional way, and the enclosed* air space inside the drum communicates strong vibrations to the head opposite. The two heads

* There is, however, always a small hole in the shell to equalize the pressure of air inside and outside the instrument.

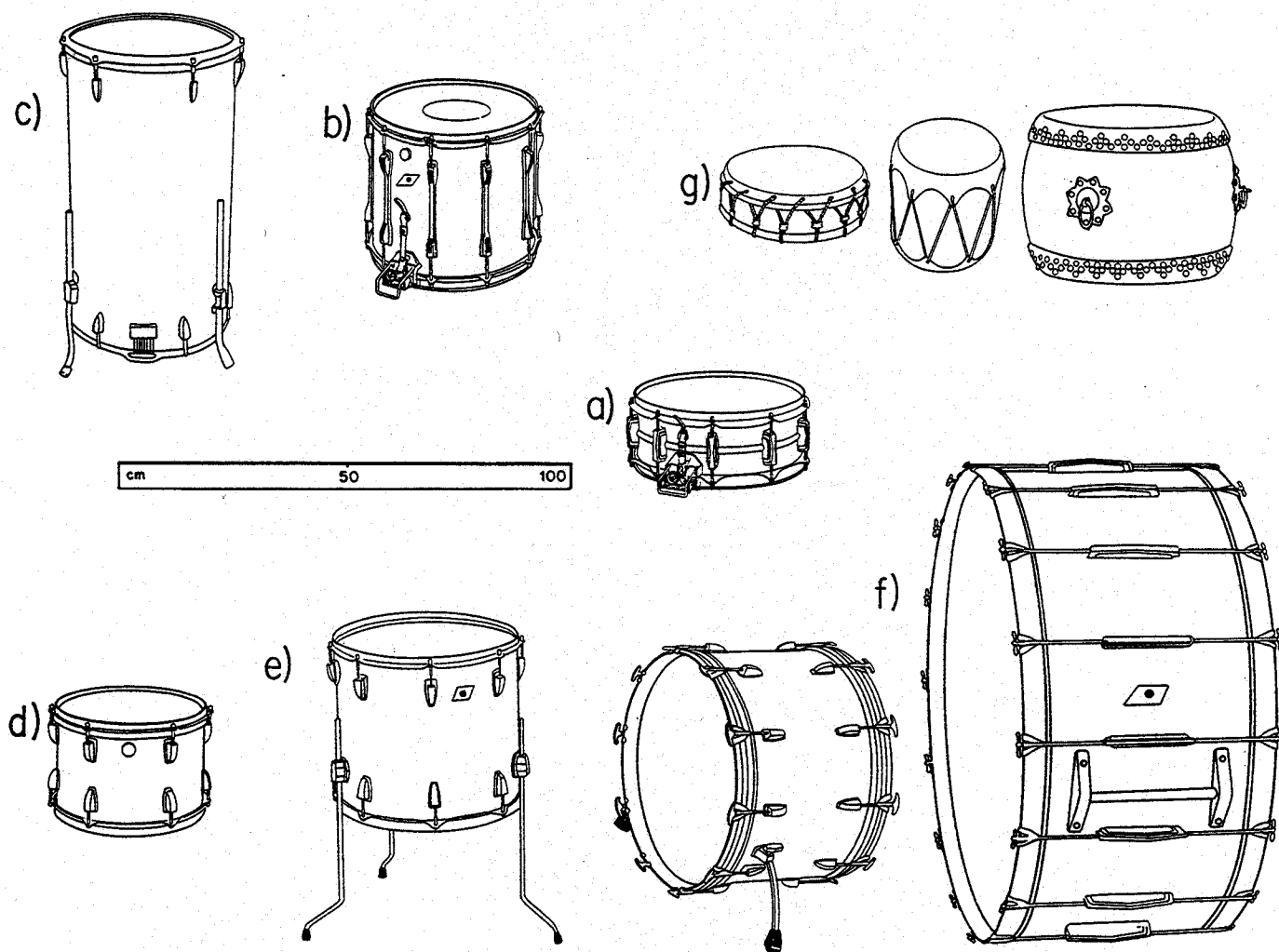


FIGURE 83. *Double-headed drums: (a) snare drum; (b) field drum; (c) long drum; (d) small double-headed drum; (e) tenor drum; (f) bass drums; (g) Indian drums.*

are ordinarily tuned a major second apart (or at some other dissonant interval), so that their combined vibration is genuinely indefinite in pitch. On some of these drums the pitch is made even more indefinite by the addition of **snare**s, a number of lightly coiled metal wires stretched across the lower head. These rattle against the head whenever the drum is struck, bringing out so many high partials that the sound becomes an almost unbroken band of white noise. In drums of this type the pitch is determined less by the tension on the drumheads (though this is usually kept high) than by the distance between the snare head and the batter head: the closer the two heads are, the greater will be the number of high partials strongly transmitted to the snare head and the higher the drum will sound. Accordingly, although all these drums have roughly the same diameter, they vary considerably in length. High-pitched ones, much shallower than they are wide, are called **snare drums**, medium-pitched drums of approximately equal height and diameter are called **field drums**, and the low-pitched, deep ones are called **long drums**. In the long drum (and some field drums) the snares are made of gut rather than wire, so that (being more massive) they will respond to somewhat




<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>dynamic range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
snare drum 	s.d. sn. dr.	side drum	<i>pp(p)-fff</i>	snare sticks	standard	ubiquitous
field drum 	f.d. f. dr.	parade drum military drum tenor drum	<i>pp(p)-fff</i>	snare sticks	standard	common
long drum 	l.d. long dr.	(none)	<i>pp(p)-fff</i>	snare sticks	standard	rare

FIGURE 84. *Snare drums—vital statistics.*

lower frequencies. The long drum is most commonly called for under the name **tambourin provençal** (or its synonyms **tabor**, **provençal drum**)—a term which, unfortunately, can denote not only the long drum but a tomtom or tenor drum, with or without a single gut snare stretched across the *batter* head. Even the term “long drum” is not quite clear and may be misunderstood as a synonym for “tenor drum” unless an expression such as “long drum (with snares)” is used.

The snares raise the pitch of all these drums; even the long drum is moderate rather than low in pitch. The snares can be disengaged (“released,” “relaxed”) by means of a lever attached to the shell (typically at the top of the instrument where it can easily be reached). With the snares relaxed, the drums are much lower in pitch and quite different in timbre: the snare drum is then medium in pitch, the field drum low, and the long drum very low, and they all sound like tomtoms but without definite pitch and with somewhat quicker decay times (due to the high tension of the heads). When the snares are relaxed the pitch of the drum is governed as much by the tension on the heads as by the depth of the shell, so that one snare drum may sound higher than a second when their snares are engaged, but lower when their snares are relaxed.

If a drum is to play an entire piece with snares engaged, no special direction is necessary, but if it is to play entirely without the snares, then the instrument should be listed at the beginning as, e.g., “snare drum with snares relaxed.” The instruction for engaging or releasing the snares is simply “snares on” or “snares off.” The snares can be engaged or disengaged with one hand in a fraction of a second. An unavoidable little snapping sound occurs when the snares come in contact with the lower head of the instrument, so they should be engaged at a point in the music when the snap will be covered by louder sounds or at any rate will not be obtrusive.

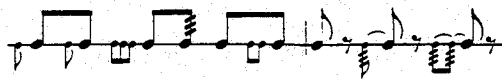
The snares are so sensitive to any vibration of the snare head that sympathetic vibrations caused by the playing of other instruments nearby will cause them to hiss as loudly as *piano*; for this reason it is best to relax the snares whenever the drum is not being played. The player should do this automatically, but failure to do so is a common fault even among

professionals, and the composer cannot go wrong in specifying every occasion on which the snares are to be relaxed.

Snare drums, field drums, and long drums are usually used individually rather than in sets. When used in sets, distinct differences in pitch can be achieved only among a relatively small number of drums: no more than three of each type to a possible maximum of nine drums in this timbre. With snares relaxed the individual drums sound more distinctive, and up to four of each sort may be employed effectively.

With snares engaged the sound of these drums, particularly the snare drum, is very crisp, with decay times of a quarter-second or less. Interestingly, muffling—which can be applied with identical effect to either head—subdues the snare sound as well as the head sound, giving a particularly covered, “dead” effect. Varying the striking position between edge and center produces a slight difference in sound, much more subtle than the effect when the snares are relaxed. Snare sticks are standard for all three drums. Nonetheless, the various tomtom mallets are of use here, too. Vibraphone mallets or hard timpani sticks are particularly useful when the snares are relaxed. When the drum is played *ppp*, the snares will not vibrate; if they *do* vibrate, the volume is automatically raised to *pianissimo*.

Special performance techniques possible only with snare sticks are widely used to make these dry-sounding drums more expressive, and these techniques are useful on drums of other sorts as well, especially those with tight heads. First of all, in producing a roll, each stick is allowed to bounce as it strikes the batter head, making a double repercussion for each stroke of the roll. The roll thus produced is very uniform, smooth, and fine, and can be applied to extremely short notes. The use of grace notes both rolled and unrolled to vary the attack is an integral part of snare drum technique.*



Whether rolled or not, each grace note represents a separate stroke, so that, for instance, the rolled double grace (“closed drag”) before the last note of the above example represents two strokes, each allowed to bounce. This bouncing technique is also used for one-handed performance of extremely rapid rhythms. Notes meant to be so played should be grouped together under a slur and each note should be marked with a staccato-dot.

Playing on the rim is somewhat more convincing on snare, field, and long drums than it is on drums of other types, because the clicking “rim” sound is not very different from the normal sound of the drum itself. For some reason, playing on the rim does not cause the snares to vibrate. The rim shot, however, causes *everything*—heads, snares, shell—to vibrate. It sounds like rifle fire and can be as loud as *ffff*.

The wire brush, developed for use with the snare drum, is very useful on field and long drums as well. When they are rubbed the vibration of the snares makes a delicate, smooth hiss; when struck, they make a “chick” sound. The overall effect is of the snares vibrating with little or no attack noise or head sound. Similar effects can be produced with finger-style playing, in which varying the manner or position of striking will have next to no effect as long as the snares are engaged.

* Percussionists speak of “open” and “closed” “flams,” “drags,” and “ruffs.” This terminology is an unnecessary mystification of a really rather straightforward process.


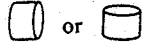
<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>dynamic range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
small double-headed drum	sm. 2-h. dr.	tomtom drum	<i>ppp-fff</i>	variable	standard	common
tenor drum	t.d. t. dr. 	tomtom drum	<i>ppp-fff</i>	variable	standard	common
bass drum	b.d. b. dr. 	(none)	<i>ppp-fff</i>	bass drum beater(s) (light, heavy)	standard	ubiquitous

FIGURE 85. *Double-headed drums—vital statistics.*

A special effect possible on these drums but so far unexploited is playing with snares half-engaged. Each note so played will sound like a “snares off” note accompanied by a long dying rattle from the snares of up to four seconds’ duration. This rattle will not occur on notes played softer than *piano*.

The sympathetic vibration of the snares can be exploited by leaving them on while *any* instrument plays nearby at *mf* or louder. The best and most obvious use of this effect occurs when a voice or wind instrument* plays directly into the batter head, which will then respond even to a *pianissimo*.

SNARELESS DOUBLE-HEADED DRUMS

Double-headed drums with raised rims but without snares are found in three varieties. The “small double-headed drum” is an almost invariable component of a set of traps (p. 122). Almost always incorrectly called “tomtom,” it is of the same general size, sound, and pitch as a snare drum without snares but has a smaller, looser head. Except for this and the Indian drum (see below), snareless double-headed drums are all quite large; those longer than wide are called **tenor drums**, while those wider than long are called **bass drums**. Size or depth of pitch is not the determining factor here: the small bass drums used in traps are no bigger than the tenor drum used beside them. This tenor drum is usually called the “floor tomtom,” and indeed it may be one, since the lower head is not mandatory.

The tenor drum is usually used singly and is made in a rather narrow range of sizes generally intermediate between the field drum and long drum, either of which may be substituted for it (snares relaxed) with impunity. Bass drums are quite variable in size and can be divided into two groups: small ones for use in traps, and much larger ones (often twice the diameter) used in orchestras. Intermediate sizes can be found if necessary, and one occasionally sees a rare “monster drum” dragged out as a (mainly) theatrical effect. With such a range

* See restrictions on woodwinds, p. 147.

it is quite feasible to write for bass drums in groups—though, because of their size, they are usually assigned one-to-a-player. Even without recourse to “monster drums,” as many as five bass drums can be used at once with good effect.

It is still considered traditional for the bass drum to be set on its side when it is played; when the instrument is used singly this saves a lot of space. Thus set up, it will normally be played one-handed; passages requiring two-handed playing must be executed with alternate strokes on opposite heads. When the bass drum part is tightly bound to other percussion lines—for instance, when the instrument serves as the lowest of a set of mixed drums—or when a single player must handle more than one bass drum, the drum is usually laid flat like other drums. In any piece in which the position of the bass drum makes a difference, the instrument list should specify “bass drum (standing)” or “bass drum (laid flat).”

Sets of double-headed drums covering a wide pitch range can be formed by using snare drums (snares relaxed) for the highest sounds, field and/or tenor drums in the middle, and bass drums (usually only one) at the bottom.* The performance techniques involved for such a set are exactly the same as for tomtoms, save that since double-headed drums are, on the average, larger and lower-pitched than tomtoms, timpani sticks are virtually mandatory except for special effects. When the bass drum is played by itself, a single bass-drum beater is generally used, assuring maximum power and depth of pitch. For rapid or complex rhythms a pair of soft timpani sticks are used, with virtually the same effect. A barbaric “Ben Hur” sound can be gotten from the bass drum with wooden timpani sticks. In traps, the bass drum is provided with a removable, adjustable, pedal-operated bass-drum beater and the instrument is played with one foot. This pedal beater does not rebound unless the foot is quickly removed—an awkward motion—so the sound is automatically damped with each stroke, producing a precise thud rather than the indefinite five-second boom of a hand stroke. To guarantee this, the bass drum in a traps set is usually heavily muted from inside. Increasingly common are traps with two adjacent pedal bass drums, so that by using both feet a “rolling thunder” trill can be produced. The pedal mechanism is detachable and can be fitted to any bass drum, though it works best on small ones. A drum so used must be set on edge with one head facing the player, making hand strokes awkward (the player must lean down and strike *forward*) but possible.

Two-headed drums (except where snares are involved) can be given the effect of definite pitch by doubling each drum with a single specific note (in the appropriate range) from any non-sustaining instrument. True definite pitch can be obtained by tuning the two heads of a drum to the same pitch, but the resulting sound is virtually indistinguishable from that of a tomtom. Combining the deep, indefinite rumble of a bass-drum roll with a sustained low pitch from some other instrument(s) gives the distinct impression of doubling that pitch at a lower octave.

THE INDIAN DRUM

The Indian drum is a double-headed drum without raised rims. More important, the heads are quite loose and are attached to the shell by tacks or lashings, making the drum difficult, if

* Bass drums are so large that no player can profitably handle more than three, and this to the exclusion of all other drums (unless placed behind the player). Up to five is *possible*, but this would completely surround the player with bass drums and comprise the complete possible horizontal array.

<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>dynamic range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
Indian drum	Ind. dr.	tomtom	<i>ppp-ff</i>	variable	exotic, novelty	rare

FIGURE 86. *The Indian drum—vital statistics.*

not impossible, to tune. The drum is usually small and less deep than wide; despite this it is typically as low in pitch as a tenor drum—or lower—because of the looseness of the head. The sound of the drum is typically dark and “tubby” with a rapid decay, and cannot exceed *ff* in loudness. An unambiguous name for this drum is badly needed. The term “Indian drum” is distressingly vague—by no means do all Amerindian drums fall within the limits here described, nor are all drums of this type Amerindian in origin. In Europe, for instance, this type of drum is more likely to be written for under the name “Chinese tomtom.”

Indian drums exist in every size from tiny to monstrous, but since the tension on the head of an Indian drum is roughly the same on drums of all sizes, large ones are comparable to the Western tenor and bass drums in both head-tension and timbre. Even small drums tend to differ among each other less in pitch than in timbre: the smaller the drum, the weaker and “deader” the tone.

The weakness and delicacy of tone of Indian drums, together with the absence of raised rims, make them ideal for finger-style playing, and all the techniques discussed below in the section on bongos can be used. Sticks must be light, for example, rubber-series mallets (wound or unwound), snare sticks, or wire brushes.

FRAME DRUMS

THE TAMBOURINE

The shell of a frame drum is so shallow relative to its width that it acts simply as a tensioning hoop for the head without providing any resonance. The tambourine shell is studded with pairs of tiny “cymbals” strung on thin metal rods set vertically across slots cut in the shell; these jingles so completely dominate the instrument that it hardly sounds like a drum at all.

The tambourine, uniquely among drums, is a hand instrument: normally it must be held in one hand while it is being played, which means that time must be allotted for it to be picked up and set down and that while it is being held the player will have only one hand free to play any other instrument. The tambourine is struck with the free hand using the fingertips, the knuckles of the fist, or the flat of four fingers together; the instrument may also be struck against the player’s knee. These modes of striking do not differ significantly in timbre; the method used is determined by the dynamics and articulation of the part, and the composer need not specify the form of stroke. Playing near the edge produces a crisp staccato from the jingles, playing in the center a broad tenuto. Here too it is only necessary to specify the articulation, because there is no difference in timbre. The roll on the tambourine can be executed by shaking the instrument, by alternating strokes with the index and ring

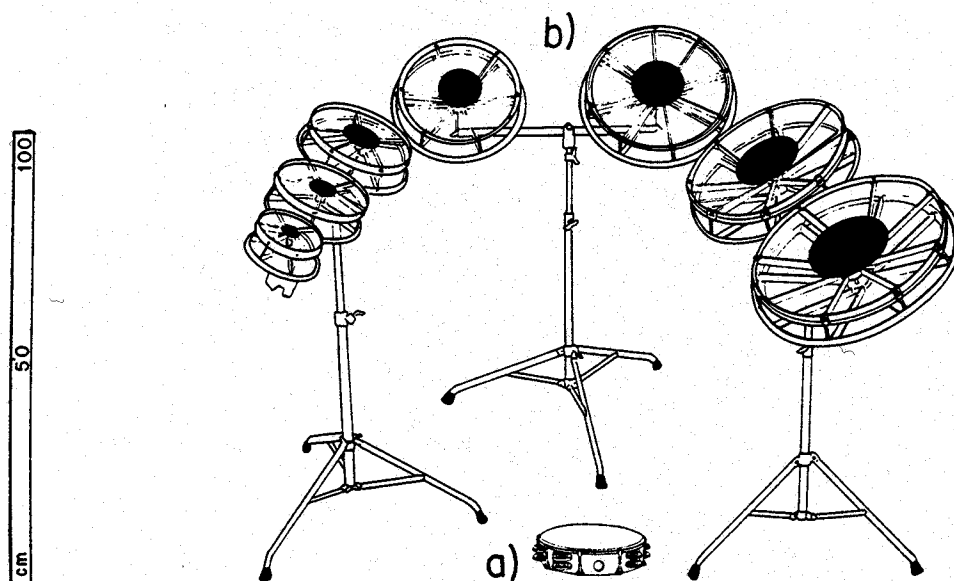




FIGURE 87. Frame drums: (a) tambourine; (b) rototoms.

fingers of the free hand, or by performing the **thumb roll** (described on p. 135 above). This last should be notated as a rubbing effect: . The other two rolls are notated in the usual way: . The distinction between these notations should be explained in the introduction to any piece in which they occur; alternatively, the precautionary notations “shaken,” “fingers,” and “thumb” (or the standard thumb sign, ♯) may be placed at the beginning of each roll. The finger and shaken rolls differ more in volume than timbre (the finger roll is softer); dynamics aside, it is not usually necessary to distinguish between them. The thumb roll is, however, quite distinctive in its precision and clarity, and one will generally want to be specific in demanding it. It should be remembered that the thumb roll cannot be performed louder than *ff*.

It is not necessary to strike the head of the tambourine in order to play it. Shaking can be used not only for rolls but for individual notes. The attack will be somewhat vague, and in the *fortissimo* will lack the “pow!” normally contributed by the head. A “normal”-sounding attack—but with no trace of head sound—can be achieved by striking the lower rim of the drum against one’s leg or with the heel of the free hand.

All high-quality tambourines are provided with tensioning screws; these do not change the pitch of the instrument (which is entirely determined by the jingles) but serve to tighten the head to the optimum level for the transmission of vibration through the shell to the jingles. Tambourines are made in a wide variety of sizes which, however, differ little if at all in pitch. Large tambourines have more jingles than small ones, though, and thus differ from them in timbre, having a lusher, fuller tone and a somewhat more sluggish attack. For tambourines of different pitches, one must have recourse to the non-Western tambourines of North Africa and Southwest Asia; these sound very much like the Western tambourine (to which they are closely related historically) but many are much lower in pitch. Unfortunately, these instruments are very rare in North America.

<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>dynamic range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
tambourine	tamb.	(none)	<i>pp(p)-fff</i>	fingers	standard	ubiquitous

FIGURE 88. *The tambourine—vital statistics.*

Like most hand instruments, the tambourine may be played with both hands. It need only be laid on a cushion, either side up, and played either with the fingers or with sticks. More commonly, though, the tambourine is attached to a stand—unlike a cushion, a stand is adjustable in height, and there is no chance of knocking the tambourine away in *fortissimo* passages. When the instrument is attached to a stand the head is free to vibrate after each stroke, in contrast to either hand-held or cushion playing, in which the head is normally damped. Vibrations of the head will thus decay at natural speed, about half a second, and particularly at low dynamic levels the head will continue to ring after the jingle sound has ceased. The resulting sound is not unitary—it is exactly as if a simple frame drum and a set of jingles were being played simultaneously. At loud dynamic levels this is not a problem, but the only way to get a real tambourine sound out of a suspended tambourine at low volume is either to muffle the instrument or to damp it by hand or stick. The *ppp* is problematic on the tambourine no matter how it is played, for when the head is struck this softly the jingles will not vibrate. The only way to get a *ppp* jingle sound is to tap a single pair of jingles *very* gently.

Only light sticks may be used with a tambourine: vibraphone or marimba mallets are best. Hard xylophone mallets or snare sticks bring out the head sound; with reversed rubber-series mallets the head and jingle sounds will actually be of equal volume. As a special timbre the tambourine may be played with a single stick even when the instrument is hand-held.

Like most other hand instruments, the tambourine can be used to strike another instrument. Obviously, the second instrument must be large (timpano, bass drum, tam-tam). The effect will be as if it were struck with a particularly large and clumsy wooden mallet, and the tambourine will jingle.

ROTOTOMS

Despite their name, rototoms are not tomtoms but frame drums. They are provided with a rotary tuning mechanism at one time widely used in timpani: turning the top of the instrument clockwise raises its pitch and turning it counterclockwise lowers it. Simple frame drums (“hand drums”) in the form of jingleless tambourines have existed as long as the tambourine itself; the rototom, introduced in the late 1960s and marketed by Remo, supersedes these drums almost entirely.* While hand drums and rototoms have exactly the same timbre (it would be surprising if they did not), the latter are infinitely more flexible instruments, not only because they can be tuned to specific pitches almost as easily as timpani but because they

* This is reflected in the fact that since 1968 as much music has been written for rototoms as had been written for hand drums in all the preceding centuries.


<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
rototoms	rot. rtms.	(none)	 <p>loudest: <i>fff</i> softest: <i>ppp</i></p>	variable	standard	usually available

FIGURE 89. *Rototoms—vital statistics.*

are available in a wide range of sizes (rototoms have a greater overall pitch range than any other drum) and because they are not hand instruments.

Rototoms are made in seven sizes, ranging from 15 to 46 cm in diameter. The exact range of each drum is somewhat variable (depending on the weather, the type of head used, and its age) but each drum can be tuned across a full octave without any distortion of timbre. This range can be expanded to a twelfth or more. The extension pitches outside the octave span (including the overall extension pitches given in Fig. 89) are uncharacteristic in timbre. The low ones are flabby and weak in pitch and the high ones acquire the crisp brittle tone and weak pitch of bongos or timbales.

The tone of the rototoms is similar to that of tomtoms, but a harsh little cluster of high partials gives the tone a certain pungency lacking in tomtoms. The envelopes of these drums are virtually identical to those of tomtoms of similar diameter; one must accordingly watch out for the effects of overlapping decays in the lowest fifth of the range. The writing of chords should be handled as for timpani or small kettle drums; there will be some loss of pitch definition, but above about *c*¹ even full triads should be effective; dissonances, however, will always seem merely unpitched. Because the pitch is significantly stronger than that of tomtoms but weaker than that of timpani or small kettledrums, rototoms may be written for with equal effectiveness either as pitched or unpitched instruments.

Their relatively small size permits rototoms to be handled by a single player in groups of as many as nine. As with tomtoms, drums in the four smallest sizes can be arranged in a square, allowing complete flexibility in the choice of **hammerings** (pattern of left and right strokes—also called **stickings**). Players (or institutions) are unlikely to own more than one rototom of any given size, so unless one is willing to go to the effort of acquiring extra drums it is probably best neither to write for more than seven at once nor to require two drums of identical pitch range.

Pitch changes on rototoms are not quite as carefree as they are on timpani, since on the rototoms the process requires the use of a hand;* such changes should therefore be used comparatively infrequently. Composers should make use of as many as necessary of the notations used with timpani (pp. 143–44), taking care that all changes are clearly indicated at the appropriate places in the music. As with timpani, single-stroke glissandos are much more effective ascending than descending. Also as with timpani, new pitches may not be perfectly accurate if the percussionist has no chance to fine-tune them before they are played; as an aid in this process, players sometimes mark the perimeter of a drum with masking tape to indicate the position to which it should be turned for a given pitch.

* It is not necessary, however, to put down the stick in that hand.

A detachable pedal tuning mechanism for rototoms has been developed within the past year or so. As we go to press this device is not yet widely distributed, but it certainly seems promising.

The choice of sticks for rototoms is much the same as for tomtoms. The rototoms are of somewhat higher pitch, on the average, so vibraphone sticks are the best all-round mallets to use. Because rototoms have (slightly) raised rims, the use of finger techniques is unfortunately limited. In this area at least, the old hand drums have an advantage—like tambourines, they do not have rims. On the other hand, the various “rim” effects, including the rim shot, can be performed on rototoms.

MISCELLANEOUS DRUMS

BONGOS AND CONGAS

Bongos and congas are rimless drums, open at the bottom, with single, small, very tight heads. In the purest form of both drums, the heavy shells are constructed of vertically aligned wooden slats tapering toward the bottom; bongos are conical, congas fusiform. In actual practice, cost-cutting and hybridization with other drums have resulted in the widespread elimination of slat-type construction and the development of conical congas and completely cylindrical bongos. The best drums of both types retain the original features, which help considerably to establish their distinctive tone qualities. In their Latin-American homeland, congas are made in three slightly different forms called (from largest to smallest) **tumba** (or **tumbadora**), **conga**, and **quinta**. These distinctions have been lost in commercially made congas, not only through hybridization but through the introduction of unclassifiable new varieties, such as the tiny (30 cm tall) congas one occasionally sees in music stores. “Tumba” survives as a vague term indicating a larger-than-average conga and as an even vaguer synonym for a conga of any sort.

As Figure 91 implies, congas differ from bongos not so much in range as in timbre. Both drums have a precise, dry sound that is also somehow pleasingly rich and full. To this quality the conga adds a slightly woody hollowness contributed by the extremely thick head and cavernous interior. The conga has a very quick decay—about a quarter of a second—and this contributes much to the precision and clarity of its sound. The bongo decay takes longer—about half a second—but it is initially very rapid, and all the very prominent upper partials and attack sounds die as quickly as a conga note.

The pitch of these drums is very weak (weaker even than that of a tomtom) but definable enough to be specifically demanded if desired, although both bongos and congas are normally written for as unpitched instruments. Tuning is by means of tension screws. The range of pitches available is quite narrow, partly because the heads must be kept so tight and partly because the drums are made in a very limited variety of diameters. The extension pitches at the bottom of the range are available only at a sacrifice in tone quality—the bongo sounds tomtom-like (indistinguishably so in the case of hybrid, “tomtomoid” bongos) and the conga sounds boomy, almost like a boobam. Leaning on the head will raise the pitch temporarily, as on tomtoms (p. 150). The limits for this are a sixth for congas, a fourth for large bongos, and a minor third for small ones.

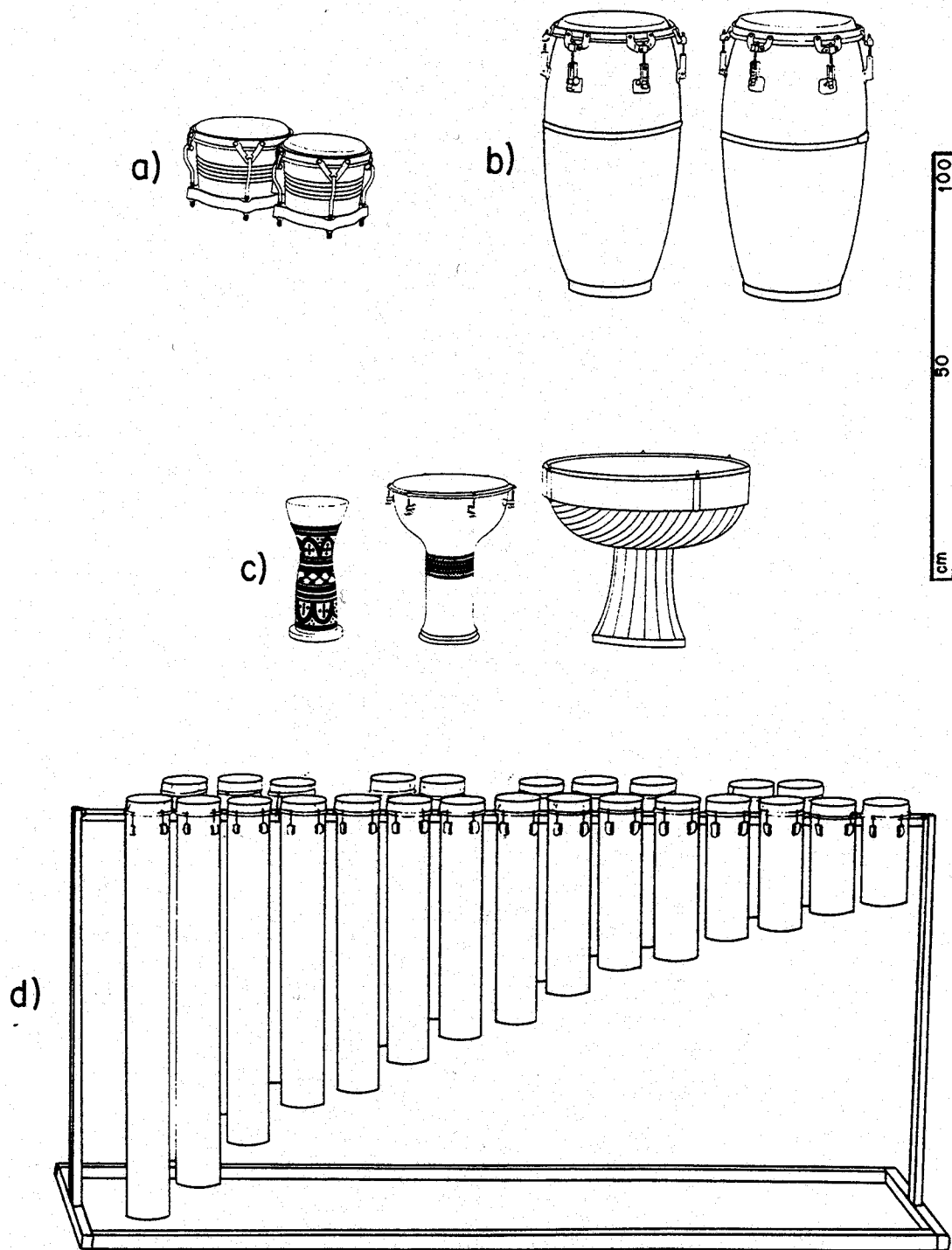


FIGURE 90. *Miscellaneous drums: (a) bongos; (b) congas; (c) dumbbells; (d) boobams.*


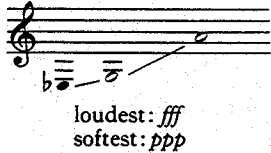


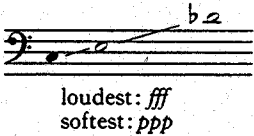
<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
bongos		bongo drums	 <p>loudest: <i>fff</i> softest: <i>ppp</i></p>	fingers	standard	common
congas	 	conga drums tumbas	 <p>loudest: <i>fff</i> softest: <i>ppp</i></p>	fingers	standard	common

FIGURE 91. *Bongos and congas—vital statistics.*

Bongos and congas are traditionally played in pairs, and for finger-style playing this is perhaps just as well. When sticks are used, however, the small diameter of the drums makes it possible for one player to handle many at once; a complete chromatic set covering the entire pitch range of the instrument (fifteen bongos or ten congas) is not out of the question. Such an array would presumably be laid out in two rows, like the bars of a mallet instrument: watch out for cross-overs and double beats!

On congas in particular, playing with the fingers can be grueling—it is not unknown for a drummer to break a hand against the extremely thick, tight head.* Professional conga specialists develop rope-like tendons and thick calluses that protect their hands; “all-purpose” percussionists often wrap their hands and/or fingers with surgical tape when faced with the task of extended, loud conga-playing. On both congas and bongos the tightness of the head coupled with the focusing power of the (it is to be hoped) thick, tapered shell enables the production of a true *fff*, which is not otherwise possible in finger-style playing.

The subtle complexities of finger-style playing have so far eluded attempts to develop a standardized notation. The notations suggested in Figure 92 are designed to be as simple and clear as possible and are consistent with the general system of percussion notation used in this book.

All these techniques are a normal part of bongo playing except the rubbed sounds, the fingernail taps, and the stroke with the heel of the hand, which are special effects. On congas, almost everything is played with the flat of the hand.

It is not necessary to notate every detail of bongo or conga performance—many very successful parts have been written for these instruments in which most or all of the details have been left to the performer. When a whole rhythmic phrase is to be played mostly or entirely with one technique, the part will be easier both to write and to read if that technique is indicated verbally at the beginning of a passage rather than as separate symbols on each note. Verbal indications may also be used to give somewhat less detailed instructions—for

* Lay people are often startled to find that the head of a conga does not yield at all. It is about a millimeter thick, and could not be any thicker without ceasing to act like a membrane altogether.



<i>notation</i>	<i>meaning</i>	<i>sound</i>	<i>dynamic range</i>
	center stroke with flat of 4 fingers	ordinary, with a somewhat slapping attack	<i>ppp-fff</i>
	edge stroke with the flat of 1-4 fingertips	same, but bright, clear, precise; at high dynamic levels a ringing crack; acoustically homologous to rim shot	<i>ppp-fff</i>
	center stroke with fingertip(s)	ordinary, with little attack noise	<i>ppp-ff</i>
	edge stroke with fingertip(s)	same, but brighter tone	<i>ppp-ff</i>
	stroke with fingernail(s), center	tapping sound	<i>ppp-f</i>
	stroke with fingernail(s), edge	same, but more pronounced	<i>ppp-f</i>
	thumb stroke, center	sharp thud	<i>pp-fff</i>
	thumb stroke, edge	same, but brighter sound; at high dynamic levels a sharp crack	<i>pp-fff</i>
	head struck with heel of hand	dull thud, usually with some "scooping" of pitch	<i>pp-fff</i>
	head rubbed with finger	moaning or grunting sound	<i>pp-f</i>
	thumb roll	moaning or grunting sound	<i>pp-f</i>
	head rubbed with fingernail(s) or very lightly with fingers	a fine, light hiss	<i>ppp-f</i>
	true roll (flats of both hands)	ordinary	<i>pp-fff</i>
Except for the true roll, any of the above can be combined with the following:			
	"dead" stroke (damped as it is played)	sound choked off (cannot be combined with rubbed sounds)	—
	stroke damped by opposite hand	sound heavily muffled	—

FIGURE 92. *Suggested notations for finger-style playing.*


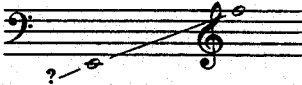
<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
dumbegs 	dumbs. dbgs.	darabuccas Arab drums Arabic tablas goblet drums clay drums	 loudest: <i>fff</i> softest: <i>ppp</i>	fingers	exotic, standard	rare

FIGURE 93. *Dumbegs—vital statistics.*

instance, specifying “fingertips” without differentiating center and edge strokes, or “edge” without indicating whether the flats or the tips of the fingers are to be used. When the two hands are to play complex, independent rhythms it may be necessary to notate them separately, using stems pointing in opposite directions. In extreme cases it may even be necessary to use two separate lines.

Bongos and congas are often played with sticks, particularly when they are included in an array containing other drums. Rubber-series mallets are best—the whole series will work well on congas, while the hard and medium ones are best for bongos. Timpani sticks may be used on congas in a pinch but should be avoided if possible. For wooden sticks the usual choice is snare sticks (either end) on bongos, and wooden timpani sticks or reversed snare sticks on congas.

Both congas and bongos give a satisfactorily wooden “clack!” when struck on the shell with a hard (unwound) stick; soft or wound sticks produce only an anonymous knocking sound. A special effect peculiar to the bongo is use as a rattle, by turning it upside down and dropping in small round objects (dried beans work best), which can then be swished around.

DUMBEGS

It is difficult to say anything with certainty about dumbegs, because neither the name nor the drum is standardized. The drums involved have all the following features in common: (1) a single head, loosely tensioned; (2) no raised rim; (3) a goblet-shaped shell, open at the bottom. The last of these characteristics places them organologically as **goblet drums**, a perfectly satisfactory and well-defined term, adopted, unfortunately, by no one except organologists. Of the names in regular use the least ambiguous and most widespread is **dumbeg**. Even that name is spelled and pronounced in an astonishing variety of ways: I have seen “dumbec,” “dumbek,” “dombak,” “tumbak,” “tunbuk,” and “dunbak”; most of these are the names of local varieties from various places in the goblet drum’s homeland of North Africa and Southwest Asia. “Dumbeg” itself seems to be a strictly Western variant, and is thus legitimate as a general term for all such drums.

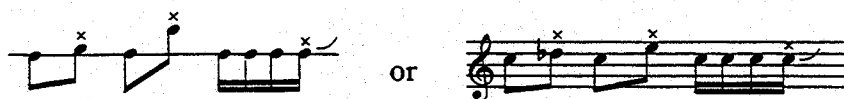
As for the actual drums, it sometimes seems as if no two are alike. The shell may be of metal, clay, or wood; the drum may be truly goblet-shaped, or shaped like a vase, or anything in between; the head may be tunable with tension screws, with primitive lashings, or not at all; and the ratios among head diameter, stem diameter, depth of bowl, and depth of

stem are completely variable. A few generalizations can, however, be made: (1) Dumbegs manufactured on this continent are almost always equipped with tension screws, have metal shells, and are medium to large in size. (2) The largest dumbegs are made of wood. (3) Small dumbegs usually have clay shells and primitive or nonexistent tuning mechanisms. These small drums, often called **darabuccas** (this term, too, is highly variable in spelling and pronunciation), must be imported. (4) Shape and dimensions tend to vary with the diameter of the head. The larger the drum, the more strongly goblet-shaped it will be, with a *relatively* smaller stem and shallower bowl. The smallest darabuccas are vase-shaped and are almost all stem.

The rareness and variability of dumbegs make it difficult to define their pitch range. The extremes given in Figure 93 represent only the limits of my own experience with these drums. The upper limit of f^2 is almost certainly correct, since drums that produce this note are tiny indeed; E_0 as a lower limit is a cautious guess—lower pitches may well be available.

The best way to describe the tone of the dumbeg is by comparison: it is halfway between an Indian drum and a kettle drum. It is tubby and weak but also very rich, with a weak but definable pitch about as clear as that of a tomtom. The decay time varies, from the largest to the smallest drums, between about three seconds and half a second. In the highest drums, the pitch of the head is reinforced by a **cavity resonance** one or two octaves lower. This cavity resonance is determined by the size and dimensions of the shell, so that whether tunable or not the drum is really built to produce only a single pitch. Despite this, dumbegs are usually treated—both in the West and in their home cultures—as indefinitely pitched drums.

No drum is more clearly specialized for finger-style playing than the dumbeg. The unusual shape of the drum was developed to enable it to be held easily under the arm and played with both hands. The loose head provides the strongest possible differentiation among the sounds of all the different techniques summarized in Figure 92 and permits bending the pitch with relatively little pressure on the head. Even the highest drum can be forced up as much as a fifth (to $c^3!$) with surprisingly little pressure. The muffling thus produced is less than with other drums, though of course it increases as the pressure is increased. This bending of the pitch is ordinarily produced with the hand that does *not* deliver the stroke: this enables considerable precision and even the production of specific pitches above the “open” note. Both the raised pitch and the muffling should be indicated in the notation, thus:



It is also possible to bend a pitch as it is struck; this should be notated as an indefinite upward swoop, thus: $\overset{\sim}{\text{f}}$. The drums can be played no louder than *ff* with the fingers.

Dumbegs can, of course, be placed on stands and played with sticks like other drums. The small “darabucca” drums will need sticks like those used for small kettle drums; larger instruments should be treated like tomtoms. Because of the looseness of the head, strokes in *ff* or *fff* will “scoop” in pitch and thus sound “rubbery” to the ear.

Dumbegs show up in scores even more rarely than in reality; there is no dumbeg part in any of our musical examples. For those interested in hearing one, there is a “dumbec” in Terry Riley’s *Rainbow in Curved Air*; otherwise, recordings of non-Western music are the best bet.

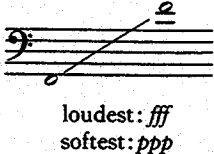
<i>name of instrument</i>	<i>abbreviations</i>	<i>synonyms</i>	<i>range</i>	<i>normal sticks</i>	<i>status</i>	<i>availability</i>
boobams	bbms. boobs.	bamboo drums		wound marimba sticks	standard	very rare

FIGURE 94. *Boobams—vital statistics.*

BOOBAMS

Boobams are unique among drums in that the pitch is not determined by the head at all but by the dimensions of the shell. Each drum consists of a long tube about 15 cm wide, open at the bottom and with an appropriately small drumhead affixed to the top. Acoustically this system behaves as a stopped pipe, the head acting as a kind of reed to set up vibrations in the enclosed air column, the frequencies of which are determined by the length of the tube. Since each drum produces only a single pitch, it is customary to place groups of them side by side in a specially designed rack, arranged keyboard-fashion like the bars of a mallet instrument. Considering the rarity of boobams and how recently they were invented, there is a surprising unanimity of opinion that their overall range should be that given in Figure 94. A two-octave set of boobams covering this range makes a combined instrument some two and a half meters long, which is about the maximum manageable size. It must be emphasized, however, that the drums are not readily available in such sets of twenty-five. Very few players own boobams: the drums must be rented or borrowed, and naturally only those pitches needed for the specific occasion will be acquired; if these are few, the drums will be simply racked up in a line from lowest to highest just like any other drums. In light of this, it is probably best to indicate at the beginning of the piece what boobam pitches will be required.

The tone of the boobam is a deep, rich boom of great purity that is surprisingly similar to a marimba. What makes the timbre of the boobam unique are the sounds contributed by the head, all of which must be considered attack noise. The tiny head cannot meaningfully be tuned lower than about c^1 , so that except at the top of the range the pitch of the head will be higher than that of the tube—increasingly so for lower boobams. The result is a kind of "ghost pitch," somewhere between c^1 and g^1 , that doubles a harmonic or privileged frequency of the drum and has a timbre of its own rather resembling a high tomtom. In the highest boobams, where the head is tuned to the actual pitch of the tube, the sound of the instrument is more unitary, resembling a tomtom of unusually clear pitch. The attack sound dies more quickly than the main pitch of the drum but is initially much louder, and in order to keep it as unobtrusive as possible only the softest wound marimba sticks are normally used. Of course, harder sticks can be utilized—even snare sticks and such—but the harder the mallet the more the head sound will be brought out at the expense of the tube sound, particularly for the lower pitches. The head sound is also brought out by playing loudly, and the *fff* (available only from hard sticks) obliterates the main pitch altogether. Because of the different decay times for head and tube (about one-quarter and three-quarters of a second, respectively), boobams sound most effective when played at slow or moderate speed; fast passages,

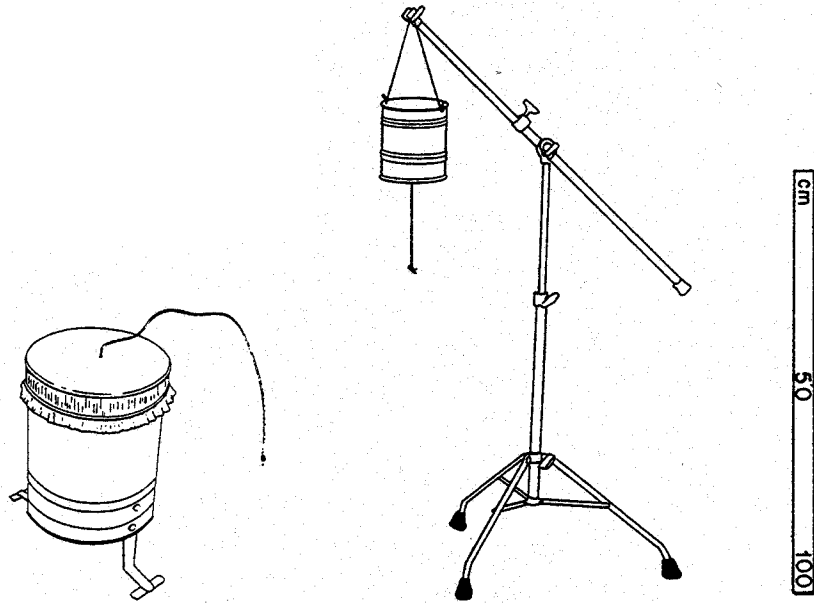


FIGURE 95. *String drums.*

and rolls in particular, will be somewhat unclear in pitch because of the constantly overlapping attack sounds.

The tube-sound of the boobam is the most clearly pitched of all drum sounds. Chords, even full triads, are quite effective, and in the middle part of the range even dissonances will work.

The playing technique for boobams is essentially the same as that for mallet instruments (discussed in Chapter VII). The following exceptions should be noted: (1) glissandos are impossible; (2) when two sticks are held in one hand, the maximum spread is between two drums separated by no more than three others—i.e., in a chromatic set of boobams, the interval of a fifth; (3) hammerings must be very carefully planned to avoid bad cross-overs, as the distance between adjacent notes in a set of boobams is even greater than in a bass marimba.

FRICITION DRUMS

A string drum is just that: a drum with a long string attached to the center of the head. A tiny hole is made in the head, and the string (usually a gut cello or contrabass string) is passed through and knotted underneath the head. The instrument is played by pulling the string taut and rubbing along it lengthwise with a rosined cloth or glove. In its modern form the string drum was originally used only as a theatrical sound-effect, the *lion's roar*, and it is still occasionally encountered under this name.

A real "lion's roar" sound is given out only by the largest string drums. These are usually about the size and shape of an inverted washtub and are firmly attached to a large, flat board.

<i>name of instrument</i>	<i>abbreviation</i>	<i>synonym</i>	<i>dynamic range</i>	<i>status</i>	<i>availability</i>
string drum	string dr.	lion's roar	<i>p-ff</i>	homemade	usually available

FIGURE 96. *The string drum—vital statistics.*

The player must put one foot on the board while playing, because in order to put sufficient tension on the string considerable upward pull must be exerted, and the instrument would be lifted off the ground if it were not held down. More commonly seen than these large string drums are medium-sized ones, often made by simply attaching a string to a tenor drum or tomtom. These higher-pitched string drums produce not a lion's roar but a variety of moaning or grunting sounds—more like a Wookiee. As these instruments are rarely attached to a base, they must be held down with the player's free hand. High-pitched string drums are only occasionally encountered but are very easily made by poking a hole in the bottom of an empty coffee can and running a knotted string through it; the string is then pulled and rubbed in the usual way. The sound produced is a kind of whoop or squawk, and the fact that the can bottom is not, strictly speaking, a membrane seems to make no difference. Small string drums of any fature can be suspended from any appropriate stand or rack, with the string hanging downward; when the string is pulled the rack automatically holds the instrument in place. Occasionally one sees a particularly elegant medium-sized string drum suspended in this same fashion.

Unlike most percussion, string drums are sustaining instruments and should be notated as such. The pitch is quite definite, but so utterly uncontrollable that the notation of specific pitches would be foolish. Often a note will rise slightly in pitch as it is played, and almost invariably there will be a sudden downward swoop at the end. Dynamics are determined by the pressure with which the string is rubbed.

Usually the string hangs loose when it is not being played. To play the instrument, the percussionist must lean down, grab the string at its base and pull slowly along it, using one hand both to make the sound and to keep the string taut. Suspended string drums eliminate this awkward downward reach. A single note can be played only for about two seconds, though if the player has both hands free a vaguely continuous sound can be produced by continuously pulling along the string hand-over-hand. Both hands must also be free if rapid repeated notes are to be played; for anything faster than eighth-notes at $\text{♩} = 100$ the player holds the string taut with one hand and rubs back and forth with the other. By this means one can even produce a roll of sorts. As a special effect the string may be bowed or plucked.

String drums and other friction drums occur worldwide as folk instruments; they all sound much the same. Composers need not concern themselves with any but the ordinary string drum, but two of these exotic friction drums occasionally enter the purview of the Western percussionist. The **Waldteufel** (German: "forest devil") is a Central European toy consisting of a tiny string drum with a loop in the far end of the string, through which one end of a rod is passed. The instrument is held by the rod and whirled round and round, producing sound by friction between the end of the rod and the loop in the string and keeping the string taut by centrifugal force. The **cuica** is a Latin-American instrument that is essentially a bongo, with a wooden rod attached to the center of the lower surface of the head. The player

reaches inside the drum to stroke the rod. The sound is a wordless commentary of falsetto whoops suggesting surprise, pleasure, or amusement. A cuica-like sound can be obtained by resting the tip of a snare stick on the head of a bongo or other small drum and rubbing the stick with a rosined cloth or glove—in fact, this technique can be used (with varying timbres) on *any* drum, using any rigid object that comes to a point. The drum will act as a natural amplifier not only of rubbing sounds but of all sorts of minute tapping, scraping, and scratching sounds, raising them from the subaudible range to *pianissimo* or even louder.