

MONOGRAPH

Formal Aspects of Performance Practice In Central Javanese Gamelan Music

by Roger Vetter

Preface

Certain aspects of Central Javanese gamelan performance practice have fascinated me from my earliest encounters with this music tradition in 1973, when I joined the University of Hawaii gamelan ensemble under the direction of Pak Hardja Susilo. In particular, how was it that a neatly organized block of ciphers on a sheet of paper titled something like *Ladrang Pangkur* could reside at the core of a realization of itself that consumed twelve or more minutes of time with layer-upon-layer of melodic and rhythmic gestures produced by over a dozen musicians who were not following detailed notational instructions? This question, and the drive to provide myself with answers to it, has stuck with me over my forty-five years of involvement with Javanese gamelan music. As a music theory graduate student, my 1977 M.A. thesis, reproduced here in its nearly-original form¹, was a first attempt at putting into words my evolving understanding of Javanese gamelan performance practice. I would continue over the years to

How do we comprehend a new musical system while we are participating in it? This article shows how Vetter, using the intellectual and analytical tools of his own background, attempted to make sense of the complex sound world that he had entered with both passion and curiosity. His writing reveals as much about the adventure of the mind as about the music itself.

Vetter used observations from his own experience, along with printed and recorded material available at the time, to postulate categories and rules of engagement guiding the gamelan music and musicians he encountered in Central Java. I am pleased to be able to share Vetter's insights and graphic representations of time and form with others who have encountered this rich musical tradition. The entire thesis in its original form, including parts not included here, is online (under current edition or with back issues) at www.gamelan.org/balungan.

—jody diamond

Roger Vetter is an ethnomusicologist specializing in the gamelan of Central Java, with an extensive knowledge of the court gamelan of Yogyakarta. This article is from his master's thesis, written at the University of Hawaii in 1977 when he was a musicology student who had been playing Javanese gamelan for only five years. He was trying to understand, and find a way to explain to others, the "formal forms and processes" of this tradition.

incorporate my ideas about form that were first developed in this thesis in other scholarly efforts: my 1981 article "Flexibility in the Performance Practice of Central Javanese Music" (*Ethnomusicology* 25/2: 199-214), in my dissertation "Music for the 'Lap of the World': Gamelan Performers, Performance, and Repertoire in the Kraton Yogyakarta" (University of Wisconsin-Madison, 1986); and in "Flexing the Frame in Javanese Gamelan Music: Playfulness in a Performance of *Ladrang Pangkur*," a chapter co-authored with Andy Sutton that appeared in *Analytical Studies in World Music* (Tenzer, 2006).

My primary goals in researching and writing this thesis back in 1977 were to define some fundamental form-related aspects of the Javanese gamelan tradition and to examine how they interact during performance to create large-scale formal relationships—what I call the formal process. I used as my data for this project published books of gamelan notation and commercially-available audio recordings of performances by professional Javanese gamelan groups, the majority of these recordings produced by the Indonesian national recording company Lokananta. These resources provided me with two very different representations of gamelan pieces: the notation collections presented lean encapsulations of the melodic framework (balungan) and phrase structure (colotomic) of pieces; the recordings presented me with case studies of unique realizations of those notational frames and examples of how performers flex or play with their apparent rigidity in the course of performance. I subjected both of these resources to analysis of one sort or another to suggest generalizations about 1) Javanese melodic/balungan organizational sensibilities, 2) the options musicians have in the course of a performance in regard to the repeating, the temporal flexing, and the editing of melodic/structural material, and 3) the sequential joining of pieces into medleys. The result is not a complete explication of Javanese gamelan performance practice, but a foundational overview of the formal processes at work in the performance practice of this tradition. Although compositional innovations have been introduced into the world of gamelan performance since the writing of my thesis some forty-two years ago, I feel confident that the observations and generalizations about Central Javanese gamelan performance practice set forth herein are still pertinent in contemporary practice.

—Roger Vetter, Grinnell College, 2019

THE GAMELAN TRADITION

The Gamelan Orchestra and Its Music Tradition

Throughout Mainland and Insular Southeast Asia there are numerous orchestras—such as the *pi phat* of Thailand, the *saing waing ah-pwe* of Burma, the *pin peat* of Cambodia, the *kulintang* of the Philippines, and the gamelan of Malaysia and Indonesia—which are comprised in part or predominantly of percussion instruments made of metal (bronze, brass, or iron). The construction, composition, style of playing, pitch and formal organization, and repertoire of these orchestras and their traditions differ not only from one country to the next, but often between regions within the same country. Within Indonesia there are numerous differences between the gamelan orchestras and music traditions found on the island of Bali and those on the island of Java. Indeed, on Java alone there are a number of distinct gamelan traditions that make it difficult to generalize about a single tradition of even this one island. Thus, when using the word “gamelan” it becomes necessary to clearly specify which “gamelan” tradition is being referred to. Here “gamelan” will refer to the Central Javanese orchestra and its music tradition.

There are thousands of gamelan on the island of Java alone, and the instruments of one gamelan are not interchangeable with the instruments of another gamelan (Kunst, 1973:546–571). The casings of the instruments of any one gamelan are carved and painted uniquely, and the chances of finding two gamelan tuned exactly alike are quite slim. Gamelan are housed in palaces, radio stations, wealthy merchants' houses, business offices, etc. Musicians meet at these places to rehearse and perform rather than owning their own instruments. Each gamelan is unique, and many are given their own name, e.g. *Kyai Guntur Madu* (“The Venerable Torrent of Honey”), *Kyai Udan Asih* (“Venerable Shower of Love”), and so forth, to express the emotional feeling (*rasa*) created by its sound.

Flexibility in the Gamelan Tradition

Gamelan music was, until recently, entirely orally transmitted. Today the use of notation as a means of preservation and transmission is becoming more accepted, although a standard system of notation is lacking (Kunst, 1973:346–355; Becker, 1972:30–60). Gamelan music has built into it a high degree of flexibility, and to appreciate this tradition and understand the limitations of even a detailed notational system one must be aware of its basic nature.

The pitch organization of gamelan music offers a good example of this flexibility. There are two tuning systems, called *laras*, used in gamelan music: *slendro*, which is pentatonic with roughly equidistant-intervals, and *pelog*, which is heptatonic with a variety of interval sizes. The exact pitch and intervallic relationships that exist in these two tuning systems differ from one gamelan to the next. Thus, the instruments tuned to slendro in one gamelan will probably not match the slendro pitches of another

gamelan, and if measurements of the interval sizes between corresponding steps of the two slendro tunings were taken, these would also likely differ. The same applies to pelog tuning system.

The process by which gamelan pieces are realized—the tradition's performance practice—is another excellent example of flexibility. On a micro-level, most of the individual instrumental parts can be realized by knowing a few basic details. If the melody, tuning system, and mode (called *pathet*) of a piece are known, a competent musician should be able to realize a traditionally acceptable part on any instrument he or she knows (and most experienced gamelan musicians know several instruments well enough to do this). One competent musician's realization of a particular piece on a particular instrument may not be the same as another's, yet both may be acceptable.

On a macro-level, the overall formal result of any piece can vary from one performance to the next. Performance practice allows for a wide range of acceptable realizations, depending on how many times a piece or a section of a piece is repeated, what tempo or tempi it is performed at, whether or not certain variable sections of a piece are performed, and whether or not another piece is inserted into the original piece.

Musical Functions of Instruments in the Gamelan

Each instrument type carries out a singular musical role in gamelan performance practice. An instrument can be thought of as fulfilling one of five basic musical functions: melodic, structural punctuation, melodic abstraction, melodic elaboration, or tempo control. The two groups of instruments functioning as melodic (or “balungan” instruments) and as structural punctuation instruments (or “colotomic” instruments) will be of the greatest importance to the discussion that follows.

Balungan Instruments

The melodic instruments of the gamelan are the *saron barung*, *saron demung*, and *slenthem*. They are, for the most part, single-octave instruments that play the balungan (lit. skeleton) of the piece. “Balungan” has been variously described as a “saron part,” “nuclear theme,” “fixed melody,” “cantus firmus,” etc. None of these terms, for one reason or another, is quite satisfactory. Sutton says: “... the concept ‘balungan’ may be defined as a single-octave melodic outline, almost always realized on one or more of the balungan instruments” (Sutton, 1975:31). This is probably the safest definition and the one to be used here. The balungan of most pieces are successions of pitches in a steady, even pulse. Rhythmic variety in a balungan, when present, is created either by sustaining a pitch through one or more balungan-pulses or by adding tones between two consecutive balungan-pulses in duple (sometimes quadruple) subdivision. Hereafter, the term “balungan” will refer to single-octave melodic outlines as they exist in the gamelan repertoire. The term “balungan-pulse” will always refer to an

underlying even pulse, void of any rhythmic variety.

An important characteristic of the balungan-pulse is the grouping of four pulses to form a unit called a *gatra*. Comparing a *gatra* to the Western concept of a musical bar or measure is counterproductive, mainly due to a difference in metric accent. In a measure of 4/4 meter the metric accent is understood to be (accents in bold) **1 2 3 4** (with the first beat stronger than the third) while in a *gatra* the metric accent would be: 1 **2 3 4** (with the fourth beat stronger than the second). Although gamelan musicians do not add a dynamic accent on either accented pulse of a *gatra*, other musical actions, such as the activities of the accentuating, elaborating, and abstracting instruments, reinforce these pulses and create stress. For clarity here, the *gatra*, when notated, will be set off as a unit of four pulses separated by a space.

1 gatra 1 gatra
balungan-pulse •••• ••••

Gamelan music is cyclic in nature, and begins and ends at the same point. Thus, the initial balungan-pulse of a piece is not the first pulse of the first *gatra* but the last pulse of the piece's introduction (called the *buka*). The balungan-pulse immediately following this initial pulse is the first pulse of the first *gatra*, as shown below.

end of buka first gatra
balungan-pulse • ••••

Colotomic Instruments

In scholarly studies, the group of accentuating instruments as a whole is labeled the "colotomic instruments" (Kunst, 1973:296; Hood and Susilo, 1967:16; Susilo, 1967:9). These instruments punctuate the balungan-pulse in patterns of varying design that, here, will be called "colotomic patterns." These patterns are fundamentally important to the delineation of structure in gamelan music. The colotomic instruments can be considered as two groups differentiated by their details of construction, suspension, and sound envelope characteristics.

The first group of colotomic instruments is the vertically-suspended knobbed-gongs. These instruments are struck with thickly padded beaters to produce a soft attack and long decay of sound. The *gong ageng*, *siyem*, and *kempul* comprise this category. The *gong ageng* is the largest and lowest-pitched instrument in the gamelan and has a long decay of sound. There are only one or two *gong ageng* in each gamelan. Pitched in the octave above the *gong ageng* are the *siyem*, more formally called the *gong suwukan*. Gamelan usually have more *siyem* than *gong ageng*, the exact number varying from one gamelan to the next. *Kempul* are pitched in the octave above the *siyem* and are the smallest members of this group of colotomic instruments. Generally speaking, there is a *kempul* for nearly every pitch of both tuning systems, although there is no fixed number to be found in all gamelan.

Since the sound decay period of the *gong ageng* can last for several seconds, it is quite common to substitute the *siyem*, with their shorter decay period, in pieces with short *gong* phrases. When serving this function, both these instruments will be referred to as "gong." If the *siyem* is used in another capacity, it will be referred to as "siyem."

Horizontally-suspended knobbed gongs—the *kenong*, *kethuk*, *kempyang*, and *engkuk-kemong*—constitute the second group of colotomic instruments. These instruments are struck with thinly padded, thus relatively harder, beaters, which produce a sharper attack and a shorter sound decay period than those of the horizontally-suspended colotomic instruments. The *kenong* are pitched two octaves above the *kempul*, and most gamelan have a *kenong* for nearly every pitch of both tuning systems. There is only one *kethuk* for each tuning system, their pitch falling in the octave above the *kempul*. The *kempyang* (used only in the *pelog* tuning system) and the *engkuk-kemong* (used only in the *slendro* tuning system) are pairs of small gongs. Their roles in the delineation and classification of structures are of secondary importance and will not be discussed here.

Three terms that relate directly to the colotomic instruments are *gongan*, *kenongan*, and *wela*. The first two terms describe musical units set off by strokes of *gong* 5 and *kenong* respectively. A *gongan* is the musical unit that begins immediately after a stroke of *gong* and ends on the next stroke of *gong*. Likewise, a *kenongan* is the musical unit that begins immediately after a stroke of *kenong* and ends on the next stroke of *kenong*. The term *wela* identifies a structurally important point that does not coincide with a colotomic event.

THE FORMAL STRUCTURES OF GAMELAN MUSIC

Delineation of Formal Structures

Structure in gamelan music can be conceived of as the product of the interaction of two musical variables: 1) repeating musical patterns formed by the composite activities of the colotomic instruments, in this work labeled "colotomic patterns," and 2) the number of balungan-pulses in a colotomic pattern.

A colotomic pattern is more than a punctuating rhythmic cycle, since each event comprising it has particular characteristics of timbre and pitch. When combined with the tone and octave placement of each colotomic event, a colotomic pattern becomes a complex, multi-dimensional component of the entire gamelan texture. Figure 1 gives the octave placement and tones of each of the colotomic instruments in one typical *slendro* gamelan (*Kyai Gundrung*, a Yogyanese gamelan at the University of Hawaii). The octave placement of the colotomic instruments in the *pelog* tuning system is similar. When interpreting figures and transcriptions in this work, note that the symbol used to label a colotomic event communicates the dimensions of timbre and pitch as well as the rhythmic placement of that event.

slendro pitches	symbol	octave				
		low 1	2	3	4	high 5
kenong	N	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
kethuk	t				xxx	xx
kempul	P			xxx	xx	
siyem	S		x	xx		
gong ageng	G	x	x			

Figure 1. Octave Placement and Pitches of the Colotomic Instruments.

Groupings of Formal Structures

Most gamelan pieces fit into one of three groups, differentiated from one another by the structure of their colotomic patterns:

- 1) structures with a two-kenongan-per-gongan colotomic pattern;
- 2) structures with a four-kenongan-per-gongan colotomic pattern;
- 3) structures with gongan of variable length.

The colotomic patterns of the first two groups are complete gongan differentiated from one another by the number of kenongan each contains. Within a piece with one of these structures the gong ageng or siyem will be sounded at the end of each repetition of its colotomic pattern. This type of structure is labeled "strict" by Susilo (1967:8) based upon this regularity of gong punctuation. In each of these two groups there are structures that use kempul in their colotomic patterns and those that do not. Various colotomic patterns for the first two structural groups are shown in the following figures.

The design of the colotomic pattern for the group of two-kenongan-per-gongan structures that use kempul is shown in Figure 2. It is best expressed as a circle due to the cyclic nature of the music. This cyclic colotomic pattern, as well as those for the other strict group of structures discussed below, can be conceived of as the composite result of several sub-cycles of punctuation activity each of which is associated with one type of colotomic instrument. Figure 3 diagrams the sub-cycles for this particular group of structures.

The design of the colotomic pattern for the group of two-kenongan-per-gongan-without-kempul structures is in Figure 4. Although not shown in this diagram, the kethuk plays a very important role in these structures. However, since the design of the kethuk subdivision varies within and between structures in this group, the details of kethuk punctuation will be presented later (see Two- and Four-Kenongan-without-Kempul Structures).

The colotomic pattern for the group of four-kenongan-per-gongan-with-kempul structures is presented in Figure 5, while that for the four-kenongan-per-gongan-without-kempul structures is found in Figure 6. There are several possible kethuk subdivisions of the gongan for the latter group (discussed later).

The colotomic pattern for the third group of structures, unlike those for the first two groups, does not

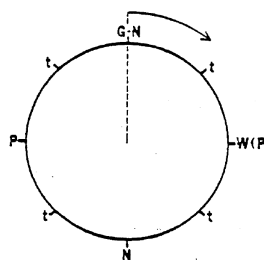


Figure 2. Colotomic Pattern for Two Kenongan-per-Gongan Structures, Using Kempul.

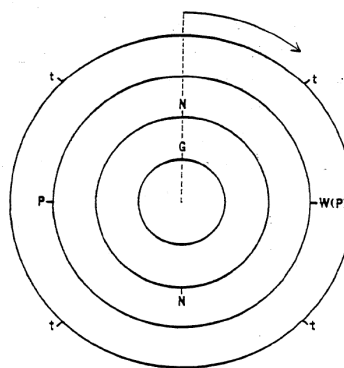


Figure 3. Individual Colotomic Instrument Subcycles for the Group of Two Kenongan-per-Gongan Structures, Using Kempul.

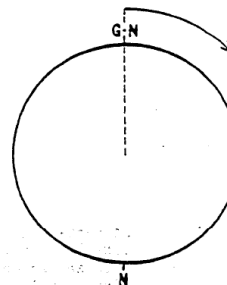


Figure 4. Colotomic Pattern for Two Kenongan-per-Gongan Structures, Not Using Kempul.

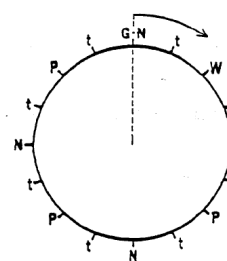


Figure 5. Colotomic Pattern for Four Kenongan-per-Gongan Structures, Using Kempul.

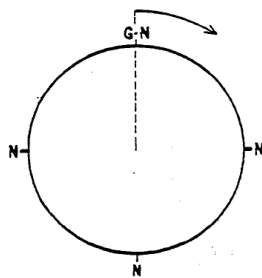


Figure 6. Colotomic Pattern for Four Kenongan-per-Gongan Structures, Not Using Kempul.



Figure 7. Colotomic Module for the Group of Structures with Gongan-s of Variable Length.

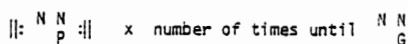


Figure 8. A Gongan in the Free Structures

constitute a gongan. This pattern, diagramed in Figure 7, is repeated a number of times before a gong (either a *siyem* or a *gong ageng*) is struck instead of a *kempul* at the end of the pattern, as shown in Figure 8. This modular construction allows for gongan of variable length within a piece. Structures with this type of colotomic pattern are called “free” by Susilo (1967:8). Because of the modular nature of these structures, this pattern will be referred to as “colotomic module” (CM).

Descriptions of the Formal Structures

Several formal structures exist in the Javanese gamelan tradition, some of which are applied to numerous pieces in the repertoire, others to only one or a few pieces.

Two-Kenongan-per-Gongan-with-Kempul Structures

Ketawang (Figures 10 and 11): sixteen balungan-pulses per gongan grouped into two 8-balungan-pulse kenongan. The Solonese version of this structure has the *kempul* sound in the middle of the second kenongan only (Figure 10). In Yogya, the *kempul* is sounded in the middle of both kenongan (Figure 11).

Four-Kenongan-per-Gongan-with-Kempul Structures

Lancaran (Figure 12): eight balungan-pulses per gongan grouped into four 2-balungan-pulse kenongan.

Bubaran or *Bibaran* (Yogya) and *Lancaran Mlaku* (Solo) (Figure 13): sixteen balungan-pulses per gongan grouped into four 4-balungan-pulse kenongan. In Solo this structure often uses the same drumming pattern as the *lancaran*

structure. In Yogya, the *bubaran* structure has its own specific drumming pattern and is considered a more autonomous structure.

Ladrang (Figure 14): thirty-two balungan-pulses per gongan grouped into four 8-balungan-pulse kenongan

Two- and Four-Kenongan-per-Gongan-without-Kempul Structures

The structures belonging to these two groups have two sections, the first called *merong* (Solo) or *dados* (Yogya) and the second *inggah* (Solo) or *ndawah* (Yogya). These sections differ in the number of *kethuk* strokes per kenongan and/or the number of balungan-pulses per kenongan and gongan. The exact size and design of these structures can be discerned by three factors: 1) the number of kenongan per gongan, 2) the number of *kethuk* strokes per kenongan, and 3) the position of the *kethuk* strokes within the kenongan.

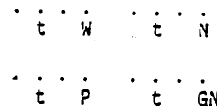


Figure 10. Solonese Ketawang Structure.

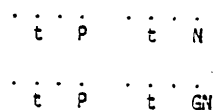


Figure 11. Yogyanese Ketawang Structure.

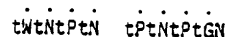


Figure 12. Lancaran Structure.

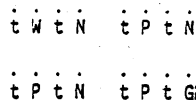


Figure 13. Bubaran or Lancaran Mlaku Structure.

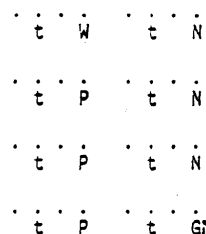


Figure 14. Ladrang Structure.

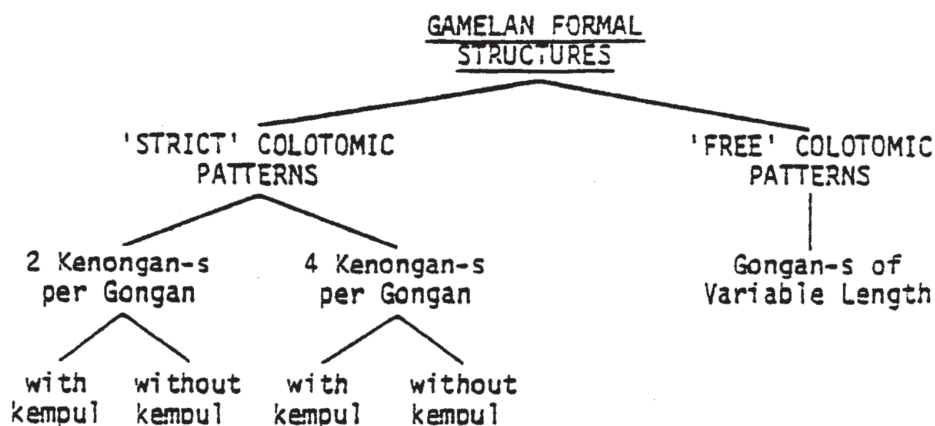


Figure 9. Groups of Gamelan Formal Structures

If a structure is labeled *ketawang gendhing* it has two kenongan in each gongan; if it is called simply *gendhing* it has four kenongan in each gongan. The number of kethuk strokes per kenongan in these structures will be either 2, 4, 8, or 16. Figure 15 plots out comparatively the subdivision of the kenongan for each of these options and reveals an underlying organizational symmetry of punctuation. Wela are recognized midway between strokes of the kethuk except where the kenong sounds. Generally, the larger the structure the more need there is for a greater number of kethuk strokes to serve as secondary structural markers to the more important, but less frequent, kenong strokes.

There is specific Solonese terminology for the frequency and position of kethuk strokes within the

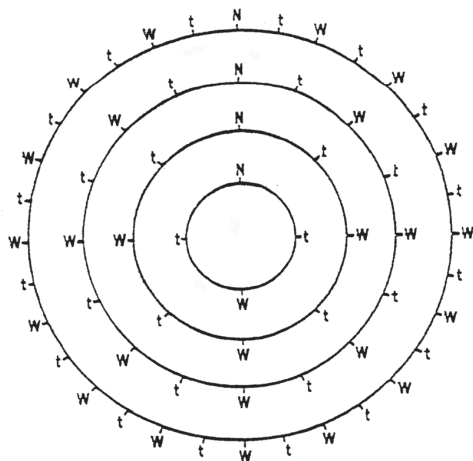


Figure 15. The Various Kethuk Subdivisions of the Kenongan in 'Strict' Structures Not Using Kempul.

kenongan of sections of these two- and four-kenongan-per-gongan-without kempul structures.

kethuk: the kethuk sounds in the middle of each gatra of the kenongan,

kethuk kerep: the kethuk sounds at the end of every other gatra starting with the first gatra of a kenongan (kerep means frequent),

kethuk arang: the kethuk sounds at the end of every fourth gatra starting with the second gatra of a kenongan.

There are nine different kenongan structures found in two- and four-kenongan-per-gongan-without-kempul structures. These are diagrammed in Figure 16 and grouped according to their number of balungan-pulses per kenongan.

Generally speaking, the merong section of these structures has half as many kethuk strokes per kenongan and a different position of kethuk strokes as its inggah section. An exception to this proportion of kethuk strokes in each section occurs when a piece in a strict structure using kempul, represented by the kenongan-type 1 (kethuk 2), is used as the inggah section. This is a common occurrence in *ketawang gendhing* and is also found in four-kenongan-per-gongan *gendhing*. Figure 17 lists the various *ketawang gendhing* and *gendhing* structures encountered in the written and audio resources consulted for this work.

Structures with Gonggan of Variable Length

The colotomic module for these free structures can be repeated a number of times before a gong sounds at the end. Individual structures within this group are differentiated by the number of balungan-pulses per repetition of the colotomic module. The naming of the individual structures in this group is confusing due to differences in terminology between Yogya and Solo.

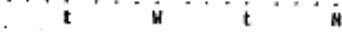
B balungan-pulse kenongan-s

type 1: kethuk 2

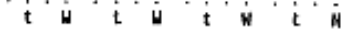


16 balungan-pulse kenongan-s

type 2: kethuk 2 kerep

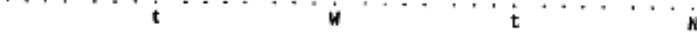


type 3: kethuk 4

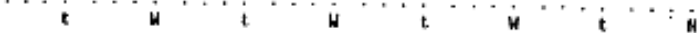


32 balungan-pulse kenongan-s

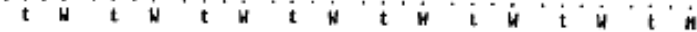
type 4: kethuk 2 arang



type 5: kethuk 4 kerep

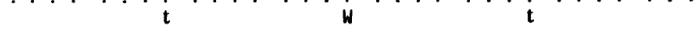


type 6: kethuk 8



64 balungan-pulse kenongan-s

type 7: kethuk 4 arang



type 8: kethuk 8 kerep



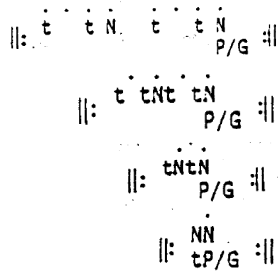
type 9: kethuk 16



Figure 16. Nine kenongan types found in two- and four-kenongan-per-gongan structures not using kempul.

	merong section	# of bp per gongan	inggah section	# of bp per gongan or section	inggah section	# of bp per gongan
ketawang gendhing-s	kethuk 2 kerep	32	kethuk 2	32	kethuk 4	64
	kethuk 4 kerep	64	kethuk 2	32		
	kethuk 8 kerep	128	kethuk 16	128		
gendhing-s	kethuk 2 kerep	64	kethuk 4	64	kethuk 2	32
	kethuk 2 arang	128	kethuk 4	64	kethuk 2	32
	kethuk 4 kerep	128	kethuk 8	128	kethuk 2	32
	kethuk 4 arang	256	kethuk 8	128		
	kethuk 8 kerep	256	kethuk 16	256		

Figure 17. Two- and four-kenongan-per-gongan structures not using kempul.



From the top, Figures 18–21.

Ayak-ayak (Yogya): eight balungan-pulses per colotomic module (Figure 18). This structure does not exist in Solonese practice.

Srepegan (Yogya) and *Ayak-ayak* (Solo): four balungan pulses per colotomic module (Figure 19). This structure is also used for Solonese pieces labeled *bentuk kemuda*.

Sampak and *Playon* (Yogya) and *Slepegan* (Solo): two balungan pulses per colotomic module (Figure 20).

Sampak Gara-gara (Yogya) and *Sampak* (Solo): one balungan-pulse per colotomic module (Figure 21).

STRUCTURAL FLEXIBILITY

The formal structures as introduced in the previous section appear rigid and void of any temporal referent. In this section, the ways in which Javanese gamelan performance practice allows these abstract and rigid structures to be temporally flexed and structurally interrupted will be introduced.

Irama

In the gamelan tradition the relationships created between a musical unit and the units that divide it are fundamental to the delineation of several musical phenomena. The division of the gongan into kenongan (or colotomic modules) and balungan-pulses is essential to the identification of many structures. Thus far, the balungan-pulse has been the smallest unit of division discussed, functioning only on structural levels (those levels of the musical hierarchy involving units larger than the balungan-pulse, i.e., *gatra*, *kenongan*, *colotomic module*, and *gongan*.) This same pulse is subdivided by certain instruments that play at a higher rhythmic density. The fastest subdividing pulse of any given musical texture is called the “density referent” by Mantle Hood (1971:114). The density referent in gamelan music is of particular importance to the delineation of what is called “*irama*.” Irama, defined by Sutton (1975:50) as “... the rhythmic relationship between the balungan beat (pulse) and the parts that subdivide it,” can be expressed as a ratio of the number of density referents (DR) to one balungan-pulse (bp). The number of DR per bp is determined by the tempo of the bp, so irama is a function of the bp tempo. The number of DR per one bp can be 2, 4, 8, 16, or 32. These five rhythmic relationships are most commonly called *irama seseg* (or *irama lancar*), *irama tanggung* (or *irama siji/satu*), *irama dados* (or *irama loro/dua*), *irama wilet* (or *irama telu*

irama	# of DR	to	bp
seseg	2	:	1
I	4	:	1
II	8	:	1
III	16	:	1
IV	32	:	1

Figure 22. Rhythmic Relationships of the Five Irama-s.

tiga), and *irama rangkep* (or *irama papat/empat*). Hereafter, the five irama will be referred to, respectively, as *seseg*, I, II, III, and IV (Figure 22). Theoretically, the rate or tempo of the DR (called *laya*) in all five irama is approximately the same, although in performance distinctions can be made between three tempi for each irama: slow (*tamban*), moderate (*sedheng*), and fast (*seseg*). The general effect on the tempo of the bp is one of doubling with each successive irama, i.e., the bp tempo in irama I is twice that of irama II because it has half as many DR.

A survey of metronome readings (MM) from sections of several recordings, summarized in Table 1, reveals the range of tempi for each irama encountered in actual performance practice. The average balungan-pulse tempo (bp-MM) and average density-referent tempo (DR-MM) are also given. Two tendencies are apparent: first, when going from a higher irama (one with fewer DR) to a lower irama (one with a great number of DR) the tempo of the bp will always be slower; and second, the rate of the DR can be the same, slightly faster, or slightly slower when going from one irama to another (notice that there seems to be a preference for the rate of the DR to be faster in irama I and IV than in the other irama).

The effect of irama on a structural level is a magnification of what happens on the bp level. This can be demonstrated by deriving performance times for one gongan of the 32-balungan-pulse *ladrang* structure in all five irama using the average balungan-pulse tempos (bp:MM) given in Table 1:

- irama seseg: 15 seconds**
- irama I: 20 seconds**
- irama II: 59 seconds**
- irama III: 1 minute 59 seconds, and**
- irama IV: 3 minutes 10 seconds.**

irama	# of samples	range of bp-MM	average bp-MM	average DR-MM
seseg	6	116–144	128.3	256.6
I	9	80–104	95.1	380.4
II	15	27–44	32.7	261.6
III	8	14–17	16.1	257.6
IV	6	10–11	10.1	322.6

Table 1. Balungan-Pulse Tempo Survey

Regardless of whether the performance time for one gongan takes fifteen seconds or more than three minutes, it is still recognized as a *ladrang* structure as long as the criteria for this structure are met.

	ssg	irama-s					
		I	II	III	IV		
STRICT STRUCTURES	4 Kenongan-s per Gonggan	ketawang	x	x	x		
		gendhing ket. merong	x	x			
		lancaran	x	x	x		
		inc. miaku and bubaran	x	x	x		
		ladrang	x	x	x	x	
	2 Kenongan-s per Gonggan	gendhing merong	x	x			
		inggah	x	x	x	x	
		FREE STRUCTURES	ayak-ayak	x	x	x	
			slepegan	x	x	x	
			sampak	x	x		

Table 2. Irama-s Possible for each Gamelan Structure.

Not all gamelan structures are realized in all iramas. While pieces in nearly every structure can be performed in iramas I and II, pieces in a much narrower range of structures can be performed in iramas seseg, III, and/or IV. Only some pieces in the ladrang structure can be performed in all five iramas. Table 2 lists the iramas possible for each structure as encountered in the research.

Irama Change

In the process of realizing a piece in performance it is common to change from one irama to another. Irama changes are generally made between adjacent irama and in either direction. There are two basic ways to change irama.

1) Slow down or speed up to a point where the instruments creating the DR must either double or cut in half their density. Sutton (1975:53) graphs this as shown in Figure 23, in which "x" marks the point of irama change. This graph can be read in either direction; this type of irama change will be referred to as "Type 1."

2) Double or halve the bp without breaking the DR. This type of irama change, referred to as "Type 2," occurs frequently when changing from irama IV to III (Figure 24) and at points of structural transition in the free structures (Figure 25).

Type 1 irama changes do not have to take place at specific structural points nor do all the instruments operating at the DR need to change simultaneously (although they do so in close proximity). This type of change occurs only when the tempo of the DR becomes uncomfortably fast or slow for each individual musician. Type 2 irama changes usually take place at structurally important points, such as at a stroke of a gong, with all of the balungan instruments changing their density together. The perception of these two types of change is quite different due mainly to the way in which the tempo of the bp is changed, which is gradual in Type 1 and sudden

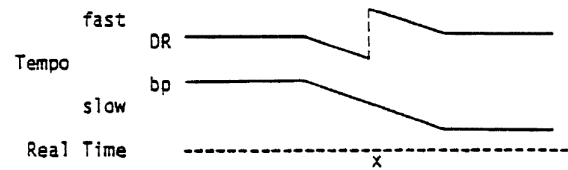


Figure 23. Type 1 Irama Change.

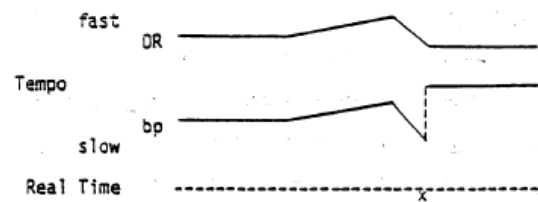


Figure 24. Type 2 Irama Change from Irama IV to III.

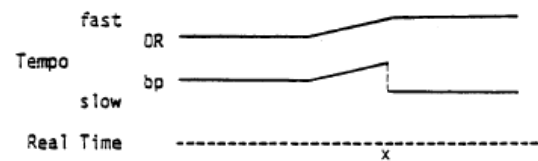


Figure 25. Type 2 Irama Change in Free Structures.

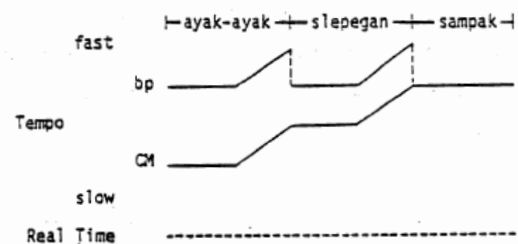


Figure 26. Free-Structure Changes

in Type 2. Both types of irama change provide smooth, seamless means of transitioning from one irama to the next without interrupting the continuous flow of the texture. This ability to move between different time frameworks and yet retain structural identity is an outstanding characteristic of Javanese gamelan performance practice.

Free-Structure Change

It is common in performance practice to hear the three free structures—Solonese Ayak-ayak, Slepegan, and Sampak, or

structure	type	kendelan	irama
ketawang	1	WN ¹	II
	2	PN ²	II
lancaran	1	N ²	I
ladrang	1	t ¹ N ¹ ; t ¹ N ² ; t ¹ N ³	III, IV
	1a	t ² N ¹	ssg, I
	2	PN ⁴	III, IV
	1-2	t ¹ N ² ; t ¹ N ³ ; PN ⁴	IV
	3	WN ¹	II
4	N ³	III, IV	
structures not using kempul:			
16 bp per kenongan	1	w ³ N ¹ ; w ³ N ²	III, IV
	2	N ³	III
	3	t ¹ N ¹ ; t ² N ¹ ; t ¹ N ² ; t ² N ²	III
	3a	t ³ N ¹ ; t ³ N ² ; t ³ N ³	III
32 bp per kenongan	1	w ⁷ N ¹ ; w ⁷ N ² ; w ⁷ N ³	III, IV
key:	The <i>kethuk</i> and <i>wela</i> superscripts refer to the stroke of <i>kethuk</i> or the <i>wela</i> in a <i>kenongan</i> , the <i>kenongan</i> superscripts refer to the <i>kenongan</i> in a <i>gongan</i> .		

Table 3. Kendelan Location.

their Yogyanese equivalents—played in a sequence from the largest, in terms of the number of bp per colotomic module (CM) to the smallest. The interesting aspect of this sequence is that in transitioning from one structure to the next, the CM never breaks its density but simply accelerates. In response to sudden accelerandi, the bp-density halves at each point of structural transition (Figure 26) to establish the new bp-to-CM relationship of each successive structure. The mechanics and tendencies of these free-structure changes are identical to those of Type 1 irama changes (compare Figure 26 to Figure 23, reading from right to left); the bp and CM in the free-structure changes behave respectively like the DR and bp in irama changes. The main difference between these two types of change is the level of the musical hierarchy on which they occur.

Structural Editing

Irama choices in performance flex the temporal dimensions of a piece and its colotomic structure, whereas structural editing choices interrupt the otherwise continuous flow of a piece and its structure in the course of a performance. Structural editing is manifested in gamelan in two ways: *kendelan* and *selingan*.

Kendelan

A *kendelan* (from *kendel*, “to stop, halt”), or *mawi mandeg* (“with stopping”), labels an action that momentarily suspends the normal tempo and structural flow of a piece in performance. *Kendelan* occur at internal structural points

such as at strokes of *kethuk*, *kempul*, *kenong*, and *wela*. This stopping is not the same as ending a piece (*suwuk*, “end”), which concludes the performance of a piece and always coincides with a stroke of *gong ageng*.

A *kendelan* is initiated with a special drum signal and is usually, but not always, completed with a short and sudden *ritardando*. *Kendelan* occur most frequently in pieces with strict structures, but musicians must know from experience the appropriate locations for them in any given piece. After a few seconds of silence, a vocalist will perform a short melodic phrase that concludes with the entire ensemble resuming the performance of the piece a few *balungan* beats later, with no change to the piece. In Appendix A, the structural locations of *kendelan* in recorded performances of forty-one pieces are detailed. This data is summarized in Table 3, where the various structural locations of stops are grouped by formal structure. Also listed are the irama in which each type of *kendelan* took place.

A few generalizations can be made about the occurrence of *kendelan*: they occur most frequently in pieces in *ladrang* structure and in the *ingguh* section of pieces with structures not using *kempul*, and they occur most often in irama III and IV. The correct location of *kendelan* in performance depends on the shared knowledge of the musicians about the treatment of each particular piece rather than on set locations associated with each formal structure.

Selingan

A *selingan* (“something interspersed”) is performed material of a contrasting nature that is infixed into the performance of a gamelan piece in a strict structure. The infix takes place at an internal structural point, often following a *kendelan*, and once the infixed material is completed a return is made to the initial piece.

While the nature of *selingan* varies greatly, there are four common types:

1) Pieces in strict and free structures. These include pieces in the *ladrang* and *ketawang* structures as well as a special category of pieces labeled *gendhing dolanan*, which are gamelan pieces of a light-hearted nature with texts enjoyed by children and adults alike.

2) *Macapat*, which is sung poetry performed by a solo vocalist with only the *gender barung* providing sparse, improvised accompaniment for pitch reinforcement. The poetry is in traditional Javanese verse structure and can be of substantial length, taking up to three or four minutes to deliver in a rhythmically free, ornate, and often melismatic manner.

3) *Palaran* (Solo) or *Uran-uran* (Yogya), which are *macapat* performed over a free-structured colotomic pattern without a *balungan*. A small subset of elaborating gamelan instruments (*gender barung*, *gender panerus*, *gambang*, *celempung*, and *suling*) fill out the texture, and the drummer controls the tempo and signals for phrase-ending punctuation (performed on the *siyem* or *gong ageng*) in accordance with the singer’s pacing.

4) Conversation, often of a humorous nature, that may be interspersed with singing and occasionally a *palaran*.

A few generalizations can be made about *selingan*:

- 1) part of the structure of the main piece usually, but not always, is deleted in the process of infixing material;
- 2) the infix material and the main piece do not have the same formal structure; and
- 3) *selingan* occur relatively infrequently and are often associated with special treatments of particular pieces.

The effect of infix material on the structure of a piece is one of diversion, and its inclusion in a performance would perhaps be agreed upon by the musicians beforehand.

Structural editing, as manifested by *kendelan* and *selingan*, affects structure in a different manner from *irama*. *Irama* expands and contracts structure from within by changing the duration of the *balungan*-pulse, while structural editing affects the structure externally by interrupting its cyclic flow to insert contrasting musical material. The application of *irama* and structural editing during performances adds dimensions of flexibility to gamelan music.

MELODIC ORGANIZATION IN PIECES WITH STRICT STRUCTURES

We turn now to a discussion of how the *balungan* of gamelan pieces with strict structures are organized at various structural and formal levels. Patterns of melodic repetition and contrast occur both between *kenongan* within *gongan* and between *gongan* in multi-*gongan* pieces, and *gongan* can be grouped into repeatable cycles that in turn become the building blocks of macro-level formal relationships.

Patterns of Kenongan Repetition Within the Gongan

The *balungan* of a *gongan* in any piece set to a strict structure is divided into phrases of equal length by strokes of the *kenong*, thus setting off melodic units parallel to the structural *kenongan*. The terms *gongan* and *kenongan* can denote both structural units as well as the melodic material (*balungan*) they contain.

The *balungan* of gamelan pieces are often not fixed. In printed sources as well as live performances one frequently finds differences in melodic detail of a piece's *balungan*, thus making a study of melodic organization on the consecutive-pitch level difficult. There is seldom found, however, any discrepancy between sources as to the melodic relationships between *kenongan* within a *gongan*. Thus a *gongan* may start out with a *kenongan* (here called *a*) that is repeated (another *a*), followed by a contrasting *kenongan* (called *b*) and another, different, contrasting *kenongan* (referred to as *c*). Sources will tend to agree that the *kenongan* pattern of this *gongan* is *abc* even though the versions of *a*, *b*, and/or *c* might differ slightly.

Any *kenongan* can relate melodically to a previous *kenongan* in one of four ways:

kenongan patterns	# of occurrences
abcd	23
aabc	23
aaab	14
abbc	12
abba	10
abac	5
abca	2
abcc'	1
aabb	1
aaba	1
abab	1
total	93

Table 4. Frequency of Kenongan-Patterns for Lancaran-s, Lancaran Mlaku-s, and Subaran-s.

kenongan patterns	# of occurrences	basic kenongan patterns	# of occurrences
abcd	31	abcd	37
abcb*	2		
aa*bc	2		
aa*bb*	2		
aabc	18	aabc	34
aaba*	2		
aaa* ^b	6		
aa'bc	5		
aa'a'b	1		
aa'bb*	2		
aaab	15	aaab	21
aa'a'b	5		
aaaa*	1		
abbc	6	abbc	10
abb'c	4		
abca	3	a__a	9
abba	1		
abb'a	1		
abb'a'	1		
aaba'	1		
aba'a	2		
aabb'	2	aabb	5
aa'bb	1		
aa'bb'	2		
aaaa	2	aaaa	5
aa'aa'	1		
aa'aa''	2		
abcc	2	abcc	4
abcc'	2		
abac	1	a_a_	3
aba'c	2		
abcb'	2	_b_b	3
aa'aa*	1		
total	131		131

Table 5. Frequency of Kenongan-Patterns for Lacrang-s.

- 1) it can be an exact repeat of a previous *kenongan*,
- 2) it can be a partial repeat of a previous *kenongan* with melodic differences occurring in its first half,
- 3) it can be a partial repeat of a previous *kenongan* with melodic differences in its second half, or
- 4) it can be totally contrasting.

The reason for differentiating between first- and

second-half melodic alterations is that any change in the first half of a kenongan is of less melodic consequence (in terms of melodic direction) than a change in its second half. This end-orientation is a basic characteristic of gamelan music. As a result, kenongan with first-half alterations will be considered related to kenongan that are exact repeats of previous kenongan, while kenongan with second-half alterations will be viewed as related to kenongan of contrasting material. Symbols are used here to notate these relationships:

- ' an alteration to the first half of the kenongan represented by the letter preceding it
- " a different first-half alteration to the kenongan represented by the letter preceding it
- * an alteration to the second half of the kenongan represented by the letter preceding it

These superscripts are additive, so, for example, *a''** denotes an end-alteration (*) to a preceding *a'* kenongan.

Melodic Form in Pieces with Four-Kenongan-per-Gongan-with-Kempul Structures

Pieces in the ladrang structure, which have eight-note-long kenongan, invite a more detailed level of melodic analysis than pieces in the lancaran, lancaran mlaku, and bubaran structures that have kenongan only two or four balungan-notes long.

The kenongan-patterns of melodic (balungan) form of 93 different gongan from thirty pieces with lancaran, lancaran mlaku, and bubaran structures are summarized in Table 4. Repetition of melodic material, when it occurs, is most frequently found between adjacent kenongan and either at the beginning of or in the middle of the gongan—seldom at the end. The notable exception among the frequently occurring patterns is *abba*, in which the repetition of *a* is separated by two kenongan. Regardless of this, *abba* still displays the standard characteristics of adjacent, repeated kenongan (*b*) in the middle of the gongan.

Although the kenongan-patterns for ladrang are more complex than those displayed in Table 4, they can be grouped into similar basic kenongan-patterns by applying two assumptions: 1) kenongan with first-half alterations are viewed as repetitions of the kenongan with which they share identical second halves, and 2) kenongan with second-half alterations are in contrast to the kenongan with which they share identical first halves. Therefore, the pattern *aa'a'b* will be generalized to *aaab*, and the pattern *aaa*b* to *aaab*. Detailed kenongan-pattern data gleaned from 131 different gongan belonging to forty-nine ladrang are presented in Table 5. The large number of patterns in this table demonstrates the variety of melodic relationships that can exist within a ladrang gongan, yet reinforces the same generalizations made about the first group of structures represented in Table 4.

<u>kenongan patterns</u>	<u># of occurrences</u>	<u>basic kenongan patterns</u>	<u># of occurrences</u>
aabc	27	aabc	57
aaa*b	18		
aa'bc	8		
aa'a'*b	4		
abcd	19	abcd	34
abb*c	3		
aa*bc	12		
aaab	15	aaab	31
aaa'b	1		
aa'a'b	12		
aa'a'a'*	1		
aa'a"b	2		
abbc	14	abbc	27
abbb*	2		
abb'c	10		
abb'b*	1		
abca	2	a__a	9
aa*ba	1		
abca'	1		
abba	2		
aaba'	2		
aba'a"	1		
aaaa'	3	aaaa	4
aa'a'a"	1		
aba'a'*	1	a_a_	2
aa*a'b	1		
aa*bb'	1	abcc	1
abcb'	1	abcb	1
total	166		166

Table 6. Frequency of Kenongan-patterns for Pieces with Four Kenongan-s per Gongan, Not Using Kempul.

pattern	bp per gongan		
	8, 16	32	64, 128 256
abcd	24.7	28.3	20.5
aabc	24.7	26.0	34.3
aaab	15.1	16.0	18.7
abbc	12.9	7.6	16.3
other	22.6	22.1	10.2
total	100.0	100.0	100.0

Table 7. Percentages of Total Gongan-s Surveyed With Most Common Kenongan-Patterns.

Proportionally, the patterns *abcd*, *aabc*, *aaab*, and *abbc* are approximately the same for both sets of pieces, while the number of occurrences of *abba* is considerably fewer in ladrang pieces. Thus, pieces with four-kenongan-per-gongan-with-kempul structures display a strong tendency towards similar patterns of melodic organization within the gongan.

Melodic Form in Pieces with Four-Kenongan-per-Gongan-without-Kempul Structures

Data on the kenongan-patterns of melodic (balungan) form of 166 different gongan taken from fifty-two pieces with four-kenongan-per-gongan-without-kempul structures is presented in Table 6. Although the same patterns that had the greatest presence in pieces summarized in Tables 4 and 5 also dominant here, the pattern *aabc* is by far the most common in this group of pieces. Not only is the basic kenongan-pattern *abcd* proportionately less frequent than in the pieces of the other four-kenongan structures, but the pattern *aa*bc*, which demonstrates at least partial repetition and a resemblance to *aabc*, is considerably more frequent than in those other four-kenongan-per-gongan pieces. This greater overall preference for repeated kenongan-patterns can, at least in part, be attributed to the larger gongan size of these structures.

The results of the preceding survey of balungan kenongan-patterns for structures with four kenongan-per-gongan are summarized in Table 7. Given under each structural group is the percentage of the total number of gongan surveyed for each of the four most common patterns, as well as the total percentage of the less frequent patterns.

Taking into consideration the contents of Tables 4-7, several generalizations may be made concerning the basic melodic organization of the balungan within the gongan of pieces with four-kenongan-per-gongan structures:

- 1) kenongan repetition, both partial and complete, is very common in these structures;
- 2) repetition most frequently occurs between adjacent kenongan of a gongan;
- 3) repeated kenongan are most frequently located in the first three kenongan of a gongan;
- 4) repeated kenongan are infrequent in the final two kenongan of a gongan;
- 5) patterns beginning and ending with the same kenongan occur but are infrequent;
- 6) the most common kenongan-patterns involving repetition are *aabc*, *aaab*, and *abbc*, in that order; and
- 7) the larger the structure the greater the frequency of these most common patterns.

Melodic Form in Pieces with Two-Kenongan-per-Gongan-with-Kempul Structures

The balungan of 207 gongan from forty-five pieces in the ketawang structure were examined for patterns of kenongan repetition. With only two kenongan per

pattern	# of occurrences
ab	187
aa	11
aa*	7
aa'	2
total	207

Table 8. Frequency of Kenongan-Patterns for Ketawang-s.

two-kenongan pattern	infixes kenongan-s	becomes the four-kenongan pattern
"a" and a contrasting kenongan	bc	abcd
	ab	aabc
	aa	aaab
	bb	abbc

Figure 28. Derivation of Four-Kenongan Patterns.

gongan in this structure, there exists only four possible formal patterns. The pattern *ab* was found in nearly ninety percent of these gongan, completely dominating the patterns displaying partial or complete kenongan-repetition (Table 8).

The preference for ending a gongan with melodic material different from its beginning also appeared in four kenongan-per-gongan structures. In fact, the most common four-kenongan patterns (*abcd*, *aabc*, *aaab*, and *abbc*) can be derived from the two-kenongan pattern *ab* by infixing two new or repeated kenongan (Figure 28).

Melodic Form in Pieces with Two-Kenongan-per-Gongan-without-Kempul Structures

The balungan of sixty-two gongan from eleven pieces in the ketawang gendhing structure were analyzed for patterns of kenongan repetition (Table 9). Although there is a proportionally greater number of occurrences of the patterns *aa*, *aa**, and *aa'* than found in pieces in the ketawang structure, the pattern *ab* is still clearly dominant.

In summarizing the form of the balungan in pieces with two kenongan-per-gongan structures it can be said that melodic repetition of kenongan, whether partial and complete, is rare, though more frequent in pieces with larger structures than with ketawang pieces.

Melodic Relationships of Gongan Within Pieces

The balungan of 187 pieces in a range of strict structures were analyzed for melodic relationships between their gongan and for how those gongan are organized into repeatable gongan-cycles. Tables 12-16 in Appendix E

<u>pattern</u>	<u># of occurrences</u>
ab	49
aa*	6
aa	4
aa'	3
total	62

Table 9. Frequency of Kenongan-Patterns in Ketawang Gendhing-s.

contain the formal designs of this group of pieces. A formal design is a distilled representation of a piece's macro melodic organization and of its potential to produce large-scale formal relationships across multiple realizations. In my attempt to capture the awareness competent gamelan performers command of the formal potential of a piece, I have made some generalizations about the nature of the melodic relationships between gongan of multi-gongan pieces, also exploring the variables of repetition of melodic material in pieces.

The balungan of most strict-structure gamelan pieces is distributed over multiple iterations of its gongan structure, thus creating the possibility of melodic relationships between its gongan. Any gongan can relate to a previous gongan in one of four ways. It can be:

- 1) an exact repetition of a previous gongan;
- 2) a partial repeat of a previous gongan with melodic differences occurring in its first half;
- 3) a partial repeat of a previous gongan with melodic differences occurring in its second half; or
- 4) totally contrasting.

The melodic effects of first- and second-half alteration on the gongan level are parallel to those discussed for kenongan. Partial and complete repetition of melodic material on the gongan level is more common in pieces with small structures (those using kempul) than in pieces with large structures (those not using kempul). Partial and complete repetition most frequently occurs between adjacent gongan.

Three distinctive types of melodic relationships found between gongan of some pieces need to be introduced:

- 1) *Mulur* (lit. to stretch, expand) is a term applied to the irama III and IV versions of balungan, most often for pieces in the ladrang structure. The balungan of many pieces in these irama might be exactly the same as in other irama, but in some pieces the balungan is altered. The density of the balungan notes in a mulur gongan is frequently twice, and occasionally quadruple or half, that of the structural balungan-pulse. A mulur gongan, regardless of balungan alterations, is always closely related to the regular balungan, especially in terms of the melodic pitches sounded at structurally important points.

- 2) *Umpak minggah* (transition to the inggah section, also called *pangkat ndawah*) is a melodic alteration that

occurs during the transition from the merong section to the inggah section of a piece's structure. The last one-half to two kenongan of the final merong gongan is altered, quite frequently to match the balungan located in the corresponding position of the inggah section that follows.

- 3) Inter-gongan repetition of kenongan. In a substantial number of kenongan repetitions surveyed, the first kenongan of a gongan was a partial or exact repetition of the final kenongan of the gongan immediately preceding it. This occurs in pieces in all of the strict structures. In two kenongan-per-gongan structures this kind of repetition is as common as the various "inner-gongan" patterns discussed previously. Although found less frequently in the four kenongan-per-gongan structures, more variants exist. Two of the more common patterns are:

First gongan: *aabc*

Second gongan: *ccde*

and

First gongan: *aaab*

Second gongan: *bbbc*

This latter pattern is sometimes sequenced through all of the gongan of a piece:

First gongan: *aaab*

Second gongan: *bbbc*

Third gongan: *cccd*

Fourth gongan: *ddda*

Grouping of Gongan into Repeatable Gongan-Cycles

The degree of flexibility available to gamelan musicians in the course of realizing a piece is much greater than that allowed players in a symphony orchestra. This flexibility, apparent in many aspects of gamelan music, is perhaps nowhere more obvious than in the range of formal relationships possible in multiple performances of any given piece. The number of times each section or the entire piece is repeated, how many and in which irama it is played, and what kind—if any— structural editing takes place are the most important variables that are left up to the performers and that interact to create a variety of possible formal outcomes. Thus, to do justice in a formal sense to a gamelan piece, one must examine the formal possibilities it possesses as well as the formal outcome of each performance.

One hundred eighty-seven strict-structure pieces were examined for cycles of repeated gongan as well as for melodic relationships between gongan. The results, presented in Appendix E, are expressed as formal designs that, when combined with the information pertaining to irama and structural editing choices that are left up to the performers, begin to give a fairly complete idea of the complexity of the realization process and the range of possible formal relationships for any one gamelan piece.

A presentation of the variables of repetition of melodic material in these gamelan pieces uses these symbols:

- : : The gongan enclosed by colons constitutes a main gongan-cycle that in performance can be played either once or repeated.
- ; ; The gongan enclosed by semicolons constitutes a repeatable gongan-cycle contained within a main gongan-cycle that, likewise, can be played once or repeated a number of times.
- ⁿ The gongan with this superscript are played only upon a special melodic signal from one of the elaborating instruments; these are called the *ngelik* section of a piece.
- () The gongan and repetition patterns enclosed by parentheses are optional.
- / The slash separates main gongan-cycles that have different colotomic patterns, e.g. *merong* section or *inggah* section of a piece.

Gamelan pieces in the strict structures always have a section (or sections) of one or more repeatable gongan that can be played either once or repeated a number of times. All of the pieces surveyed belong to one of two basic formal schemes: 1) schemes with one main, repeatable gongan-cycle; or 2) schemes with two main, repeatable gongan-cycles.

A repeatable gongan-cycle is most commonly from one to five gongan in length (sometimes even more) and may be preceded or followed by other gongan that are played only once. Gongan-cycles with *ngelik* gongan may not have the same number of gongan with each repeat, a possibility not present in cycles without a *ngelik* gongan, which for some pieces is optional in performance.

Formal schemes with One Repeatable Gongan-Cycle

Pieces with one repeatable gongan-cycle will have one of two formal schemes: 1) one repeatable gongan-cycle without *ngelik* gongan, or 2) one repeatable gongan-cycle with *ngelik* gongan. The first scheme can be expressed as:

:_:

which is interpreted as a cycle consisting of one or more gongan that may be played once or a number of times in a performance. This formal scheme is most commonly found in pieces with the structures *lancaran*, *lancaran mlaku*, *bubaran*, or *ladrang*.

The second scheme is diagrammed as:

;;_n:

Within the repeatable cycle of pieces with this scheme there is a gongan, or multiple gongan, that can be played either once or, theoretically, any number of times (seldom more than twice in practice) before the *ngelik* signal is given and the *ngelik* section played. After the *ngelik* section, a return is made to the beginning of the entire cycle. Most pieces in the *ketawang* structure have this formal scheme, as well as some pieces in the *ladrang* and *lancaran* structures. The *ngelik* section of *ketawang* pieces is typically three gongan in length, while pieces in the *ladrang* structure using this scheme have *ngelik* sections of one or two gongan.

Performances of pieces with one repeatable gongan-cycle generally conclude (*suwuk*) at the end of the repeatable cycle, although some pieces can *suwuk* in any of the gongan within the cycle. A few pieces must end in a specific gongan either within the cycle or, very rarely, a special gongan outside of it. This *suwuk* placement variability can be, at least in part, explained by the fact that these pieces are often used to accompany dance and theater

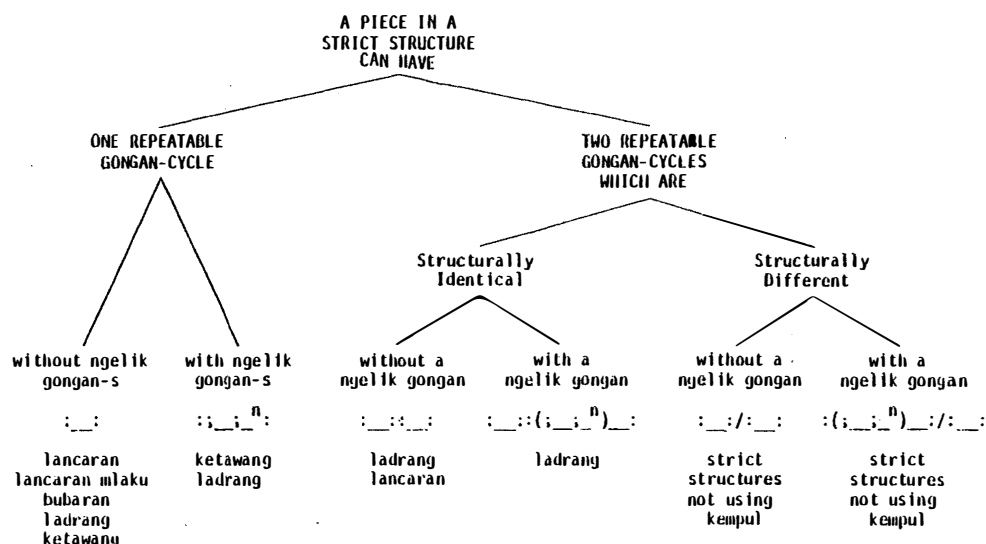


Figure 29. Formal Schemes for Pieces with Strict Structures.

that require them to end at a dramatically satisfactory point that could occur at any stroke of gong ageng in a piece.

Formal Schemes with Two Repeatable Gongan Cycles

Pieces with two repeatable gongan-cycles will belong to one of four formal schemes:

- 1) two repeatable gongan-cycles that are structurally identical and without a ngelik gongan;
- 2) two repeatable gongan-cycles that are structurally identical with a ngelik gongan in the second cycle;
- 3) two repeatable gongan-cycles that are structurally different and without ngelik gongan; or
- 4) two repeatable gongan-cycles that are structurally different with a ngelik section in the first cycle. These schemes are diagrammed as follows:

:_:::_:

This indicates pieces with two structurally identical gongan-cycles, not including a ngelik gongan. Ladrang and lancaran structures belong to this scheme. The main difference between the two cycles is the irama in which they are performed, the first cycle being in a faster irama than the second. In some pieces with the ladrang structure the second cycle is the mulur gongan. Although the first cycle can be returned to after the second cycle, it is more common not to make this return and simply suwuk in the second section.

:_:::(;_; n)_:

Some ladrang pieces have this scheme of two structurally-identical gongan-cycles with a ngelik gongan in the second cycle. The main difference between these two cycles is irama, with the first cycle performed in irama I and II, the second in irama III and possibly IV. The ngelik gongan, which is optional, will always be preceded and followed by the playing of at least one non-ngelik gongan.

:_:/:_:

This scheme is shared by many pieces with two- and four-kenongan-per-gongan structures not using kempul. The cycle to the left of the slash is the merong section, and to the right, the inggah section. The structural distinctions between these two cycles/sections of a piece can be slight, such as the number of kethuk strokes per kenongan in each, or marked, such as having a different number of balungan-pulses per gongan. The two cycles of some pieces using this scheme can also be differentiated from one another by irama treatment. The merong section is not returned to once the inggah section is entered.

:(;_; n)_:/:_:

This formal scheme is similar to the previous one but includes an optional ngelik sub-cycle in its first section. If performed, the ngelik gongan is always preceded and followed by at least one gongan of

		TRANSCRIPTION			
		3	4	5	6
MODAL ORGANIZATION	tuning system pathet	pl br	sl--pl--sl myr br myr	sl 9	sl-pl-sl 9 6 9
# OF GONGAN-S	in irama seseg	1		1	
	in irama I	7			4
	in irama II	1	1	3	4
	in irama III	3	4	4	4
	in irama IV	1	1		2
	total	13	6	8	14
# OF NGELIK GONGAN-S	in irama III		1		
	in irama IV	1	1		1
	total	1	2	0	1
# OF KENDELAN-S	in irama seseg			2	
	in irama I				2
	in irama IV	3	2		3
	total	3	2	2	5
SELINGAN	infixes material	palaran			
PERFORMANCE TIME	first cycle	3:17	:39	2:11	4:06
	second cycle	11:46	10:22	6:55	13:04
	total	15:03	11:01	9:06	17:10

Table 10. Data Drawn From the Pangkur Transcriptions.

the non-ngelik cycle. The merong section is not returned to once the inggah section has begun.

Gamelan musicians are guided in their performance of any given piece by their shared knowledge of its formal organization, which involves the ordering of essential and optional melodic material (balungan) into units (gongan and groupings of gongan) that can be repeated within constraints. An attempt has been made here to extract from the analysis of the formal organization of a number of pieces (their “formal designs”) a small set of schemes that might be thought of as the syntax of macro-level formal relationships for this tradition (Figure 29).

PERFORMANCE PRACTICE FLEXIBILITY

A comparison of four recorded performances of a single gamelan piece—*Ladrang Pangkur*--illustrates how the variables of gamelan performance practice interact to create considerably different formal results. Of the many performances of *Pangkur* available on commercial recordings from Java, four have been chosen for the variety of performance options their performers made while realizing the piece and for their strikingly different formal outcomes. (Transcriptions of these four performances are found in Appendix C as Transcriptions 3, 4, 5, and 6, abbreviated T3, T4, T5, and T6, respectively in the commentary and figures to follow.)

Ladrang Pangkur has the two-gongan-cycle

s1 sanga-T5	3
s1 sanga-T6	5
s1 mnyr-T4	6
pl br-T3	6
	GN
2 1 2 6	2 1 6 5
2 1 2 6	2 1 6 5
3 2 3 1	3 2 1 6
3 2 3 7	3 2 7 6
t W	t N
6 5 2 1	3 2 1 6
6 5 2 1	3 2 1 6
1 6 3 2	5 3 2 1
7 6 3 2	5 3 2 7
t P	t N
2 3 2 1	6 5 2 1
2 3 2 1	5 3 2 1
3 5 3 2	6 5 3 2
3 5 3 2	6 5 3 2
t P	t N
3 2 1 6	2 1 6 5
3 2 1 6	2 1 6 5
5 3 2 1	3 2 1 6
5 3 2 7	3 2 7 6
t P	t GN

Figure 30. Comparison of the Balungan-s for the Regular Gongan of Pangkur.

formal scheme :_:(;_;_n)_: and its formal design is :A: ;Am*Bn;Am:. Table 10 is a compilation of mostly quantifiable information extracted from the four performances and illuminates the various facets of the process by which gamelan pieces are realized.

Tuning Systems and Balungan

Each of the two tuning systems used in gamelan music has three main modes, called *pathet*.

Laras Slendro	Laras Pelog
<i>pathet nem</i>	<i>pathet lima</i>
<i>pathet sanga</i>	<i>pathet nem</i>
<i>pathet manyura</i>	<i>pathet barang</i>

Some gamelan pieces, including *Pangkur*, can be realized in either laras and in more than one pathet within the same tuning system. *Pangkur* can be realized in pathet sanga or pathet manyura in laras slendro, and in pathet nem or pathet barang in laras pelog.

Figures 30, 31, and 32 present, respectively, the regular (A), mulur (A^m), and ngelik (Bⁿ) balungan of *Pangkur* as played in the four transcribed performances.

Figure 30 compares the balungan for the regular gongan of *Pangkur* as found in the four performances. This

s1 sanga-T5	5
s1 sanga-T6	5
pl nem-T6	5
s1 mnyr-T4	6
pl br-T3-T4	6
	GN
2 1 2 6	2 1 6 5
2 1 2 6	2 1 6 5
2 1 2 6	2 1 6 5
3 2 3 1	3 2 1 6
3 2 3 7	3 2 7 6
t W	t N
6 3 5 6	2 3 2 1
5 6	5 5 6 1
6 6	5 5 6 1
1 1	6 6 1 2
7 7	6 6 7 2
t P	t N
5 6 1 2 5 3 2 1	3 5 3 2 5 3 2 1
2 5 3 2 1	2 1 3 2 5 3 2 1
6 5 6 5 5 6 2 5 5 6 5 5 6 1	2 1 3 2 5 3 2 1
3	3 6 5 3 2
3	3 6 5 3 2
t P	t N
5 6 2 1 5 2 1 6	2 1 6 5
5 6 2 1 5 2 1 6	2 1 6 5
5 6 2 1 5 2 1 6	2 1 6 5
6 1 3 2 6 3 2 1	3 2 1 6
6 7 3 2 6 3 2 7	3 2 7 6
t P	t GN

Figure 31. Comparison of the Balungan-s for the Mulur Gongan of Pangkur.

		s1 sanga-T6	1
		s1 mnyr-T4	2
		pi br-T4	2
		pi br-T3	2
			GN
1	3 3	2	2 3 5 6 3 5
2	5 3 2 3		3 5 5 1 5 6
2	4 3 2 3		3 5 5 7 5 6
2	4 3 2 3		3 5 6 7 5 6
	t	W	t
1 1	3 2 1 6	2 1 5 3	2 3 2
2 2	() 5 1 6 5 3	
2 2	4 3 2 7	3 2 6 5 7 5 5 3	
2 2	() 5 7 6 5 3	
	t	p	t
			N
2	3 5 6 1 5 1 5	2 3 5 6 5 3 2 1	
3 5	() 6 3 5 6 1 5 5 3 2	
3 5	6 7 5 6	3 5 6 7 6 5 3 2	
3 5	() 6 3 5 6 7 6 5 3 2	
	t	p	t
			N
5 6 2 1 5 2 1 6		2 1 6 5	
5 1 3 2 5 3 2 1		3 2 1 6	
6 7 3 2 5 3 2 7		3 2 7 6	
6 7 3 2 6 3 2 7		3 2 7 6	
	t	p	t
			GN

Figure 32. Comparison of the Balungan-s for the Ngelik Gonggan of Pangkur.

is the only gongan in the first cycle of *Pangkur's* formal scheme and it can be performed in irama seseg, I, and II. Transcriptions 3 and 4 are basically transpositions of the Transcription 6 balungan. Transcriptions 5 and 6 are both in slendro pathet sanga and are identical except for two pitches found in the third kenongan. The balungan for Transcriptions 3 and 4 are basically the same except pitch 1 in slendro pathet manyura becomes pitch 7 in pelog pathet barang.

Figure 31 compares the various mulur balungan found in the performances. The mulur gongan is the primary gongan in the second cycle of *Pangkur's* formal scheme and can be performed in irama III and IV. In general, the balungan found in Transcriptions 3 and 4 are transpositions of those found in Transcriptions 5 and 6, although a number of versions exist for the second and third kenongan. However, the pitch sounded at the end of any given gatra does not vary from one balungan interpretation to the next.

Figure 32 compares the balungan of the various ngelik gongan, an optional gongan in the second cycle of the *Pangkur* formal scheme that can be performed in irama III and IV. The first two-and-one-half kenongan display considerably different interpretations of the balungan, although there are again no discrepancies found at the end

of gatra. Pitch 4 is sometimes used instead of pitch 5 in pelog pathet barang.

The above comparison suggest that performers have some degree of flexibility in interpreting the melodic dimension of a piece, but whichever interpretation is used for any one performance must be agreed upon by all the performers.

In two of the performances a change is made from one tuning system to the other in the course of the performance. This is called *molak-malik* (lit. to keep changing) and occurs only between pathet settings of a piece that share the same gong-tone and, for the most part, the same pitches throughout. Examples of molak-malik are found in Transcription 4 (slendro pathet manyura to pelog pathet barang and back to slendro pathet manyura) and Transcription 6 (slendro pathet sanga to pelog pathet nem and back to slendro pathet sanga).

Laras and pathet choice is therefore another aspect of performance practice flexibility. The performers must know in which laras and pathet a piece can be performed and if it is traditionally acceptable to molak-malik between them. With this knowledge, the performers can choose a laras-pathet option for a performance of a piece and whether to stay in that laras-pathet choice throughout the entire performance (as in Transcriptions 3 and 5) or to molak-malik (as in Transcriptions 4 and 6). In the latter case, obviously contrasting sections are created on a macro-level which are not present in performances that remain in the same laras-pathet combination throughout.

		normal	ladrang		GN
T3	kebar	variant			GN
T6	kebar	variant			GN
	t	W	t	N	
	t	P	P t	N	
	t	P	P t	N	
	t	P	t	N	
	t	P	P t	N	
	t	P	P t	N	
	t	P	t	GN	
	t	P	P tP	GN	
	t	P	Pt P	GN	

Figure 33. Ladrang Structure and Kebar Variants.

Structure

Pangkur is cast in the 32-balungan-pulse ladrang colotomic structure with four eight-beat-kenongan-per-gongan using kempul (Figure 14). When performing, Javanese musicians have available to them for certain pieces in the ladrang structure, including *Pangkur*, a treatment called *kebar*, which originates in the world of Javanese dance where such pieces accompany lively sections of certain dances. Kebar treatment is performed only in irama I and includes the use of specific drumming patterns, specific functions in certain elaborating and melodic instruments, and a variant of the ladrang colotomy that includes additional kempul strokes. Musicians in T3 and T6 chose to apply the kebar treatment to their performance. Each of these performing groups used a slightly different variant of the ladrang structure for their kebar treatment, and these are compared to the regular ladrang structure in Figure 33. The two variants differ from one another only in the last four beats of the gongan, when the placement of a kempul stroke creates a syncopated rhythmic relationship with the balungan-pulse. Performers choose whether or not to invoke the kebar treatment in a performance, but when they decide to do so it articulates a section within the performance that stands in clear contrast to other sections of the performance, therefore contributing to the perception of the macro-level formal organization of the performance.

Irama and Irama Transitions

Pangkur can be performed in all five irama: the regular gongan in irama seseg, I, II, and the mulur and ngelik gongan in irama III and IV. Table 10 lists the number of gongan in each irama found in each of the four performances. Some transitional gongan passed through as many as three irama that, like all of the gongan in these performances, are listed in Table 10 under the irama that was in effect for the greatest part of the gongan. Two important points reinforced by this data are: 1) although *Pangkur* can be performed in all five irama, it does not have to be performed in all of the irama in each performance, and 2) choices such as which irama are performed and how many gongan are played in each of them are variables left to the performers.

Irama changes are abundant throughout these performances. Type 1 irama changes (Figure 23) are found in each performance, most commonly from a faster bp irama to a slower bp irama (e.g., seseg to I, I to II, etc.), although one example of an irama change in the opposite direction is found in the final gongan of Performance 5 (irama III to II). Type 2 irama changes (Figure 24) occur in Performances 3, 4, and 6 when changing from irama IV to irama III, in Performance 5 from irama I to irama seseg, and in Performance 6 from irama II to irama I.

The combined effect of irama choice and repetition of gongan made by the performers resulted in vastly different cycle lengths; see “Performance Time” in Table 10. Additionally, pronounced differences are found in these four

regular	3 2 3 7	3 2 7 6
mulur	3 2 3 7	3 2 7 6
	t W	t N
	7 6 3 2	5 3 2 7
	77 6672	3263 2 7
	t P	t N
	3 5 3 2	6 5 3 2
	3 2	36532
	t P	t N
	5 3 2 7	3 2 7 6
	67326327	3 2 7 6
	t P	t GN

Figure 34. Comparison of the Regular and Mulur Balungan-s for Ladrang Pangkur.

mulur	3 2 7 6
ngelik	3 2 672
	t GN
	3 2 3 7
	2 4323
	t W
	3 2 7 6
	77 6672
	22 4327
	t P
	3 2
	356756
	t P
	67326327
	67326327
	t P

Figure 35. Comparison of the Mulur and Ngelik Balungan-s for Ladrang Pangkur.

realizations of *Pangkur* between the proportion of time spent in the first gongan-cycle of the piece compared to that in the second gongan-cycle.

Structural Editing

All four of the performances had kendelan (Table 10). Of the twelve kendelan executed by the performers, two each took place in irama seseg and I, and the other eight in irama IV. I have never heard a kendelan in Irama II during a performance of *Pangkur*, and while tradition permits kendelan in irama III, none occurred in these particular performances.

At the point of the final kendelan in performance T3 a palaran is inserted, the only example of structural infix in these four performances of *Pangkur*. The end of the final phrase of the palaran coincides with the continuation of *Pangkur* in irama III. Thirty of the thirty-two balungan

pulses in this gongan of *Pangkur* are skipped as a result of this structural infix.

Melodic Organization

The balungan of both the regular and the mulur gongan of *Pangkur* have the kenongan pattern *abca'*. The mulur gongan, regardless of the various renditions found in these transcribed performances, is an interesting combination of melodic repetition, elaboration, and abstraction of the regular gongan of *Pangkur*, as shown in Figure 34 for the pelog pathet barang balungan. The balungan pitches at every stroke of gong ageng, kenong, and kempul (and wela), as well as half of the strokes of kethuk, are the same in both versions, confirming the melodic similarity between these two balungan. Performers consider the regular gongan (A) to be derived from the mulur gongan (A^m).

The ngelik gongan has the kenongan pattern *defa'*. To get to the ngelik from the mulur gongan, the pitches in the last two balungan-pulses of the mulur gongan are altered to arrive at a different gong-tone. The ngelik balungan differs from the mulur balungan until the last two balungan-pulses of the third kenongan; from that point on they are identical (Figure 35).

The balungan of *Pangkur* is melodically very unified, since the regular and mulur gongan are basically the same (the former derived from the latter), and since the ngelik gongan, although obviously contrasting, nonetheless has the same final kenongan as the mulur gongan.

The formal scheme of *Pangkur* has two repeatable gongan-cycles. The first cycle consists simply of one gongan, the regular gongan (A); this can be played either once or several times and expressed as (:A:). The second gongan-cycle of *Pangkur* has one basic gongan, the mulur gongan (A^m), as well as the optional ngelik gongan (Bⁿ). The second gongan-cycle, in its simplest form, can be expressed as (:A^m:). With the possible inclusion of the ngelik gongan, however, the form of the second cycle is expressed as (;A^m*Bⁿ;) with A^m* representing the mulur gongan with the alteration leading to the ngelik gongan, Bⁿ representing the ngelik gongan, the semicolons representing the possibility of repetition, and the parentheses the fact that it is optional. Thus, *Pangkur's* second gongan-cycle can be expressed, with all its possibilities, as (:A^m*Bⁿ;)A^m:. Table 11 presents the

	first gongan-cycle	second gongan-cycle		total # of gongan-s
	:A:	:(;A ^m *B ⁿ ;)A ^m :		
T3	9	1	2	13
T4	1	2	1	6
T5	4		4	8
T6	8	1	4	14

Table 11. Gongan Repetition in the Transcribed Performances of Ladrang *Pangkur*.

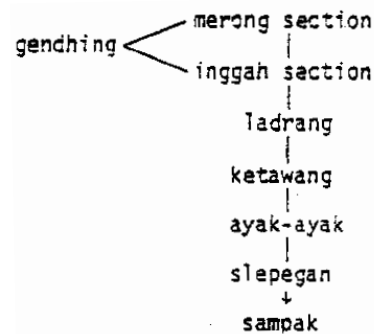


Figure 36. Sequence of Structures Found in the Talu.

entire formal design of *Pangkur* and the number of times each of its gongan was performed in the four performances. One time through (;A^m*Bⁿ;) is two gongan long, two times through is four gongan long. The range in terms of the number of gongan in each section attests to the flexibility of performance practice in gamelan music.

The preceding discussion of the structural, melodic, and formal organization of a gamelan piece and the consequences of choices made by performers in the course of realizing it illustrates the flexible nature of Central Javanese gamelan music and performance practice. The overall formal shape of a gamelan piece is created anew with each performance, the result of interacting musical components being combined in various ways to produce endless renditions of the same piece.

STRUCTURAL ORGANIZATION IN SEQUENCES OF PIECES

Gamelan pieces are frequently strung together in performance to form sequences of pieces. Although no written principles or guidelines exist to dictate how pieces are sequenced, after hearing numerous performances certain modal (pathet) and structural relationships appear recurrent and significant. For instance, with few exceptions, all of the pieces in any one sequence belong to the same pathet.

How the structures of the pieces forming a sequence are ordered and connected is somewhat complex. The information presented here is drawn from forty-four recorded performances identified and summarized in Appendix F.

Talu Sequence

The most elaborate sequence of pieces found in gamelan music is the one used for the *taluh* (overture) to theatrical productions such as *wayang kulit* (shadow puppet plays) and *wayang orang* (human actor-dancer plays). Although different combinations of pieces can be used for a talu, their order in the sequence appears to be determined by their structures (Figure 36). The first piece in this sequence will have a four-kenongan-per-gongan-without-kempul

structure with either 128 or 64 balungan-pulses per gongan in both of its two repeatable gongan cycles (merong and inggah). This is followed by a piece with the ladrang structure (32 bp per gongan) and then by a piece with the ketawang structure (16 bp per gongan). Following the ketawang structure are pieces in the free structures of ayak-ayak, slepegan, and sampak. All of the pieces in this sequence are connected without interruption.

Two important tendencies are apparent in the talu sequence:

- 1) a progression from pieces with large structures to pieces with small structures, and
- 2) the sequence begins with pieces in the strict structure and ends with pieces in the free structures.

These tendencies seem to be important organizing principles for not only the talu, but also for the sequencing of pieces in other settings, including *klenengan* (gamelan performance for listening pleasure).

Talu-Related Sequences

Of the forty-four performances examined, only three were talu for wayang kulit performances with the sequence of structures diagrammed in Figure 36. However, the sequence of structures found in thirty-five of the remaining forty-one medleys of pieces displayed some degree of relationship to the talu sequence and will be called “talun-related sequences.”

A variety of talu-related structural sequences were found in the corpus (Figure 37). The left side of the chart lays out the talu sequence and its structural tendencies, while all of the encountered deviations from this sequence are mapped out on the right. All but one of the eleven talu-related sequences represented follow the tendencies of the talu sequence; in the one exception a ladrang was played after a ketawang. Three of the performances contained pieces in the lancaran or lancaran mlaku structures. Although pieces in these structures are not found in talu, these pieces are positioned in their respective medleys where one might expect according to the structural tendencies of talu sequences—at the end of pieces in strict structures and before pieces in free structures.

Although the underlying tendencies of the talu sequence are reinforced in these related sequences, the only element they all include is the merong section of a piece in a four- or two-kenongan-per-gongan-without-kempul structure. After the merong section of the initial piece is played, either its inggah, the inggah of another piece, or a ladrang follows. The possibilities after this point become more numerous, including skipping one or more of the structures of the talu sequence and frequently ending the sequence before all of the possible structures are used (five of the sequences do not include any pieces in the free structures).

The means by which the pieces in talu-related sequences are connected are occasionally more complex than in the talu sequence itself. Whereas the talu sequence is performed without interruption between its constituent pieces, it is not uncommon for some kind of interruption to

the flow of performance to occur in talu-related sequences. These typically occur somewhere after the first two structures of a sequence and in one of two ways:

- 1) a piece in the sequence is ended (suwuk) and is immediately followed by the introduction (buka) of the next piece in the sequence; or
- 2) a piece in the sequence is ended (suwuk) and is followed by a solo vocal piece of substantial duration that either leads directly into the next piece of the sequence or is followed immediately by the buka for the next piece.

Regardless of the nature of the interpretation, it is no more than a temporary break in the otherwise continuous flow of the music. Such interruptions are similar in their effect to kendelan and structural infix.

The individual pieces within a sequence are subject to the variables of structural flexibility (irama and structural editing choices) and melodic repetition. As these play out in the realization of each piece in a medley, they also contribute to the perception of the overall form of the medley itself.

Other Sequences

Only six of the forty-four performances in the corpus did not have talu or talu-related sequences (Figure 38). Four of these performances consisted simply of two ladrang, while the remaining two began with a piece in the lancaran structure followed by a ladrang and returning to the initial lancaran; one of these performances after this point went to another piece in the ladrang structure. The first of these sequences is heard only in *klenengan* performances, its two pieces joined sequentially simply because they complement one another musically. The latter two sequences reveal influences from the world of Javanese dance, where gamelan music as accompaniment provides temporal frameworks into which movement is choreographed. The basic sequence of lancaran to ladrang (or sometimes ketawang) to lancaran pieces is used for the accompaniment to several dances such as *Gambiranom*, *Klana*, *Eko Prawiro*, and others.

Joining pieces into a medley is a common occurrence in Javanese gamelan performance. It appears that gamelan musicians, when arranging medleys for *klenengan* performance, are guided to at least some degree by two distinct models—either by the talu or by dance accompaniment. Regardless of which model is guiding the sequence, in performance the constituent pieces comprising the medley become the basic building blocks of its formal design.

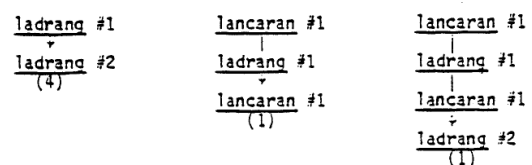


Figure 38. Non Talu-Related Sequences.

THE FORMAL PROCESS

The process by which a gamelan piece is realized is a complex interaction between a number of musical elements—some more-or-less fixed, others variable (Figure 39). The fixed elements of a piece discussed here include its structure, its *balungan*, and its formal design. Together, these do not themselves constitute a piece—which can only be brought into existence when it is realized in performance—but they do summarize the basic structural, melodic, and procedural information musicians must know in order to successfully realize a piece.

So much of what gives a performance of a piece its overall formal shape and interest is determined by choices the performers make in the actual moment of performance, where they breathe life into the rigid representation of a piece's fixed elements. They choose how many times to repeat a structural-melodic unit in a particular *irama* and with a particular treatment before transitioning to either repetitions of the same structural-melodic unit in another *irama* and treatment or to a different repeatable and expandable (in terms of *irama*) structural-melodic unit of the piece.

The musicians decide whether the flow of the performance will be continuous or disrupted, and what, if any, contrasting musical material they will insert into the performance of the piece. A remarkable characteristic of the Javanese gamelan tradition is that the way its performance practice has evolved makes it possible for any piece to retain its identity even as it is given new form each time it is performed by a group of competent musicians. ▀

[Note: A pdf of the complete original manuscript, including all Transcriptions and Appendices, is online and will be found in either "current issue" or in "back issues" at <http://www.gamelan.org/balungan>.—Ed.]

Endnotes

1. A few parts of the original manuscript, including its preface and appendices, are not included here but can be found in the pdf of the complete original work online.

2. The pitch frequencies (expressed in vibrations-per-second) and interval sizes (expressed in cents) for thirty-nine *pelog* gamelan and forty-six *slendro* gamelan are given in Kunst (1973:572-575).

3. The *pelog* instruments have an open octave. The *slendro saron* and *slenthem*, depending on where a gamelan was made, will have either a closed octave or a closed octave plus one pitch.

4. The idea of using circles to represent repeating cycles of colotomic punctuation in Javanese gamelan music comes from Hoffman (1975).

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Discography

SOURCES

Key

RRIS	RRI Surakarta
RRİY	RRI Yogyakarta
ACD	Lokananta cassette
BRD	Lokananta LP
a-h	wayang recording series

Cassettes

Klenengan Gobjob. RRIS. ACD001
Klenengan Gobjob. RRIS. ACD002
Pangkur Djenggleng. RRIY. ACD003
Gending Soran. RRIS. ACD010
Gatutkatya Gandrung. RRIS. ACD011.
Sambul Gending. RRIS. ACD012.
Titipati. RRIS. ACD014.
Kinanti Djura Demung. RRIS. ACD015.
Gatutkaca Sungging. ACD022(a-h).
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Logondang. RRIS. ACD033.
Randanunut. RRIS. ACD034.
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Gending Djawa (II). RRIS BRD002
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Javanese Court Gamelan. Paku Alaman. Nonesuc H72044
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Field Recordings

Field tape, recorded by Roger Vetter in Yogyakarta at the
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PERFORMERS

RRI Yogyakarta. *Gamelan Kesenian Djawa Studio Yogyakarta*.
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Alaman palace in Yogyakarta.
Mangkunegaran. The gamelan musicians from the
Mangkunegaran palace in Surakarta.
[Kraton] Surakarta. The gamelan musicians from the main
palace in Surakarta.
Nartosabdho. A famous dhalang and musician with his own
gamelan group: *Condong Raos*.
Anom Soeroto. A dhalang with his own gamelan group:
Paguyuban Raras Irama.