

Combining the Principles of Symphony and Gamelan Orchestras in Marius Baranauskas' Work *Alrediph*

Abstract. The possibility of interaction between orchestras formed in different cultures always raises many questions, doubts, and some curiosity. Can orchestras based on fundamentally different principles interact effectively, and what creative results can be achieved when combining these principles into one system? This paper presents the concept of my composition *Alrediph* (for tam-tam and symphony orchestra, 2020) and shows the main creative solutions combining gamelan and symphony orchestra principles. The main idea of the interaction is revealed in a separation between the structural levels of *micro* and *macro*. The *macro* level includes the entire form of the work and all its elements. The elements of the *micro* level are emphasized in small compositional formations of the work, such as the internal structure of fragments, micro-textures, and the like. In this way, two orchestral characteristics of different types can exist simultaneously. The following three points make this principle possible:

1. *Micro* and *macro* orchestras. The entire instrumentation of the work is divided into two relative orchestras. Firstly, there is the standard symphony orchestra with its internal structure of elements (referred to as the *macro* orchestra); secondly, there is the solo instrument, the tam-tam, which reveals itself in a large number of different timbres and embodies a kind of an orchestra within itself (the *micro* orchestra), with many of the elements that are characteristic of an orchestral structure.
2. *Micro* and *macro* structural unit. The structural unit is formed at two levels. The characteristics of the gamelan form the *macro* level, while the characteristics of the symphony orchestra form the *micro* level of the structural unit.
3. *Micro* and *macro* structural elements. The whole set of structural elements is reflected in a dual system. The elements of the gamelan are most prominent at the *micro* level, while the elements of the symphony orchestra are largely at the *macro* level.

The two aforementioned levels function primarily as a way to separate the structural elements of different types of orchestras and, at the same time, to combine them into a single system. This paper discusses in detail all the main aspects and peculiarities of the hybrid orchestral structure of the work under consideration.

Keywords: symphony orchestra, musical cultures, gamelan, orchestration, orchestral structure, structural elements, composition technique, Marius Baranauskas.

Introduction

The search for new paths and a distinctive sound in orchestral music inevitably turns to orchestras formed in other cultures. This not only opens up the possibility of finding a more precise place of the European orchestra in the world musical panorama, clarifying the different ways of orchestral thinking but also revealing new and original approaches relevant to the practice of composition. Looking at the global picture of orchestral traditions, we can identify a number of orchestras from different cultures around the world that are very distinctive, geographically widespread and have established their artistic, cultural, and civilizational significance throughout history: the various archaic orchestras, the Indonesian gamelan, the Japanese gagaku, the European symphony orchestra, etc. These orchestras are formed in completely different cultural environments and therefore possibly reflect different principles of orchestral composition and orchestration (Baranauskas 2004, 33–40). For the contemporary composer, this is a significant opportunity to become liberated from the confines of the traditional symphony orchestra. For more than a century, both gamelan and other non-European musical traditions have penetrated European orchestral thinking in one way or another. Despite the differences between the gamelan and the symphony orchestra, it is clear that there is a certain amount of interaction and influence between them. Since the beginning of the 20th century, this mutual influence has become more and more apparent. Not only have composers from European culture (Claude Debussy, Olivier Messiaen, Pierre Boulez, György Ligeti, Lou Harrison, etc.) enriched their music with elements and concepts from gamelan, but the gamelan orchestra itself has inevitably been influenced by Western culture.

The relationship between European and culturally alien music, and its integration, can be seen from diverse and quite different angles. What has driven this process and what have been the motivations behind it? John Corbett emphasizes the importance of experiment and the phenomenon of the rise of experimental music as such. The various attempts to integrate alien cultures can be seen in some ways as a kind of consequence of the desire to experiment. Experimentation, both as a phenomenon and as a field of study, provides an ideal context for drawing on elements from other cultures and observing the resulting outcomes. The most important thing, of course, is that something new and unheard of will result either way (Corbett 2000).

Based on Corbett's observations, we can distinguish at least two strands of experimental music.

The first is revealed when experimenting with conventional musical parameters such as pitch, harmony, form, and timbre. The result is more audible in the external sound, and we can usually distinguish elements from different cultures, clearly identifying the fact of their use and the means by which they are employed.¹

The second direction is not so much on the surface of the sound, but in the very nature of the thinking itself: the processes used, the creative methods, the procedures, and even the contexts. Meanwhile, the external sound may not resemble in the slightest the sound of the musical cultures from which these processes are drawn.

The former takes many forms. As an example, we can use some of Neil Sorrell's observations in his study of the interactions between European music and Indonesian gamelan (Sorrell 1992). In his discussion of Messiaen's music, he notes the importance of the high-pitched timbre of the metallic percussion group as a kind of symbol or embodiment of the gamelan orchestra within the European symphony orchestra (*Turangalila* Symphony), and the use of several gamelan polyphonic techniques, whereby a melody is repeated in conjunction with other ostinato layers composed largely by augmentation or diminution of the same melody. Meanwhile, Britten's ballet *The Prince of the Pagodas* shows yet another integration of the Balinese gamelan into the symphony orchestra. He tries to imitate the sound of gamelan music and the gamelan orchestra itself, using only conventional European orchestral instruments. Not only does he use original musical material from another culture, but he also orchestrates it so skillfully that we can almost believe we are hearing Indonesian Bali gamelan.

Interesting examples of the second case can be found in John Cage's creative experiments. Cage's conceptual approach does not begin with an attempt to import a foreign idea into his work or to incorporate an exotic element; nor does it rely on any non-Western system or sound; it does not touch on the outside, it does not aim for a non-Western sound. Instead, Cage creates a conception of the conditions in which certain events might take place, a conception that can be roughly based on, for example, a particular Asian source (Corbett 2000, 171). In this way, the sonic result has little, if anything, to do with the non-European system, way of thinking, or idea used in the source. In many cases, Cage even deliberately avoided any outward signs that might resemble the stylistics or stereotypical sound of certain cultures.

The composer Harrison has spoken in this regard about the need to be familiar with at least one musical tradition besides the one you were born into. According to him, this second knowledge must be equivalent, so that alongside Haydn's music, one should study analogous court music: for example, the Javanese *gadon* tradition, or Chinese, Japanese, Korean court, or chamber music (Harrison 1992, 255).

Western culture's fusion with other musical cultures can take many different forms of interaction, ranging from the simple integration or imitation of elements to the use of foreign instruments or the imitation of their sound on Western instruments, to conceptual relationships using borrowed processes, ways of thinking, and creative strategies. So how can this relationship be realized? In the form of mutual influence, of equal interaction, or perhaps only superficial imitation?

In addition to Cowell, Cage, and Partch, who, stimulated by non-Western impulses, have produced conceptually or famously original results, there is a group of composers such as McPhee, Harrison, and Hovhaness, who sought to directly imitate the sound of certain cultures, using Western instruments or original instruments from that culture.² In this way, a kind of imitation of the original, adapted to Western culture, is presented.

Interestingly, we find cases where the conceptual and decorative use of non-European elements are combined into one whole. In this case, the musical result, both in terms of external sound, structure, and conception, is more or less based on these elements. The music of some minimalists could serve as an example.

Meanwhile, for example, Reich raised the problem of the absorption of influences. What is a composer to do with his knowledge of the music of other cultures? He has expressed the desire for music not to sound like the music of the culture being studied, pointing out that the composer should study the music of another culture and allow it to influence the composer's thinking, instead of trying to imitate the musical sound of that culture. This creates an interesting situation in which non-Western influences are present in the thinking

¹ Corbett gives the example of the replication of the gamelan's sound on Western instruments in McPhee's piano piece *Tabub-tabuban*, in which the composer expanded the notion of influence by coming dangerously close to the true sound of the Balinese gamelan, which raises the ethical question of its authorship (Corbett 2000, 173).

² Lou Harrison used real Javanese gamelan instruments and even musical processes in his compositions for the so-called American gamelan, but he did so by applying a Western, object-based approach to the instruments and the orchestra itself. Although sonically his music is very close to the actual gamelan sound, the mindset towards the instruments and the orchestra itself remains distinctly Western, as do the performance contexts—concert instead of ritual.

but not in the sound (Reich 1974). In *Drumming*, the composer refrained from the original idea of writing a piece for African drums, not wanting to imitate too directly the music of the African tribe he was studying and to be freer to realize the experience he had gained in the medium of that culture. Nevertheless, we can see that both in this and in some of Reich's other works we can hear cultural influences at both the outer and deeper levels or the level of the overall perception of music.

It is clear that the interaction between different cultures and their orchestras can take place on different levels, conceptual and aesthetic planes, and can take very different forms. However, in most cases, the prevailing influence of one culture is likely to persist, with only partial incorporation of the principles of the other. In general, we can identify the following levels of interaction as the most obvious and relevant for composing practice:

1. Imitating the external sound. This is the most superficial level, which can occur in certain parts of a piece (partial use) or the whole piece of music (total use). In this case, an attempt is made to imitate certain external features of another orchestra (e.g., symphony orchestras use instruments with a timbre reminiscent of gamelan instruments; fragmentary use of gamelan-like intonations, rhythms, etc.).
2. Integration of original orchestral instruments from other cultures. In this case, instruments from another culture are used alongside the standard orchestral instruments to create an orchestra within an orchestra (e.g., a symphony orchestra using gamelan gong sets, etc.).
3. Application of musical concepts and structural principles of orchestral music from another culture. It can be:
 - a) fragmentary covering only one musical parameter (rhythm, texture, form, etc.) or occurring only in certain sections of the work;
 - b) holistic—underpinning the structure of the whole work or covering most of the elements of the musical language.

The last type of interaction is potentially the deepest and most inclusive. It involves not only the replication of the external sound (the sound of such works may not even resemble the acoustic sound of an orchestra from another culture), but also penetrates deeper into the perception of the music itself, the logic of the formation of the musical parameters, and ultimately the compositional process itself. The interaction at this level can vary considerably, depending on which musical parameters are integrated, which principles of orchestral structure from another culture are applied, and how widely and deeply they are used.

In the following, I will present the analysis of my work *Alrediph* as a means and opportunity to see the validity of these ideas and their potential creative possibilities. This composition was originally conceived as a kind of experiment in combining two orchestras from different cultures. In this way, I expect to find answers to important creative questions such as:

- Is it possible to achieve a roughly equivalent relationship between orchestras from different cultures?
- What principles of orchestral structuring work best in this process?
- Can *the system of structural elements of the orchestra* provide a creative basis for interaction?
- What are the most appropriate musical compositional tools for this interaction (models of musical form, timbres, and their combinations, textures, etc.)?
- The most appropriate orchestration tools and techniques.

One of the most important goals in composing *Alrediph* and in the analysis presented in this paper is to verify that the interaction between gamelan and symphony orchestra is possible on multiple levels, both audible and structural and that it can lead to new creative solutions and sonic results.

1. Creative and Structural Starting Points for *Alrediph*

Alrediph (for tam-tam and symphony orchestra, 2020) was created to systematically combine the features of the symphony orchestra and the gamelan, and to realize the interaction of these orchestras at different levels. Integrating the principles of different orchestras, particularly orchestras from different cultures, requires a conceptual approach and a search for points of contact in the aspects and at the levels that will lead to the desirable result. Given the three levels of interaction mentioned in the introduction, several important moments reveal the relationship between the gamelan and the symphony orchestra in this work. Firstly, some of the features of the imitation of the gamelan orchestral sound are also present in this work. The instrumental composition of the work (tam-tam *solo* and symphony orchestra) inevitably implies certain similarities. First of all, there is the timbre of the solo tam-tam, which in some cases, depending on the playing techniques used, resembles the sound of a gamelan gong. Also, the use of a set of gongs in an orchestral percussion ensemble.

These elements are partly related to the first two levels of interaction—the external replication of the sound of an orchestra from another culture and the integration of instruments from another culture. However, in this case, they are minor and do not form the basis for the interaction between different types of orchestras. It is important to emphasize that in this composition, I aimed to create a kind of hybrid formation, in which the elements of the different orchestras are integrated into each other as much as possible, and are not just external decorations or flavourings of one another. Therefore, this interaction focuses on the third—structural—level. Thus, in this case, the combination at the level of the structural elements has been chosen for the synthesis of two orchestras from different cultures.

The *system of structural elements of the orchestra*³ is the basis for understanding the concept behind *Alrediph*. It defines the main structural components of the orchestra and suggests systematic relationships between the individual elements. The following elements are required to define orchestra:

- a) structural unit;
- b) the elements of orchestral vertical: formation principle of orchestral groups; interrelation between orchestral groups; layers of orchestral texture;
- c) the elements of orchestral horizontal: orchestral dramaturgy; factors of timbre stability; dominating musical parameters.

The following additional factors are provided, to achieve a more comprehensive definition and to balance out the elements of the system: intergroup interrelation between elements, intergroup shift, and a level of significance of the element (Baranauskas 2019, 22–34).

A comprehensive view of the system is shown in Diagram 1.

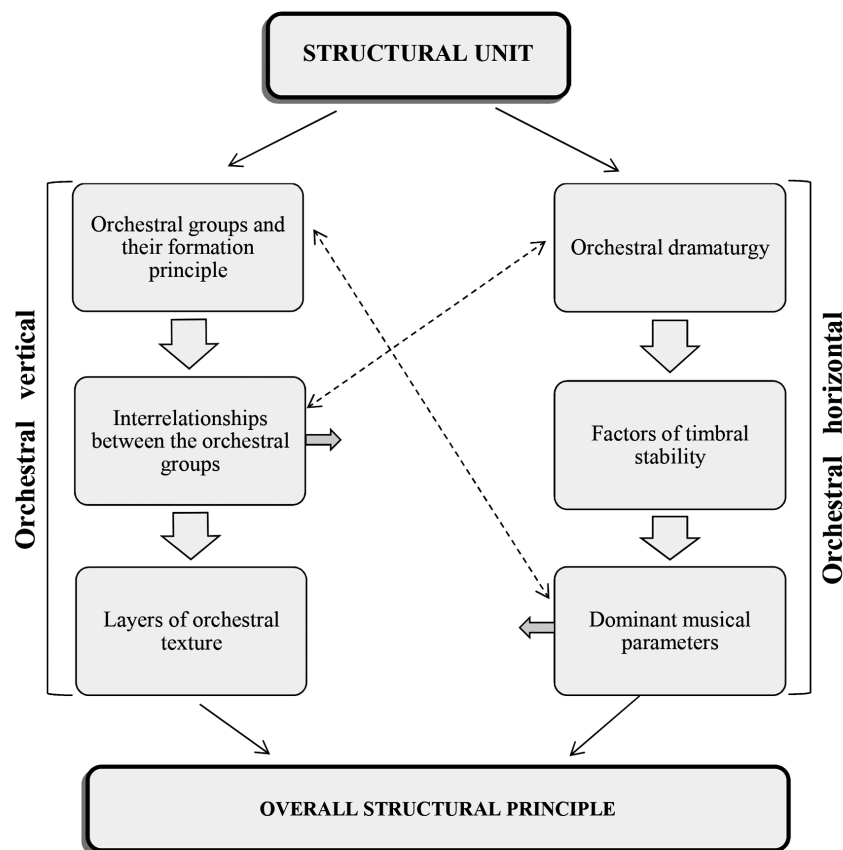


Diagram 1. A comprehensive view of orchestral structural elements

³ The system of structural elements was developed by the author of this article as a tool for analyzing orchestral music, distinguishing different types of orchestral concepts, and as a composing tool. As a result, despite the variety of orchestral music and concepts, a universal system of orchestral structural elements might be possible. More on this topic in Baranauskas (2019, 22–34).

Several **key elements of orchestral structure** in *Alrediph* were formulated. They became the basis for the entire composition.

As a guiding principle for interaction, a distinction is made between *micro* and *macro* levels of structure. The *macro* level encompasses the structure, form, dramaturgy, and all the elements of the work as a whole. It embodies the audible and aurally perceptible musical elements of the work. The *micro* level elements are manifested in the small compositional formations of the work: the internal structure of the fragments of musical form, micro-textures, etc. This level is harder to perceive by ear and lies in the fine-level structure of various musical formations. Thus, two different types of orchestral characteristics can exist simultaneously. Where one is at the *macro* level, the other is at the *micro* level. This principle is implemented in the following key aspects:

1. *Micro* and *macro* orchestras. The entire instrumentation of the work is divided into two relative orchestras. Firstly, there is the standard symphony orchestra with its internal structure of elements (referred to as the *macro* orchestra); secondly, there is the solo instrument, the tam-tam, which reveals itself in a large number of different timbres (Table 3) and embodies a kind of an orchestra within itself (the *micro* orchestra), with many of the elements that are characteristic of an orchestral structure.
2. *Micro* and *macro* structural unit.⁴ The structural unit is formed at two levels. The characteristics of the gamelan form the *macro* level, while the characteristics of the symphony orchestra form the *micro* level of the structural unit.
3. *Micro* and *macro* structural elements. The whole set of structural elements is reflected in a dual system. The elements of the gamelan are most prominent at the *micro* level, while the elements of the symphony orchestra are largely at the *macro* level.

The *micro* and *macro* levels function primarily as a way of separating the structural elements of different types of orchestras, and at the same time bringing them together in a single system. When the gamelan elements function at the *macro* level, the symphonic elements are at the *micro* level, and vice versa, when the *micro* level is formed by the gamelan elements and the *macro* level by the symphonic elements (Table 1).

Table 1. Distribution of *micro* and *macro* levels

	Orchestra	Structural unit	Structural elements
<i>Macro</i> level	Symphony orchestra	Gamelan	Symphony orchestra
<i>Micro</i> level	Tam-tam (gamelan)	Symphony orchestra	Gamelan

These structural provisions become the basis for the creation of the whole hybrid, dual structure of the orchestra and create the conditions for a new quality of interaction and the emergence of a new sound.

⁴ The concept of structural unit as a basic element of orchestral structure has been introduced by the author of this paper. It makes a foundation of the system of orchestral structural elements. The following criteria are key to the identification and isolation of the orchestral structural unit: a) indivisibility (this uniform formation or element functions as an indivisible whole; it is either impossible to split it into smaller elements or it goes against the logic of the work); b) stability (during the work, the formation or element maintains all of its core characteristics across both, the orchestral vertical and orchestral horizontal); c) domination (the formation or element clearly dominates the orchestral score); d) tendency to disseminate across the orchestral vertical and horizontal (the formation or element becomes the basis when shaping the orchestral vertical and horizontal). The structural unit manifests itself in the form of *micro* or *macro*, both of which often have a different number of musical parameters. This allows for an identification of *mono-parametric* or *poly-parametric* structural units as well as their specific sound quality and types. Different structural units give rise to different orchestral types. As an example we can outline several different structural units: a) in a symphony orchestra: *individual instrument, instrumental block, sound mass, individual timbre, sound spectrum* (Baranauskas 2016); b) in a gamelan orchestra: the melodic core (*balungan*). The dissemination of structural unit in the orchestral horizontal and vertical determine all other structural elements. The structural unit of a symphony orchestra functions fundamentally differently from that of a gamelan orchestra. In the case of gamelan, the structural unit is an overall *macro* model that can be broken down and divided. While in a symphony orchestra, the structural unit is an essential *micro* construction detail, from which the entire orchestra is put together. More about this topic in Baranauskas (2019, 22–34).

2. Composing the Structural Unit

In general, a structural unit can have either *micro* or *macro* characteristics. If the structural units of symphony orchestra types usually are characterized as *micro*,⁵ the structural unit of the gamelan, by contrast, takes on a *macro* form.⁶ In *Alrediph* the two forms are merged into one. In this way, a dual hybrid *micro-macro* structural unit is created.

The **macro structural unit** of the work is based on the principle of gamelan *balungan*.⁷ However, there are also fundamental differences. Whereas in gamelan the structural unit consists of a melodic core whose main characteristic is a sequence of pitches, in this case, the melodic core is replaced by a timbral core, i.e., a sequence of timbres. This transforms the *balungan* principle by replacing the pitch parameter with the parameter of timbre. This structural unit encompasses the whole of the work and contains a certain sequence of timbres, which form the structures of the whole composition and reflect the subdivisions of the musical form. Figure 1 shows the model of this structural unit as a whole. It is made up of ten elements—a sequence of ten *macro* timbres. We can see that some of the elements are repeated, so there are seven different *macro* timbres involved in total. The repeating elements create the conditions to maintain timbral stability, like the repeating pitches in a melody. In this case, three distinct degrees of timbral stability can be identified, based on the frequency of repetition and the evenness of distribution across the entire work:

- a) the highest degree of stability is observed in timbres 2a, 2b, and 2c, which are repeated three times and are widely spaced in the timbre sequence;
- b) the medium degree of stability is evident in timbres 1a and 1b, which are repeated twice and have a narrow arrangement in the sequence, encompassing approximately the first third of the sequence;
- c) lowest degree of stability: timbres 3, 4, 5, 6, and 7 appear once.

In the process of dispersion of this structural unit in the vertical and horizontal⁸ of the orchestra, the stable timbres form the basis for maintaining the stability of the structure, while the timbres of the lowest stability underpin the process of timbral renewal. Thus, the inclusion of different degrees of stability in the formation of a *macro* structural unit is of great importance and provides the conditions for achieving a balanced structure of the whole.

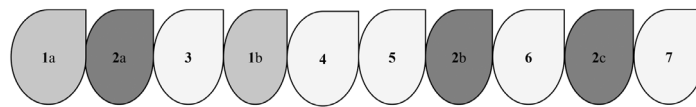


Figure 1. The sequence of timbres of a *macro* structural unit

⁵ *Micro structural unit* – a relatively small formation, the multiplication of which forms the orchestral structure as well as a concrete work; i.e., this structural unit is much smaller than the entire work and is disseminated using the principle of multiplication or repetition. The logic of *micro* structural unit allows small details to form the entire composition. It is characteristic of many different types of symphony orchestra compositions (Baranauskas 2019).

⁶ *Macro structural unit* – a uniform formation that encompasses the entire scope of the work or its major part which is disseminated by the method of division; i.e., this structural unit holds the entire scope (or a major part) of the work and is divided into smaller sections. In the case of gamelan orchestra—*balungan*, the structural-melodic core—could be seen as a structural unit. In comparison to the structure of a symphony orchestra, in the case of gamelan, we see a comprehensive structural unit which, in the process of composition, is divided both in the vertical (layered with the help of instrumental groups and textures) and in the horizontal (acquires a musical form). Such a structural unit has the characteristics of a *macro* unit and is seen through one main musical parameter—a melodic line. The dissemination of this structural unit happens largely in the vertical direction, rather than the horizontal. The structural unit of *balungan* is characterized as macro mono-parametric with a tendency towards vertical dissemination (Baranauskas 2019).

⁷ The concept of *balungan* is one of the most significant and fundamental in gamelan music. It describes the melodic core, which is the skeleton, the starting point of every gamelan piece. It serves as the central melodic thread that defines the parts of all instruments. As such, it is all that is to be preserved, thus notated collections of gamelan works record only the *balungan* and a few other indications of form and accentuation (Sorrell 1990, 62). The *balungan* in gamelan music is divided into groups (*gatra*), each consisting of four strokes, with the most significant supporting one being the final fourth stroke. The musical concept of *balungan* is characteristic not only of Javanese gamelan, but also of the structure of gamelan music on other Indonesian islands, and is thus a universal element of gamelan music. In Bali gamelan it is called *pokok* (Tenzer 2000). In modern gamelan notation, only the *balungan* and its colotomic support are usually recorded, which is fully sufficient to unfold the entire composition (Sorrell 1990, 107). This once again justifies the functioning of the *balungan* as a fundamental model and as a starting point for the whole composition.

⁸ The notion of *orchestral vertical* refers to the elements that sound more or less simultaneously and that can be discerned despite the parameter of time; they also easily reveal themselves in the vertical cross-section of an orchestral score. Meanwhile, the elements of *orchestral horizontal* are disseminated in time, across the structure of the work, and the time parameter is crucial for their identification and understanding; they reveal themselves in the horizontal cross-section of the score.

Each of the ten timbral segments that make up the *macro* structural unit has its individual internal structure and characteristics. This internal structure takes on slightly different characteristics for each timbre. Thus, individual macro timbres are formed from individual *micro structural units* and are characterized by the characteristics of the *micro* structural unit. In this way, we move from the *macro* to the *micro* level. The *micro* structural unit in this work is formed as a homogeneous unit of timbre, texture, and harmony (Figure 2).

The image shows a musical score for a micro structural unit. It consists of eight staves. The top staff is for T.-T. (Timpani) with a single note followed by a tremolo. The next two staves are for Vln. I (Violin I), and the next two for Vln. II (Violin II). Below these are two staves for Vla. (Viola), and two for Vc. (Violoncello). Each string instrument staff begins with a 'sul D' marking. The string parts feature a rhythmic pattern of eighth notes, with specific fingering numbers (6, 7, 3) indicated above certain notes. The score is written in a key signature of one sharp (F#) and a common time signature (C).

Figure 2. Example of a *micro* structural unit based on timbre, texture, and harmony (*Alrediph*, m. 25)

Each *macro* timbre is made up of this or similar types of *micro* formations. The main characteristics of such *micro* formations are:

- a) a group of timbre-blending instruments (characteristic timbre);
- b) a single characteristic harmonic structure (interval or chord);
- c) texture and orchestral register as additional factors for fusion.

One illustrative example of such a formation (or *micro* structural unit) is presented in Figure 2. This formation gives rise to the macro timbres 1a and 1b.

The different *macro* timbres formed by the *micro* structural units mentioned above are listed in Table 2.

Table 2. Characteristics of *macro* timbres

<i>Macro</i> timbre	Timbral characteristics	Harmonic characteristics
1a, 1b	Strings <i>col legno</i> Wooden non-pitched percussion instruments Tam-tam with hard beater	No distinctive pitches Noise sounds Occasional unison
2a, 2b, 2c	Strings <i>arco, legato</i> Pitched percussion Horn – long notes Tam-tam with medium-hard beater, <i>superball</i>	Dominant chord structure: triton + perf. fourth
3	Strings <i>legato, sul tasto, sul ponticello</i> Tam-tam <i>arco</i>	Dominant chord structure: maj. second + min. second
4	Strings <i>tremolo</i> Brass <i>frull.</i> Pitched percussion Tam-tam with ordinary beater	Dominant chord structure: perf. fifth and maj. third projection
5	Strings <i>col legno tratto</i> , harmonics Metal percussion (high) Tam-tam with a metal beater	No distinctive pitches Noise sounds Occasional unison
6	Strings <i>air sound</i> Winds <i>air</i> Tam-tam <i>arco</i> , brushes	No distinctive pitches Noise sounds
7	Woodwinds <i>ord.</i> – long notes Pitched percussion Tam-tam with a metal beater	Unison, expanding up to a minor second

It is also important to pay attention to the direction of the dispersion of the discussed structural units in the orchestra's horizontal and vertical. Here, the aforementioned interweaving of levels is implemented, where the *micro* structural unit spreads further into the *macro* structural elements, while the *macro* structural unit spreads further into the *micro* elements. To summarise, the *macro* structural unit could be described as *monoparametric* (timbre dominates) with a tendency to *vertical dispersion*, while the *micro* structural unit has *polyparametric characteristics* (timbre, harmony, texture) with a tendency to both *vertical and horizontal dispersion*.

3. Composing an Orchestral Vertical

Since a dual structural unit is used, the orchestral vertical is also emitted at two qualitatively different levels: the large-scale (*macro*) and small-scale (*micro*).

Orchestral instrumental groups are formed primarily based on timbral logic, creating unified timbral-harmonic formations. This is characteristic of orchestral groups at both levels because the parameter that characterizes both of them—timbre—coincides. The harmonic parameter plays an additional unifying role in the formation of the minor-level groups, while the common textural pattern plays a secondary role. The result is a mono-timbral orchestral group that is unified by a common harmonic characteristic and texture.

In the largest scale, the orchestral instruments, and thus timbres, are grouped into two *macro* groups:

- a) the symphony orchestra as a whole;
- b) the tam-tam group.

Each of these is further broken down into sub-groups. The instruments of the symphony orchestra form seven timbral groups according to the structure of *macro* structural unit already discussed (Table 2). As timbral segments of a structural unit, they also form orchestral instrumental groups connected by a common timbre. Meanwhile, the tam-tam group is also subdivided into several timbral subgroups at a finer level, based on different playing techniques and the resulting timbres. They represent, in a way, the individual orchestral groups within a single instrument. A summary of the tam-tam techniques used in the work, and the different timbral groups they form, is shown in Table 3.

Table 3. Tam-tam timbral groups

Timbral groups	Tam-tam playing techniques
High register percussive attacks	A strike with a metal beater on the edge or center of an instrument.
Low register percussive attacks	A strike with a soft beater on the central part of the instrument.
High register continuous sounds (controlled continuation)	Rubbing the surface of an instrument with a metal beater or brushes; playing with a bow (<i>arco</i>).
Low register continuous sounds (controlled continuation)	Rubbing the surface of an instrument with a <i>superball</i> .
Generalized sound of all timbral groups (<i>tutti</i>)	A strike with an ordinary beater to the standard part of the instrument.

In the **interaction between** the two *macro* groups (tam-tam/symphony orchestra), the principle of expansion and development of timbre dominates. In other words, one group seems to extend and timbrally complement the other without creating a contrast. The type of texture and timbre is usually similar. This tendency is dictated by the episodes of *macro* timbres, elements of the *macro* structural unit, which require one dominant musical characteristic throughout the episode. Such a case can be seen in Figure 3, where the timbres of the orchestral instruments and the tam-tam are unified as much as possible using special playing techniques.

Figure 3. Timbral fusion of *macro* orchestral groups (*Alrediph*, mm. 101–107)

The second model of group interaction is used less frequently but adds significantly to the variety of ways in which *macro* groups interact, and thus to the dynamism of the work. Whereas the first model was dominated by the merging of groups, this model is characterized by separation. The timbres of orchestral groups become separated and, more importantly, the parameters of the musical language begin to diverge. This effect is achieved by introducing a parameter of harmony that the tam-tam cannot perform due to the non-tonal nature of the instrument. Thus, the harmonic parameter begins to dominate only within the *macro* group

(the symphony orchestra). One example of such a separation can be seen in Figure 4. Not only does the harmonic parameter (which is impossible for the tam-tam) appear in the orchestra, but also the timbre and, to some extent, the texture is different.

Figure 4. Timbral separation of *macro* orchestral groups (*Alrediph*, mm. 108–110)

This alternation between the merging and separation of the two *macro* orchestral groups becomes a significant driver of the compositional idea of the work.

At the *micro* level, usually, one massive poly-parametric group (timbre + harmony + texture) is created at a time. We can speak of a certain amount of change only when the groups are spread out in the time parameter—the horizontal. As the individual episodes change, the instruments also regroup according to the timbral needs, thus forming ever new groups (as we have seen in Tables 2 and 3).

The **layers of orchestral texture** at the *macro* level correspond directly to the *macro* orchestral groups just discussed. Meanwhile, at the *micro* level, orchestral groups can be subdivided into smaller layers of texture.

In particular, the following general features of the overall texture should be noted:

- Typically, a single continuous layer of texture is formed.
- Such a textural layer usually spreads out in the vertical of the orchestra—expanding and contracting its range.
- Several monolithic layers may overlap in transitional episodes, briefly creating the illusion of two layers.

It is further important to note that these homogeneous textural formations are composed of individual microlayers. To coordinate these microlayers, the logic of gamelan orchestral grouping is applied. For this purpose, the following gamelan technical elements are used:

- a) *kotekan* method of pairwise grouping of complementary instrumental parts in which the material of a musical line is divided between two instruments;
- b) functional grouping of instruments; instruments are grouped according to their function in the musical material; the assigned function remains unchanged throughout the episode.

Figure 5. Integrating Gamelan techniques into an orchestral texture (*Alrediph*, mm. 135–140)

An adapted use of these gamelan techniques can be seen in Figure 5. Here, four textural layers exist simultaneously, each with its own distinct and unchanging function. The second layer is built on the principle of complementary rhythmic grouping (2a + 2b). This principle is also partly visible in the relationship between the first and third layers.

4. Composing an Orchestral Horizontal

The *macro* structural unit forms large subdivisions of musical form in the work’s horizontal plane. Each *macro* timbre becomes a subdivision of the form and a separate element of the *macro* dramaturgy. Meanwhile, the development of the *micro* structural unit forms a smaller-scale orchestral dramaturgy within each of the *macro* timbral divisions.

The main factors of **orchestral dramaturgy** are:

- The changing relationship between the two *macro* orchestras (tam-tam/symphony orchestra).
- Changes in the relationship between the orchestral groups.
- Sequence of macro-timbres (dispersion of a *macro* structural unit).
- Change in micro-structures (dispersion of a *micro* structural unit).
- Insertion of *colotomic*⁹ beats that divide musical time; the change of time proportions between individual beats.

⁹ The term *colotomic* structure, introduced by Jaap Kunst, describes one of the most important features of the horizontal of a gamelan orchestra. According to this concept, time is divided according to the specific order and position of the entry of certain instruments, which serves as a guide for the parts of the other instruments, leading to the cyclical nature of the musical form (Kunst 1973). In the gamelan orchestra, these beats are rhythmically regular and divide the form into equal subdivisions, whereas in *Alrediph* the beats appear irregular.

The elements of the colotomic structure are integrated into the work and create a separate dramaturgical layer. The work is divided into cyclically recurring segments of form, separated by an easily identifiable timbral structure—the tam-tam striking the central part of the instrument and the symphony orchestra extending the timbre of the tam-tam (Figure 6). These colotomic beats are in turn developed in time into short but distinctly characteristic orchestral episodes, which on the one hand have elements of their own internal micro-dramaturgy, while on the other hand, their periodic repetition forms a distinct layer of colotomic dramaturgy, in which these beats recur in a slightly altered form each time, with varying durations and spacing in different proportions.

The image shows a page of a musical score for the work *Alrediph*, measures 16-19. The score is for a full symphony orchestra, including woodwinds, brass, strings, and percussion. A specific rhythmic motif in the Tuba I part is circled in red, and a line from this circle points to its expansion in the Tuba II part. The score includes various musical notations such as dynamics (f, mf, p), articulation (acc), and performance instructions like 'con sord. (straight)'. Time signatures of 5/4 and 4/4 are visible at the top of the page.

Figure 6. Colotomic beat and its expansion (*Alrediph*, mm. 16–19)

Figure 7 shows the overall picture of the macro-dramaturgy of the work. Two main layers can be distinguished:

1. The *macro* timbre layer is an outgrowth of the *macro* structural unit discussed above. It forms ten subdivisions of form and seven different *macro* timbres. The repeating timbres are connected by arrows. They form a chain of timbral stability around which new timbral subdivisions are introduced. The duration of each segment is indicated by numbers (1 = quarter note value). As can be seen, only the second timbre maintains maximum stability. Not only is it repeated three times and covers a large part of the work as a whole, but it also does not change its duration (52 quarter notes).
2. The *colotomic* layer inserts one stroke in each of the ten subdivisions of form. The beats are inserted irregularly (indicated by the time interval between the beats, 1 = quarter note), thus forming unpredictable time-division proportions.

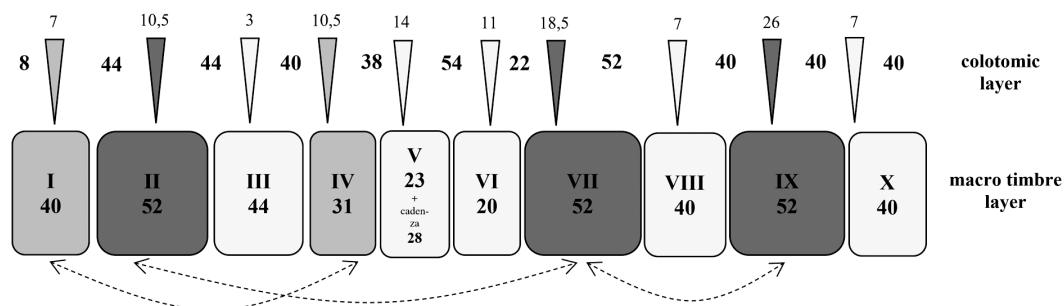


Figure 7. The macro-dramaturgy of the work as a whole

This combination of different dramaturgical elements ensures the balance of the composition in terms of orchestral horizontality. Important attention is paid to the proportions of the episodes and the timing of the beats, as well as the balancing of the factors of stability and variability. At the same time, both layers of the dramaturgy embody the newly reformulated concepts of the gamelan orchestra.

The factors that ensure **timbral stability** are partially visible in Figure 7. They can be summarized in order of importance as follows (from most important to least important):

- a) the unifying timbre of a tam-tam (*micro* orchestra);
- b) periodic colotomic beats;
- c) recurring *macro* timbres (two levels of stability, the most stable being 2abc, the less stable 1ab) (see Figure 1).

The **dominant musical parameters** largely correspond to the parameters characterizing the structural unit. At the *macro* level, the parameter of timbre is the most pronounced, while at the *micro* level, the timbre, harmony, and texture are dominant. It is important to note, however, that the parameter of melody, which was not present in the characterization of the structural unit, is audible in certain episodes of the work. It becomes an important link between the two levels, as it appears in both of them. For example, the characteristic melodic phrases become an important part of the recognizability of *macro* timbres 2abc.

5. The Overall Compositional Structure of the Orchestra

Summing up the compositional whole of the work, we see a full-fledged hybrid structure in which the principles of the gamelan orchestra and the symphony orchestra play an equal role. Their harmonious coexistence is ensured by creating a two-level structure—*micro* and *macro*. A complete systematic view of the orchestral structure can be seen in Diagram 2. The system is based on the relationship between the two structural units and their dispersion on two different levels. In this way, the descriptions of all the structural elements become twofold. The upper part indicates the macro-level characteristic and the lower part the micro-level characteristic.

In this framework, all structural elements participate equally. None is singled out as less important. In the intergroup interaction of the elements, attention should be paid to the relationship between the *formation of the orchestral groups* and the *dominant musical parameters*, as well as to the mutual influence between the *orchestral dramaturgy* and the *interaction between the groups*. These relationships are observed at both *micro* and *macro* levels.

The overall structural principle can be formulated as follows: *orchestra as a two-level dispersion of a timbral core*.

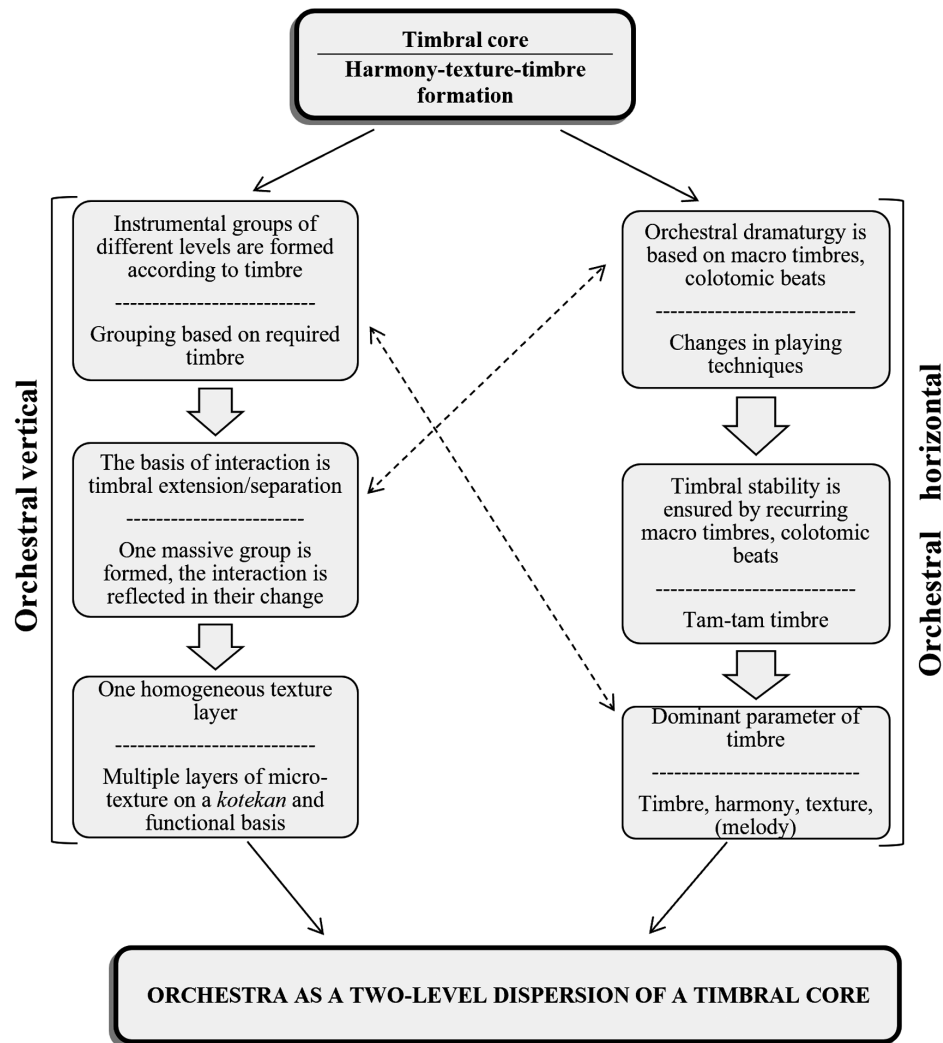


Diagram 2. A complete systematic view of *Alrediph* structural elements

6. Concluding Remarks

In conclusion, it should be noted that the system of composing orchestral music based on roughly equal interaction of different cultures is possible and can produce interesting results, as the analysis of *Alrediph* demonstrated. When combining the principles of orchestras with strong cultural differences, it is particularly important to find the appropriate points of contact and a way for them to coexist. This was achieved by separating the micro and macro structural levels so that two orchestral characteristics of different types could exist simultaneously. The following points made this principle possible:

- *Micro* and *macro* orchestras. The entire instrumentation of the work was divided into two relative orchestras: the standard symphony orchestra (referred to as the *macro* orchestra); and the solo instrument tam-tam, which revealed itself in a large number of different timbres and embodied a kind of an orchestra within itself (the *micro* orchestra).
- *Micro* and *macro* structural unit. The structural unit was formed at two levels. The characteristics of the gamelan formed the *macro* level, while the characteristics of the symphony orchestra formed the *micro* level of the structural unit.
- *Micro* and *macro* structural elements. The whole set of structural elements was reflected in a dual system. The elements of the gamelan were most prominent at the *micro* level, while the elements of the symphony orchestra were largely at the *macro* level.

The main gamelan elements on which the structure of *Alrediph* was based are the *balungan* core (melodic in the case of gamelan and timbral in the case of *Alrediph*) and the colotomic structure.

It is also important to note that the interaction was successfully achieved mainly by using the system of orchestral structural elements. This system is not only capable of revealing the orchestral principles of already written works but also acts as a compositional tool that can be used to create orchestras based on new principles or the interaction of various existing principles, thus achieving a renewal of orchestral sound.

After studying the case of *Alrediph* it is obvious that the interaction between a gamelan and symphony orchestra is possible on multiple levels, both audible and structural, and that it can lead to new creative solutions and sonic results.

In the long term, there are many possible ways to develop the ideas presented in this paper, which I may also try out in my own compositions. This idea of interaction/synthesis based on a specific system can be applied to combine different principles of symphonic music, as well as using not only gamelan but also the wonderfully interesting orchestras from other cultures (gagaku, archaic, etc.), opening up endless possibilities for combinations and interactions. Moreover, the process of interaction/synthesis itself, as we have seen in this article, is possible at different levels (from the surface acoustic sound replication to the deepest level of integration of compositional principles) and in different proportions (greater or lesser dominance of one principle, with partial integration of the other versus an evenly balanced integration, and also everything in between). Further orchestral explorations, creativity, and fantasy horizons lie ahead.

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Simfoninio orkestro ir gamelano principų sąveika Marius Baranausko kūrinyje *Alrediph*

Santrauka

Kūrinys *Alrediph* (tamtamui ir simfoniniam orkestrui, 2020) sukurtas siekiant sistemškai sujungti simfoninio orkestro ir gamelano bruožus ir įgyvendinti šių skirtingose kultūrose susiformavusių orkestrų sąveiką struktūros lygmenyje. Mariaus Baranausko suformuluota orkestro struktūrinių elementų sistema tapo pagrindu kūrinio *Alrediph* koncepcijai. Joje apibrėžiami pagrindiniai orkestro struktūriniai komponentai ir siūlomi sisteminiai ryšiai tarp atskirų elementų.

Orkestrui apibrėžti reikalingi šie elementai:

- a) struktūrinis vienetas;
- b) orkestrinės vertikalės elementai: orkestrinių grupių formavimo principas, orkestrinių grupių tarpusavio ryšiai, orkestrinės faktūros sluoksniai;
- c) orkestro horizontalės elementai: orkestro dramaturgija, tembro stabilumo veiksniai, dominuojantys muzikiniai parametrai.

Suformuluotos kelios esminės orkestro struktūros nuostatos, tapusios pagrindu visai kūrinio kompozicijai. Kaip sąveikos pagrindinis principas yra atskiriami mikro- ir makrostruktūros lygmenys. Makrolygmuo aprėpia kūrinio struktūrą, formą, dramaturgiją ir kitus elementus, atsiskleidžiančius kūrinio visumoje. Jis įkūnija girdimą ir klausą suvokiamą įprastą kūrinio elementų pavidalą. Mikrolygmens elementai išryškėja smulkiuose kūrinio kompoziciniuose dariniuose: formos fragmentų vidinėje sandaroje, mikrofaktūroje ir kt. Šis lygmuo sunkiau apčiuopiamas klausai ir slypi įvairių struktūrų smulkiyo lygmens sandaroje. Taip vienu metu gali egzistuoti dviejų skirtingų tipų orkestro charakteristikos – kai vienos yra makrolygmenyje, kitos skleidžiasi mikrolygmenyje.

Kūrinio makrostruktūrinis vienetas sudarytas gamelano *balungan* principu. Tačiau yra ir esminių skirtumų. Jeigu gamelano atveju struktūrinį vieneta sudaro melodinis branduolys, kurio pagrindinė charakteristika – garso aukščių seka, tai šiuo atveju melodinis branduolys pakeičiamas tembrinių branduolių (tembrų) seka. Taip *balungan* principas transformuojamas garso aukščio parametą pakeičiant tembro parametru. Šis struktūrinis vienetas apima kūrinio visumą, jame iš karto slypi tam tikra tembrų seka (makrotembrai), kuri sudaro kūrinio visumos struktūras ir atspindi kūrinio formos padalas. O pavieniai makrotembrai yra formuojami iš atskirų mikrostruktūrinių vienetų ir apibūdinami mikrostruktūrinio vieneto charakteristikomis. Mikrostruktūrinis vienetas šiame kūrinyje suformuotas kaip vienalytis tembro, faktūros ir harmonijos darinys.

Kadangi yra naudojamas dvilypis struktūrinis vienetas, orkestrinė vertikalė ir horizontalė išsiskleidžia taip pat dviem kokybiškai besiskiriančiais lygmenimis – stambiojo (makroplano) ir smulkiojo plano (mikroplano).

Pagrindiniai orkestrinės dramaturgijos veiksniai-varikliai yra šie:

- santykio tarp dviejų makroorkestrų (tamtamais ir simfoninis orkestras) kaita;
- santykio tarp susiformuojančių orkestrinių grupių kaita;
- makrotembrų seka (makrostruktūrinio vieneto sklaida);
- mikrodarinių kaita (mikrostruktūrinio vieneto sklaida);
- laiką dalijančių kolotominių smūgių įterpimas, skirtingos laiko proporcijos tarp atskirų smūgių.

Visuminis struktūrinis principas – orkestras funkcionuoja kaip dviejų lygmenų tembrinio branduolio sklaida.

Apibendrinant verta pabrėžti, kad orkestrinės muzikos komponavimo sistema, pagrįsta skirtingų kultūrų sąveika, yra įmanoma ir gali duoti įdomių rezultatų. Jungiant kultūriškai gerokai nutolusių orkestrų principus, ypač svarbu rasti tinkamus sąlyčio taškus ir būdą jiems koegzistuoti. Tą pavyko pasiekti atskiriant *mikro-* ir *makrostruktūrinius* lygmenis, taip pat kitomis straipsnyje pristatytomis priemonėmis, o svarbiausia – pasitelkiant autoriaus sukurtą orkestro struktūrinių elementų sistemą. Ši sistema ne tik yra pajėgi atskleisti jau parašytų kūrinių orkestro formavimo principus, bet ir veikia kaip komponavimo priemonė, kurią pasitelkus galima kurti naujais principais arba skirtingų jau egzistuojančių principų sąveika pagrįstus orkestrus, taip pasiekiant atnaujintą orkestrinį skambesį.