Notating Sundanese Kendang: Historical Approaches and a New Font

by Ed Garcia and Een Herdiani

Abstract
This article surveys the history and current practices of Sundanese kendang notation, and introduces KendangFont Sunda—a continuation of its notational predecessors. First, we will examine the history of different approaches to kendang notation developed in West Java, considering the inspiration and intended purpose of each system. We analyze notation trends and symbol functions of the past five decades to explore salient characteristics for developing further applied research tools. We then introduce KendangFont Sunda, a new font based on our findings, and discuss computer input methods, legibility, and ease of use. With this new tool for notating Sundanese kendang—and this overview of musical concepts, people, and notation ideas—we hope to increase awareness, develop interest, and further wider comprehension of Sundanese kendang performance.

Artikel ini meninjau sejarah dan praktik notasi kendang Sunda saat ini, dan memperkenalkan KendangFont Sunda – lanjutan dari notasi sebelumnya. Pertama, kami mengkaji sejarah dari berbagai pendekatan notasi kendang yang berkembang di Jawa Barat, dengan mempertimbangkan inspirasi dan tujuan dari masing-masing sistem. Kami menganalisis tren notasi dan fungsi simbol dari lima dekade terakhir untuk mengeksplorasi karakteristik yang menonjol untuk mengembangkan alat penelitian terapan yang lebih lanjut. Kemudian kami perkenalkan KendangFont Sunda, font baru yang kami temukan, dan mendiskusikan metode cara memasukan pada komputer, keterbacaan, dan kemudahan penggunaan. Dengan alat baru untuk notasi kendang Sunda ini, dan juga gambaran umum tentang konsep musik, orang, dan ide notasi – kami mengharapkan dapat meningkatkan kesadaran, mengembangkan minat, dan pemahaman yang lebih luas tentang pertunjukan kendang Sunda. —translation by Ed Garcia

Introduction

Sundanese kendang are a set of double-headed barrel drums originating in West Java, and often associated with Sundanese traditional music and culture. Like many traditional instruments throughout Indonesia, Sundanese kendang playing is not typically taught or performed using written notation. Instead, students learn and perform from memory, often aided by vocal mnemonics that mimic kendang drumming sounds. These mnemonic syllables are also practiced in traditional Sundanese dance pedagogy, where there is a close relationship between dance movements and their accompanying kendang drumming patterns.

Notation, however, is used in West Java as a tool for institutional pedagogy, scholarly analysis, and preservation projects. Sundanese scholars and musicians over time have developed several approaches to notating Sundanese kendang music. Each approach was shaped by the technology available at the time to represent the elements of the notation, influencing its musical scope and functionality.

Kendang Mnemonics

The vocalization of kendang sounds and drumming phrases is prevalent in West Java. Mnemonic syllables are widely used amongst kendang players and non-kendang players (e.g., dancers or other gamelan musicians), especially because the syllables can be spoken as in conversation and do not require the technical prowess of producing sounds on the actual instrument. This vocal system constitutes a powerful tool and makes group rehearsals more time-efficient, inclusive, and collaborative. It allows any member of the ensemble to communicate effectively and with expedience about the music and the complex relationships between kendang, dance movements, and other instruments.

Traditional dance performers and teachers often vocalize kendang sounds due to the close relationship between kendang and dance. As almost every dance movement, stance, or gesture is accompanied by particular kendang drumming patterns, the kendang-dance relationship can be described as *membungkus* (Indonesian for "wrapped or entwined"). Though they may not be drummers themselves, Sundanese dancers must be well-versed in kendang vocables in order to interact with drumming phrases.

Verbalized drum sounds are integral in traditional dance pedagogy. For example, if the dance student is learning *cindek* (a feet-flat stance with toes pointed outward, knees bent, and various other upper body movements),

the teacher coaches the student by rhythmically speaking the kendang sounds "pak tung dong" (PTD). The student is taught to automatically react to these syllables with the appropriate coinciding cindek dance movements. Additionally, Sundanese dance sometimes utilizes drastic tempo changes, and these temporal shifts are directed musically by the kendang player. Therefore, dance teachers often coach students about these elements by singing the corresponding kendang phrases at the appropriate speeds.

The greatest kendang players are able to fully memorize the dance choreography, and follow any improvisations or variations from the dancer. During rehearsals, dancers and kendang players often use kendang vocalizations to resolve any discrepancies in their coordination of movements and sound. For example, if the kendang part does not align correctly with the dance movements, the dancer could facilitate corrections using mnemonic syllables. The dancer could recite while simultaneously dancing, or explain the issue via dialogue only, e.g., "when I dance this movement, I should hear ___" (a particular kendang sound).

One written version of kendang mnemonics, as taught by master musician Undang Sumarna[1], is shown in Figure 1. These vocal recitations are a principal aspect of Sumarna's pedagogy, and often taught in tandem with playing kendang. Similar methods were used by other teachers encountered during our research in West Java, albeit with slight variations.[2] Figure 1 includes syllables that represent sounds produced by a single drum strike, such as "pak," "tung," "pong," and "dong." Vocalizations like "terpak," "dlong," "bang," "kling," "pang," and "blang"

1. Undang Sumarna comes from a lineage of Sundanese dance drummers. He began teaching Sundanese gamelan at UC Santa Cruz in 1975.

2. For further analysis on the connection between vowel/consonant pairing and kendang mnemonic syllables, and for speculations on the origins of this vocal practice, see Spiller 2016: 18–23, 26–28.

```
[glong ▪pak glong glong▪pak glong:]
▪bang bang bang pak dong

pak pak pak pak pak tung ting tung ting
pak ting pong ting pak bang tung ting
dong blang pak ting pong
tung tung dong
▪pak bang pak bang pak dong tung tung dong
tung tung tung tung tung tung

▪pak tung ting b-lang
ttt ting ting ting pak kling tung pak
▪tung pak tung pak dong tung tung blang
ttt ting ▪tung pak tung b-lang
ttt ting pak dong tung pak
pang tung pang tung▪
bang pak tung▪tung pak
bang pak tung▪tung pak ▪ ▪
pang tung pang tung▪
```

Figure 1. Kendang mnemonics from the "Anjasmara" dance. Transcribed by Ed Garcia from kendang lessons with Undang Sumarna at UCSC in 2005.

Figure 2. Sundanese kendang drum types, drumhead names, common instrument arrangement; measurements given are of this set.

are combinations of single sounds that are produced on the kendang by striking two heads at once or in quick succession, similar to grace notes. The combination of multiple kendang sounds into singular syllables ensures there are no rhythmic hindrances during vocal reproduction. Dots and spacing provide some rhythmic context, and circled syllables denote a cadential gong strike.

Comparing Approaches

Table I provides an overview of kendang mnemonic syllables, descriptions of kendang stroke sounds and the ways to produce them, and the different symbols proposed by various notation systems. The information in Table I is compiled from Sundanese publications (Upandi, 1979; Soepandi and Suaman, 1980-81; Suparli,

Table I. Various Approaches to Sundanese Kendang Notation

Drumhead (Sound Source)	Sound and Technique Description	Kendang Mnemonic Syllable	NOTATION SYMBOLS						
				PASUNANDA			LILI SUPARLI		
			PTD	Pandi Upandi (1979)	Maman Suaman (1980)	Tutun Hatta (1996-97)	Lili Suparli (2010)	Sunarto (2017)	Yosep Nurdjaman / Ed Garcia (2019-20)
Keplak / Kutiplak	a bright, sharp, closed slapping sound produced by striking the head with 4 fingers (or 3, excluding the forefinger), and not allowing the striking fingers to rebound from the drumhead.	Plak	P				P	P	P
	a bright, sharp, open slapping sound produced by striking the head with 4 fingers (or 3, excluding the forefinger), and allowing the striking fingers to rebound from the drumhead.	Pak		a	a		P	P	P
	a resonant, warm tone usually produced by striking the head with 1 finger.	Peung		a	a		P	P	P
	a multiple-bounce stroke that ends with a pak stroke. Strokes prior to the pak can be struck with the finger (like peung) or with a padded stick.	Prak							...P
Congo / Kemprang / Kumpyang	a bright, sharp slapping sound usually produced by striking the head with 4 fingers.	Phak		o (Plak)	a (Pak)		P	P (Pap)	P
	a bright yet resonant sound usually produced by striking the head with 4 fingers.	Pang		o	a		P (Phang)	P	P
	a resonant, warm tone usually produced by striking the head with 1 or more fingers	Ping		ø	a–		P	P	P
	a hollow, overtone sound produced by striking the edge of the head with 3 fingers (excluding the forefinger).	Pong		o	a+		P	P	P
	a sustained, high-pitched sound produced through the friction of rubbing a finger across the head.	Nguk		o					x
Gedug	a resonant bass tone produced by striking the head with 4 fingers.	Dong	D	U	U		D	D	D
	a raised-pitch bass sound produced by placing the foot heel against the head and then striking the head with 4 fingers	Det		U (Deng)	U		D	D	D (basic) D (higher)
	a series of ascending/descending pitches (sometimes arhythmic) produced by multiple strokes on the head with 4 fingers.	Deded		U... (Dededed.....d)			D...	D...	D... (basic) D... (ascending) D... (descending)
	a sustained bass sound produced by striking the head and then pushing the heel of the hand across the head.	Du.....t		U					
	a muffled, upper harmonic sound usually produced by striking the middle of the head with 4 fingers.	Ting		U	U		T	T	T
	description has not yet been found.	Tek			U				
	description has not yet been found.	Teng			U				
Kentrung / Katipung	a resonant, warm tone usually produced by striking the head with 1 or more fingers	Tung	T	u	U		t	t	t (primary) t (secondary)
	a series of tung sounds, sometimes arhythmic	Turuntung						t...	t...

2010; Sunarto, 2017), consultations and interviews (Yosep, 2019; Suparli, 2020), and corroborated in lessons with kendang teachers at UCSC (Undang Sumarna) and in Bandung (Mamat Rahmat, Dana, Sunarto, Wahyu Roche, and others). Most of Sumarna's syllables align with the other examples in Table I, although some have functions unique to Sumarna's pedagogy and performance style, e.g. Sumarna's "ting" sound typically aligns with the sound described as "peung." Because kendang mnemonics are often individualized, those in Table I should not be considered exhaustive nor universally employed. Instead, this data references the most commonly used kendang mnemonics across all sources, each paired with their corresponding sound/technique description and notation symbol. If one of the published sources used a syllable other than the one listed in the Kendang Mnemonic Syllable column, then that sound name is parenthesized next to the appropriate symbol (e.g., Upandi referred to his "Phak" sound as "Plak").

When vocalized, kendang syllables flow together with poetic ease and cadence, and demonstrate clear distinctions between drum sounds. For written purposes, however, the lack of rhythmic clarity is a major weakness. Figure 1, for example, shows a clear chronological order of kendang sounds, but rhythmic information is only vaguely alluded to through spacing and dots marking musical rests of undefined length. Since written shorthand was developed in West Java to accompany precise rhythms that were difficult to notate accurately, kendang mnemonics became fundamental to the functionality of these approaches.

The "PTD" Approach

According to Sundanese kendang master Mamat Rahmat, the Central Javanese-based PTD system (from the drum sounds "Pak-Tung-Dong") was likely the first written kendang notation system to be adapted for Sundanese gamelan. It was already a known shorthand documentation of classical gamelan degung drumming when Rahmat began learning music in the 1960s (M. Rahmat, personal communication, September 20, 2019). Traditionally speaking, classical gamelan degung music did not use any drum sounds outside of "pak," "tung," and "dong," making the PTD system ideal for classical degung drumming notation.

One application of the PTD approach is shown in Figure 3. Sundanese cipher notation is used for pitch reference for the Jengglong instrument line, and the letters "P," "T," and "D" correlate with drum sound symbols in the Kendang instrument line. Dots represent singular musical rests, brackets indicate repetition of a section, and the equal spacing between each character helps delineate rhythm. GOONG signifies the gong stroke at the end of the phrase.

Despite its intuitively named notation syllables, the PTD system was not equipped for referencing kendang sounds that accompany traditional Sundanese dance. In order to convey the numerous drum sounds heard in 20th-century presentational dance styles like *tari keurseus*, *tari klasik*, *tari jaipong*, and others, Sundanese theorists began developing more complex approaches to notation.

THE "PASUNANDA" SYSTEMS

Responding to pedagogical needs, Sundanese scholars produced notation models for Sundanese dance drumming in the 1970s and '80s. These models were largely advanced through essays written by Pandi Upandi, Maman Suaman, Nandang Barmaya, and Atik Soepandi. These four musicians and scholars worked in Bandung at SMKN 10 (*Sekolah Menengah Karawitan Negeri,* Vocational Performing Arts High School #10), and they shared their ideas and concepts for how to craft a legible and logical pedagogical kendang notation system (L. Suparli, personal communication, February 7, 2020). Their mutual ideas and collaboration led some scholars to reference their notation approaches under the collective label of "Pasunanda" (Pa-Su-Nand-A), an initial syllable blend of Pandi, Suaman, Nandang, and Atik (Sunarto 2001: 29).

Pandi Upandi's Approach

In his 1979 pedagogical guidebook, Upandi furthered the interconnectedness between kendang drumheads and written notation symbols. Upandi used four distinct glyphs (a, o, u, U) based on three alphabetic letters (a, o, u). Each glyph represented one of the four widely-used kendang drumheads: "a" for keplak, "o" for congo, "u" for kentrung, and "U" for gedug (L. Suparli, personal communication, February 7, 2020.). Figure 2 provides a pictorial guide to the names and locations of each kendang drumhead.

Each drumhead glyph (a, o, u, U) served as a base for further diacritic treatment. Diacritics represented specific sound performance techniques played on a given drumhead. Refer to Table 1 for a complete listing of kendang symbols in all notation approaches discussed here. Upandi utilized a two-row system to organize his kendang sounds. Base glyphs "u" and "U" were notated

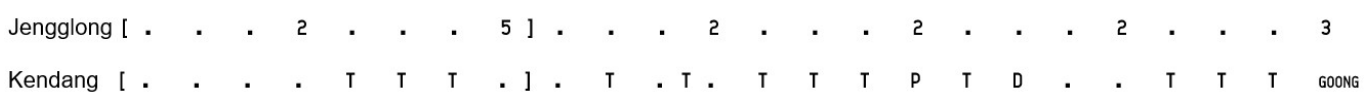


Figure 3. Example of PTD kendang notation from the classic gamelan degung piece "Jipang Lontang." (Structural jengglong tones are displayed in the Sundanese pelog degung scale using Sundanese cipher notation, which represents pitches from low to high as 5 4 3 2 1.) Transcription: Burhan Sukarma.

in the bottom row, and "a" and "o" were notated in the top row. The separation of drum tones into two rows allowed simultaneous notes to be vertically aligned to display precise rhythm. This organization also logically separated the drum sounds according to which hand produced the sound: the "u" and "U" bottom row contained sounds produced with one hand, and the "a" and "o" top row contained sounds produced with the other hand.[3]

Maman Suaman's Approach

Many of the notation ideas expressed in Upandi's publication made their way into Maman Suaman's subsequent revised system, as published in Soepandi and Suaman (1980). The goal of this practical guide was to take inventory of all available Sundanese kendang terminology and notation models and create a sophisticated system for preserving and developing kendang documentation. Soepandi and Suaman were both university teachers at ASTI (*Akademi Seni Tari Indonesia,* Indonesian Dance Academy). They hoped that their research would be helpful for high school and university students in Bandung, as well as interested artists outside of these institutions (Soepandi and Suaman 1980: 5). Their revised method became the main representation of the Pasunanda-era notation concepts, and became the de facto kendang notation system in Sundanese scholarship for the next few decades.

Soepandi and Suaman's research was informed through interviews and consultations with prominent music scholars and kendang players in the Bandung area. Many of them gathered together for a meeting on August 21, 1980, to expand upon terminology, notation concepts, and issues presented in previous publications by Pandi Upandi and Maman Suaman (Soepandi and Suaman 1980: 29, 46). Some of the scholars and artists consulted were: music theorist/author A.S. Pradjakusumah; dancer/choreographer Nugraha Sudiredja; and musicians/kendang players Nandang Barmaya, Otong Rasta, Dase Suherman, Entjar Tjarmedi, Tosin Mochtar, and Mamat Rahmat (Soepandi and Suaman *ibid*: 133). Many of these people were teaching at ASTI and SMKN at the time, and thus were invested in the potential pedagogical advancements stemming from this research.

Although this revised notation model appeared in Soepandi and Suaman's joint publication, it is generally referred to as Suaman's system by Sundanese scholars (Sunarto 2017, 12; L. Suparli, personal communication, February 7, 2020). The most notable improvements upon Upandi's system were Suaman's exterior placement of diacritics. For example, in Upandi's system, many of the diacritics partially obscured the base glyph (such as "**ø**"). Suaman eliminated most of these diacritic types, instead preferring diacritics placed above, below, or next to the base glyph (such as "**a**–"). Note how the adjacently-placed diacritic "—" widens the horizontal space typically reserved for the base glyph "**a**." If applied to a kendang phrase with too many "**a**–" in a row, then it would potentially create vertical alignment issues with gamelan pillar tones or other written kendang sounds.

Even though Suaman utilized more legible base glyphs than Upandi, he decreased the functional importance of base glyphs. Like Upandi, Suaman maintained a two-row staff system. However, where Upandi used one base glyph per drumhead (four base glyphs total), Suaman used one base glyph per hand (only "a" and "U"). Suaman likely made this decision because the kendang is conventionally played so that each hand is responsible for striking two drumheads each. Therefore, diacritics not only delineated which hand technique to use, but also which drumhead to strike. Because hand usage was also differentiated by using the top and bottom staff rows, it made the role of base glyphs redundant. It also put

3. Many of the diacritics used partially obscured the base glyph: a strikethrough typically represented a slapping technique; a forward slash "/" was prescribed for warm middle tones; and a right parenthesis ")" was used for sustained friction sounds. Ellipses "..." placed to the right of the base glyph indicated a series of repeated sounds, and the absence of diacritics demarcated an open tone.

Gamelan Pillar Pitches	NG 2	P N P N 5 1 3 4	P PN P NG 5 1 3 2
KENDANG MNEMONICS:	dung ping ping	dungpingping dungpingping dungpingping dungpingping	dungpingping dungpingping dungpingping dungpingping
PTD:	DPP	DPP DPP DPP DPP	DPP DPP DPP DPP
PANDI UPANDI: Kemprang	·øø	·øø ·øø ·øø ·øø	·øø ·øø ·øø ·øø
Gedug	U	U U U U	U U U U
MAMAN SUAMAN: Kemprang	·a–a–	·a–a–·a–a–·a–a–·a–a–	·a–a–·a–a–·a–a–·a–a–
Gedug	U	U U U U	U U U U

Figure 4. "Topeng Klana" dance excerpt (opening of piece), transcribed by Ed Garcia from kendang lessons with Mamat Rahmat in Bandung, Indonesia, 2019. Gamelan pitches are in Sundanese cipher notation; a dot beneath indicates a higher octave.

an overwhelming emphasis on small diacritics to be the primary indicator of drumhead and technique rather than the larger-sized base glyphs.

These comparisons can readily be seen in Figure 4. An excerpt of a common kendang phrase used to accompany traditional dance, Figure 4 displays renditions of kendang notation approaches discussed thus far. Each system is vertically aligned to specified structural events (NG = gong, P = kempul, N = kenong) and pillar pitches (numerals). Note that the PTD example lacks the symbol depth necessary to express specific sounds or performance techniques found outside classical degung, and the Kendang Mnemonics example lacks rhythmic clarity.

The "Cilok" Approach

Further experiments into Sundanese kendang notation include Tutun Hatta's "Cilok" approach (L. Suparli, personal communication, February 7, 2020). Hatta introduced new notational ideas for kendang as a teacher at ASTI in 1996-97. His scheme was inspired by the Pasunanda diacritics but also resembled certain traits found in European staff notation and was named after a favorite Sundanese delicacy.[4]

Like the PTD system, Hatta's system set notation in a single row. Borrowing from European staff notation, Hatta connected horizontal beams denoting rhythm to blackened circular noteheads representing specific drumheads with a vertical stem. Noteheads attached to the top of the stem represented the keplak and congo drumheads (both played with the same hand), and bottom noteheads represented the kentrung and gedug drumheads (both played with the opposite hand). Diacritics borrowed from the Pasunanda systems showed specific performance technique.

Hatta's system (Fig. 5) incorporated the compactness of PTD's single-row system by allowing the usage of simultaneous sounds into a single notation row. His system also capitalized on the familiarities of the Pasunanda diacritics and the structure of European staff notation. Despite the similarities to established notation systems, Hatta's system never became widely used. Hatta taught this system for only two semesters, and students had a difficult time transitioning from the Pasunanda concepts. It was likely viewed as too radical of a change compared to Pasunanda's vowel-based glyphs, which were more similar to the commonly used kendang sound-syllables. Furthermore, Hatta's system would have been difficult to reproduce using a typewriter/computer, making it challenging for students and scholars wishing to include notation in their typed essays and publications.

Lili Suparli's Approach

In the 2000s, Dr. Lili Suparli, a professor at ISBI Bandung (*Institut Seni Budaya Indonesia*, a national arts institute) compiled a new notation system that refined preexisting notation styles (Suparli 2010, 61). In general, Suparli's system retained Suaman's diacritics, but reverted back to Upandi's philosophy of using four base glyphs (one per drumhead). Furthermore, Suparli used the simplicity of the older PTD system to inform the letters for his base glyphs: "p" (from the sounds "pak" and "peung" produced on the keplak drumhead), "P" (from the sounds "phak," "pang," "pong," and "ping" on the congo drumhead), "t" (from "tung" on the kentrung drumhead), and "D" (from "dong" and "det" on the gedug drumhead). Logically, Suparli used lowercase alphabet letters ("p" and "t") to represent sounds produced on the two small kendang kulanter, and uppercase alphabet letters ("P" and "D") for sounds produced on the large kendang indung (see Fig. 2).

Suparli further merged legibility and theoretical cohesion in a number of ways. In his system, drum sounds providing similar musical functions were represented by variants of the same alphabet letter. For example, the keplak and congo drumheads are functionally used for treble-ranged tones and slap sounds. Due to this, Suparli notated those two drumheads with the same alphabetic base glyph, but with different case treatment: "p" and "P." The uppercase "T" represented the "ting" sound from the gedug drumhead, which serves to remind the reader that this sound comes from the large kendang indung (not the kentrung drumhead from the smaller kendang kulanter, which used the lowercase "t"). The "T" symbol was chosen instead of "D" because it was the only gedug sound that did not onomatopoetically begin with the letter D (Sunarto 2017: 13-18).

Although Suaman's system is still preferred by some, Suparli's system has become popular due to a combination of concepts: logical references to widely accepted kendang mnemonic syllables, the base glyph simplicity of PTD, Upandi's usage of four base glyphs, and Suaman's externally-placed diacritics. After consulting with

4. Cilok is a tapioca-based West Javanese street food, shaped into a ball and often eaten with a toothpick, that bears a resemblance to the stem and notehead design of Hatta's notation system.

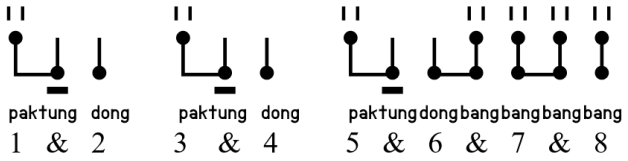


Figure 5. Example of Tutun Hatta's "Cilok" kendang notation with beat count.

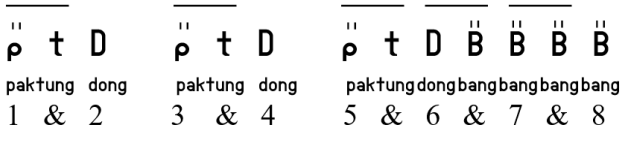


Figure 6. Example of Lili Suparli's single-row kendang notation with beat count.

Suparli, kendang player/ISBI teacher Sunarto included minor adjustments to Suparli's diacritics for his 2017 book Kendang Sunda, likely to increase legibility for readers who were accustomed to Suaman's system. The symbol revisions found in Sunarto's book are presented in Table 1.

Suparli also contributed an alternative single-row notation concept, similar to the PTD and Cilok systems, but also referring to common kendang mnemonic syllables. In this theoretical system (i.e., the system was only described in theory, and not actively practiced), simultaneous sounds are notated in a single row by merging diacritics and base glyphs in previously unconventional ways. For example, if the sounds "tung" and "peung" occur simultaneously (written independently as "ṫ" and "ᵖ̣"), then the two sounds combine to form "teung" (written as "ṭ̇"). Suparli also added the base glyph "B" to represent combined sounds between the gedug drumhead and keplak/congo drumheads, like "bang," "bap," "blong," etc. (Sunarto 2017, 16-18). Figure 6 is a rendition of the drum phrase found in Figure 5, but it instead applies Suparli's single-row notation concept. Between his two systems, Suparli's single-row system takes up less written space and has merit for readers who are familiar with kendang vocalizations. However, his two-row system is conceivably more legible since it partitions notation symbols according to which hand performs the sounded attack.

Other Important Notational Features

It is important to note that Sundanese publications typically omit or gloss over certain stylistic or improvisatory elements, such as dynamics, striking implements (hands or, sometimes, a padded stick), repeated sounds and pitch-bending practices. Their absence in notations should not be taken to indicate their relative importance to performance, however. In Sundanese dance drumming the execution of some of these elements often relies on cues from the dancer; Sundanese notators purposefully omit these in published renditions to allow for individualized interpretations and collaborations between drummer and dancer.

The dance drumming pattern for the characteristic dance movement *doyong*—a sideways lean of the body with knees slightly bent—can be represented in three of the aforementioned kendang notation systems (Figure 7). In the doyong movement, dancers gradually lean their body to one side, which the drummer often accompanies by playing a tremolo of repeating, ascending pitch slides on the gedug drumhead. This series of sounds is achieved by pressing the heel of the foot into the gedug drumhead while simultaneously striking the head with the hand. This frequently used technique may be executed in various ways in terms of the number of drum strokes, rhythmic density, and pitch arc. Multiple factors inform these parameters: the character portrayed by the dancer, and the resulting tempo of the music; the volume and pitch of the actual drums, and how this complements the dance and music; and any idiosyncrasies of the drummer's personal performance style.

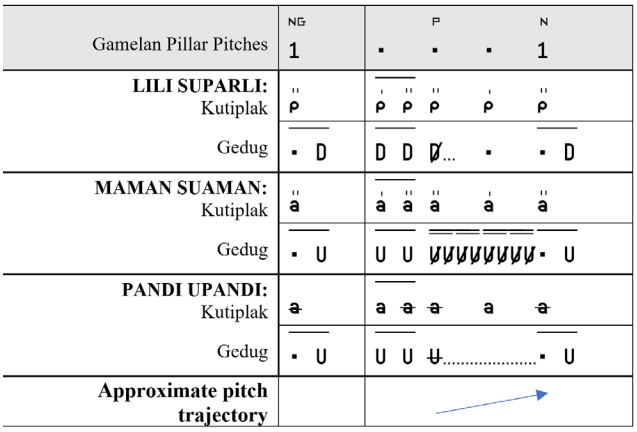


Figure 7. Doyong excerpt from the Sulintang dance. Transcribed by Ed Garcia from kendang lessons with Dana in Bandung, Indonesia, 2019. Gamelan pillar pitches are displayed in Sundanese cipher notation.

Notation for this type of drumming pattern has varied, and the most common methods use ellipses ("…") to represent the series of repeated strikes on the gedug drumhead. In Lili Suparli's approach, it is implied that the sound "det" (marked as "D̸") will repeat an unspecified number of times, ceasing at some point prior to the struck notes at pillar pitch 1̂. In contrast, Upandi's ellipses dictated the exact length of the "det" tremolo ("U̶"), thus making the pillar pitch 1̂ a fixed stopping point. It is notable that Suaman's system did not specify any shorthand for this pattern, instead employing a fully-notated 16th-note metered approach.

Of the examples in Figure 7, Suparli's system offers the most flexibility since it acknowledges that kendang players do not always play repeated sounds until the next pillar pitch, nor do they always play something metered. None of the displayed systems provide pitch-bending instructions despite its iconic presence in Sundanese drumming. The pitch-trajectory arrow in Figure 7 indicates that the gedug passage continually ascends in pitch throughout the length of the tremolo. The absence of a representation of pitch trajectories in all previous notation approaches was likely based on the assumption that experienced drummers would already know this technique without needing explanation of that detail.

Font Development and Technology

Sundanese kendang notation has an intimate connection with the technologies that enabled its development. The typewriter mechanics of the Pasunanda-era systems allowed input of symbols to be manually placed and overlayed with ease, such as typing a forward-slash over a letter (like "a̸") and typing quotation marks above a letter (like "a̋"). The replacement of typewriters with word processing software that does not accommodate such overlaying presents a significant challenge to the future of these notation systems. Many ISBI teachers and students

use a hybrid solution by supplementing standard word processing fonts with precisely pasted images of diacritics and/or beams (Y. Nurdjaman, personal communication, 2019). Others prefer to handwrite nonstandard symbols, which typically must be done post-printing. These methods can be tedious and time consuming to produce even basic notations. A specialized computer input method for Sundanese kendang symbols could resolve the need for these workarounds.

At the heart of all Sundanese kendang notation approaches are mnemonic syllables—the primary mode of verbal communication with dancers—and PTD remains the simplest written method. However, symbols for mnemonic words are not ideal for notating rhythm, and PTD was not designed for the multitude of performance practices found in Sundanese dance drumming. In order to accommodate the wider range of drumming sounds and techniques, Sundanese scholars like Upandi, Suaman, Hatta, and Suparli each improved upon the notation methods of their predecessors in regards to glyphs, diacritics, and number of notation staffs.

Introducing "KendangFont Sunda"[5]

Building on our research into the history of these notation systems and in consultation with musicians in Bandung, we developed a new Sundanese kendang font based on Suparli's notation system. The font, named KendangFont Sunda, was constructed using the internet tool FontStruct with supporting consultation and research from kendang player and ISBI teacher Yosep Nurdjaman. In order to construct a font that was both user-friendly and theoretically accurate, we prioritized alignment maintenance, input efficiency, keyboard layout, and diacritic development. Technical inspiration—especially in regards to cipher, metric, and colotomic organization—was garnered from the Central Javanese-based fonts Kepatihan, designed by Carter Scholz, and KepatihanPro, developed by Raymond Weisling and Matthew Arciniega.

KendangFont Sunda is an attempt to synthesize many aspects from these notation approaches into a word-processing font, making it a readily applicable notation tool for Sundanese kendang drumming. The primary glyphs are each assigned to one of the four kendang drumheads (as in Upandi's approach), and are further based on the mnemonics associated with each drumhead (as in Suparli's approach). The diacritic treatment used in the font matches Suparli's approach, which evolved from Suaman's earlier approach. As is the case with most of the notational approaches that we examined, the font is best used in a two-staff notation system, where each staff represents the drum strokes produced from a single hand.

5. Download KendangFontSunda from the AGI online library at gamelan.org.

While some stylistic and improvisatory elements, like pitch bending and tremolo, were purposefully omitted from earlier Sundanese notation methods, KendangFont Sunda includes multiple options for these symbol types so that users can notate them according to their preference (see Appendix 1 for a full list of symbols and some input examples). Consolidated input methods for beams and rhythmic alignment– as well as keyboard grouping of kendang keystrokes – are chief elements that make KendangFont Sunda a premiere tool for Sundanese kendang notation.

The font is effective for prescriptive purposes like music pedagogy and composition, and is appropriate for presenting high degrees of musical detail for scholarly

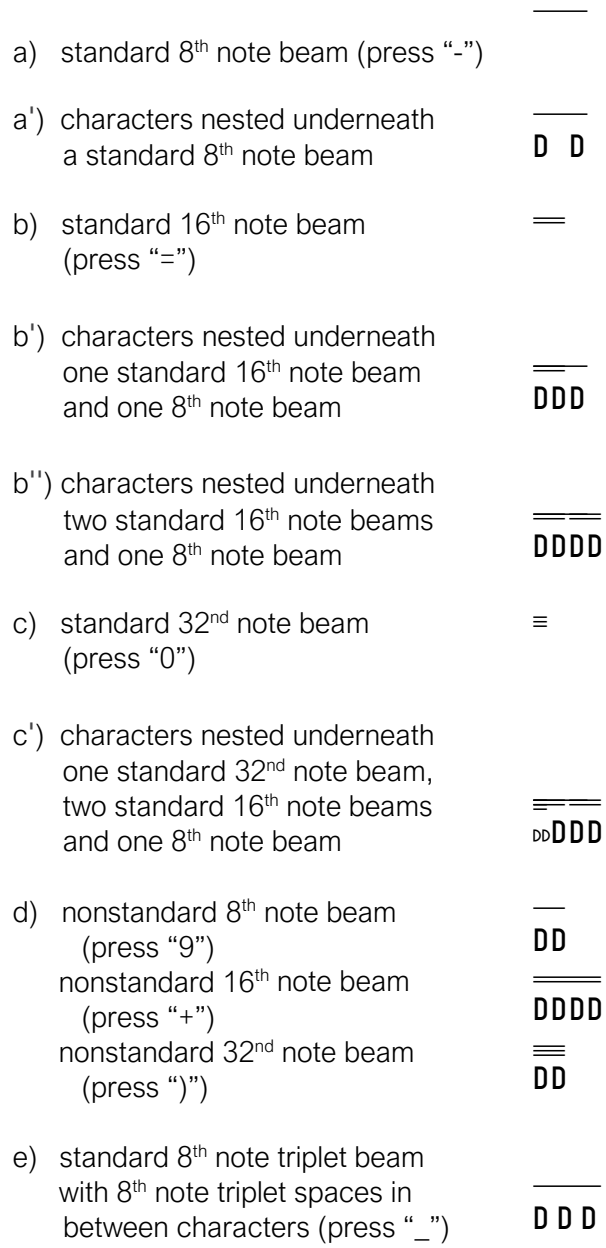


Figure 8. Several keystrokes for KendangFont Sunda.


Doyong dance movements from Tari Sulintang (left) and Tari Kupu Kupu (right)

analysis and comparison. Since it draws from Sundanese music theory as well as gamelan font strategies previously introduced by the Kepatihan font family, it may also help foster international discourse about Sundanese drumming. KendangFont Sunda was created using a free internet font construction tool (FontStruct) which could be a fruitful resource for others interested in developing customized notation fonts.

Appendix 1 depicts a complete keyboard map and key list for KendangFont Sunda. In addition to facilitating Suparli's notation symbols, the font also includes supplemental gamelan symbols. The keyboard layout prioritizes logical placement of kendang sounds by grouping sounds from the same drumhead together; other musical symbols—cipher numbers, beams, and gongs—are clustered separately. The most commonly used symbols can be made with a single keystroke. Dedicated keys for space width, pitch bending, and grace note groupings are also included.

Figure 8 (previous page) shows details of some of the font keystrokes. Rhythm beams (eighth-, sixteenth-, and 32nd-note beams) are entered in groups that span multiple spaces. A standard eighth note beam (Fig. 8a) spans the width of three full-sized, equal-width characters (for example, "D," "full space," and "D," as shown in Figure 8a'). Similarly, a standard sixteenth note beam (b) spans the width of two characters, and can be stacked on top of a standard eighth note beam (b'). A second sixteenth note beam can be stacked above the third "D," which automatically extends the beams to accommodate a fourth "D" (b"). A standard 32nd note beam spans the width of a single sixteenth note (c), which can accommodate two half-sized, equal-width characters (c'). These concepts increase input efficiency since beams do not need to be inserted manually for every space. Depending on the font user's needs, there are also single keystroke options to create eighth note beams that span two full-sized characters, sixteenth note beams that span four full-sized characters, and 32nd note beams that span two full-sized characters (d). Eighth-note triplet beams and eighth-note triplet spaces (spaces that are ⅓ of the width of a standard space) are also provided (e), and their function ensures alignment with other standard four-note phrases. As in the Kepatihan and KepatihanPro fonts, all beams are zero-width characters, and can be combined in any number of ways to create custom-length rhythmic groupings. The beams also help create compact, legible scores with perfect vertical alignment which ensures rhythmic clarity.

Font Application: Notating the Doyong Dance Movement

In addition to basic prescriptive tasks, like the Suparli excerpt shown in Figure 7, KendangFont Sunda is also suitable for lengthier descriptive transcription projects. As an example, Appendix 2 shows transcriptions of doyong dance drumming patterns as realized in two Sundanese dance videos. Segments of these videos are useful for identifying and analyzing Sundanese dance drumming patterns within the context of larger choreographed dance pieces. (See References for links to videos.)

The doyong dance movement appears at the beginning of Tari Sulintang [Sulintang Dance] video (Salim 2017), just after the dancers circle the stage. In the Tari Kupu Kupu [Butterfly Dance] video (Emperor Edutainment 2019), the doyong movement and its associated drumming pattern appears multiple times as part of a repeated cycle of dance movements, e.g. sideways-moving foot shuffle, doyong, elaborate wrist-scarf motion, etc.

The doyong drum patterns in each video can be heard in alignment with the respective dance movements. The tempo slows down prior to all doyong instances, serving to spotlight this subtle, static motion, which often precedes more active, stepping-like movements. This brief slowdown also provides the kendang players more musical space to allow for flexible rhythmic density when performing gedug pitch slides. In both videos, the drummers play approximately five strikes per beat, but not in an exact, metered fashion. The exact pitches of each strike are also not precisely executed, although each follows a general ascending contour. As alluded to earlier, these complexities are the principal reason for their omission or approximation via ellipses in the previous notational approaches.

Despite some distinctions, there are broad similarities between all doyong transcriptions in this article (Figure 7; Appendix 2a, measures 5–6; and Appendix 2b, measures 4–7 and 12–15). For example, the gedug pitch slides are always preceded by a low, resonant gedug strike (notated as "D") on the upbeat of beat 1, and warm unaccented tones (notated as "ꝑ́") typically provide rhythmic structure on beats 1 and 3. For reference, the transcriptions in Appendix 2 include video time counters, tempo markings, and dance movement descriptions.

Reflection

As with any notation system, no Sundanese kendang notation approach can fully account for what happens during live performance. Great kendang players do not just memorize drum patterns or dance choreographies. They must also react to improvised musical and dance-related events. These iconic elements of Sundanese drumming are, therefore, absent from Sundanese notational approaches by design. Ultimately, the best way to understand Sundanese drumming is to study directly with a master teacher, whether in West Java or elsewhere. Perhaps a font such as KendangFont Sunda, which introduces a handful of symbols to represent otherwise notationally-elusive kendang techniques, will inspire users to enrich their understanding through direct experience with the many talented artists who are the living manifestation of this remarkable tradition. With that in mind, we encourage all interested learners to pursue finding an appropriate teacher to help them learn Sundanese kendang, dance, and its interconnected concepts. ◗

Ed Garcia has studied Sundanese music since 2004, and conducted Fulbright-sponsored research in Bandung, West Java, 2019–2020. He has an M.F.A. in percussion music from California Institute of the Arts, and did doctoral work at UC Santa Cruz in music composition. He lives in Santa Cruz, California.

Een Herdiani is a scholar, author, and performer of Sundanese traditional arts. She is the rector of ISBI Bandung (Indonesian Arts Institute in Bandung), where she teaches traditional dance performance and art history. She lives in Bandung, West Java.

References

Cook, Simon
2001 "V. West Java." From Yampolsky et al., "Indonesia," Grove Music Online. https://www-oxfordmusiconline-com.oca.ucsc.edu/grovemusic/view/10.1093/gmo/9781561592630.001.0001/omo-9781561592630-e-0000042890

Soepandi, Atik and Maman Suaman
1980 *Peranan dan Pola Dasar Kendang dalam Karawitan Sunda* [The Fundamental Role and Patterns of Kendang within Sundanese Karawitan]. Jakarta: Institut Kesenian Indonesia.

Spiller, Henry
2004 *Gamelan: The Traditional Sounds of Indonesia*. Santa Barbara, CA: ABC-CLIO.
2010 *Erotic triangles: Sundanese dance and masculinity in West Java.* University of Chicago Press.
2016 "Sonic and tactile dimensions of Sundanese dance." *Sounding the Dance, Moving the Music*, pp. 13-30. Abingdon, Oxon: Routledge.

Sunarto
2001 *Pola-Pola Dasar Tepak Kendang Ketuk Tilu.*(Fundamental Ketuk Tilu Kendang Patterns]. Bandung: Departemen Pendidikan Dan Kebudayaan Sekolah Tinggi Seni Indonesia Bandung.
2017 *Kendang Sunda*. Bandung: Sunan Ambu Press ISBI Bandung.

Suparli, Lili
2010 *Gamelan Pelog Salendro, Induk Teori Karawitan Sunda* [Gamelan Pelog Salendro, Master Theory of Sundanese Karawitan]. Bandung: Sunan Ambu Press ISBI Bandung.

Suweca, I Wayan and Hendra Santosa
1994 "*Kendang Sunda*" [Sundanese Kendang]. Mudra, Vol. 2, No. 2. Denpasar: STSI Denpasar.

Upandi, Pandi
1979 *Penuntun Belajar Kendang* [A Kendang Study Guide]. Bandung: SMKI Bandung.

Videos (used with permission)

Emperor Edutainment
2019, February 25. *Menari Tari Kupu Kupu dan Tari Topeng Kelana: Kostum dan Pagelaran Tari Kupu Kupu* [Dancing the Butterfly and Kelana Masked Dances: The Costume and Presentation of the Butterfly Dance]. VIDEO of Tari Kupu-Kupu

Salim, Aim
2017, July 19. *Tari Sulintang* [Sulintang Dance]. VIDEO of Tari Sulintang

DOWNLOAD

KendangFont Sunda

(direct download here)

or in the AGI library at

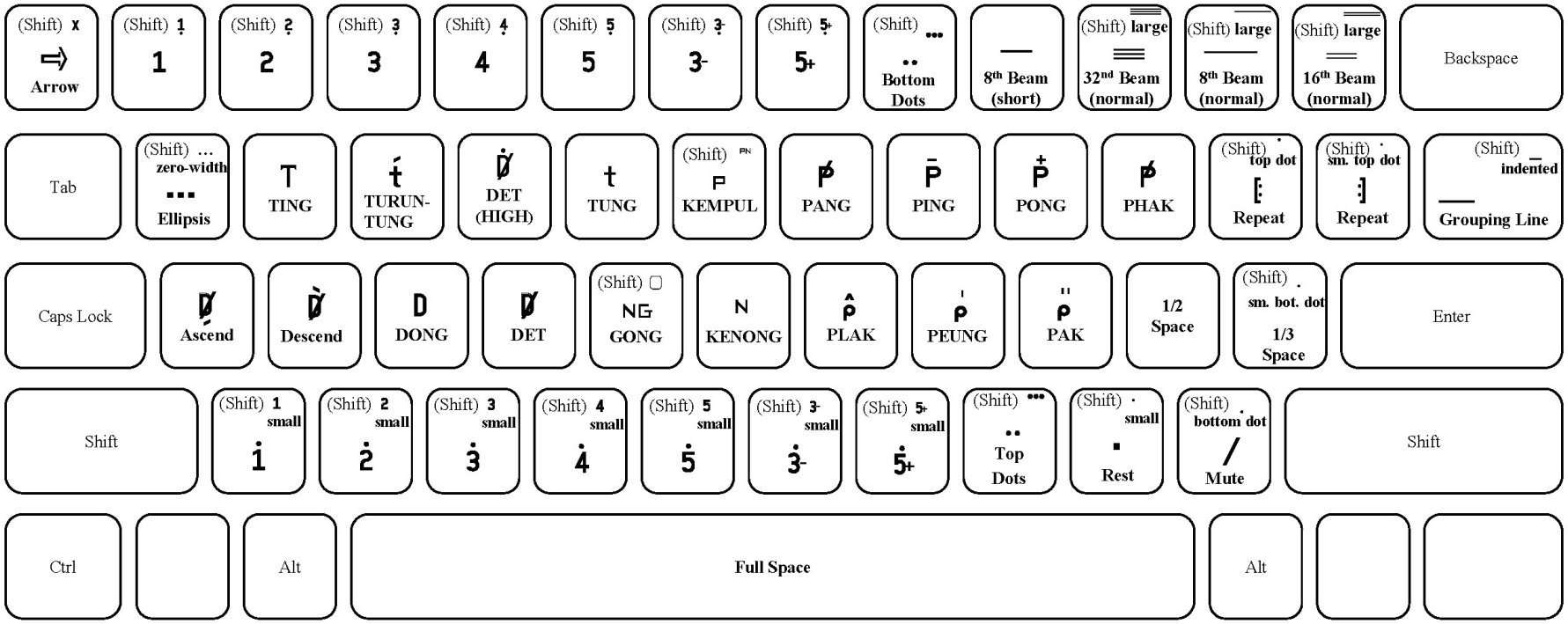
www.gamelan.org

(under FONTS)

Appendix 1: Keyboard Functions for KendangFont Sunda

1a: Keyboard Map

This is a keyboard map of all symbols found in the font "KendangFont Sunda." Symbols that are entered in conjunction with the SHIFT key are expressed in the top portion of each square. For example, the cipher numeral "1" is inserted by pressing "1" on the keyboard, and "1̣" is inserted by pressing "SHIFT" + "1." Keystrokes that represent kendang mnemonic syllables can be pressed to input a full-sized symbol (e.g., press "d" to see "D"), or in conjunction with the SHIFT key to input a half-sized symbol (for example, press "SHIFT" + "D" to see "ᴅ"). For a complete description of keyboard shortcuts, see Appendix 2b: Keyboard Shortcuts.



1b: Keyboard Shortcuts

NAME (DESCRIPTION)	PRESS THIS	TO SEE THIS
Pitch Cipher, standard octave	1	1
	2	2
	3	3
	4	4
	5	5
	6	3-
	7	5+
Pitch Cipher, bottom dot (+1 octave)	SHIFT 1	1̣
	SHIFT 2	2̣
	SHIFT 3	3̣
	SHIFT 4	4̣
	SHIFT 5	5̣
	SHIFT 6	3̣-
	SHIFT 7	5̣+
Top Dot (+1 octave)	SHIFT /	˙
(+2 octaves)	8	¨
(+3 octaves)	SHIFT 8	...
Pitch Cipher, top dot (-1 octave)	z	1̇
	x	2̇
	c	3̇
	v	4̇
	b	5̇
	n	3̇-
	m	5̇+
Bottom Dot (-1 octave)	SHIFT [	˙
(-2 octaves)	,	¨
(-3 octaves)	SHIFT ,	...
32nd Note Pitch Cipher	SHIFT z	₁
	SHIFT x	₂
	SHIFT c	₃
	SHIFT v	₄
32nd Note Pitch Cipher (Continued)	SHIFT b	₅
	SHIFT n	₃̄
	SHIFT m	₅̇
32nd Note Octave Dots	SHIFT]	·
	SHIFT ‘	.
Rest	.	▪
32nd Note Rest	SHIFT .	.
Ellipsis (repeated notes)	q	...
Ellipsis, zero-width (repeated notes)	SHIFT q	...
Eighth Note Beam (3-space width)	-	———
Eighth Note Beam (triplet width)	SHIFT -	———
Eighth Note Beam (2-space width)	9	—
16th Note Beam (2-space width)	=	═
16th Note Beam (4-space width)	SHIFT =	═══
32nd Note Beam (1-space width)	0	≡
32nd Note Beam (2-space width)	SHIFT 0	═
Muted Struck Note (dead stroke)	/	/

Grace Note Grouping Line (for grace notes preceding principal note)	\	
Grace Note Grouping Line (indented, for grace notes proceeding principal note)	SHIFT \	
Repeat Signs	[	
	]	
Arrow	`	
Full Space (1-space width)	SPACE	full space
Half Space (½-space width, for use with 32nd notes)	;	½ space
Third Space (⅓-space width, for use with 8th note triplets)	'	⅓ space
Gong	g	NG
	SHIFT g	
Kempul	y	
Kenong	h	N
Kempul + Kenong	SHIFT y	PN

Pak (32nd note)	l	
	SHIFT l	
Peung (32nd note)	k	
	SHIFT k	
Plak (32nd note)	j	
	SHIFT j	
Phak (32nd note)	p	
	SHIFT p	
Pang (32nd note)	o	
	SHIFT o	
Ping (32nd note)	i	
	SHIFT i	
Pong (32nd note)	u	
	SHIFT u	
Dong (32nd note)	d	
	SHIFT d	

Det (32nd note)	f	
	SHIFT f	
Det (higher pitched) (32nd note)	r	
	SHIFT r	
Deded (Ascending) (32nd note)	a	
	SHIFT a	
Deded (Descending) (32nd note)	s	
	SHIFT s	
Ting (32nd note)	w	
	SHIFT w	
Tung (32nd note)	t	
	SHIFT t	
Turuntung (32nd note)	e	
	SHIFT e	
Nguk	SHIFT `	

APPENDIX 2: Applications of KendangFont Sunda

2a: *Doyong* Excerpt #1

This is a *Sulintang* dance excerpt notated with "KendangFont Sunda," and transcribed by Ed Garcia from Salim (2017). Gamelan pillar pitches are displayed in the Sundanese pelog degung scale using Sundanese cipher notation (ascending to descending pitch = 1,2,3,4,5; subscript dot = pitched raised by one octave).

Measure Number, Tempo (and Video Time Counter)	**M. 1, bps ≈ 95 (0'41")**
Dance Movements	
Gamelan Pillar Pitches	NG 2
Kutiplak, Kemprang	
Gedug, Katipung	

M. 2 **bps ≈ 88**

Dancers circle the stage			*Doyong* (lean to right)
P N 2	P N 2	P PN 5 1 2 3	P NG 5
TT TT	TT TT TT TT		D D

M. 6 **(1'02")**

Dancers straighten torso		Pivot to right, drop scarf	Scarf left hand
P N 5	P N 5	P PN 3	P NG 2
D	t D t	DD	t D t D

2b: *Doyong* Excerpt # 2

This is a *Kupu Kupu* dance excerpt notated with "KendangFont Sunda," and transcribed by Ed Garcia from Emperor Edutainment (2019). Gamelan pillar pitches are displayed in the Sundanese pelog scale using Sundanese cipher notation (ascending to descending pitch = 1,2,3,4,5).

Measure Number (and Video Time Counter)	**M. 1, bps ≈ 105 (5'59")**
Dance Movements	
Gamelan Pillar Pitches	4
Kutiplak, Kemprang	
Gedug, Katipung	D

M. 2 **bps ≈ 87**

Sideways foot shuffle		*Doyong* (lean to one side)	
3	4	1	2
t t t t	t D t t	T	D t t

M. 6 **bps ≈ 105** **(6'20")**

		Wrist flicks, holding scarf	
1	2	3	4
D T	DD t	t D t	t D

M. 10 **bps ≈ 84**

Sideways foot shuffle		*Doyong* (lean to one side)	
3	4	1	2
t t t t	t D D t D	D T	DD t t

M. 14 **bps ≈ 100** **(6'41")**

		Wrist flicks, holding scarf	
1	2	3	4
D T	DD t	t D t	t DD