THREE IDEAS,
A COLLECTION OF THREE ONE-ACT
(MUSICAL) PLAYS FOR MIXED ENSEMBLE

THESIS

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Davis H. Chapman, B.M.
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*Three Ideas* is a collection of three one-act (musical) plays intended to be performed either as a series or as separate pieces. In order for them to be performable in either of those ways, they need some sort of unifying fabric running throughout the collection, yet they must remain individually strong enough to stand alone outside the context of the series and still seem complete.

The concepts *Tonal and Nagual*, *Bell's Theorem*, and *Breakdown of the Bicameral Mind* were chosen because of their theatrical possibilities as well as their philosophical implications. All three of the concepts deal with an unknown, or at least unseen, force that has a strong influence (possibly control) over our actions and the actions of objects around us. This force could possibly radiate from within ourselves, or it could be completely outside us.
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OVERVIEW/INTRODUCTION

The composer is a playwright, and musicians are actors. This is not a new or unique philosophy. It has been stated in various ways for years by such diverse people as John Cage, Marcel Duchamp, and Walter Benjamin. The extension of this philosophy, all the arts as a continuum, has been at the center of performance art throughout the twentieth century. The philosophy does not stop with art, but includes life as part of the continuum of art. With the inclusion of life as art came the development of the 'temporal' art work, existing in one place at one time, never to recur as the same work of art. The temporal and traditional art forms soon begin to mix, producing art works that when viewed on different occasions, contain enough similarities to be considered the same work, but are still different enough to be considered distinct art works. I intend that my work fall under this last category of art.

1For in depth discussion on these philosophies and trends in art, see the following sources:
The electronic revolution has produced a generation of mature artists who have grown up with the sophisticated combination of visual imagery with high quality sound production available not as a special theatrical event, but as an everyday occurrence in the home. Television has changed the way society views the world, as well as what is expected in the way of entertainment. What can we expect from a generation of artists who do not remember a world without television? It is my opinion that, for these artists, multimedia production is the next logical step in the development of the arts. These artists find it appropriate to utilize technology to stimulate several of the viewer's senses simultaneously. Desire to present the type of ideas common to the conceptual art movement has forced these artists to abandon the traditional multimedia form known as opera, as well as tear down the divisions between the various artistic medias. The manner in which a work of


art is viewed is no longer determined by the media of the art work.

Three Ideas is a collection of three one-act (musical) plays intended to be performed either as a series or as separate pieces. In order for them to be performable in either of those ways, they need some sort of unifying fabric running throughout the collection, yet they must remain individually strong enough to stand alone outside the context of the series and still seem complete. This has been accomplished, in part, through the concepts upon which the plays are based.

The concepts Tonal and Nagual, Bell's Theorem, and Breakdown of the Bicameral Mind were chosen because of the theatrical possibilities as well as their philosophical implications. I have used these concepts merely as a 'fictional' basis for the musical plays that follow. I am not concerned with the provable validity of any of the concepts used, nor am I attempting to prove any point with them. All three concepts, aside from the truth of the concepts, have very strong and, to a certain degree, similar philosophical implications. All three of the concepts deal with an unknown, or at least unseen, force that has a strong influence (possibly control) over our actions and the actions

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of objects around us. This force could possibly radiate from within ourselves, or it could be completely outside us. To some degree or another, all three concepts also have theatrical possibilities. There are aspects of each of the concepts that can be portrayed on a stage by actors/musicians (I shall examine some specifics of this later.) To get to the theatrical aspects, a roundabout method of presenting the concept may have to be used (as in Bell's Theorem, where the theatrical aspects were taken from the implications of the theorem instead of the theorem itself), but the prospects are there. The combination of these two, the similarity in the implications and the diversity (among the concepts) in the theatrical possibilities, give the series of plays an underlying unity while maintaining sufficient independence among the works for each to stand alone.

The collection is composed for a small ensemble of one to five musician/actors (depending on how many of the works are to be performed), dancers, and technical crew. There are several reasons for keeping the instrumentation as small as it is. First, a larger number of musicians was unnecessary for realizing the intentions of the composer. Second, a large amount of stage space needed to be kept uncluttered for use by the dancers and actor/musicians. Third, with the varied instrumentation used, composing for a large ensemble is impractical, organizationally, unless it for a specific
performing organization (in which the work would, for the most part, be limited to the specific ensemble for whom the works were originally composed).

I shall attempt to explain the three concepts upon which the three plays were based, explain how I translated them into theatrical situations, and explain the compositional and techniques used.
CHAPTER ONE

TONAL AND NAGUAL

Explanation of the Concept

The concept of the "tonal" (produced toh-na'hl) and the "nagual" (pronounced nah-wa'hl) comes from Central American Indian mythology/shamanism (as related by Carlos Castaneda). They form a mythological/philosophical duality, a true pair (in the sense of a Taoistic true pair in which both parts are necessary to complete the whole).

First I will try to explain the tonal. A philosophy that is assumed in the concept of the tonal is the idea that reality is "only a description of the world which we [have] learned to visualize and take for granted." From the day that we are born, the world is described to us over and over, until we "see" the world in the way that society tells us we should. If this is true, then we have to realize that what we see as "reality" may not be true at all, and that there

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2As a philosophical line of thought, this idea of creating 'reality' to match a description given us has several parallels throughout history. Plotinus (A.D. 204-270), one of the last great philosophers before the philosophical monopoly of the Roman-Catholic Church (known as
could be an infinite amount of matter that we do not see because it does not fit our version of "reality."

The tonal is the organizer of the world...Perhaps the best way of describing its monumental work is to say that on its shoulders rests the task of setting the chaos of the world in order. It is not farfetched to maintain...that everything we know and do as men is the work of the tonal.3

The tonal is what we know as "reality." Since this is what the Middle Ages), said that "the Soul generates its image which is Nature and the world of sense." George Berkeley is important as a philosopher because of his "denial of the existence of matter...material objects only exist through being perceived." Berkeley's philosophies were developed further by David Hume. Hegel retained "a belief in the unreality of separateness...nothing, he held, is ultimately and completely real except the whole." (Bertrand Russell, A History of Western Philosophy, (New York, 1945), pp. 291, 647, 659, 231)

This idea of reality being an illusion is a central philosophy within the practice of the occult. "Occultism" is not an attempt to draw aside the veil of the unknown, but simply the veil of banality that we call the present." The curtain is 'everydayness'. It is a state of mind rather than an objective reality." (Colin Wilson, The Occult, A History, (New York, 1971) pp. 135,178) Among the earliest concepts to be understood in the teachings of George I. Gurdjieff is the idea that "in the state of consciousness in which we are, with all this identification, considering, negative emotions and absence of self-remembering, we are really asleep. We only imagine that we are awake." (P.D. Ouspensky, The Fourth Way, (New York, 1971) p. 13)

As the philosophy appropriate to quantum mechanics is developed, this same idea begins to reappear. "Philosophically... the implications of quantum mechanics are psychedelic. Not only do we influence our reality, but, in some degree, we actually create it." This reality of quantum physics prompted John Wheeler, of Princeton University, to ask, "May the universe in some strange sense be 'brought into being' by the participation of those who participate?" (Gary Zukav, The Dancing Wu Li Masters, An Overview of the New Physics, (New York, 1979) pp. 28,29)

has been described to us as reality, there is thus a personal
tonal and a collective tonal. The collective tonal is the
tonal of society. Everything in the collective tonal is
contained within everyone's personal tonal, but not
vice versa. It can be said that the collective tonal is a
subset of the personal tonal.

The tonal has two levels or sides:

One is the outer part, the fringe, the surface of the
island. That's the part related to action and acting,
the rugged side. The other part is the decision and
judgment, the inner tonal, softer, more delicate and
complex.4

Included within the second part of the tonal are all the
concepts and ideas of the social world, thus any and every-
thing that there exists a name for, description of, etc.,
falls within the domain of the tonal.

Since all words, names, and concepts fall under the
domain of the tonal, and the tonal and the nagual are the
opposing sides of a duality, how do we describe the nagual?
We don't! "The nagual is the part of us for which there is
no description--no words, no names, no feelings, no
knowledge." We can best describe the nagual by imagining
the tonal as an island, with everything we know on it. This
island is our reality, our world. We have never been off the
island and for some reason have never had more than a glance

4Ibid., p. 143.

5Ibid., p. 125
at the ocean surrounding the island. The ocean surrounding
the island is the nagual (of which we know virtually nothing,
since we have not had any more than a glance of it, and
definitely have never ventured into). But by naming the
nagual, are we not placing it within the realm of the tonal?
No, the nagual is named only to create awareness of its
existence.

"The tonal's great art is to suppress any manifestation
of the nagual in such a manner that even if its presence
should be the most obvious thing in the world, it is
unnoticeable." The tonal acts as a guardian, protecting
our being. Because an inherent quality of the tonal is to be
cagey and jealous of its work, it eventually changes from
guardian to a guard. Despite the tonal's efforts, the nagual
does surface on occasion and manifest itself in the form of
various "hallucinations." "The nagual, once it learns to
surface, may cause a great damage to the tonal by coming out
without any control." "Any threat to the tonal always
results in its death. And if the tonal dies, so does the
whole man." The tonal thus has to keep the nagual from
being noticed to protect its (the tonal's) existence.

6Ibid., p. 131.
7Ibid., p. 159
8Ibid., p. 160
"The tonal begins at birth and ends at death."\(^9\) At birth, we are completely nagual. As we grow and are taught how to perceive reality, we eventually become all tonal.

\[\ldots\] At the moment of death the other member of the true pair, the nagual, becomes fully operative and the awareness and memories and perceptions stored in our calves and thighs, in our back and shoulders and neck, begin to expand and disintegrate.\(^10\)

Correlations Between the Concept and the Play

In the first play, which is based on the **Tonal and Nagual**, one possible surfacing of the nagual is portrayed. The trombonist is the Tonal Man, secure in his version of "reality," his thoughts and emotions echoed and magnified by the electric guitar and percussion. He is confronted with the nagual in audible, visual, and physical form by the Synclavier tapes(s), projections, and dancers respectively.

As the scenario opens, we find the Tonal Man in a relaxed state, with his defenses (against the nagual) lowered. The nagual surfaces as a "whisper" at first, catching the Tonal Man off guard. The nagual frightens the Tonal Man, causing his tonal to shrink, giving the nagual a "foot inside the door," of which the nagual then takes advantage and shoves the door wide open, scaring the Tonal Man.

\(^9\)Ibid., p. 123

\(^{10}\)Ibid., p. 132.
Once the nagual has surfaced, the Tonal Man begins to alternate between curiosity and sheer terror, prompted by unfamiliarity with anything resembling the nagual. Eventually, the tonal reaches the point where it realizes that its very existence is threatened by the surfacing of the nagual. At this point the tonal chooses to ignore the nagual, to pretend it is not there, and basically refuse to acknowledge its presence. By this "covering up" of the nagual, the tonal restores "reality" to its proper state, and thus saves itself from eradication.

Analysis of the Play

In analyzing Tonal and Nagual the first thing to note is that there are two categories of musical material. The first category we shall call tonal music (in the sense of the concept of Tonal and Nagual). The tonal music is all derived from, and is all explainable in terms of, four themes (Example 1). In the first (and primary) theme (theme A), the melodic motion is based primarily upon minor seconds and thirds, although the theme opens with a major second. The second and third themes (B & C), which are elaborations upon types of motion in theme A, bring the horizontal relationship of the major second into more prominence. These intervals (major second, minor second and third) will almost take on the stature of a "fifth theme" in the second half of the play. The second category of musical material shall be
referred to as nagual music. The nagual music is not
explainable in terms of the tonal music, or, for the most
part, in terms of itself. The majority of the nagual music
is indeterminate in nature.

EXAMPLE 1

The play opens with the guitar stating theme A, to
be echoed shortly thereafter by the trombone repeating it a
minor third higher. Between these two statements of theme A,
the percussionist introduces the gliss between the fourth and
fifth notes of theme B followed by a variation on the final
three notes of theme A. During this introducing of theme A,
the "tonal world" is unveiled in the form of the table and newspaper, followed by the introduction of theme B.

The nagual is introduced with the entrance of the Synclavier and the projection. From this point on, the nagual is continually present in the form of the pedal note. As the nagual's presence is diminishing to its now minimum state, the guitar responds with the introduction of theme C, echoed by the trombone a minor second lower. This is followed by the percussionist reminding the Tonal Man of the presence of the nagual, causing the Tonal Man to take one last look around before settling back into his "tonal world." The return to complacency is signified by the guitar stating theme B a major second away from the pitch level of its last statement, omitting the third note. The nagual quickly makes its presence known again, closing its statement mockingly with the last three notes of theme B, a minor second above where the guitar had just stated it, punctuating its mockery with visual correspondence from the projections.

The percussion introduces theme D, which can be interpreted as the quickening of the pulse rate, as the initial physical manifestation of the nagual is made by the appearance of the first dancer. In a panic-fed state of

11In Tales of Power, Don Juan introduces the concept of the Tonal and Nagual to Castaneda using the analogy of a table with all the items on it being the tonal, everything for which there is a name being some item on the table and all the space around and under the table being the nagual
fright, the trombone shouts a paraphrase of theme A at the dancer. This is rapidly followed by a variation on theme C (a major second higher than its last statement) by the guitar. The last note of the statement of theme C becomes the third from last note of theme B, the final note of which stays at that same level, instead of moving up the normal minor second. Two successive statements of theme D quickly follow as the panic and fright build. The percussion then makes another statement on behalf of the nagual, introducing the parade of nagual projections.

After the Tonal Man calms himself down somewhat, he cautiously starts to investigate the nagual. The trombone plays an inversion on theme B, followed by a variation of theme C, and finally theme A, with the guitar punctuating in between with statements of theme D. As the trombone is holding the final note of theme A, the percussion enters with a strong statement of the nagual, causing the Tonal Man's fright to become too powerful for him to resist. The guitar meekly responds with theme A minus the first note, a major second above its last statement, followed by the trombone (from in hiding) a major third above that, now also missing the last note of theme A.

As the Tonal Man begins to calm himself down somewhat, and curiosity begins to overtake fright, the percussionist enters with a nagual obligato to add to the Synclavier pedals
while the Synclavier makes another statement of the nagual. The guitar answers with theme A, a major third above the last statement, minus the final note, proceeding with a variation on theme D instead, moving about in major seconds as more physical manifestations of the nagual enter the stage. The Synclavier makes another statement of the nagual as the Tonal Man becomes surrounded by the physical manifestations of the nagual and the guitarist provides another visual manifestation of the nagual.

At this point the Tonal Man decides to fight back and tries to force the nagual back into "nonexistence" by ignoring its presence. He begins with theme A a major second above its last statement, follows with theme B also a major second above its last (noninverted) statement, then theme C (a perfect fourth from its last statement). Next he starts playing retrograde excerpts from theme B, first on the same level as the last statement, rising a minor second to repeat the same excerpt, then dropping a major third to play the last three notes followed by a minor second step up. The next thing he plays is an inversion of theme B (a major third below the last statement of the inversion), followed by steps of a minor second and two minor thirds upward. Finally, he plays theme A minus the first note, up a major third from its last statement, followed by a step up a minor third. At this point he looks around to find that the nagual has resumed its
normal dormant state. He is safely back in his "tonal world."
CHAPTER TWO

BELL’S THEOREM

Explanation of the Concept

Bell’s Theorem is a mathematical construct which shows "that either the statistical predictions of quantum theory are false or the principle of local causes is false." Experiments have been performed which validate the relevant statistical predictions of quantum theory. According to Bell’s theorem, since the statistical predictions of quantum theory is valid, the principle of local causes must be false. One of the implications of Bell’s theorem is that "at a deep and fundamental level, the 'separate parts' of the universe are connected in an intimate and immediate way." In other words, any particle, separated from another particle in a space-like manner, somehow always knows the state of the other particle. In order for this to be true, the particles have to be able to communicate at superluminal (faster than light) speeds.

In this picture, what happens here is intimately and immediately connected to what happens elsewhere in the universe, which, in turn, is intimately and

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2Ibid., p. 282.
immediately connected to what happens elsewhere in the universe, and so on, simply because the 'separate parts' of the universe are not separate parts.3

There is no such thing as chance; everything that happens is because of something else that is happening somewhere else.

The conversion of potentialities into actualities cannot proceed on the basis of locally available information. If one accepts the usual ideas about how information propagates through space and time, then Bell’s theorem shows that the macroscopic responses cannot be independent of far-away causes. This problem is neither resolved nor alleviated by saying that the response is determined by 'pure chance.' Bell’s theorem proves precisely that the determination of the macroscopic response must be 'nonchance,' at least to the extent of allowing some sort of dependence of this response upon the far away cause.4,5

There are two other possible explanations of Bell’s theorem that do not eliminate locality, the first possibility

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3Ibid., p. 300.
4Ibid., p. 301.

5Could quantum mechanics be the scientific backing needed to 'legitimize' the popular belief in astrology? Astrology has proven effective in the past as a means of divination. "Johannes Kepler...was forced to produce a yearly 'almanac' as part of his duties at Gratz in the last decade of the sixteenth century. His first almanac contained prophecies of an intense cold spell, and of an invasion by the Turks. In 1594 the cold was so intense that many died of it, and the Turks devastated the country from Vienna to Neustadt." Is it possible that man's subconscious mind can tap into this level and affect things around us? This assumption is the basis for C.G. Jung's theory of synchronicity, "the assumption that 'accidents' and 'coincidences' are, in some way, linked with the unconscious mind." (Wilson, The Occult, pp. 233,81) "The psychological rule says that when an inner situation is not made conscious, it happens outside, as fate." Wolfgang Pauli stated that, "From an inner center the psyche seems to move outward, in the sense of an extraversion, into the physical world..." (Zukav, The Dancing Wu Li Masters, p. 31) Could our 'externalizing' our inner situations have any connection with our 'creating' of reality?
being that free will is an illusion. "Perhaps there is no such thing as 'what would have happened if...'. Perhaps there can be only what is. In this case, we are led to a superdeterminism." According to determinism, "if the initial situation of a system is changed, then the future of the system also is changed." However, according to superdeterminism, "not even the initial situation of the universe could be changed. No matter what we are doing at any moment in time, it is the only thing that we could have been doing at that moment.

The other option that retains locality is the Many Worlds Interpretation of Quantum Mechanics which says that "whenever a choice is made in the universe between one possible event and another, the universe splits into two different branches." Whenever anyone chooses between two

7Ibid.
8Ibid.
9The Atomists (Approximately 440-410 B.C.) were "strict determinists, who believed that everything happens in accordance with natural laws. Democritus explicitly denied that anything can happen by chance." (Russell, A History of Western Philosophy, p. 66) In this (and other ways not pertinent to the subject at hand) the Atomists were the philosophical forerunners of quantum physics (by about 2300 years).

possibilities, the universe doubles itself, creating two identical universes, one in which one of the possibilities was chosen, the other possibility being chosen in the second universe.

Correlations Between The Concept and the Play

The play based upon Bell's Theorem presents a monologue derived from a few of the implications of the theorem (i.e. the state of particles at one place influencing the state of particles everywhere, the illusion of free will, etc.) This monologue directly controls the primary melodic motion of the piece, rhythmically through the parsing and speed of speech, and melodically through the natural speech motion used by the vocalist (it is thus unimportant, theoretically, whether or not the speech is intelligible after being processed by the pseudovocoder).

This monologue is being spoken over a rhythmic loop that represents the constant pushing and pulling of all the interrelated particles in the universe (the great machine, so to speak). This rhythmic loop starts out in simple form, but builds to a complex obligato. The final form of the loop could be theorized as being dependent on the arrangement of the particles of the universe, determining how the bits and pieces fall within the loop during each performance. The raising and lowering of the lights on the vocalist are
directly related to the rhythmic loop as it builds and resolves.

The other aspects of the play act as analogues to the monologue. The Synclavier tape represents the planet that is knocked out of orbit by an asteroid. The aimless meanderings of that planet continue to be heard for a good portion of the play as its orbit becomes more and more radical. Since everything is theoretically interconnected, this could be understood as affecting the formation of the rhythmic loop, as well as the pacing of the monologue, and thus, the primary melodic motion.

The projections and the dancers also serve as analogues to the monologue. The dancers provide a concrete analogue to the middle section, portraying the main character as a puppet. Its strings are being pulled by the rhythmic loop, Synclavier planet, and monologue, as well as the puppeteer's hands that are being projected above them. Except for that one section, the projections serve as abstract analogues (to the monologue), using imagery based upon portions of the imagery being portrayed in the monologue, but taking certain liberties in the transition (from spoken to visual).

Analysis of the Play

The desired effect of the monologue of Bell's Theorem is that of a naturally spoken oration, stopping and starting at the whim of some unseen force. The closest standardized
notational method to this (sprechstimme) was rejected on the grounds of being too stiff and mechanical in nature. After much thought and deliberation, I chose the notation used, text alone with appropriate spaces for pauses, as most likely to produce the desired effect.

The compositional process utilized in parsing the text for Bell's Theorem was intuitive in nature. It consisted of inserting pauses within the phrases for the purpose of dramatic enhancement of the text. Despite the intuitive nature of the parsing process, the size of the groupings

Example 2

1. 14 or 14
2. 123 or 234
3. 22
4. 23132
5. [121, 2314132]
(according to the number of words in a group) fall into five distinct patterns (Example 2). Patterns 1, 2, and 4 occur on specific group sizes, while patterns 3 and 5 are not group size size dependent. The five patterns are as follows.

1. 4 1 - Pattern common throughout the first verse and occasionally in the following verses. The first verse includes an octave transposition of this pattern where the size of both groups have been doubled with the pattern in a retrograde form, resulting in the pattern 2 8 near the end of the first verse. Also to be considered is an augmentation in the third verse where one word has been added to both groups, producing the pattern 2 5.

2. 1 2 3 or 2 3 4 - This pattern is introduced in the first verse and developed in the second. The second verse begins with an extended retrograde form of this pattern; 4 3 (3) 2 1.

3. Pairs of like size groups - Very common in the first verse, not as common in the remaining two verses but appearing throughout the work. An enlargement of this pattern, 1 1 1, occurs twice in the first verse and once in the second.

4. 2 3 1 3 2 - An outgrowth of pattern 5 (below), the frequency of its occurrence (including an inversion in the third verse, 2 1 3 1 2) qualifies it for independent consideration. This pattern always occurs with pattern 2 on one
or both ends, overlapping the two end groups.

5. Symmetrical Alternation - The most versatile, as well as most common pattern in the work, this pattern occurs most often as a three group alternation where two groups of like size surround a third group of a different size. A variation of this pattern is found at the end of the second verse, where the last group in the pattern 3 4 3 is transposed an octave to produce the pattern 3 4 6. This pattern is enlarged in the first verse where two pairs of groups (pattern 3) of like size surround a third pair of groups of different size (e.g. 2 2 1 1 2 2, 5 5 2 2 5 5). This pattern is developed on a larger scale by having a progression that goes to a central group, then retrogrades back through the progression. The largest occurrence of this pattern consists of pattern 2 overlapping with pattern 4, reaching a center group of size three before retrograding through the same combination of patterns (i.e. 1 2 3 1 3 2 3 2 3 1 3 2 1).

The delay loop starts out simply with a repeating one bar phrase that is completed by adding additional parts at two later points to form the phrase

\[ \text{Quantum Mechanics} \]
By the time that phrase is complete, it is probably so obscured by all the other parts in the loop that the listener (as well as the performer) will find it difficult to hear. The rest of the parts that are added to the loop are designed to take advantage of the vocalist's full range, and give a variety of percussive vocal sounds, to provide as much possible variety in the many possible variations available. The final arrangement of the loop should be different every performance. The degree of difference or sameness is dependent on the performer and how much he or she is (un)influenced by the pattern created by the loop.
CHAPTER THREE

BREAKDOWN OF THE BICAMERAL MIND

Explanation of the Concept

Julian Jaynes' theory about the origins of consciousness proposes that consciousness is a learned process brought about by the growth of civilization, contrary to the belief that consciousness evolved out of animal evolution before any degree of civilization had developed.

[Early men] were not conscious. They could not narratize and had no analog selves to 'see' themselves in relation to others. They were what we could call signal-bound, that is, responding each minute to cues in a stimulus-response manner, and controlled by these cues.1

Early man was not much more than an automaton, listening to and obeying auditory and visual hallucinations. According to Jaynes, these hallucinations originated in the right hemisphere of the brain, in the area corresponding to Wernicke's area (one of the primary speech centers) in the left hemisphere. These "voices" occurred because of a lack of cross-communication between the two halves of the brain, and disappeared (followed by the beginnings of consciousness) when the two halves of the brain started communicating on a

much higher level. The purpose of the voices was as a decision-making process. Any time a choice was necessary that would require some degree of "consciousness", the voices would make the decision for the individual concerned.

.. Auditory hallucinations may have evolved as a side effect of language and operated to keep individuals persisting at the longer tasks of tribal life. Such hallucinations began in the individual's hearing a command from himself or from his chief.2

The "voices" became the voices of the gods and king (thus lending substance to the myth of the king being a descendent of the gods), telling all their subjects what, when, where, and how to do practically everything (at least everything that requires any degree of consciousness). These auditory hallucinations were not like tape recordings of what the king had commanded. They may have began as such, but there is no reason not to suppose that over time, these voices developed the ability to 'think' and solve problems, albeit, of course, unconsciously. They were the muses of the poets and oracles, telling them what to say, word by word, phrase by phrase, in meter and rhyme. The voices were compulsory, they had to be obeyed.3

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2Ibid.

3"There seems hardly any doubt that the historical Socrates claimed to be guided by an oracle or daimon... Joan of Arc was inspired by voices, which are a common form of insanity." (Russell, A History of Western Philosophy, p. 90) Jaynes compares the Bicameral Mind to present day schizophrenia, a mental disease in modern time because of its rarity, but if it was the natural state for society, it would
When the king died, what happened to his voice?

... The occasion of an hallucination was stress... we may be sure that the stress caused by a person's death was far more than sufficient to trigger his hallucinated voice... If this were so for an ordinary individual, how much more so for a king whose voice even while living ruled by hallucination... I am suggesting that the dead king... was in the hallucinations of his people still giving forth his commands.4

Although the king's body was dead, his voice continued to command, so he must have still been alive in some way. "The king dead is a living god. The king's tomb is the god's house." But what about the new king? There appeared a new not be considered a diseased. Is this in any way similar to the 'controlled hallucination' which became so common for Jung? He could call these hallucinations at will by allowing "his subconscious mind to well up, and allow himself to be carried along, still conscious, by its images." Many of these 'controlled hallucinations' were prophetic by nature. Would this be forewarning of what the unconscious mind will cause to happen, or could it be the unconscious mind receiving signals, from the same level on which it creates reality, of what is to come? Along this same line, in his book on the occult, Colin Wilson puts forth his theories on a latent human capacity which he calls Faculty X. "We say something and mean it only when Faculty X is awake, that painful reaching-beyond-the-senses. Faculty X is the key to all poetic and mystical experience; when it awakens, life suddenly takes on a new poignant quality... Faculty X is a sense of reality, the reality of other places and other times." The more Wilson says about this Faculty X, the more it sounds like the awake levels of consciousness that Gurdjieff strives for, as well as the awareness of the nagual that Don Juan tries to establish in Castaneda. Wilson sums up his discussion of Faculty X as stating that "it unites the two halves of man's mind, conscious and subconscious." (Wilson, The Occult, pp. 470, 58, 59)


5Ibid., p. 147
voice commanding the people of the populace. Since the dead king's voice never died out and the new king's voice appeared, over several generations the number of voices ruling the populace kept growing larger and larger, possibly if not probably contradicting each other at some point in time, until finally the bicameral mind broke down and communication was firmly established, thus prompting the birth of consciousness. Man began to think for himself.

Correlations Between the Concept and the Play

Before I discuss how the concept taken from The Origin of Consciousness in the Breakdown of the Bicameral Mind was illustrated as a play, I will explain why I chose to use a tone poem by Hugo Ball as the text. Being a tone poem, the text gives the impression of being some sort of language, even though it (supposedly) is not any known language (e.g. I Zimbrabim, Gadji Berri Bimba, etc.). By using Ball's poem as a text, the idea of verbal communication between the Gods/Kings and the Bicameral Man is conveyed without having to address the problem of semantical content.

The piece begins with the Bicameral Man (violin) surrounded by his muses (dancers) and taking direction from his God/King (Synclavier tape). Everything is just fine as far as the Bicameral Man is concerned. He has his gods and king telling him what to do any time that he needs to make any sort of decision, driving him to finish any task that he
starts, and congratulating him on any accomplishment. As civilization grows and develops (pedestrians), the voices grow more numerous, and eventually the muses begin to drop from sight. These developments begin to worry the Bicameral Man as he is beginning to receive the contradictory directions from his Gods/Kings. As the dawn of civilization (backdrop lighting) continues to break and cities develop (projections), the muses drop completely from sight and the voices become very contradictory, beginning to mix with the voices of his fellow men. Because of a lack of clear directions to follow, the Bicameral Man soon collapses in total confusion.

Shortly thereafter, the voices of the Gods/Kings are gone (along with the muses) and civilization seems to grind to a (temporary) halt. The Bicameral Man is no longer bicameral; consciousness has been born. The (former) Bicameral Man can think for himself. He spends some time philosophizing, acting, playing, and exerting his newly found free will. He then goes on his merry way, and civilization continues as it was.

**Analysis of the Play**

In *Breakdown of the Bicameral Mind*, all of the musical material performed by the violinist is derived from the theme which opens the play. Since the violinist is "being told what to play" by the Synclavier, let's compare the opening
themes for the two performers (Example 3). Except for two added notes, two notes deleted shortly afterwards, and dropping the final note of the theme, the violin theme is basically the same as the Synclavier theme from which it is "derived." It is easy to see from this that the characteristic interval of the theme is the minor second. As a matter of fact, three notes a minor second apart (covering a major second) happens to be a primary motive throughout the play. In the violin version, the theme is initialized with the only major second in the theme, which happens to be the prominent interval between pitch levels of statements of the theme and excerpts throughout the play.

---

\[\text{Example 3}\]

\[\text{Note: Pitch level of an excerpt of the theme is determined by the pitch level of the first note of the entire theme on the transposition level of the excerpt being examined.}\]
The play begins with the auditory (Synclavier) and visual hallucinations (dancers) of the Bicameral Man's muses dancing around and directing him through his motions. The violin enters at ten seconds with the theme, followed a major second lower by an inversion of the theme minus the final note. This is followed immediately by a motive consisting of the first four notes of the original Synclavier theme (this will be referred to from here on as motive A). After a pause of approximately ten seconds, motive A is repeated a minor third higher. Another pause of approximately five seconds passes before playing an inversion of the theme, delaying the final three notes for five seconds. Nine seconds later, a retrograde of motive A is played a major second above the inversion of the theme that it follows.

At one minute twenty seconds, the Bicameral Man speaks for the first time. His speech is stiff and awkward because he is basically acting as an automaton with the words moving directly from his inner voice to his outer voice. He then plays the first seven notes from the theme, takes the last three notes of the seven (the minor second motive mentioned above, to be referred to as motive B) and repeats them a major second higher, moves up another major second to repeat the motive again and continues on this time, leaving off the last four notes of the theme. After speaking the next four "words" of the text, the Bicameral Man plays the final four
notes of the theme a minor second lower than before, then repeats the four note excerpt minus the last note a major second lower. He then takes that (now) three note excerpt and begins to repeat it several times, at first moving down a minor second each time, then continuing the downward movement with the first note while moving upward by major second with the other two notes, until an octave G is reached with the first two notes of the figure. The effect of this development is that of the excerpt expanding outward, chromatically, to a perfect octave. This motion is suspended while speaking the next four words of text, only to be extended another minor second in each direction. The upper note of this resulting major ninth becomes the first note in the opening seven notes of the theme, extending motive B to double its normal length.

Stepping backward about twenty seconds, we find civilization beginning to grow as pedestrians begin to appear and the sun rises a little higher (the dawning of civilization, symbolized by the backdrop lighting). As civilization develops and the Bicameral Man has more stimulus to which he needs to respond, he ceases to start at the beginning of the theme and work his way through to the end without leaving out any of the notes within. Not only will he begin to skip portions of the theme, he will start to take longer pauses, abruptly end statements, and generally act more and more
confused as the internal voices begin to be more contradictory in nature.

After the extended chromatic motion downward, the Bicameral Man skips to the eleventh note of the theme, plays a three note excerpt and repeats it three more times while raising the pitch level a major second between each repetition. After the last repeat, he continues with the next four notes of the theme, speaks the next two words of text, then repeats the last four note excerpt a major second higher. The Bicameral Man then speaks the next three words of text and repeats motive A (up a major second from the last statement of motive A) while the first muse disappears from sight.

At three minutes, the Bicameral Man begins with the second note of the theme, up a major second from the last four note excerpt before the statement of motive A, and plays four notes before abruptly aborting the excerpt as he notices the missing muse. Once he notices that two of the muses are still there, he relaxes a little and plays the complete idea of six notes, then begins the last line of text. Next he starts with the last three notes of the last excerpt and adds the next two notes. The excerpt is abruptly ended as the next muse disappears and the Bicameral Man panics as confusion sets in. Civilization continues to grow with the addition of the projections and the increase in intensity of
the backdrop lights. In his confusion and panic, the Bicameral Man somehow manages to squeeze out the last three words of text, then complete the musical excerpt he aborted thirty seconds earlier.

At four minutes ten seconds, the Bicameral Man finds the one remaining muse. This find calms and relaxes him. He plays the last three notes of the previous excerpt and continues with the next four notes. With renewed confidence that his muses have not deserted him, he calmly strolls away playing the final five notes of the theme up a minor second from the last excerpt, followed by the first four notes of the theme up another minor second. When the final muse disappears the Bicameral Man panics again. He gets stuck on the last note of the excerpt he just played. Civilization continues to grow, the inner voices begin to mix with external voices, and the Bicameral Man begins to suffer the bicameral equivalent of a nervous breakdown. He drops an octave and makes four efforts to play motive B before he is able to force out the final note, then completely surrenders to the confusion.

At approximately six minutes twelve seconds, the bicameral mind breaks down completely, the inner voices cease, and civilization seems to come to a complete standstill. The Conscious Man (formerly Bicameral Man) slowly stands and takes in the world around him. He begins to play,
cautiously at first, as he tries out his new ability to think for himself, a nine note excerpt beginning with the fifth note of the theme. After a pause, he starts again with the final five notes of the theme. Feeling more confident, he takes the first three notes of the theme and repeats the figure in rising pattern, the final statement of which is a major ninth above the first, and continues up another minor second to attack the final five notes of the theme only to bounce back to the next to last note to play a three note retrograde-inversion of the three notes on the same pitch level. Next he starts into the first three notes of the theme a tritone away, the second and third note of which become the sixth and seventh notes of the theme on a pitch level a minor third away, and continue through the thirteenth note of the theme. The eleventh through thirteenth notes are repeated a major second higher, then continues with an inversion of the fourteenth through seventeenth notes another major second higher. The last note of this figure becomes the first note of the theme as the first four notes are played and then repeated a major third lower, followed by the next three notes of the theme before taking another pause.

After catching his breath, the Conscious Man begins with the first seven notes of the theme (down a major third), repeats motive B a minor second higher, then a major second above that and continues to the thirteenth note. Next, he
launches into the final three notes of the theme a tritone away, the last note of which becomes the first note of the final five notes of the theme. Next comes three repetitions of a variation on motive B. The last note of the variation is restated as the fourth note of the theme in a three note retrograde, the last note of which becomes the first note of the theme in a ten note excerpt. Next comes an inverted variation on the fourteenth through seventeenth notes (the sixteenth note is omitted) on the same pitch level. The last note of the inverted variation becomes the first note of that same inverted variation a minor third higher, followed by the first three notes of the theme another minor third higher. This is followed by an inversion of the seventh through tenth notes a tritone away. He then steps down a major second to play an inversion of the fourteenth through sixteenth notes, the last note of which becomes the first note of the same three note figure, and continues with this through the final note of the cadenza.

Once the Conscious Man has completed the violin cadenza, he takes one last look around, then leaves following the path of his own choice. Civilization ceases to stand still, and gradually moves on, completing the play.
CHAPTER FOUR

THE COMPOSITIONAL COMPUTER PROGRAMS

How do the Synclavier parts fit in musically? What is going on in them? I explained how they fit in the overall scheme of the compositions, but just exactly what is happening within the parts? For a detailed explanation see the Appendices, where you will find the PASCAL code for the compositional algorithms that composed the Synclavier parts. I will give a brief overview here of what each program does, as a starting point for analyzing the code.

NAGUAL, the program used in Tonal and Nagual, took text (from Castaneda, "discussing" the nagual) and read it letter by letter. Each letter is assigned a mathematical function governing melodic shape, along with a rhythmic seed for governing the range of step lengths (horizontally) to be taken along the function (thus deciding the specific melodic interval, as well as the note duration). Rests are inserted between words, as well as at punctuation (varying in length, according to what the punctuation is). Given a few words of text, the program will output a corresponding number of musical phrases, the length of each phrase and the melodic shape depending on the length of the word, and the character content of the words themselves. With just a few words, this
content of the words themselves. With just a few words, this program can and will put out a melodic phrase quite lengthy in nature, so I set the tempo on the Synclavier at $\frac{4}{4} = 640$ or greater.

The programs used for Bell's Theorem and Breakdown of the Bicameral Mind are both derived from the same basic algorithm. In Bell's Theorem, the program (BELL) takes a musical phrase input by the composer (the phrase in the score), repeats it a few times, then changes a couple of notes, repeats the new phrase a few times, changes a couple more notes, etc. When it changes a note, it can raise or lower the pitch up to a perfect fourth interval away, and raise or lower all of the other parameters (rhythm, volume, articulation, timbre) up to five increments away from where the value was (rhythm values are notated as the denominator in the fractional portion of a whole note; e.g. $4 = \frac{1}{4}$ = quarter note, $8 = \frac{1}{8}$ = eighth note, $2 = \frac{1}{2}$ = half note, etc., this allows for all the irregular divisions of the whole note; e.g. fifth notes, seventh notes, thirteenth notes, etc.).

In Bell's Theorem, the decaying orbit of the planet is portrayed by the gradual transformation of the musical phrase the length of the composition. I used two timbres voiced in an octave relationship to create a composite timbre. Since the two timbres have different scores, within a few
repetitions of the phrase, they are no longer creating a composite timbre, but are in counterpoint to each other, and by the time the Synclavier part exits from the composition, they no longer resemble the original phrase.

For *Breakdown of the Bicameral Mind*, a few adaptations were made to the previous program. First, because every syllable on the Synclavier requires its own score, and the need of the composition to start with one voice and gradually build up to numerous voices, the phrases entered into the computer started with a lot of notes with volume values of zero (as opposed to starting with rests). As the piece progressed, every time a note was altered, if its volume was below sixty, its volume could only be raised (with a range of up to ten increments). So, for the first part of the composition, the number of voices kept increasing, thus illustrating the gradual increasing of the number of voices heard in the head of the Bicameral Man.

After the violin cadenza, it was necessary for the program to start with the voices as numerous as they were before the cadenza, and gradually reduce to the original, single-voice phrase that started the composition. In order to do this, the program took the amount of time allotted for the tear-down, and calculated the average number of repetitions needed between note-alterations to bring the appropriate volume levels down to zero. Next, it lifted the
rhythmic values from the original phrase, scrambled them, and replaced the current rhythm values with the scrambled, original values. Then it flagged the notes whose original volume were zero. While it was generating the score to this portion of the composition, it did not change any of the rhythm values, but reshuffled them instead, until they were back in their original order by the end of the work. Notes whose original volume was zero could only lower their volume until it was back at zero (at which time it should have its original rhythm value and thus was tagged so as to prevent it from being altered in any way for the remaining duration of the work). Although the pitches are different, the Synclavier part is thus returned to a single-voice line with the same rhythmic interaction as the original phrase.
APPENDIX I

program NAGUAL(INPUT,OUTPUT,LAUGH,WHOME,STATIC)

type WHATEVER = set of char;
WHATAWHA = (R,C0,DF0,D0,EF0,E0,F0,GF0,G0,A0,B0,C1,DF1,D1,EF1,E1,F1,GF1,G1,A1,B1,
C2,DF2,D2,EF2,E2,F2,GF2,G2,A2,B2,C3,DF3,D3,EF3,E3,F3,GF3,G3,A3,B3,C4,DF4,D4,
EF4,E4,F4,GF4,G4,A4,B4,C5,DF5,D5,EF5,E5,F5,GF5,G5,A5,BF5,B5,C6,DF6,D6,EF6,E6,F6,GF6,G6,A6,
BF6,B6,C7);

var EMP,CGKQ,DNT,FV,HJWjLR,SXZ,AEIIOUY,BLANK,PERIOD,COMMA,EXCLAIM,QUESTION : WHATEVER;
STATIC,LAUGH,WHOME : TEXT;
SNCHR,TDCHR,CHR : char;
RHYTHM : array [0..10000] of integer;
PITCH : array [0..10000] of real;
POINTQ,SUMR,NUR,RQ,Y,SEED : integer;
X : real;
FLAG : boolean;
PITCHVIS : array[-99..73] of WHATAWHA;

function TIM(Q: integer): integer;

(*
INITIALIZES THE PSEUDO-RANDOM NUMBER GENERATOR WITH THE
CURRENT CLOCK TIME
*)

var RETURN: packed array[1..11] of char;
TEMP: char;
D,E,F,G,H,J,K,L: integer;

begin
TIME(RETURN);
TEMP:=RETURN[1];
D:=(ORD(TEMP) - ORD('0'))*10000000;
TEMP:=RETURN[2];
E:=(ORD(TEMP) - ORD('0'))*1000000;
TEMP:=RETURN[4];
F:=(ORD(TEMP) - ORD('0'))*100000;
TEMP:=RETURN[5];
G:=(ORD(TEMP) - ORD('0'))*10000;
TEMP:=RETURN[7];
H:=(ORD(TEMP) - ORD('0'))*1000;
END.
\textit{TEMP:=RETURN[8];}
\textit{J:=(ORD(TEMP) - ORD('0'))*100;}
\textit{TEMP:=RETURN[10];}
\textit{K:=(ORD(TEMP) - ORD('0'))*10;}
\textit{TEMP:=RETURN[11];}
\textit{L:=(ORD(TEMP) - ORD('0'));}
\textit{TIM:=D+E+F+G+H+J+K+L end(*TIM*);}

\textbf{function RAN(Q: integer): real;}
\textbf{(*}
\textbf{PSEUDO-RANDOM NUMBER GENERATOR *)}
\textbf{var G,H,I: integer;}
\textbf{begin}
\textit{G:=732573;}
\textit{H:=3545443;}
\textit{I:=2**24;}
\textit{RQ:=((RQ*G)+H)MOD I;}
\textit{RAN:=RQ/2**24}
\textbf{end(*RAN*);}

\textbf{procedure LOAD;}
\textbf{(*}
\textbf{LOADS PITCH NAMES INTO A CHART ARRAY, THUS}
\textbf{MAKING IT POSSIBLE TO USE NUMBERS INSTEAD OF}
\textbf{PITCHES IN THE MATHEMATICAL COMPUTATION *)}
\textbf{var ARF,BARK : integer;}
\textbf{DOZE : WHATAWHA;}
\textbf{begin}
\textit{for BARK:=-99 to -12 do}
\textit{(* VALUES FROM -99 THROUGH -12}
\textit{ARE RESTS *)}
\textit{PTCHVLS[BARK]:=R;}
\textit{ARF:=-11;}
\textit{while ARF <= 73 do}
\textit{(* READS PITCH NAMES FROM EXTERNAL}
\textit{FILE (STATIC) AND PLACES IN}
\textit{APPROPRIATE SLOT IN ARRAY}
\textit{(PTCHVLS*)})
\textit{begin}
\textit{while NOT EOLN (STATIC) do}
\textit{begin}
\textit{read(STATIC,DOZE);}
\textit{PTCHVLS[ARF]:=DOZE;}
\textit{ARF:=ARF + 1;}
\textit{end(*NOT EOLN*);}
\textit{readln(STATIC);}
\textit{end(*ARF <=73*);}
\textit{end(*LOAD*);}
procedure SETRANGE;

(* COMPOSER SETS THE RANGE OF THE INSTRUMENT (TIMBRE) THAT THE RESULTING SCORE WILL BE PERFORMED ON *)

var ZAT, ZOT : WHATAWHA;
ZIP, ZAP : integer;
TOG, TAG : boolean;

begin
writeln('ENTER THE LOWER LIMIT FOR THE RANGE PLEASE');
(* LOW NOTE OF RANGE *)
readln(ZAT);
writeln('ENTER THE UPPER LIMIT FOR THE RANGE PLEASE');
(* HIGH NOTE OF RANGE *)
readln(ZOT);
TOG := false;
TAG := false;
ZIP := 0;
ZAP := 0;
while NOT TOG do (* FIND NUMBER CORRESPONDING TO LOW NOTE OF RANGE *)
begin
ZAP := ZAP + 1;
if PITCHVLs[ZAP] = ZAT
then TOG := true;
end;
while NOT TAG do (* FIND NUMBER CORRESPONDING TO HIGH NOTE OF RANGE *)
begin
ZIP := ZIP + 1;
if PITCHVLs[ZIP] = ZOT
then TAG := true;
end;
POINTQ := ROUND(((ZIP - ZAP) / 2.26) + ZAP) (* CALCULATE \'0\' FOR MATHEMATICAL FUNCTIONS THAT

end(*SETRANGE*);

(***********************************************************************)

(**** PRO1 - PRO13 GENERATE MELODIC PATTERNS ACCORDING TO WHAT CHARACTER IS READ FROM THE TEXT FILE ****)

(*************************************************************************)
procedure PRO1;  (* B M P *)
begin
X:=X-3.0;
if CHR='B'
then SEED :=5
else if CHR='M'
then SEED :=5
else SEED :=8;
while X<=3.0 do  (* GENERATE MELODIC PATTERN *)
begin
PITCH[Y]:=-(X**3)/9)*3;  (* CALCULATE PITCH *)
RHYTHM[Y]:=(ROUND((SEED*2) * RAN(0) + (SEED / 2)));  (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)
X:=X+(2/RHYTHM[Y]);
Y:=Y+1;
NUMR := NUMR + 1
SUMR := SUMR + RHYTHM[Y-1];  (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*X<=3*);
X:=X-3.0
end(*PRO1);

procedure PRO2;  (* C G K Q *)
begin
X:=X-1;
if CHR = 'C'
then SEED:=5
else if CHR = 'G'
then SEED:= 8
else if CHR = 'K'
then SEED:=5
else SEED:=8;
while X<=0.2 do  (* FIRST PART OF PATTERN *)
begin
PITCH[Y]:=((13 / 5)*X)*3;  (* CALCULATE PITCH *)
RHYTHM[Y]:=(ROUND((SEED*2) * RAN(0) + (SEED / 2)));  (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)
X:=X+(1/RHYTHM[Y]);
Y:=Y+1;
NUMR := NUMR + 1
SUMR := SUMR + RHYTHM[Y-1];  (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*X<=0.2*);
end(*X<=0.2*);
while X<=3.0 do (* SECOND PART OF PATTERN *)
begin
  PITCH[Y] := -(LN(ABS(x**3))*2); (* CALCULATE PITCH *)
  RHYTHM[Y] := (ROUND((SEED*2) * RAN(0) + (SEED / 2)));
  (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)
  X := X + (2/RHYTHM[Y]);
  Y := Y + 1;
  NUMR := NUMR + 1;
  SUMR := SUMR + RHYTHM[Y-1];
  (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*X<=3.0*);
X := X - 3.0;
end(*PRO2*);

procedure PRO3; (* D N T *)
begin
  X := X - 3.0;
  if CHR = 'D' (* CHOOSE RHYTHMIC SEED *)
  then SEED := 5
  else if CHR = 'N'
  then SEED := 5
  else SEED := 8;
  while X <= -0.2 do (* FIRST PART OF PATTERN *)
  begin
    PITCH[Y] := -(LN(ABS(x**3))*2); (* CALCULATE PITCH *)
    RHYTHM[Y] := (ROUND((SEED*2) * RAN(0) + (SEED / 2)));
    (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)
    X := X + (2/RHYTHM[Y]);
    Y := Y + 1;
    NUMR := NUMR + 1;
    SUMR := SUMR + RHYTHM[Y-1];
    (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
  end(*X<=-0.1*);
  X := X + 0.4;
  PITCH[Y] := PITCH[Y-1];
  RHYTHM[Y] := 3;
  (* CALCULATE PITCH *)
  (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)
  Y := Y + 1;
  NUMR := NUMR + 1;
  SUMR := SUMR + RHYTHM[Y-1];
  (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
while $x \leq 3.0$ do

```
begin
  PITCH[Y] := -(LN(ABS($x^3$))*2); (* CALCULATE PITCH *)
  RHYTHM[Y] := (ROUND((SEED*2) * RAN(0) + (SEED / 2))); (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)

  $x := x + (2/RHYTHM[Y])$;
  $y := y + 1$;
  NUMR := NUMR + 1;
  SUMR := SUMR + RHYTHM[Y-1]; (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*x<=3.0*);

X := X - 3.0
end(*PRO3*);
```

procedure PRO4; (* F V *)

```
begin
  if CHR = 'F' (* CHOOSE RHYTHMIC SEED *)
    then SEED := 5
    else SEED := 8;
  while $x \leq 3.0$ do (* GENERATE MELODIC PATTERN *)
    begin
      PITCH[Y] := (SIN($x^3$)*4); (* CALCULATE PITCH *)
      RHYTHM[Y] := (ROUND((SEED*2) * RAN(0) + (SEED / 2))); (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)

      $x := x + (1.5/RHYTHM[Y])$;
      $y := y + 1$;
      NUMR := NUMR + 1;
      SUMR := SUMR + RHYTHM[Y-1]; (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
    end(*x<=3.0*);

X := X - 3.0
end(*PRO4*);
```

procedure PRO5; (* H J W *)

```
begin
  $x := x - 3.0$;
  if CHR = 'H' (* CHOOSE RHYTHMIC SEED *)
    then SEED := 8
    else if CHR = 'J'
      then SEED := 8
      else SEED := 5;
  while $x \leq -0.2$ do (* FIRST PART OF PATTERN A *)
```
begin
  PITCH[Y] := (LN(ABS(X**3))*2); (* CALCULATE PITCH *)
  RHYTHM[Y] := (ROUND((SEED*2)*RAN(0) + (SEED / 2))); (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)

  X := X + (2/RHYTHM[Y]);
  Y := Y + 1;
  NUMR := NUMR + 1;
  SUMR := SUMR + RHYTHM[Y-1]; (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*X<=-0.2*);
while X<=2.8 do (* SECOND PART OF PATTERN *)
begin
  PITCH[Y] := ((SIN(X**2))*8); (* CALCULATE PITCH *)
  RHYTHM[Y] := (ROUND((SEED*2)*RAN(0) + (SEED / 2))); (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)

  X := X + (1.5 / RHYTHM[Y]);
  Y := Y + 1;
  NUMR := NUMR + 1;
  SUMR := SUMR + RHYTHM[Y-1]; (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*X<=2.8*);
  X := X - 2.8
end(*PRO5*);

procedure PRO6; (* L R *)
begin
  X := X - 1.0;
  if CHR='L' (* CHOOSE RHYTHMIC SEED *)
  then SEED := 8
  else SEED := 5;
while X<=2.0 do (* GENERATE MELODIC PATTERN *)
begin
  PITCH[Y] := ((SIN(X**2))*8); (* CALCULATE PITCH *)
  RHYTHM[Y] := (ROUND((SEED*2)*RAN(0) + (SEED / 2))); (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)

  X := X + (1.5 / RHYTHM[Y]);
  Y := Y + 1;
end(*X<=2.0*);
NUMR := NUMR + 1;
SUMR := SUMR + RHYTHM[Y-1];  (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)

end(*X<=2,0*);
X:=X-2.0
end(*PRO6*);

procedure PRO7; (* S X Z *)
begin
X:=X-2.0;
if CHR='X'
then SEED:=5
else if CHR='S'
then SEED:=8
else SEED:=5;
while X<=3.0 do
begin
PITCH[Y]:=((5 / 3) * X)*2;   (* CALCULATE PITCH *)
RHYTHM[Y]:=(ROUND((SEED*2) * RAN(0) + (SEED / 2)));
(*CHOOSE RHYTHMIC SEED *)
(* FIRST PART OF PATTERN *)
X:=X + (2 / RHYTHM[Y]);
Y:=Y+1;
NUMR := NUMR + 1;
SUMR := SUMR + RHYTHM[Y-1];  (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*X<=5.0*);
X:=X-5.0;
while X<=-0.2 do
begin
PITCH[Y]:=-(LN(ABS(X**3))*2);   (* CALCULATE PITCH *)
RHYTHM[Y]:=(ROUND((SEED*2) * RAN(0) + (SEED / 2)));
(*CHOOSE RHYTHMIC SEED *)
(* SECOND PART OF PATTERN *)
X:=X + (2 / RHYTHM[Y]);
Y:=Y+1;
NUMR := NUMR + 1;
SUMR := SUMR + RHYTHM[Y-1];  (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*X<=-.2*);
X:=X+0.2
end(*PRO7*);
procedure PRO8; (* AEIOUY *)

var ZORK : real;

begin
  ZORK := PITCH[Y-1]; (* INITIALIZE ACCORDING TO LAST PITCH *)
  if ZORK < -11
    then ZORK := 0.5;
  read(WHOME, SNDCHR);
  if SNDCHR in AEIOUY (* IF NEXT LETTER IS ALSO A VOWEL *)
    then PITCH[Y] := ZORK * (3.1415 * 0.618) + 1 (* THEN USE THIS PITCH *)
  else begin
    read(WHOME, TRDCHR); (* IF NEXT LETTER IS NOT A VOWEL, BUT THE ONE AFTER IT IS *)
    if TRDCHR in AEIOUY
      then PITCH[Y] := ZORK * (3.1415 * (0.618**2)) + 1 (* THEN USE THIS PITCH *)
    else begin
      PITCH[Y] := ZORK * 0.618 + 1 (* OTHERWISE USE THIS PITCH *)
      FLAG := true;
    end(*if TRDCHR else*);
    CHR := SNDCHR;
  end;
  SEED := 3;
  RHYTHM[Y] := (ROUND((SEED * 2) * RAN(0) + (SEED / 2)));
  (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)
  Y:=Y+1;
  NUMR := NUMR + 1;
  SUMR := SUMR + RHYTHM[Y-1]; (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
end(*PRO8*);

procedure PRO9; (* BLANK *)

( * INSERT REST, LENGTH DETERMINED BY LENGTH OF LAST WORD *)

begin
  if NUMR = 0
    then NUMR := 1;
  PITCH[Y] := -33.3;
  RHYTHM[Y] := (ROUND(SUMR / NUMR));
  NUMR := 0;
  SUMR := 0;
  Y := Y + 1
end(*PRO9*);
procedure PRO10; (* PERIOD *)

begin
   PITCH[Y] := PITCH[Y-1]; (* SUSTAIN LAST PITCH FOR ONE MEASURE *)
   RHYTHM[Y] := 1;
   Y := Y + 1;
   NUMR := NUMR + 1;
   SUMR := SUMR + RHYTHM[Y-1];
   PITCH[Y] := -33.3; (* REST FOR ONE MEASURE *)
   RHYTHM[Y] := 1;
   Y := Y + 1;
   NUMR := NUMR + 1;
   SUMR := SUMR + RHYTHM[Y-1];
end(*PRO10*);

procedure PRO11; (* COMMA *)

begin
   PITCH[Y] := -33.3; (* REST FOR ONE MEASURE *)
   RHYTHM[Y] := 1;
   Y := Y + 1;
   NUMR := NUMR + 1;
   SUMR := SUMR + RHYTHM[Y-1];
end(*PRO11*);

procedure PRO12; (* EXCLAIM *)

begin
   SEED := 8; (* RHYTHM SEED *)
   while X <= 2.0 do (* GENERATE MELODIC PATTERN TO CLOSE EXCLAMATION *)

   begin
      PITCH[Y] := (SIN(X**3)*4); (* GENERATE PITCH *)
      RHYTHM[Y] := (ROUND((SEED*2) * RAN(0) + (SEED / 2)));
      (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)

      X := X + (1.5 / RHYTHM[Y]);
      Y := Y + 1;
      NUMR := NUMR + 1;
      SUMR := SUMR + RHYTHM[Y-1]; (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)

   end(*X<=2.0*);
\begin{verbatim}
X:=X-2.0;
PITCH[Y]:=-33.3; (* REST FOR ONE MEASURE *)
RHYTHM[Y]:=1;
Y:=Y+1;
NUMR := NUMR + 1;
SUMR := SUMR + RHYTHM[Y-1];
end (* PRO12 *);

procedure PRO13; (* QUESTION *)
begin
  SEED:=5; (* RHYTHM SEED *)
  X:=X-3;
  while X <= -0.2 do (* GENERATE MELODIC PATTERN TO CLOSE QUESTION *)
    begin
      PITCH[Y]:=(LN(ABS(X**3)))*2; (* GENERATE PITCH *)
      RHYTHM[Y]:=(ROUND((SEED*2) * RAN(0) + (SEED / 2)));
        (* CHOOSE RHYTHM VALUE, ALSO HOW FAR TO MOVE ALONG FUNCTION *)
      X:=X + (2 / RHYTHM[Y]);
      Y:=Y+1;
      NUMR := NUMR + 1;
      SUMR := SUMR + RHYTHM[Y-1]; (* MOVE ALONG FUNCTION, CHECK TO SEE IF AT END OF PATTERN YET *)
    end(*X<=-0.2*);
  X:=X+0.2;
PITCH[Y]:=-33.3; (* REST FOR ONE MEASURE *)
  RHYTHM[Y]:=1;
  Y:=Y+1;
  NUMR := NUMR + 1;
  SUMR := SUMR + RHYTHM[Y-1];
end(*PRO13*);

procedure SEND;
  (* SENDS THE SCORE TO EXTERNAL FILE (LAUGH) *)
begin
  var F,Z,Q,I :integer;
  FACT : real;
  APR : char;

  begin
    write('DO YOU WANT TO WEIGHT THE PITCH LINE ANY?');
      (* THE WEIGHTING OF THE PITCH LINE IS THE OPTION OF EXPANDING OR COMpressING THE RANGE OF THE PITCH LINE (WITH NO WEIGHTING, THE RANGE IS TWO OCTAVES) *)
  end;
\end{verbatim}
readln(APR);
if APR='Y'
then begin
  write('WHAT MULTIPLICATION FACTOR DO YOU WANT TO USE?');
  readln(FACT);
  end(*then begin*)
else FACT := 1.0;
P:=1;
Q:=1;
Z:=1;
while Z<=Y do
begin
  write(LAUGH,'P'); (* WRITE A PITCH LINE TO LAUGH *)
  for I := Q to Q+7 do
  begin
    write(LAUGH,PITCHVLS[ROUND(PITCH[I] * FACT) + POINTQ]:8);
    Q:=Q+1
  end;
  writeln(LAUGH);
  write(LAUGH,'R'); (* WRITE A RHYTHM LINE TO LAUGH *)
  for I := Z to Z+7 do
  begin
    write(LAUGH,RHYTHM[I]:8);
    Z:=Z+1
  end;
  writeln(LAUGH);
end(*Z<=Y*);
end(*SEND*);

begin (*MAIN PROGRAM*)
  open (LAUGH,HISTORY:=NEW); (* INITIALIZE EXTERNAL FILES AND OTHER VALUES *)
  open (WHOME,HISTORY:=OLD);
  open (STATIC,HISTORY:=OLD);
  reset (STATIC);
  reset (WHOME);
  rewrite (LAUGH);
  FLAG := false;
PITCH[0] := -20;
RHYTHM[0] := -20;
LOAD; (* ALL PROCEDURE LOAD *)
RQ:=TIM(0);
AEIOUY:=[ 'A', 'E', 'I', 'O', 'U', 'Y' ];
Y:=1;
X:=0.0;
SETRANGE; (*CALL PROCEDURE SETRANGE*)
while NOT EOF (WHOME) do (*READ TEXT FROM EXTERNAL FILE (WHOME) AND GENERATE SCORE*)
begin
while NOT EOLN (WHOME) do
begin
if NOT FLAG
then begin
read(WHOME,CHR);
if CHR in AEIOUY
then PRO8;
end(*then*)
else begin
CHR := TRDCHR;
FLAG := false;
end(*else*);
write(CHR);
case CHR of
'B', 'M', 'P' : PRO1;
'C', 'G', 'K', 'Q' : PRO2;
'D', 'N', 'T' : PRO3;
'F', 'V' : PRO4;
'H', 'J', 'W' : PRO5;
'L', 'R' : PRO6;
'S', 'X', 'Z' : PRO7;
'.' : PRO9;
',' : PRO10;
'.' : PRO11;
'!' : PRO12;
'? ' : PRO13;
end (*case*);
end(*EOLN*);
readln(WHOME);
writeln;
end(*EOF*);
SEND;
end(*MAIN*).
program BELL(INPUT, OUTPUT, STATIC1, SPURT);

type WHATAWHA = (R, C0, D0, E0, F0, G0, A0, B0, C1, D1, E1, F1, G1, A1, B1, C2, D2, E2, F2, G2, A2, B2, C3, D3, E3, F3, G3, A3, B3, C4, D4, E4, F4, G4, A4, B4, C5, D5, E5, F5, G5, A5, B5, C6, D6, E6, F6, G6, A6, B6, C7);

var STATIC1, SPURT : TEXT;
NTMN, NMX, X, MIN, SEC, TEMPO, RQ : integer;
PTCHVLS : array[0..61] of WHATAWHA;
COPY, PHRASE : array[1..5, 1..100] of integer;
DONG : boolean;

function TIM(Q: integer): integer;

(* INITIALIZES THE RANDOM NUMBER GENERATOR WITH THE CURRENT CLOCK TIME *)

var RETURN: packed array[1..11] of char;
TEMP: char;
D, E, F, G, H, J, K, L: integer;

begin
TIME(RETURN);
TEMP:=RETURN[1];
D:=(ORD(TEMP) - ORD('0'))*10000000;
TEMP:=RETURN[2];
E:=(ORD(TEMP) - ORD('0'))*1000000;
TEMP:=RETURN[4];
F:=(ORD(TEMP) - ORD('0'))*10000;
TEMP:=RETURN[5];
G:=(ORD(TEMP) - ORD('0'))*10000;
TEMP:=RETURN[7];
H:=(ORD(TEMP) - ORD('0'))*1000;
TEMP:=RETURN[8];
J:=(ORD(TEMP) - ORD('0'))*100;
TEMP:=RETURN[10];
K:=(ORD(TEMP) - ORD('0'))*10;
TEMP:=RETURN[11];
L:=(ORD(TEMP) - ORD('0'));
TIM:=D+E+F+G+H+J+K+L
end(*TIM*);
function RAN(Q: integer): real;

(* PSEUDO-RANDOM NUMBER GENERATOR *)

var G,H,I: integer;

begin
  G:=732573;
  H:=3545443;
  I:=2**24;
  RQ:=((RQ*G)+H)MOD I;
  RAN:=RQ/2**24
end(*RAN*);

procedure LOAD; (* LOADS PITCH NAMES INTO ARRAY FOR ACCESS *)

var ARF : integer;
    DOZE : WHATANHA;

begin
  ARF:=0;
  while ARF <= 61 do
    begin
      while NOT EOLN (STATICi) do
        begin
          read(STATICi,DOZE);
          PTCHVLS[ARF]:=DOZE;
          ARF:=ARF + 1;
        end(*NOT EOLN*);
      readln(STATICi);
      end(*LOAD*);
end(*LOAD*);

procedure PITCH;

(* COMPOSER ENTERS PITCHES OF INITIAL PHRASE *)

var FLAG,DOG : boolean;
    B,DUNCE : integer;
    CH : WHATANHA;

begin
  writeln(Enter, in order, the pitches in the phrase.);
  writeln(Mark the completion by a R.);
  FLAG:= true;
  X:= 0;
  while FLAG = true do
    begin
      read(CH);
      DOG:=true;
      DUNCE:= 1;
      if CH = R
then FLAG:= false
else while DOG = true do
  if PITCHVLS[DUNCE] = CH
    then begin
      X:=X + 1;
      PHRASE[1,X]:=DUNCE;
      DOG:= false;
    end
  else DUNCE:=DUNCE + 1;
end;
readln;
for B:=1 to X do (* ECHO PITCHES BACK TO SCREEN *)
  write(PITCHVLS[PHRASE[1,B]]);
writeln;
end(*PITCH*);

(* CONVERTING PITCH NAMES TO INTEGERS FOR MANIPULATION *)

procedure ALLELSE;

(* COMPOSER ENTERS ALL OTHER PARAMETERS FOR INITIAL PHRASE *)

var B,VAL,A : integer;

begin
  writeln( 'Please enter the rhythm values for the phrase' );
  for A:= 1 to X do (* RHYTHM VALUES *)
    begin
      read(VAL);
      PHRASE[2,A]:= VAL;
    end;
  readln;
  for B:=1 to X do (* ECHO RHYTHM VALUES BACK TO SCREEN *)
    write(PHRASE[2,B]:4);
  writeln;
  writeln( 'Please enter the volume values for the phrase' );
  for A:= 1 to X do (* VOLUME VALUES *)
    begin
      read(VAL);
      PHRASE[3,A]:= VAL;
    end;
  readln;
  for B:=1 to X do (* ECHO VOLUME BACK TO SCREEN *)
    write(PHRASE[3,B]:4);
  writeln;
  writeln( 'Please enter the articulation values for the phrase' );
  for A:= 1 to X do (* ARTICULATION VALUES *)
    begin

read(VAL);
    PHRASE[4,A]:= VAL;
end;
readln;
for B:=1 to X do     (* ECHO ARTICULATION *)
  write(PHRASE[4,B]:4);
writeln;
writeln( ´Please enter the timbre values for the phrase´);
for A:= 1 to X do     (* TIMBRE VALUES *)
  begin
    read(VAL);
    PHRASE[5,A]:= VAL;
  end;
readln;
for B:=1 to X do     (* ECHO TIMBRE *)
  write(PHRASE[5,B]:4);
writeln;
end(*ALLELSE*);

procedure XEROGRAPH;
    (* MAKES A COPY OF INITIAL PHRASE FOR LATER USE *)
var A,C : integer;
begin
  for A:=1 to 5 do
    for C:=1 to X do
      COPY[A,C]:=PHRASE[A,C];
  end; (* XEROGRAPH *)

procedure GENERATE;
    (* GENERATES SCORE AND SENDS IT TO EXTERNAL FILE (SPURT) *)
var NTS,NUMNTS, TOP,BOT, VAL1, WHERE,T,C,Q,A,Z,PER : integer;
    FILLED,TEMP : real;
begin
  PER:=(MIN * 60) + SEC;      (* HOW MUCH TIME IS AVAILABLE *)
  FILLED:= 0.0;
  write( ´What range do you want for the number of repetitions?´);
  readln(BOT, TOP);         (* HOW MANY REPETITIONS BETWEEN ALTERATIONS? *)
  while ROUND(FILLED) <= PER do ( * SEND REPETITIONS OF PHRASE TO FILE *)
    begin
      Z:=ROUND(RAN(0) * (TOP - BOT)) + BOT;     (* EXACT NUMBER OF
      end;
for A:= 1 to Z do
begin
Q:=1;
while Q + 7 <= X do (* LINES OF EIGHT NOTES *)
begin
write(SPURT,'P'); (* PITCHES *)
for C:= Q to Q + 7 do
write(SPURT,PITCHVLS[PHRASE[1,C]]);
writeln(SPURT);
write(SPURT,'R'); (* RHYTHMS *)
for C:= Q to Q + 7 do
write(SPURT,PHRASE[2,C]:4);
writeln(SPURT);
write(SPURT,'V'); (* VOLUMES *)
for C:= Q to Q + 7 do
write(SPURT,PHRASE[3,C]:4);
writeln(SPURT);
write(SPURT,'A'); (* ARTICULATIONS *)
for C:= Q to Q + 7 do
write(SPURT,PHRASE[4,C]:4);
end;
end;
if (Q + 7 > X ) and (Q <= X) (* LESS THAN EIGHT NOTES LEFT IN PHRASE *)
then begin
write(SPURT,'P'); (* PITCHES *)
for C:= Q to X do
write(SPURT,PITCHVLS[PHRASE[1,C]]);
writeln(SPURT);
write(SPURT,'R'); (* RHYTHMS *)
for C:= Q to X do
write(SPURT,PHRASE[2,C]:4);
writeln(SPURT);
write(SPURT,'V'); (* VOLUMES *)
for C:= Q to X do
write(SPURT,PHRASE[3,C]:4);
writeln(SPURT);
write(SPURT,'A'); (* ARTICULATIONS *)
for C:= Q to X do
write(SPURT,PHRASE[4,C]:4);
writeln(SPURT);
write(SPURT, 'T');  (* TIMBRES *)
for C := Q to X do
  write(SPURT, PHRASE[5,C]:4);
writeln(SPURT);
end;

(* HOW MUCH TIME HAS BEEN TAKEN *)
TEMP := 0.0;
for T:= 1 to X do
  TEMP := TEMP + (((1 / PHRASE[2,T]) / (TEMPO / 4)) * 60);
FILLED := FILLED + (TEMP * Z);

(* HOW MANY NOTES TO ALTER *)
NTS := 1;
NUMNTS := ROUND(RAN(0) * (NIMX - NTMN)) + NTMN;

while NTS <= NUMNTS do
  begin
    WHERE := ROUND(RAN(0) * (X - 1)) + 1;  (* WHICH NOTES TO ALTER *)
    VAL1 := ROUND(RAN(0) * 10) - 5;  (* ALTER PITCH *)
    PHRASE[1,WHERE] := PHRASE[1,WHERE] + VAL1;
    if PHRASE[1,WHERE] < 1
      then PHRASE[1,WHERE] := 1
    else if PHRASE[1,WHERE] > 61
      then PHRASE[1,WHERE] := 61;
    VAL1 := ROUND(RAN(0) * 10) - 5;  (* ALTER RHYTHM *)
    if PHRASE[2,WHERE] < 1
      then PHRASE[2,WHERE] := 1
    else if PHRASE[2,WHERE] > 64
      then PHRASE[2,WHERE] := 64;
    VAL1 := ROUND(RAN(0) * 10) - 5;  (* ALTER VOLUME *)
    if PHRASE[3,WHERE] < 1
      then PHRASE[3,WHERE] := 1
    else if PHRASE[3,WHERE] > 100
      then PHRASE[3,WHERE] := 100;
    VAL1 := ROUND(RAN(0) * 10) - 5;  (* ALTER ARTICULATION *)
    PHRASE[4,WHERE] := PHRASE[4,WHERE] + VAL1;
    if PHRASE[4,WHERE] < 1
      then PHRASE[4,WHERE] := 1
    else if PHRASE[4,WHERE] > 100
      then PHRASE[4,WHERE] := 100;
    VAL1 := ROUND(RAN(0) * 10) - 5;  (* ALTER TIMBRE *)
PHRASE[5,WHERE]:=PHRASE[5,WHERE] + VAL1;
if PHRASE[5,WHERE] < 1
then PHRASE[5,WHERE]:= 1
else if PHRASE[5,WHERE] > 100
then PHRASE[5,WHERE] := 100;
NTS:=NTS + 1;
end;
end;
end(*GENERATE*);

procedure TIME_CHECK(GROG, GRUEL : integer);
(* THIS PROCEDURE CHECKS THE LENGTH
OF THE COMPLETED SCORE TO
BE SURE THAT IT IS WITHIN THE
TIME ALLOTTED *)

var A,C,RHY,MIN,SEC : integer;
    TIM : real;
    CHR : char;
begin
    reset(SPURT);
    TIM:=0.0;
    while NOT EOF (SPURT) do
(* READ RHYTHM VALUES AND ADD TIME PASSED *)
        begin
            read(SPURT,CHR);
            if CHR = 'R'
then while NOT EOLN (SPURT) do
            begin
                read(SPURT,RHY);
                TIM:=TIM + (((1 / RHY) / (TEMPO / 4)) * 60);
            end;
            readln(SPURT);
        end;
    writeln('The total time in secs. is ',TIM);  (* TELL COMPOSER LENGTH OF SCORE *)
    MIN:=TRUNC(TIM / 60);
    SEC:=ROUND(TIM) MOD 60;
    writeln('The total time in mins. & secs. is ',MIN:3,SEC:3);
    if (MIN <> GROG) or (SEC > GRUEL + 10) (* IF TOO LONG, ASK WHETHER TO START OVER WITH ORIGINAL PHRASE OR KEEP WHAT WAS GENERATED *)
then begin
  writeln('The file is not the correct length.\');
  write('Do you want to scratch it and start over?\');
  readln(CHR);
  if CHR = 'Y' (* IF STARTING OVER, ERASE SCORE AND CALL UP COPY OF ORIGINAL PHRASE *)
    then begin
      rewrite(SPURT);
      for A:=1 to X do
        for C:=1 to 5 do
          PHRASE[C,A]:=COPY[C,A];
    end
  else DONG := false;
end
else begin (* IF SCORE IS CORRECT LENGTH, TELL COMPOSER AND END PROGRAM RUN *)
  writeln('The file is the correct length.\');
  DONG := FALSE;
end;

begin (* MAIN PROGRAM *)
  open (STATIC1,HISTORY:=OLD); (* OPEN EXTERNAL FILES, INITIALIZE RANDOM NUMBER GENERATOR, ETC. *)
  open (SPURT,HISTORY:=NEW);
  DONG:= true;
  rewrite(SPURT);
  reset (STATIC1);
  RQ:=TIM(0);
  LOAD; (* CALL PROCEDURE LOAD *)
  PITCH; (* CALL PROCEDURE PITCH *)
  ALLEELSE; (* CALL PROCEDURE ALLEELSE *)
  XEROGRAPH (* CALL PROCEDURE XEROGRAPH *)
  writeln('How much time is to be filled?\'); (* ENTER LENGTH (IN CLOCK TIME), TEMPO, AND RANGE *)
  readln(MIN,SEC);
  write('At what tempo?\');
  readln(TEMPO);
  write('What is the range for the number of notes to be changed?\');
  readln(NNTX);
  while DONG do
    begin
      GENERATE; (* CALL PROCEDURE GENERATE *)
      TIME__CHECK(MIN,SEC); (* CALL PROCEDURE TIME__CHECK *)
    end;
end(*MAIN*).
APPENDIX 3

program MIND(INPUT, OUTPUT, STATIC1, SPURT, SPURT2);

  type WHATAWHA = (R, C0, D0, E0, F0, G0, A0, B0, 
                    C1, D1, E1, F1, G1, A1, B1, 
                    C2, D2, E2, F2, G2, A2, B2, C3, 
                    D3, E3, F3, G3, A3, B3, C4, D4, 
                    E4, F4, G4, A4, B4, C5, D5, E5, F5, 
                    G4, G5, A5, B5, C6, D6, E6, F6, G6, A6, 
                    B6, C7);

  var SPURT2, STATIC1, SPURT : TEXT;
  BUT, TOP, WMIN, NMIX, X, MIN, SEC, TEMPO, RQ : integer;
  PTCHVLS : array[0..61] of WHATAWHA;
  COPY2, COPY, PHRASE : array[1..3,1..100] of integer;
  DING, DONG : boolean;

  function TIM(Q : integer): integer;
    (* INITIALIZES THE RANDOM NUMBER 
       GENERATOR WITH THE CURRENT 
       CLOCK TIME *)

    var RETURN: packed array[1..11] of char;
     D, E, F, G, H, J, K, L: integer;

    begin
      TIME(RETURN);
      TEMP:=RETURN[1];
      D:=(ORD(TEMP) - ORD('0'))*1000000;
      TEMP:=RETURN[2];
      E:=(ORD(TEMP) - ORD('0'))*100000;
      TEMP:=RETURN[4];
      F:=(ORD(TEMP) - ORD('0'))*10000;
      TEMP:=RETURN[5];
      G:=(ORD(TEMP) - ORD('0'))*1000;
      TEMP:=RETURN[7];
      H:=(ORD(TEMP) - ORD('0'))*100;
      TEMP:=RETURN[8];
      J:=(ORD(TEMP) - ORD('0'))*10;
      TEMP:=RETURN[10];
      K:=(ORD(TEMP) - ORD('0'))*10;
      TEMP:=RETURN[11];
      L:=(ORD(TEMP) - ORD('0'));
      TIM:=D+E+F+G+H+J+K+L
    end(*TIM*);
function RAN(Q: integer): real;

(* PSEUDO-RANDOM NUMBER GENERATOR *)
var G,H,I: integer;
begin
G:=732573;
H:=3545443;
I:=2**24;
RQ:=(RQ*G)+H)MOD I;
RAN:=RQ/2**24
end(*RAN*);

procedure LOAD;
(* LOADS PITCH NAMES INTO ARRAY FOR ACCESS *)
var ARF : integer;
  DOZE : WHATAWHA;
begin
ARF:=0;
while ARF <= 61 do
  begin
    while NOT EOLN (STATIC1) do
    begin
      read(STATIC1,DOZE);
PITCHVLS[ARF]:=DOZE;
      ARF:=ARF + 1;
    end(*NOT EOLN*);
readln(STATIC1);
  end(*ARF <= 61*);
end(*LOAD*);

procedure PITCH;
(* COMPOSER ENTERS PITCHES OF INITIAL PHRASE *)
var FLAG,Dog : boolean;
  B,DUNCE : integer;
  CH : WHATAWHA;
begin
writeln( Enter, in order, the pitches in the phrase. );
writeln( 'Mark the completion by a R.' );
FLAG:= true;
X:= 0;
while FLAG = true do
  begin
    read(CH);
    DOG:=true;
    DUNCE:= 1;
    if CH = R
      then FLAG:= false
else while DOG = true do
    if PITCHVLS[DUNCE] = CH
        then begin
            X:=X + 1;
            PHRASE[1,X]:=DUNCE;
            DOG:= false;
        end
        else DUNCE:=DUNCE + 1;
    end;
readln;
writeln;
end(*PITCH*);

procedure ALLELSE;
    (* COMPOSER ENTERS ALL OTHER PARAMETERS FOR INITIAL PHRASE *)
var B,VAL,A : integer;

begin
    writeln(´Please enter the rhythm values for the phrase´);
    for A:= 1 to X do
        begin
            read(VAL);
            PHRASE[2,A]:= VAL;
        end;
readln;
writeln;
writeln(´Please enter the volume values for the phrase´);
for A:= 1 to X do
    begin
        read(VAL);
        PHRASE[3,A]:=VAL;
    end;
readln;
writeln;
end(*ALLELSE*);

procedure XEROGRAPH;
    (* MAKES A COPY OF INITIAL PHRASE FOR LATER USE *)
var A,C : integer;

begin
    for A:=1 to 3 do
        for C:=1 to X do
            COPY[A,C]:=PHRASE[A,C];
end; (* XEROGRAPH *)
procedure GENERATE; (* GENERATES SCORE OF FIRST HALF AND SENDS IT TO EXTERNAL FILE (SPURT) *)

var NTS,NUMNTS,VALL,WHERE,T,C,Q,A,Z,PER : integer;
    FILLED,TEMP : real;
    FIRSTIME: boolean;

begin
    PER:=(MIN * 60) + SEC; (* HOW MUCH TIME IS AVAILABLE *)
    FILLED:= 0.0;
    FIRSTIME:= true;
    while ROUND(FILLED) <= PER do (* SEND REPITITIONS OF PHASE TO FILE *)
        begin
            if FIRSTIME (* IS THIS THE INITIAL PHASE OF THE WORK? *)
                then Z: TOP (* IF SO, REPEAT PHRASE THE MAXIMUM NUMBER OF TIMES *)
                else Z:=ROUND(RAN(0) * (TOP - BOT)) + BOT; (* NUMBER OF REPETITIONS TO BE MADE *)

            for A:= 1 to Z do
                begin
                    Q:=1;
                    while Q + 7 <= X do (* LINES OF EIGHT NOTES *)
                        begin
                            write(SPURT,'P'); (* PITCHES *)
                            for C:= Q to Q + 7 do
                                write(SPURT,PITCHVLS[PHRASE[1,C]]); writeln(SPURT);
                            write(SPURT,'R'); (* RHYTHMS *)
                            for C:= Q to Q + 7 do
                                write(SPURT,PHRASE[2,C]:4); writeln(SPURT);
                            write(SPURT,'V'); (* VOLUMES *)
                            for C:= Q to Q + 7 do
                                write(SPURT,PHRASE[3,C]:4); writeln(SPURT);
                            Q:=Q + 8;
                        end;
                        if (Q + 7 > X) and (Q <= X) (* LESS THAN EIGHT NOTES LEFT IN PHRASE *)
                            then begin
                                write(SPURT,'P'); (* PITCHES *)
                                for C:= Q to X do
                                    write(SPURT,PITCHVLS[PHRASE[1,C]]); writeln(SPURT);
                                write(SPURT,'R'); (* RHYTHMS *)
                                for C:= Q to X do
                                    write(SPURT,PHRASE[2,C]:4); writeln(SPURT);
                            end;
        end;
end;
write(SPURT, 'V');    (* VOLUMES *)
for C := Q to X do
  write(SPURT, PHRASE[3,C]:4);
  writeln(SPURT);
end;
end;
TEMP := 0.0;
FIRSTIME := false;
for T := 1 to X do    (* HOW MUCH TIME HAS BEEN TAKEN *)
  TEMP := TEMP + (((1 / PHRASE[2,T]) / (TEMPO / 4)) * 60);
FILLED := FILLED + (TEMP * Z);
(******************************************************************************
** ALTER THE PHRASE **********************************************************
******************************************************************************)
NTS := 1;
NUMNTS := ROUND(RAN(0) * (NIMX - NIMN)) + NIMN;    (* HOW MANY
NOTES TO
ALTER *)
while NTS <= NUMNTS do
begin
  WHERE := ROUND(RAN(0) * (X - 1)) + 1;    (* WHICH NOTES TO
ALTER *)
  VAL1 := ROUND(RAN(0) * 10) - 5;    (* ALTER PITCH *)
  PHRASE[1,WHERE] := PHRASE[1,WHERE] + VAL1;
  if PHRASE[1,WHERE] < 1
    then PHRASE[1,WHERE] := 1
  else if PHRASE[1,WHERE] > 61
    then PHRASE[1,WHERE] := 61;
  VAL1 := ROUND(RAN(0) * 10) - 5;    (* ALTER RHYTHM *)
  if PHRASE[2,WHERE] < 1
    then PHRASE[2,WHERE] := 1
  else if PHRASE[2,WHERE] > 64
    then PHRASE[2,WHERE] := 64;
  VAL1 := ROUND(RAN(0) * 10) - 5;    (* ALTER VOLUME *)
  if PHRASE[3,WHERE] < 50
    then PHRASE[3,WHERE] := PHRASE[3,WHERE] + VAL1 + 5
  if PHRASE[3,WHERE] < 1
    then PHRASE[3,WHERE] := 1
  else if PHRASE[3,WHERE] > 100
    then PHRASE[3,WHERE] := 100;
  NTS := NTS + 1;
end;
end(*GENERATE*);
procedure TIMECHECK(GROG,GRUEL : integer); (* THIS PROCEDURE
CHECKS THE LENGTH OF
THE COMPLETED SECTION
TO BE SURE THAT IT IS
WITHIN THE TIME
ALLOTTED *)

var A,C,RHY,MIN,SEC : integer;
  TIM : real;
  CHR : char;
begin
  reset(SPURT);
  TIM:=0.0;
  while NOT EOF (SPURT) do (* READ RHYTHM VALUES AND ADD TIME
                          PASSED *)
  begin
    read(SPURT,CHR);
    if CHR = 'R'
      then while NOT EOLN (SPURT) do
        begin
          read(SPURT,RHY);
          TIM:=TIM + (((1 / RHY) / (TEMPO / 4)) * 60);
        end;
    readln(SPURT);
  end;
  writeln('The total time in secs. is ',TIM); (* TELL COMPOSER
                                             LENGTH OF
                                             SCORE *)
  MIN:=TRUNC(TIM / 60);
  SEC:=ROUND(TIM) MOD 60;
  writeln('The total time in mins & secs. is ',MIN:3,SEC:3);
  if (MIN <> GROG) OR (SEC > GRUEL + 10) (* IF SCORE TOO LONG,
                                           ASK WHETHER TO START
                                           OVER WITH ORIGINAL
                                           PHRASE OR KEEP
                                           CURRENT SCORE *)
    then begin
      writeln('The file is not the correct length.');
      write('Do you want to scratch it and start over?');
      readln(CHR);
      if CHR = 'Y' (* IF STARTING OVER, ERASE SCORE AND CALL UP
                     COPY OF ORIGINAL PHRASE *)
then begin
  rewrite(SPURT);
  for A:=1 to X do
  for C:= 1 to 3 do
    PHRASE[C,A]:=COPY[C,A];
  end
  else DONG := false;
end
else begin
  writeln('The file is the correct length. ');
  DONG := false;
end;
end; (* TIME_CHECK *)

procedure DUPE;
  (* MAKES A COPY OF THE INITIAL PHRASE AT START OF SECOND SECTION FOR USE AT LATER POINT*)
var A,C : integer;
begin
  for A:=1 to 3 do
  for C:=1 to X do
    COPY2[A,C] :=PHRASE[A,C];
end; (* DUPE *)

procedure GENERATE2;
  (* GENERATE SCORE FOR SECOND SECTION AND SEND IT TO EXTERNAL FILE (SPURT2) *)
var TWIT,SWITCH,SWT,NIS,NUMNTS,VALL,WHERE,T,C,Q,A,Z,PER : integer;
FILE,TEMP : real;
begin
  PER:=(MIN * 60) + SBC;  (* HOW MUCH TIME IS AVAILABLE *)
  FILLED:= 0.0;
  while ROUND(FILLED) <= PER do  (* SEND PHRASE TO FILE *)
    begin
      Q:=1;
      while Q + 7 <= X do  (* LINES OF EIGHT NOTES *)
        begin
          write(SPURT2, 'P');  (* PITCHES *)
          for C:= Q to Q + 7 do
            write(SPURT2,PITCHVLS[PHRASE[1,C]]);
            writeln(SPURT2);
          write(SPURT2,'R');  (* RHYTHMS *)
        for C:= Q to Q + 7 do
          write(SPURT2,PHRASE[2,C]:4);
          writeln(SPURT2);
write(SPURT, 'V');  (* VOLUMES *)
for C:= Q to Q + 7 do
  write(SPURT2,PHRASE[3,C]:4);
writeln(SPURT2);
Q:=Q + 8;
end;
if (Q + 7 > X) and (Q <= X)  (* LESS THAN EIGHT NOTES LEFT
   IN PHRASE *)
then begin
  write(SPURT2,'P');  (* PITCHES *)
  for C:= Q to X do
    write(SPURT2,PITCHVLS[PHRASE[1,C]]);
  writeln(SPURT2);
  write(SPURT2,'R')  (* RHYTHMS *)
  for C:= Q to X do
    write(SPURT2,PHRASE[2,C]:4);
  writeln(SPURT2);
  write(SPURT2,'V');  (* VOLUMES *)
  for C:= Q to X do
    write(SPURT2,PHRASE[3,C]:4);
  writeln(SPURT2);
end;

TEMP := 0.0;
for T:= 1 to X do  (* HOW MUCH TIME HAS BEEN TAKEN *)
  TEMP:= TEMP + (((1 / PHRASE[2,T]) / (TEMPO / 4)) * 60);
FILLED:=FILLED + TEMP;

(************************** ALTER THE PHRASE **************************)

NTS:=1;
NUMNTS:=ROUND(RAN(0) * (NIMX - NIMN))+ NIMN;  (* HOW MANY
   NOTES TO
   ALTER *)

while NTS <= NUMNTS do
begin
  WHERE:= ROUND(RAN(0) * (X - 1)) + 1;  (* WHICH NOTES TO
    ALTER *)
  while (PHRASE[3,WHERE] = 0) or (COPY[3,WHERE] <> 0) do
    (* CAN SELECTED NOTES BE
    ALTERED *)
    WHERE:= ROUND(RAN(0) * (X - 1)) + 1;  (* IF NOT, NEW
    NOTE TO BE
    ALTERED *)
  VALl:=ROUND(RAN(0) * 10) - 5;  (* ALTER PITCH *)
  PHRASE[1,WHERE]:=PHRASE[1,WHERE] + VALl;
  if PHRASE[1,WHERE] < 1
    then PHRASE[1,WHERE]:= 1
  else if PHRASE[1,WHERE]> 61
    then PHRASE[1,WHERE] := 61;
  VOLl:=ROUND(RAN(0) * 10) - 5;  (* ALTER VOLUME
    APPROPRIATELY *)
  PHRASE[3,WHERE]:=PHRASE[3,WHERE] + VOLL;
  if PHRASE[3,WHERE] < 1
    then PHRASE[3,WHERE]:= 1
  else if PHRASE[3,WHERE]> 61
    then PHRASE[3,WHERE] := 61;
if COPY[3,WHERE] = 0
    then PHRASE[3,WHERE] := PHRASE[3,WHERE] + VAL1 - 10
if PHRASE[3,WHERE] < 0
    then PHRASE[3,WHERE] := 0
else if PHRASE[3,WHERE] > 100
    then PHRASE[3,WHERE] := 100;
SWITCH := PHRASE[2,WHERE]; (* SWITCH RHYTHM WITH ANOTHER ALTERABLE NOTE *)
if PHRASE[3,WHERE] <= 15
    then begin
        PHRASE[2,WHERE] := COPY[2,WHERE];
        for SWT := 1 to X do
            if SWT <> WHERE
                then if (PHRASE[2,SWT] = PHRASE[2,WHERE])
                    and (PHRASE[2,SWT] <> COPY[2,SWT])
                    then PHRASE[2,SWT] := SWITCH;
    end
else begin
    TWIT := ROUND(RAN(0) * (X - 1)) + 1;
    while (TWIT = WHERE) or (PHRASES[3,'IWIT'] <= 15) do
        TWIT := ROUND(RAN(0) * (X - 1)) + 1;
    PHRASE[2,WHERE] := PHRASE[2,TWIT];
    PHRASE[2,TWIT] := SWITCH;
end;
NTS := NTS + 1;
end;
end(*GENERATE2*);

procedure TIMECHECK2(GROG,GRUEL : integer);
(* CHECK LENGTH OF SECOND SECTION TO BE SURE IT IS WITHIN ALLOTTED TIME LENGTH *)
var A,C,RHY,MIN,SEC : integer;
    TIM : real;
    CHR : char;
begin
    writeln(GROG,GRUEL);
    reset(SURT2);
    TIM := 0.0;
    while NOT EOF (SPURT2) do (* READ RHYTHM VALUES AND ADD TIME PASSED *)
        begin
            read(SPURT2,CHR);
            if CHR = 'R'
                then while NOT EOLN (SPURT2) do

begin
read(SPURT2,RHY);
TIM:=TIM + (((1 / RHY) / (TEMPO / 4)) * 60);
end;
readln(SPURT2);
end;
writeln('The total time in secs. is ',TIM); (* TELL COMPOSER
THE LENGTH OF
THE SECTION *)
MIN:=TRUNC(TIM / 60);
SEC:=ROUND(TIM) MOD 60;
writeln('The total time in mins. & secs. is ',MIN:3,SEC:3);
if (MIN <> GROG) or (SEC > GRUEL + 10) (* IF SECTION IS TOO
LONG, ASK WHETHER TO
START OVER WITH
ORIGINAL PHRASE OR
KEEP SECTION AS IS *)
then begin
writeln('The file is not the correct length.');
write('Do you want to scratch it and start over?');
readln(CHR);
if CHR = 'Y' (* IF STARTING OVER, ERASE SECTION AND CALL
UP COPY OF ORIGINAL PHRASE FOR SECTION *)
then begin
rewrite(SPURT2);
for A:=1 to X do
  for C:=1 to 3 do
    PHRASE[C,A]:=COPY2[C,A];
else DING := false;
end
else begin (* IF SECTION IS CORRECT LENGTH, TELL
COMPOSER AND END PROGRAM RUN *)
writeln('The file is the correct length.');
DING := false;
end;
end; (* TIMECHECK2 *)

procedure SCRAMBLE;
(* TAKE THE PHRASE FROM THE END OF THE FIRST
SECTION, SCRAMBLE THE ORDER OF THE RHYTHM
VALUES FROM THE ORIGINAL PHRASE OF THE WORK,
SUBSTITUTE THE SCRAMBLED RHYTHM VALUE FOR THE
RHYTHM VALUES OF THE CURRENT PHRASE *)

var ONWARD: boolean;
WHERE,A,C: integer;
COUNT,SCRATCH: array[1..100] of integer;
begin
for A:=1 to X do (* READ ORIGINAL RHYTHM VALUES *)
    if PHRASE[2,A] = 0
        then COUNT[A]:=1
        else COUNT[A]:=0;
for A:=1 to X do (* SCRAMBLE THE RHYTHM VALUES *)
    if PHRASE[2,A] > 0
        then begin
            ONWARD := true;
            while ONWARD do
                begin
                    WHERE:=ROUND(RAN(0) * (X - 1)) + 1;
                    if COUNT[WHERE] = 0
                        then ONWARD:= false;
                end;
            SCRATCH[A]:= WHERE;
            COUNT[WHERE]:=1;
            PHRASE[2,A]:=COPY[2,WHERE]; (* SUBSTITUTE SCRAMBLED RHYTHM VALUES FOR CURRENT RHYTHM VALUES *)
        end;
end; (* SCRAMBLE *)

procedure FIGURE;
    (* CALCLUALTE THE NUMBER OF REPITITIONS THAT WILL FILL THE TIME ALLOTTED FOR THE SECOND SECTION, THEN THE AVERAGE NUMBER OF NOTES THAT NEED TO BE ALTERED DURING EACH STATEMENT OF THE PHRASE *)
var SED,TIM,VOL,REPNUM,AMTLWR,NUMCHG,A: integer;
begin
    TIM:=0;
    VOL:=0;
    for A:=1 to X do (* HOW MANY PHRASES? *)
        TIM:= TIM + ROUND(((1 / PHRASE[2,A]) / (TEMPO / 4)) * 60);
    SED:= SEC + (MIN * 60);
    REPNUM:=ROUND(SED / TIM);
    for A:=1 to X do (* HOW MANY NOTES NEED TO BE ALTERED *)
        if COPY[3,A] = 0
            then VOL:=VOL + PHRASE[3,A];
    AMTLWR:= ROUND(VOL / REPNUM);
    NUMCHG:= ROUND(AMTLWR / 10);
    NTMX:= NUMCHG + 1;
    NTMN:= NUMCHG - 1;
end; (* FIGURE *)
begin (*MAIN PROGRAM*)
open (STATIC1,HISTORY:=OLD); (* OPEN EXTERNAL FILES, INTIALIZE RANDOM NUMBER GENERATOR, ETC. *)
open (SPURT2,HISTORY:=NEW);
open (SPURT,HISTORY:=NEW);
DING:=true;
DONG:=true;
rewrite(SHORT);
rewrite(SHORT2);
reset (STATIC1);
RQ:=TIM(0);
LOAD; (* CALL PROCEDURE LOAD *)
PITCH; (* CALL PROCEDURE PITCH *)
ALLELSE; (* CALL PROCEDURE ALLELSE *)
XEROGRAPH; (* CALL PROCEDURE XEROGRAPH *)
write(’How much time is to be filled?’); (* ENTER LENGTH (IN CLOCK TIME), TEMPO, AND RANGE FOR NUMBER OF NOTES TO BE ALTERED FOR FIRST SECTION *)
readln(MIN,SEC);
write(’At what tempo?’);
readln(TEMPO);
write(’What is the range for the number of notes to be changed?’);
readln(NMN,NMX);
write(’What range do you want for the number of repetitions?’);
readln(BOT,TOP);
while DONG do
begin
   GENERATE; (* CALL PROCEDURE GENERATE *)
   TIMECHECK(MIN,SEC); (* CALL PROCEDURE TIMECHECK *)
end;
write(’How much time is to be filled in the second section?’);
(* ENTER LENGTH (IN CLOCK TIME), AND TEMPO FOR SECOND SECTION *)
readln(MIN,SEC);
write(’At what tempo?’);
readln(TEMPO);
SCRAMBLE; (* CALL PROCEDURE SCRAMBLE *)
DUPE; (* CALL PROCEDURE DUPE *)
FIGURE; (* CALL PROCEDURE FIGURE *)
while DING do
begin
   GENERATE2; (* CALL PROCEDURE GENERATE2 *)
   TIMECHECK2(MIN,SEC); (* CALL PROCEDURE TIMECHECK2 *)
end;
end(*MAIN*).
BIBLIOGRAPHY


THREE IDEAS

A COLLECTION OF THREE ONE-ACT (MUSICAL) PLAYS FOR MIXED ENSEMBLE

BY

DAVIS H CHAPMAN
I: TONAL AND NAGUAL
STAGE SETTING

Table should have a tablecloth that reaches to floor.
There should be a trombone stand beside the table for use
while sitting at table, reading paper.

Dancers are to wear white body bags such that no limbs can
be seen, just one big amorphous blob.

Guitarist needs some sort of lightweight white wand for waving
in projection beam to create a "floating" screen in mid-air.

Film projector needs a "Shotgun Barrel" to cast a narrow beam.
Projections all need to be unrecognizably abstract (the film
being in some type of motion).

Synclavier part is on three separate tapes (two drone tapes
and one containing all other sequences) for synchronization
purposes.
I: TONAL AND NAGUAL

DAVIS H. CHAPMAN

\[ \text{APPROX. 120} \]

- **TROMBONE**
  - Distortion through phase shifter

- **ELECTRIC GUITAR**
  - \( \text{mp} \)
  - Cymbal upside down

- **PERCUSSION**
  - soft
  - med. mallets

- **PROJECTIONS**

- **DANCERS**

- **SYNCLAVIER (TAPE)**

- **LIGHTS**
  - Single white light
  - from overhead

---

- **Walk over to table, sit down and start to read newspaper.**

- **Wend block med. mallets**

- **Blue light on table**
  - Slow fade up
Jump up, startled.
Frantically look around.
but don't see anything.

Slide #1 on
hard col.

Look around some more, study,
sit down and start reading
 sooner again
Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.

Jump up, startled, frantically look around.

Look under table, dancer rolls out.

Played toward dancer while frantically backing away.
Standing in center light

Start to follow dancer:
about stage in slow,
cautious movements

Cautiously

Slow fade in

Slow dissolves
of slides
Growing louder

Even louder

Turn and run around stage, hide behind percussionist

Thunderous noise

Chase after Tbn., using same slow movements.
Look under table, second dancer rolls out, Glance comically between two dancers.

Look under table again, jump back as third dancer rolls out, slowly get mastered into center light, constantly glancing from one dancer to another in a confused manner.

Pick up air screen wand wait for projector to start.

Once, Tbn is in center light, start film projector.

Dancer #2 rolls out from under table when Tbn lifts tablecloth to look under.

Dancer #2 joins in slow movements around stage with #1

Dancer #2 rolls out from under table when Tbn lifts tablecloth.

Three dancers slowly circle Tbn and maneuver him into center light.

Once Tbn is in center light, slow fade out blue light on table (to black)
Once projector has started, wave wand rapidly in beam to create a "floating" screen.

Slides fade out slow.

Continue circling Tbn with some slow flowing movements. Stay out of white light.

Once blue light is on, start slow fade out of green and red lights on stage.
Once red and green lights are on, start fade out.

Once red and green lights are out, should be faded to out by this time.

Once red and green lights are out, dancers exit stage.

Once red and green lights are out, should be faded to out by this time.
While holding note, look around and notice surroundings.

Shrug and exit.

If (f)
II: BELL'S THEOREM

STAGE SETTING

RED LIGHT ON FLOOR BEHIND VOCALIST, FACING AUDIENCE, FOR SILHOUETTING VOCALIST.

DIGITAL DELAY IS TO BE SET FOR 1-2 SECOND DELAY WITH REGENERATION UP SUCH THAT THE ECHO STAYS AT A STEADY LEVEL. DELAY IS TO RUN IN LOOP (REPEAT OR HOLD) MODE, USING A FOOTPEDAL TO ADD PARTS TO THE LOOP.

VOCALIST IS TO STAND AS STILL AS POSSIBLE AND IS TO HOLD ALL PAUSES SLIGHTLY LONGER THAN COMFORTABLE.

VOCAL PART IS TO BE TRANSPosed AS NECESSARY SO AS TO PLACE THE MIDDLE LINE OF THE STAFF EQUIVALENT WITH THE MIDDLE OF HIS/HER RANGE.

VOCODER IS TO USE THREE OSCILLATORS TUNED IN FIFTHS AROUND VOICE AND CONTROLLED BY AN APPROPRIATE TYPE OF PITCH FOLLOWER.
II: BELL'S THEOREM
PROJECTIONS

1ST SERIES: BILLIARDS, CROQUET, OR SIMILAR BALLS CAREENING OFF OF EACH OTHER; CHANGE TO WRECKAGE, BURNED/COLLAPSED BUILDINGS, ETC. (CUE: EARTHQUAKES AROUND THE EARTH)

2ND SERIES: LOOP OF 6-9 IMAGES OF A PAIR OF HANDS MANIPULATING PUPPET STRINGS.

3RD SERIES: START WITH PERSON PULLING A ROPE (AS IN A TUG-O-WAR), MOVE TO JUST THE ROPE, THEN THE ROPE PULLING THE UNIVERSE (OR SOME PORTION THEREOF).
ABOUT THE ILLUSION OF FREE WILL? DO WE REALLY CHOOSE

WHAT WE DO, OR IS IT CHOSEN FOR US?

LTS
WHAT IF EVERYTHING WE DO IS DETERMINED BY A PLANET

CIRCLING AROUND THE STAR ALPHA CENTAURI? WHAT IF

MY DECIDING TO PICK MY NOSE CAUSES AN ASTEROID
TO COLLIDE WITH THAT PLANET THROWING IT OUT OF ORBIT?

WHAT IF THAT PLANET, BEING THROWN OUT OF ORBIT, CAUSES A
FLURRY OF EARTHQUAKES AROUND THE EARTH,
OR A WORLD WIDE FAMINE,

OR PLAGUE?

HEAVY GUILT TRIP!

WHAT IF

Face to dark

Raise green front
light up to 1/2 strength
MY DECIDING NOT TO CLEAN THE FELT FROM BETWEEN MY

TOES CAUSES A PLANET ON THE FAR SIDE OF THE MILKY WAY

TO BLOW ITSELF UP IN NUCLEAR WAR? WHO CARES?
I DON'T HAVE ANY FRIENDS THERE,

DO YOU? WHAT IF....

One dancer on stage in front of projection screen, moving in jerky motions, staying in one spot.

Slowly raise light (blue or red) on dancer to 1/2 strength.
Have you ever felt like a puppet on a string?

Add second oscillator sound 20 cents above the first.

Just who is the person on the other.
THINGS, OUR WHOLE LIFE'S PURPOSE JUST TO KEEP SOMEONE

ENTERTAINED? WHAT WOULD HAPPEN

Second dancer leaps into lift area, dancer slams into slippery patch and Judy type routine

Slowly raise light on dancer to full strength
IF WE SUDDENLY FOUND THAT OUR STRINGS HAD BEEN

CUT? IS THAT WHAT HAPPENS WHEN PEOPLE DIE?

Projections off abruptly

Dancers collapse to floor, remain motionless until stage is dark
THEIR STRINGS GET CUT? I THINK I'LL HAVE MY STRINGS

SLOW TUNE TO DARK LIGHT ON DRUMS

ADD THIRD OSCILLATOR SOUNDING A P5 BELOW THE VOICE

REENFORCED

SLOW TUNE TO 1/4 STRENGTH RED BACK LIGHT

EVER FELT LIKE YOU WERE WALKING THROUGH MUD?
THE PULL OF A BLACK HOLE AS IT TRIED

Growing blackness covering projection area

TO SWALLOW THE PLANET WHICH YOU WERE PROPPELLING ALONG

THROUGH ITS ORBIT OR WAS IT PROPPELLING YOU?
III: BREAKDOWN OF THE BICAMERAL MIND
STAGE SETTING

Backdrop (thin white cloth, or paper)
Backlit with yellow/orange lights
Projection area

General stage lighting: green, red, and/or blue.

AUDIENCE

BACKDROP LIGHTS COVERING THE PROJECTION AREA
SHOULD BE ON A SEPARATE DIMMER.

VIOLINIST SHOULD GIVE THE APPEARANCE OF BEING MALE.
DANCERS ARE TO BE WEARING MASKS AND TIGHTS.

PROJECTIONS ARE TO BE STREET-LEVEL IMAGES
OF CITY (OPTIONAL: PROGRESSION FROM SMALL RURAL
COMMUNITY TO LARGE METROPOLIS).
III: BREAKDOWN OF THE BICAMERAL MIND

DAVIS H. CHAPMAN

TEXT BY HUGO BALL

VIOLIN

Wandering about stage, flitting with dancers

PROJECTIONS

DANCERS

Three dancers on stage, wearing masks, dance (leaping, kicking, etc.) around and with violinist.

SYNCLAVIER (TAPE)

Gad-ir sa-i him-bra tal-bra-ti sa-i bra-tal gad-ir i rim-bra

LIGHTS

General stage lighting on 3/4 strength
Backdrop lighting on 1/5 strength

0'00"

0'10"
Pedestrians in street clothes start entering stage at 15–30 sec. intervals. They wander about the stage, pause to talk with other pedestrians, etc.

Tone: City street traffic

Bring backdrop lights up to 2/5 strength.
BERI—GLASSALA

GLANDRIDI—GLASSALA

TUFFM'1—ZIMBRABIM

One dancer leaves stage

BLASSA—GALASSASA

Look around in congestion

Look at dancers and breathe a sigh of relief

Cut off very abruptly

3’10”

3’30”

3’00”

3’50”

3’20”

2’20”

2’30”

2’40”

2’50”
VLI

Start slide sequence
4-5 sec., dissolve, hold.

DNC

Second dancer leaves stage

SYN

Bring backdrop lighting up
to 3/5 strength, kill backdrop
light on projection area.

LTS

3'30"

3'40"

VLI

ZIMBRABIM

Pause momentarily
Resume panic
run in confusion

Find remaining dancer;
lean on dancer while
catching breath.

PRJ

DNC

SYN

3'50"

4'00"

4'10"
Pause pooling in center stage

Fall onto knees

Bow head in surrender

5'00"

5'10"

5'20"

5'30"

5'40"

5'50"

6'00"

6'10"
End sequence fade to dark

Pedestrians freeze and be silent as lights dim.

Stage lights to dark except for center stage light on violins. Raise backdrop light on projection area to match level with rest of backdrop.

Gaze around in surprise and wonder—stand up
Casually look around then exit into audience.

Pedestrians start moving about as before. Leave stage at 15-30" intervals. Stage should be clear within 3’49’’.

Bring stage lights up to 3/4 strength.

Slowly dim backdrop lighting to dark.