



Notes: Einstein on the Beach

Author(s): Philip Glass

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NOTES ON

Einstein on the Beach

Philip Glass

PART ONE

The music for *Einstein on the Beach* was written in the spring, summer and fall of 1975. Bob Wilson and I worked directly from a series of his drawings which eventually formed the designs for the sets. Prior to that period, we had reached agreement on the general thematic content, the overall length, its divisions into 4 acts, 9 scenes and 5 connecting "knee plays." We also determined the makeup of the company—4 principal actors, 12 singers, doubling when possible as dancers and actors, a solo violinist, and the amplified ensemble of keyboards, winds and voices with which my music is usually associated.

The three main recurring visual themes of the opera (Train/Trial/Field with Spaceship) are linked to three main musical themes. The overall thematic divisions of the opera are as follows:

Knee Play 1 (Chorus and electric organ)

Act I

Scene 1 — Train (ensemble with solo voice and chorus joining at the end)

Scene 2 — Trial (chorus, violin, electric organ and flutes)

Knee Play 2 (Violin solo)

Act II

Scene 1 — Field with Spaceship (ensemble with solo voice/dancers)

Scene 2 — Night Train (4 voices, chorus and small ensemble)

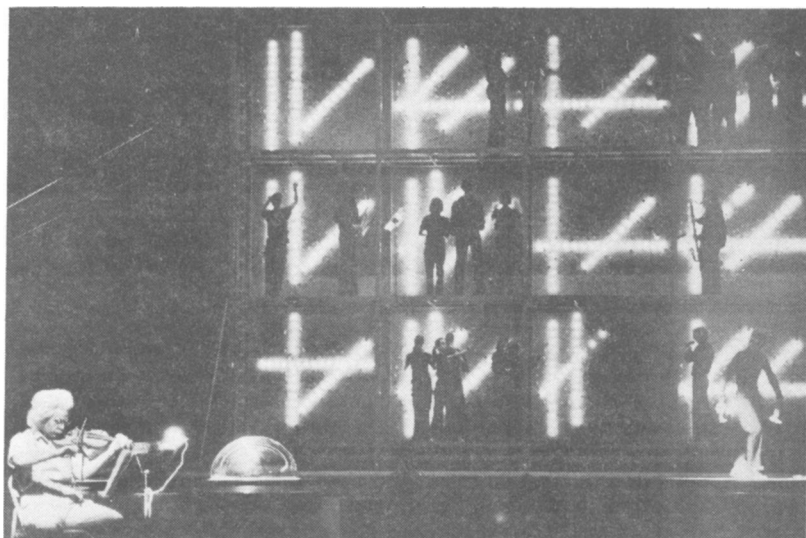
Knee Play 3 (Chorus *a cappella*)

Act III

Scene 1 — Trial/Prison (chorus and electric organ, ensemble at the end)

Scene 2 — Field with Spaceship (6 voices, violin, electric organ)

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SPACESHIP

Knee Play 4 (Chorus and Violin)

Act IV

Scene 1—Building/Train (chorus and ensemble)

Scene 2—Bed (solo electric organ and voice)

Scene 3—Spaceship (chorus and ensemble)

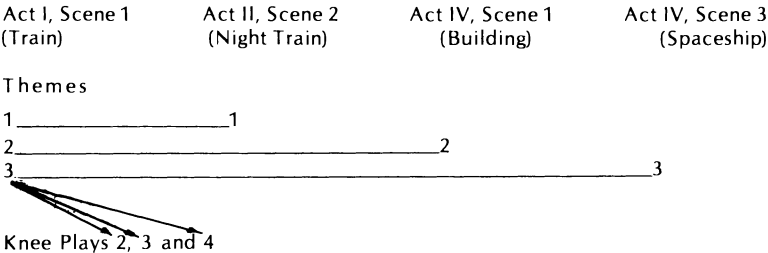
Knee Play 5 (Women's chorus, violin and electric organ)

The most important musical material appears in the knee plays and features the violin. Dramatically speaking, the violinist (dressed as Einstein, as are the performers on stage) appears as a soloist as well as a character in the opera. His playing position—midway between the orchestra and the stage performers—offers a clue to his role. He is seen, then, perhaps as Einstein himself, or simply as a witness to the stage events; but, in any case, as a musical touchstone to the work as a whole.

It might be useful to delineate some of the visual/musical transformation of the material which makes up the opera:

The image of the train appears three times—first in Act I, Scene 1, then in Act II, Scene 2 (as the Night Train), and finally in Act IV, Scene 1, where it appears in the same perspective as the Night Train, but this time transformed into a building. The music for the first train is in three parts, or “themes.” The first theme (based on the superimposition of two shifting rhythmic patterns, one changing and one fixed) makes up most of the music of this scene. The second appearance of the train image, the Night Train, is a reworking of the first theme, this time with a larger complement of voices. The music for the Building is a development of the second theme, recognizable by its highly accented rhythmic profile, in which the repeated figures form simple arithmetic progressions. The

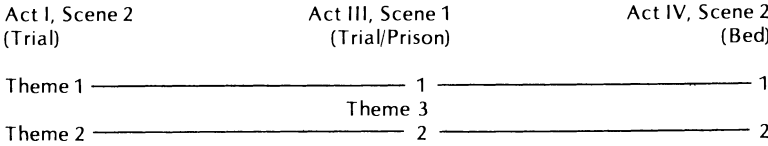
third theme is a rhythmic expansion of a traditional cadential formula. This “cadence” theme forms the principal material of the opera, being used for the 2nd, 3rd and 4th Knee Plays, as well as almost the entire music for Act IV, Scene 3, the Spaceship.



The second major visual image, the Trial, also appears three times in the opera—first in Act I, Scene 2, then in Act III, Scene 1 where, after the first few minutes, the stage divides, becoming half-trial/half-prison, and finally in Act IV, Scene 2, where the bed which has been in the center of the trial, and in half of the trial/prison, now occupies the entire stage. Here again the trial music is in three parts, or “themes.” After the opening of the first trial we hear the violin, accompanied by men’s voices, playing a simple, harmonically stable rhythmic pattern which, through an additive process, slowly expands and contracts. Later, the men’s voices join in, producing a somewhat thicker texture. Toward the end of this scene, during the judge’s speech, the second theme is heard, more chordal in nature, for solo electric organ.

The Trial/Prison begins musically in the same way as the first Trial. After the stage divides, the third theme is heard—numbers sung by the men and women in the jury box and lightly accompanied by harmonically shifting arpeggios on electric organ. Toward the end of the scene, the witness remaining alone on the stage speaks and, as the scenery is removed, the second (chordal) theme appears—this time in soprano saxophone and bass clarinet.

The Bed scene begins with a cadenza for electric organ. As the bed lifts to a vertical position and flies upwards, we hear the first theme again. Then, for the last time, the second (chordal) theme is heard, now accompanied by a solo singing voice.

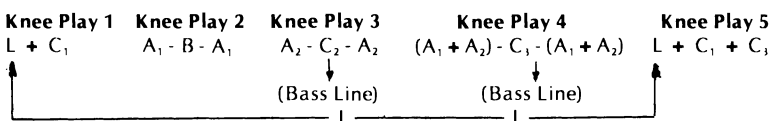


The first two appearances of the Field image are given over to dance and can be heard as similar reflections of the same musical material. For me they are two pillars equidistant from either end of the opera, sharing only superficial features with the musical content of the other scenes. During the first dance in Act II, Scene 1, a spaceship is seen in

the distance. In the second dance, Act III, Scene 2, the spaceship appears closer. The third appearance of the Field, Act IV, Scene 3, takes place inside the spaceship and, as indicated earlier, the music comes from the third theme of the train music.

The Knee Plays are the short connecting pieces which appear throughout the work much as prelude, interludes and postlude. Taken together, they form a play in themselves. They can also be seen as the seeds which flower and take form in the larger scenes. In the first four Knee Plays, two characters are seen in a room, sitting at two tables, then sitting side-by-side in two chairs, next standing together in front of a large control board and then lying on top of two large glass tables. In the final Knee Play, the last moment of the opera, they are seen sitting on a bench waiting for a bus.

The musical structure of the Knee Plays can be seen in the following diagram:



Johan Elbers

TRIAL

The 2nd, 3rd and 4th Knee Plays share the same form—first theme, second theme and return to first theme. The “cadence” theme of the first train (Act I, Scene 1) makes up the first theme in all of these Knee Plays, either expressed as violin arpeggios (A_1), in a chorale setting for voices (A_2), or, in the 4th Knee Play, as a combination of the two ($A_1 + A_2$). The middle theme (B) of the 2nd Knee Play, based on simple scale

passages, reappears during the second dance and in the middle section of the Spaceship music. The middle themes of the 3rd Knee Play (C_2) and the 4th Knee Play (C_3) are different arrangements of the same material, easily recognizable by its highly lyrical character.

The root movement (implied bass line) of this material is A-G-C. This becomes, in the pedal of an electric organ, the opening descending bass line (L) of the 1st Knee Play. After a very extended beginning, during which the audience enters, the first vocal setting (C_1) of these harmonies appears. The descending bass line (L) reappears for the 5th Knee Play, joined shortly thereafter by women's voices singing the vocal music of the 1st Knee Play (C_1), and then by the violin, playing the middle theme of the 4th Knee Play (C_3).

The vocal texts used throughout the opera are based on numbers and solfege ("do, re, mi . . .") syllables. When numbers are used, they represent the rhythmic structure of the music. When solfege is used, the syllables represent the pitch structure of the music. In either case, the text is not secondary or supplementary but is a description of the music itself. Besides seeming appropriate for the subject of "Einstein," Bob and I felt that a vocal text based on numbers would be easily understood by an international audience (*Einstein on the Beach* was premiered and toured widely in Europe before coming to the United States).

To conclude this part of the notes, one can say that, in a general way, the opera begins with a nineteenth-century train and ends with a twentieth-century spaceship. Events occur en route—trials, prison, dances—and throughout, the continuity of the Knee Plays. A number of principal characters appear and reappear in different combinations, often carrying with them an identifying gesture. The violinist, one of the Einsteins of the opera, remains (even during the final scene, the Spaceship, when the entire company is on stage) seated apart, a witness.

PART TWO

Einstein on the Beach is part of an ongoing musical project begun with "Another Look at Harmony" in the spring of 1975. This, in turn, is based on "Music in 12 Parts" (completed 1974) which developed a vocabulary of techniques (additive processes, cyclic structure and combinations of the two) to apply to problems of rhythmic structure. With "Another Look at Harmony," I have turned to problems of harmonic structure or, more accurately, structural harmony—a new solution to problems of harmonic usage, where the evolution of material can become the basis of an overall formal structure intrinsic to the music itself (and without the harmonic language giving up its moment-to-moment content and "flavor").

My main approach throughout *Einstein on the Beach* has been to link harmonic structure directly to rhythmic structure, using the latter as a base. In doing so, easily perceptible "root movement" (chords or "changes") was chosen in order that the clarity of this relationship could be easily heard. Melodic material is for the most part a function,

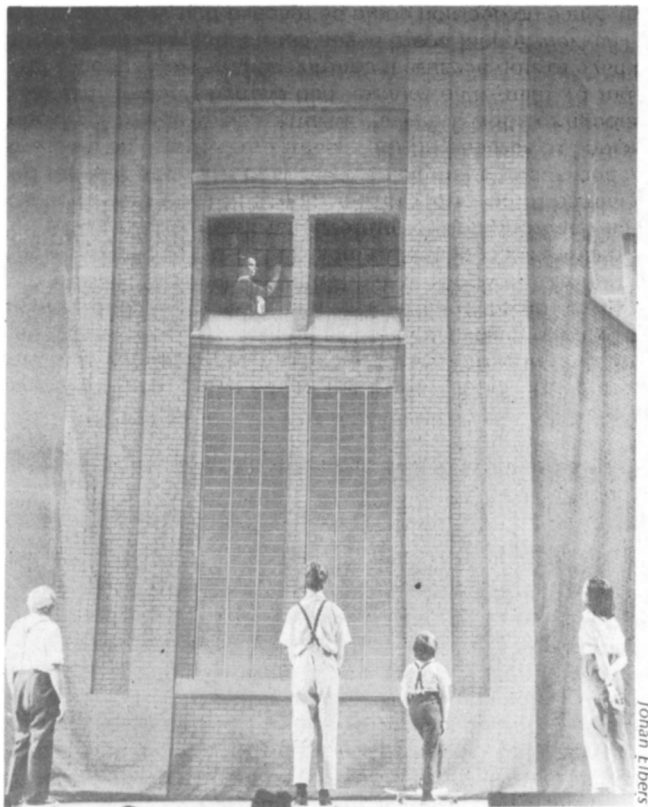
or result, of the harmony, as is true in earlier periods of Western music. However, it is clear that some of the priorities of Western music (harmony/melody first, then rhythm) have been reversed. Here we have rhythmic structure first, then harmony/melody. The result has been a reintegration of rhythm, harmony and melody into an idiom which is, hopefully, accessible to a general public, although, admittedly, somewhat unusual at first hearing.

Parts 1 and 2 of "Another Look at Harmony" became the basis of Act I, Scene 1 (Train) and Act II, Scene 1 (Field) of the opera and were the starting points from which additional material and devices were developed.

The musical material of the opera is made up of a series of 5 chords, 4 chords, 3 chords, 2 chords and 1 chord. Following is a brief description of each series and the techniques relevant to its use.

The most prominent "theme" of the opera is made from the following progression of 5 chords:

BUILDING



key of f
 f - D^b - B^{bb}
 (i) (VI) (IV^b)

A - B - E
 (IV) (V) (I)
 key of E

This combines both a familiar cadence and a modulation in one formula. What makes the formula distinctive and even useful is, of course, the way in which the IV^b (B^{bb}) becomes IV (A) of the new key, thereby making the phrase resolve a half-step lower. This, in turn, provides the leading tone for the original i (f). As it is a formula which invites repetition, it is particularly suited to my kind of musical thinking. It can be heard in the opera as the third theme of the Train music (Act I, Scene 1) with ensemble and chorus, then in arpeggio form as a violin solo in Knee Play 2, next in chorale form for chorus *a cappella* in Knee Play 3, then in both arpeggio form and chorale form in Knee Play 4, and finally combining all the previous arrangements in the Spaceship (Act IV, Scene 3).

The progression of 4 chords appears at the end of the Trial (Act I, Scene 2), Trial/Prison (Act III, Scene 1) and Bed (Act IV, Scene 2). It is a rhythmic expansion of the 4 chords:

f - E^b - C - D

As indicated, the f and C harmonies are "paired" rhythmically, as are the E^b and D harmonies. Beginning with a simple pattern of eighth notes,

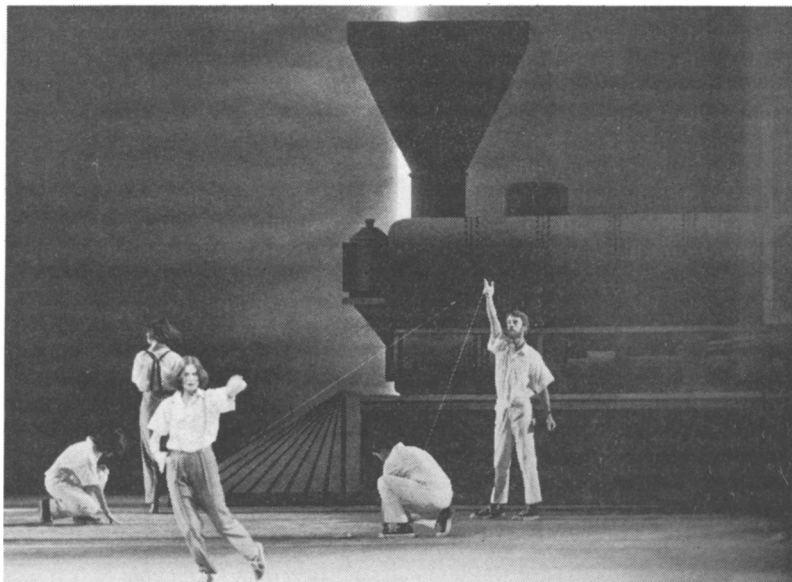
(f) (E^b) (C) (D)
 4 - 3 - 4 - 3,

the phrase gradually expands, each new phrase being played twice, until quite a long and elaborate final figure is produced. An example of the rhythmic/harmonic expansion in its early stage is as follows:

	(f)	(E ^b)	(C)	(D)
(1)	4	3	4	3
(2)	(4 + 3)	4	(4 + 3)	4
(3)	(4 + 3)	(4 + 3)	(4 + 3)	(4 + 3)
(4)	(4 + 3 + 2)	(4 + 3)	(4 + 3 + 2)	(4 + 3)

etc.

The material involving the series of 3 chords makes up the music of the two dance sections (Act II, Scene 1 and Act III, Scene 2). The procedure here is quite different, setting three key centers (A, e⁷ and B^b) "around" a central key of d. At the beginning, each of the key centers is associated with its own meter and all are played over a common rhythmic pattern of 6/8. (This, incidentally, creates a secondary polymetric "flavor" throughout the music.) The key of A appears in dotted quarters, e⁷ in eighth notes (a substitute key of C⁷ appears later) and B^b in half notes. After an excursion into one of these key centers the music returns, always, to the central key of d. As the music develops,



TRAIN

the key centers begin to exchange metrical character. Later, these form complex accumulations of meters in the same key before returning to the central key, d. This accumulative process continues until the original key/meter associations are lost in an overall texture of harmonies and meters.

The sequence of two chords is found in the Trial/Prison music. The two harmonies, a^7 and g^7 , are first heard as two alternating arpeggiated figures in 6/8 (played on electric organ with voices chanting numbers representing the rhythmic patterns). The music develops as each "half" of the figure undergoes a process of rhythmic fragmentation (wherein small increments of the original figure are added to itself). At first the process occurs equally in both halves (represented by the two harmonies) of the figure, thereby maintaining an exact overall symmetry. Gradually, the two halves begin to differ rhythmically, reaching a point where they are completely different and the figure is asymmetrical. At this point two successive asymmetrical figures in the music begin to act as mirror images of each other, thereby seeming to form one doubly-long symmetrical pattern.

The music based on one chord is first heard in the Trial (Act I, Scene 2). The violin, playing a figure in 7/8, outlines an a^7 harmony. A simple additive process begins as each successive figure adds a single eighth note, thereby changing its overall rhythmic character and causing the figure to gradually expand. The figure later contracts when the process is reversed, returning finally to its original form. The same process is heard later at the beginning of the Trial/Prison (Act III, Scene 1) and finally in the Bed (Act IV, Scene 2).

