Percussionist

An Official Publication of
PERCUSSIVE ARTS SOCIETY

VOLUME XII, NUMBER 3
SPRING, 1975

PERCUSSIVE ARTS SOCIETY
(PAS)

PURPOSE--To elevate the level of music percussion performance and teaching; to expand understanding of the needs and responsibilities of the percussion student, teacher, and performer; and to promote a greater communication between all areas of the percussion arts.

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In this issue

Editor's Note: This special issue has been compiled, prepared and totally edited by the Avant-Garde Committee.

Statement of Purpose of the Avant-Garde Committee of PAS

The primary purpose of the committee is to promote research and performance projects which are related to new percussion compositions and performance techniques. Specifically, we want both composers and performers to write about what they are doing and pursue their projects with knowledge and perhaps aid from other composers and performers.

The committee proposes to develop a reference library from material received from varied sources concerning new percussion compositions and performance techniques, and then function as a central source of information. With this material we hope to expand composer's and percussionist's understanding of existing concepts, and channel the potential of these concepts into new areas which have been, until now, unexplored.

To develop this reference library, we will:

1. Promote projects from composers and percussionists.
2. Promote an interaction between composers and percussionists.
3. Promote articles, lectures, demonstrations, performances, new compositions and recordings.
4. Develop means to locate materials for projects.
5. Protect the originators of projects; to insure that both proper credit is given to the correct persons and that the project is dealt with in the manner the persons desire.
6. Assist in developing controlled test situations for projects.

Following is an outline of areas which we are presently working on or would like to see developed. These are only suggestions; we are open to any projects as long ae they are related to new percussion composition or performance problems.

I. RESEARCH

A. **New Instrument Research** (Multiple-Percussion and individual instrument)
   1. Construction of new instruments.
   2. Sources for information and materials for construction of new instruments.
   3. Compositions which utilize new instruments (existing and potential pieces).
   4. New mallet types.
   5. New performance techniques.

B. **Research on Existing Instruments** (Multiple-Percussion and individual instruments)
1. Mechanical modification to expand timbral and technical capabilities.
2. Sources of information for construction or purchase of modifying devices.
3. Non-standard performance techniques to expand potential.
4. Electronic modification.
5. Improved multi-purpose and combination mallets.

II. INTERPRETATION AND PERFORMANCE

A. **Sources**
1. Composers.
2. Performers who have personal experience with the work.
3. Purchasing or constructing non-standard instruments; adequate substitutions.
4. Recordings, commercial and otherwise.

B. **Practical Problems**
1. Understanding notation and instructions.
2. Constructing the multiple-percussion instrument: more efficient distribution of components.
3. Special stands and racks for greater compactness.
4. Combination mallets.
5. Non-percussion performance; singing, acting, etc.
6. How to deal with difficult technical problems.

III. NOTATION

This is a vast area which will be taken up in detail in a future issue.

IV. INFORMATION FOR NON-PERCUSSIONIST COMPOSERS

We want to develop lines of communication which will aid composers in their understanding of percussion instruments, how to explore them and how to write for them. Details will be announced in a future issue.

All interested parties are requested to write either of us, at the addresses given below.

Submitted by:

Ron George
746 Stevens Ave.
Solana Beach, CA 92075

Dennis Kahle
18 Conrad
Bollingswood, N.J. 08108

SOME NEW SOUND-PRODUCING TECHNIQUES FOR IDIOPHONES
by Dennis E. Kahle

I have been interested for some time in manipulating cymbals and tam-tams in ways that tend to bring less conventional acoustical properties of these instruments to prominence. Some of these manipulations I "discovered" myself, only to find that a new work heard months later called for the same techniques. It was quite natural to assume that these techniques were more or less universally known. However, in conversations with other percussionists and composers, this was not necessarily the case: awareness was helter-skelter, to say the least.

Therefore, I would like to describe some of these techniques, with the following intentions:

(1) that at least PAS members and composer-friends of same may know of these techniques.

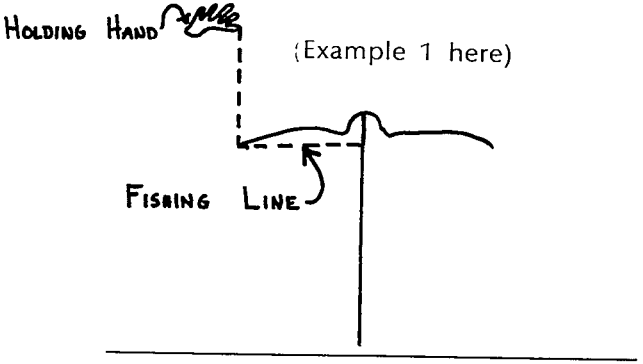
(2) that the concept of percussion instruments not being limited to conventional performance techniques may be illustrated.

(3) that the sounds resulting from the techniques be considered means, not ends.

CYMBALS

Certain generalizations will apply throughout this section: I prefer Zildjian cymbals (A & K), but have discovered that due to the resonant qualities of certain performing spaces, lesser-grade brands, such as Paiste can be used effectively. Also, since individual cymbals vary so greatly over the frequency spectrum, the suggested sizes and weights which follow should be considered merely as broad guidelines. Much experimentation is required to determine the best cymbal for a given technique in a given room.

Technique C1. Tie a piece of thin fishing line which has been well-rosined or beeswaxed to the support screw of a cymbal stand, and place on it a medium-sized (16") rather thin cymbal in the usual way. Hold the fishing line with one hand as in Example 1.



(Example 1 here)

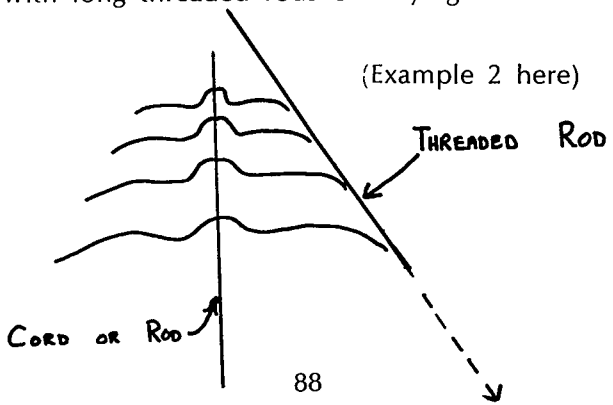
With the well-rosined thumb and index finger of the other hand, pinch the fishing line close to the cymbal and slowly glide toward the holding hand. When the proper pinch pressure is found, a sustained series of natural harmonies will be produced. This is a percussion version of the violin color which introduces the entrance of the Firebird in Stravinsky's *Le Oiseau de Feu.*

Technique C2. Bow the cymbal using either bass, cello or violin bows depending on size of cymbal, volume desired, or other factors. Upper partials will be most prominent, but changing bow pressure and/or speed will radically change the sound. Bowing is a very difficult technique which should not be discarded as soon as one is able to obtain the first sound. I recommend that a friendly string player be recruited for a couple of *ad hoc* lessons in order that a good basic technique can be mastered. At such time, the cymbal should be approached as a string instrument, e.g., changing "pitches" by placement of the fingers at different areas of the cymbal while bowing.

Technique C3. The pizzacato correlation to bowing is to strike the cymbal with soft or hard sticks in one hand and to use the other hand as described in Technique C2, above. This will produce short, pointed sounds which can be varied at will.

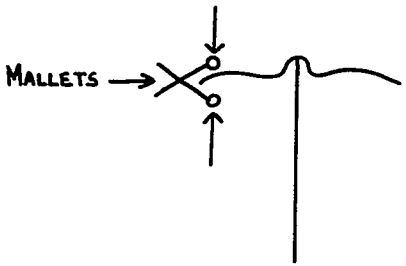
Technique C4. Cover the finger tips of both hands with various materials (thimbles, paper, rubber, mole-skin, etc.) and approach the instrument pianistically. The variations possible with this technique are limitless, but a few examples might provide a direction: cover fingers of one hand with rubber and roll at edge of cymbal as one would with the tabla. With the other hand, *a naturale*, strike variously with fingernail, knuckle, flat hand and/or heel of hand, or use the hand to damp the cymbal in varying degrees while still rolling. Also quite effective is scraping the fingernails across the ridges slowly or rapidly. Obviously, finger technique in general is quite subtle, and should be used only where the texture is sparse enough to allow maximum effect.

Technique C5. Construct a cymbal tree of several cymbals, the smallest on top, the largest on the bottom, and suspend it so that the top is slightly above eye level. Scrape down the edge of the tree per Example 2 with long threaded rods of varying diameters.



Technique C6. Pitch on a cymbal may be changed in another way: using the waist as a fulcrum, bend the cymbal with one hand and strike with the other using sticks or mallets. Bending the cymbal more or less will produce pitch variances; usually, the more bent (e.g., a "bowed" shape), the higher the pitch and vice-versa. Also effective is to roll with one hand while bending. A one-handed roll can be accomplished by several different means, but the easiest is illustrated in Example 3.

(Example 3 here)



Technique C7. To this writer, damping or muffling techniques have been seriously overlooked. There are fine gradations of sounds available depending on how and when the cymbal is damped, and the varieties are too numerous to list here. However, again merely to point a few directions, try damping in the following ways *while the cymbal is struck:* tightly pinched between thumb and all four fingers; as tightly pinched, but only between thumb and one finger; laying the flat hand lightly (or heavily) on top of the plate; damping with the cupped hand on the dome and slowly releasing it after the stroke.

TAM-TAMS

Techniques C2, C3, C4 and C7, above, are equally effective on tam-tams, Technique C2 perhaps more so. I have found that two techniques are more effective on tam-tams than on cymbals, and the general rule here is the bigger the tam-tam, the more audible the special sound.

Technique T1. This is a general technique which consists of striking or rubbing the tam-tam with things other than conventional tam-tam beaters. A partial list includes superballs, heat sinks, cowbells, triangles, all manner of wood sticks, cardboard boxes or tubes, strips of paper ("sizzle gong"), sheets of glass, blowtorches and human bodies. If some of the above objects seem ridiculous, the reader is urged to first try and then decide.

Technique T2. Suspend the tam-tam horizontally and contact mike in as many areas as necessary. Apply any or all of the "beaters" listed in Technique T1 and note the difference between acoustic and amplified sound. The greater sensitivity gained by use of amplification will probably warrant a lesser dynamic level *vis-a-vis* physical performance, but the performer will want to decide this for himself/herself. It should suffice to say that all sorts of found materials can be dropped and/or rolled on tam-tams suspended in this way. Of course, great varieties of electronic processing are also possible.

Now that the physical manipulations by which new sounds may be produced have been described, I would like to make the following pleas:

(1) That performers be aware that these sounds should be added to available resources, rather than pushed into a separate category. It is helpful to be able to produce a gliss on a cymbal (rather than a tympani), but it is ultimately the performer's musical sensitivity which will determine the most effective context for use of this technique.

(2) That composers assimilate these sounds and use them in a creative way. Percussion sonorities are no longer unique to most ears, and approaching them for purposes of mere novelty produces pieces which are nothing more than State of the Art sound effects catalogues.

Interested persons are urged to look at the May, 1974 *Instrumentalist* magazine, where I have described other effective means of sound-producing on cymbals and tam-tams. I am in the process of preparing a short tape of the above-described sounds, and would be happy to send copies to anyone for only blank tape and postage costs.

———————0———————

TUNABLE TUBE DRUMS
by Robert Erickson

In 1967 I was composing a work for singer and instruments for which I needed several sets of tuned drums. Nothing in the standard percussion arsenal seemed appropriate--either the drums were too loud, too bulky, too difficult to keep tuned, too expensive, or the sound was wrong. I wanted drum sounds that were rather dry, and with a fairly clear pitch. After some experimentation I found I could attach primitive drum heads to lengths of three inch and four inch diameters of ordinary plastic sewer pipe to make tunable tube drums.

These prototypes were utterly simple to build. I cut out the bottoms of tin cans for the drum heads and stuck them down with masking tape. I covered the metal of the tin can head completely with masking tape to damp out any metallic sounds. The sound was exactly what I needed for my composition, and the only drawback was that the drums were rather fragile. These first drums were lashed together with nylon cord. Urethane foam battens provided the shock mounting material. The circular design (see fig. 1) made for easy access to different pitches.

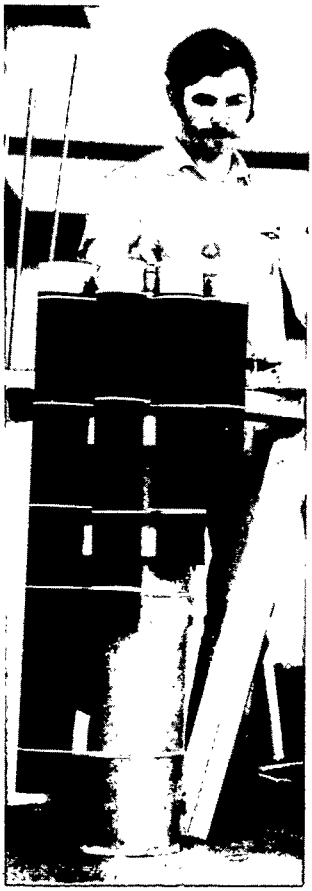


Figure 1
Original model of tube drums. Tubes are lashed to central core. Urethane foam is used for shock mounting.

During the summer of 1969 the drums were improved. Jack Logan invented a better head, consisting of a sandwich of brass and plastic, and Lester Weil developed a rack design with an ingenious shock mounting (fig. 2). These drums were used in classes and workshops at the University of California, San Diego, until we found, to our dismay, that even these sturdier improved drums were far too fragile for heavy student use.

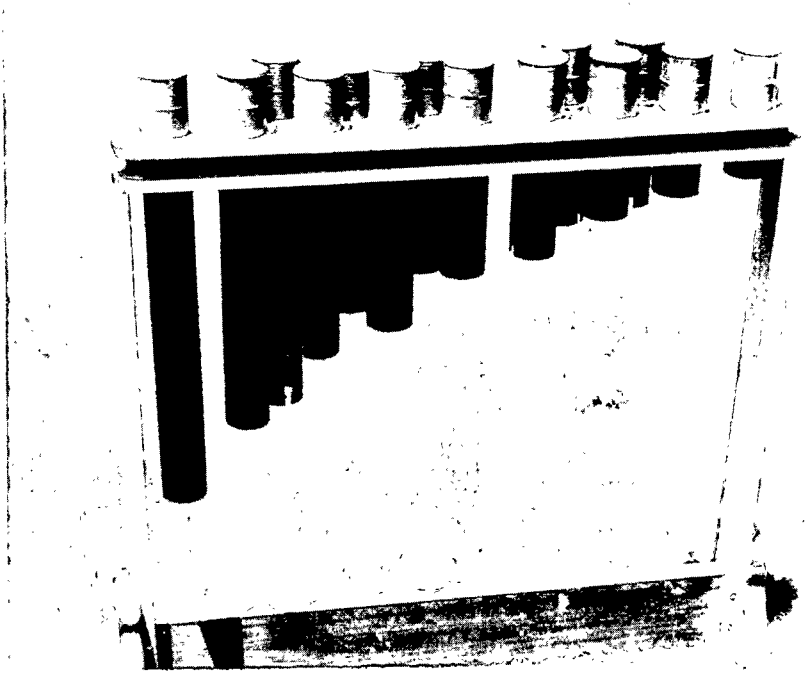


Figure 2
Three inch drums, improved heads, in a rack designed by Lester Weil.

I used these drums for some pieces designed to be played by advanced amateurs, in which I experimented with rhythmic cycles in asymmetrical polyphonic arrangements. I had long been interested in the notion of a polyphony of rhythm, and these little exercises gave me a chance to see if I could put my notions into practice (fig. 3).

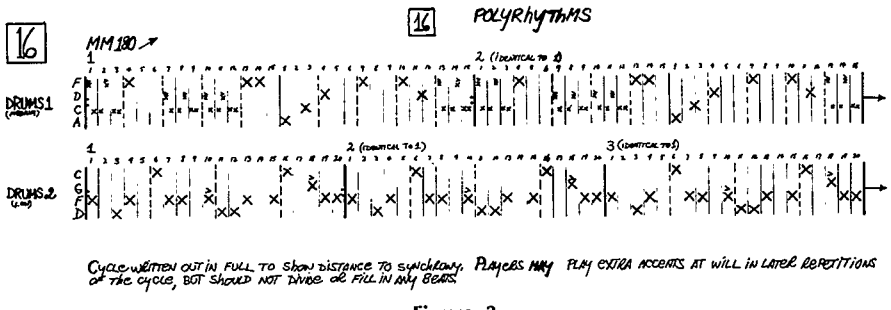


Figure 3

Cradle I and Cradle II developed these ideas about rhythmic cycles further. Cradle I calls for a group of from twelve to eighteen string and wind players, and three percussionists. It allows for considerable improvisation by the percussionists. Cradle II (fig. 4) uses four percussionists, two playing four inch drums and two playing six inch drums. There is less reliance upon improvisation from the percussionists, and an ensemble of winds and strings provides a background of slowly changing timbre. Both compositions use the principle of interlocking rhythm, familiar from the gamelan music of Bali (especially the reyong parts) and much of the drum ensemble and xylophone ensemble music of Africa. In Cradle II each player of a pair must not only project a rhythmic-melodic contour, but fit into the larger rhythmic-melodic organization produced by rhythmically interlocking with his partner. Further interlocking takes place between the two pairs to make the whole, which is fluid in its periodic organization because of the asymmetrical lengths of the rhythmic cycles in each part.

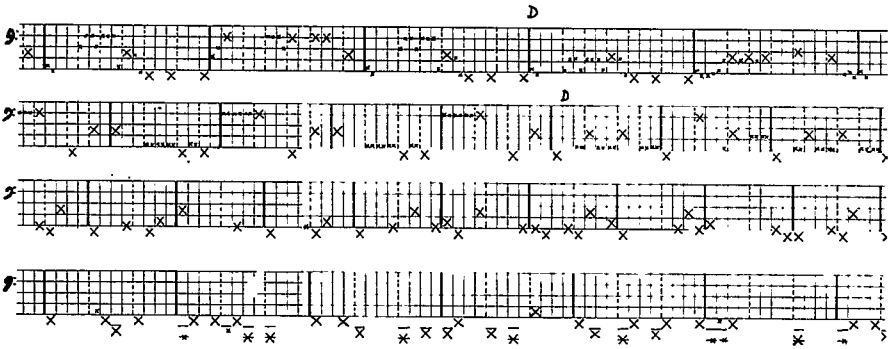


Figure 4

Section of score of drum parts for Cradle II. Heavy lines mark "measures"; dotted lines mark divisions. Large X may be thought of as a quarter note; small x as an eighth note; blank spaces are rests.

Just at the time when we had developed tube drums to the limits of home made technology I was lucky enough to meet two engineers who were interested in musical problems, Ed Hujsak and Ed Bach. They took on the task of designing drums with unbreakable plastic heads, improved tuning slots and better racks, and by 1972 they were marketing student-proof drums that served us well in our music workshops and student laboratory sessions (fig. 5). Hujsak and Bach incorporated under the name Plektron. Information about tube drums may be obtained from them at 8981 Complex Drive, San Diego, California, 92123. A range of over two octaves is available by using six inch and four inch drums. The highest pitch is around middle C, but the range may be extended upward a few notes with three inch drums.

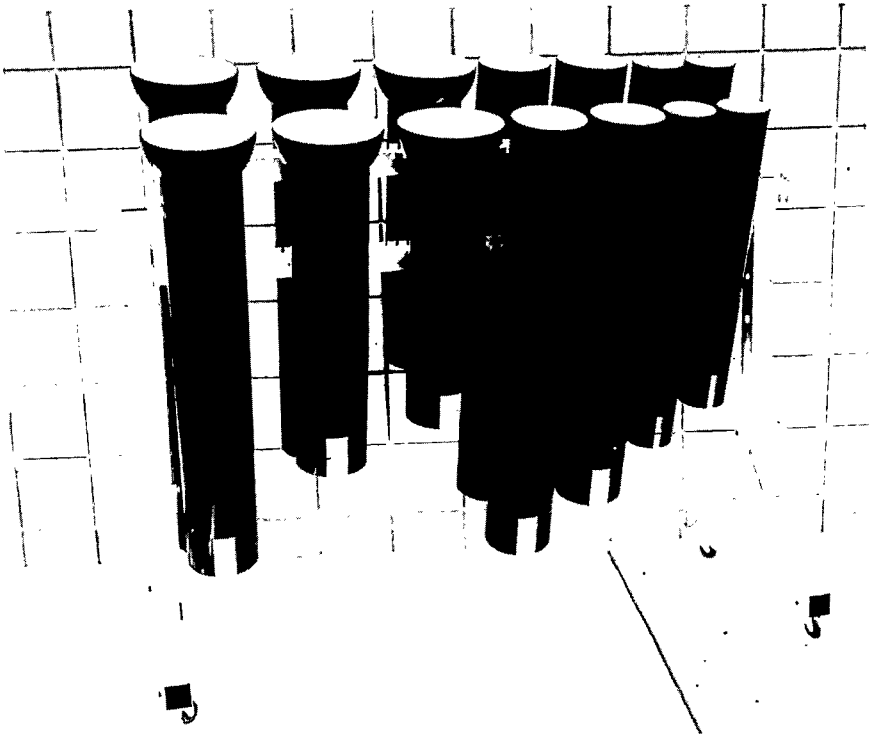


Figure 5
Improved tube drums with unbreakable plastic heads and metal rack, designed and built by Plektron.

Unbreakable plastic heads, while ideal for students, do not have as good a sound as my original tin can heads, and the most recent improvement in these drums, one that will make them fully acceptable to professional percussionists, is work we are doing now on a variable head tension mechanism for each drum (fig. 6). When the head tension can be matched to the tube resonance there is full control of the sound quality, and a new, felted plastic head material produces an excellent skin-like sound. Further improvements in tuning collars will make the drum sets easily adaptable to any conceivable tuning scheme.

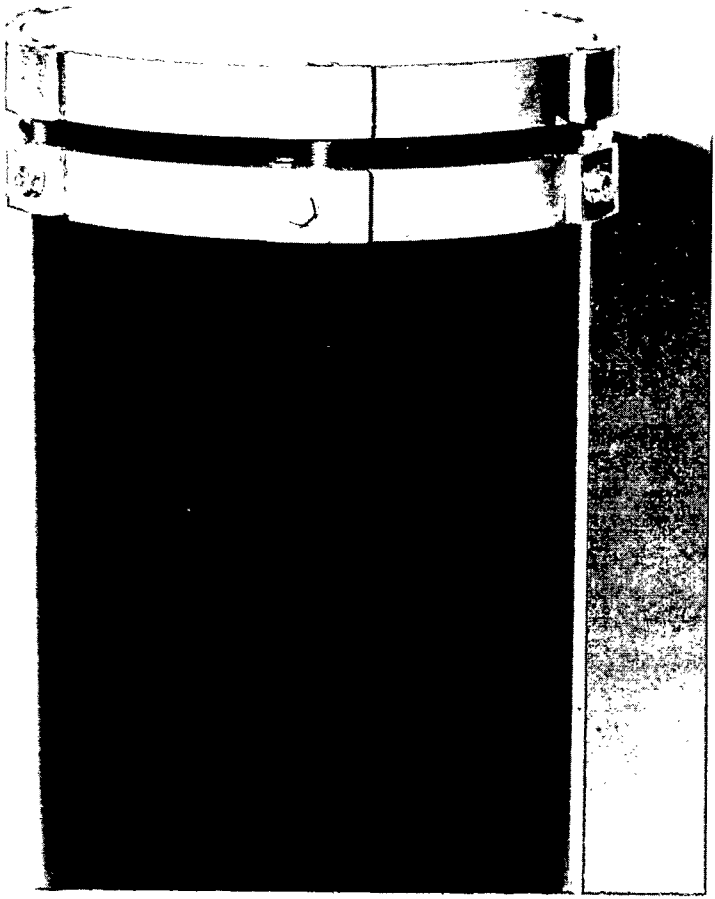


Figure 6
Experimental model of tensioning device for six inch drums, designed by Plektron.

Encinitas, Calif. April, 1975

Harold Budd --- Lirio (1971)

LIRIO (Spanish for "Lily") was composed in August '71 at Cafe El Polo Norte in Guadalajara while Eugene Bowen and I were having supper of Bohemia, Carne Asada . . . thunderclouds and conversation. Earlier in the afternoon, as Gene and I were being driven home from Lago Chapala, I experienced countless miles of devastatingly gorgeous, purple-red shimmers of lilies floating in the marshes up to the edge of the mountains. The mountains were cloud-encrusted; it was as if, at that moment, Quetzelcoatl himself had appeared.

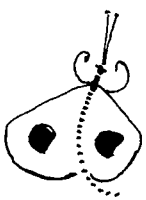
John Bergamo performed LIRIO for 45' on a Persian rug in a candlelit room on December 10, 1971. It was the second birthday of Terrence Budd and Mielle Tenney. Chateau Margaux was served; Serge Tcherepnin and Peter Garland proposed the toasts.

LIRIO

=

=

Under a blue light, roll very softly on a large gong for a long duration.

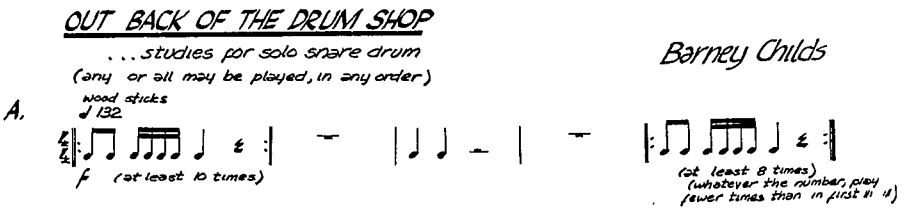


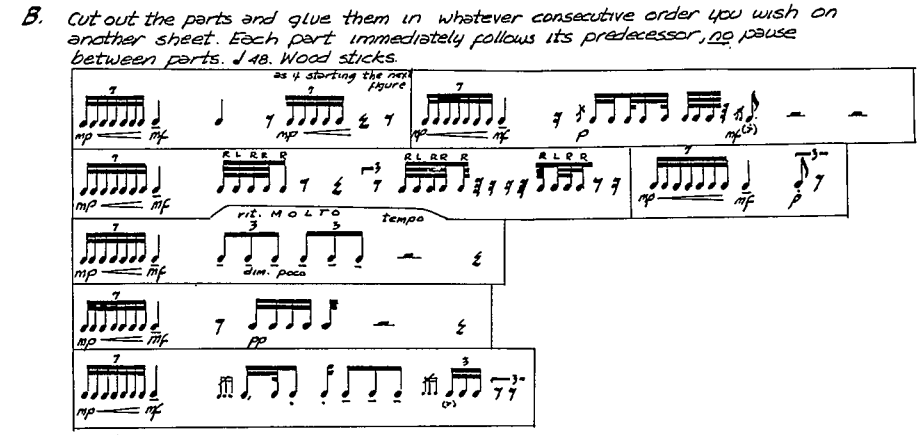
Henry Budd

Guadalajara : 24 : VIII : 71

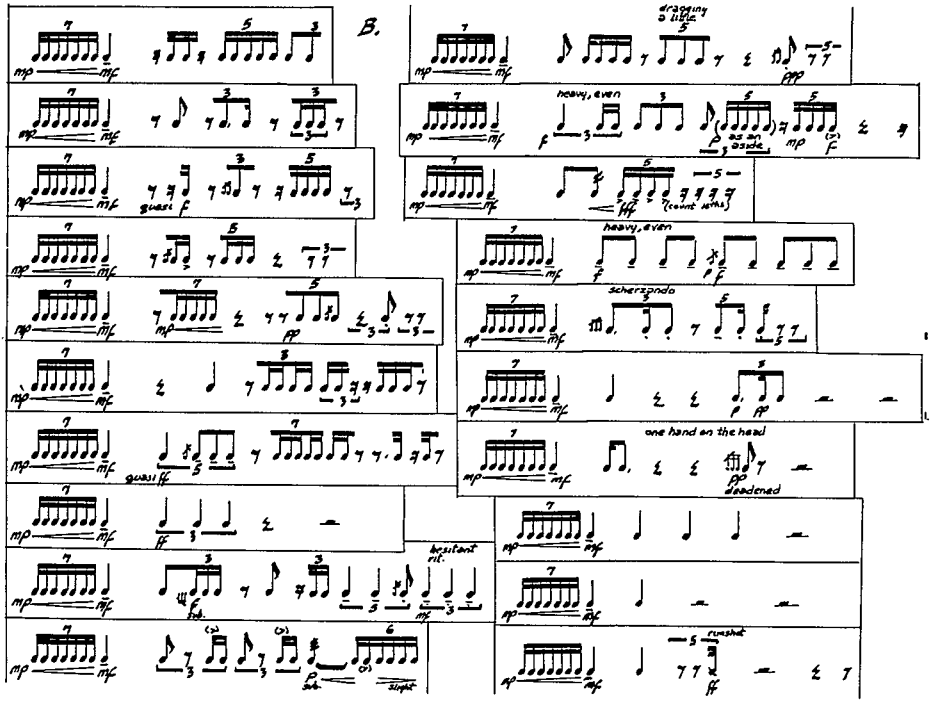
Barney Childs --- Out Back of the Drum Shop

OUT BACK OF THE DRUM SHOP is presently (1975) an in-process series of works for the solo snare drum, designed, as are those solo woodwind works in an extended earlier series, to work both as etudes and as performance pieces, in this case hopefully a pleasant change from rudimentary solos as well as exploring certain approaches to music which the student may encounter in examining immediately contemporary percussion literature. The series, inscribed to Tom Siwe (head of the percussion department at the University of Illinois and a friend of long standing), at present includes three pieces; eventually I hope to expand it to nine or ten or so. Each one emphasizes, as hopefully etudes should, particular features of technique as well as particular compositional concepts.

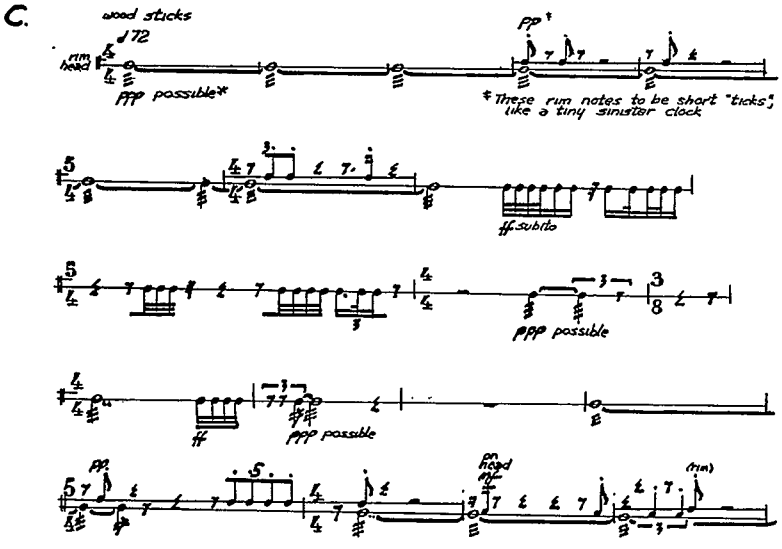




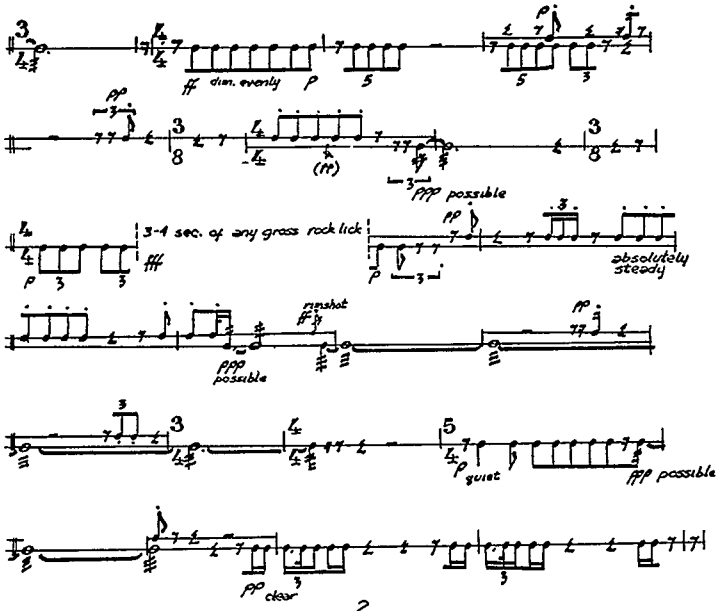
(Childs - p. 1)



(Childs - p. 2)

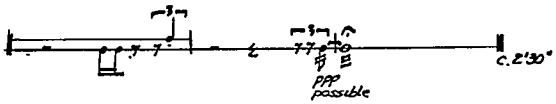


* "Like dog peeing on piece of paper"
Luciano Berio, Boulder Colorado March 1966 (Childs - p. 3)



(Childs - p. 4)

2.



3.

James Tenney --- Postal Pieces (1954-71)

Maximusic

Maximusic was conceived as a kind of collage, in which the abrupt temporal juxtaposition of the three segments was intended to transform the **dramatic** character of the second segment into a purely **formal** situation (i.e. non-dramatic/dramatic/non-dramatic - soft/loud/soft - slow/fast/slow, etc.). It was written for Max Neuhaus when he was still an active performer of solo percussion music. (6/16/65).

Scorecard No. 5: Maximusic

Postal Pieces 1954-71
James Tenney
School of Music
California Institute of the Arts

Produced by Marie McRoy at the California Institute of the Arts

Ron George
746 Stevens Ave.
Solana Beach, CA
92075

101

MAXIMUSIC

for Max Neuhaus

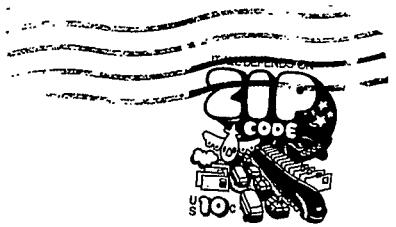
(1) Soft roll on large cymbal; constant, resonant, very long.
(2) Sudden loud, fast improvisation on all the other (percussion) instruments except the tam–tam(s)–especially (but not only) non-sustaining ones; constant texture; continue until nearly exhausted from the physical effort, but not as long as (1); end with tam–tam(s) (not used until now)–just one blow, as loud as possible.
(3) Same as (1), but now inaudible until all the other sounds have faded; continue ad lib but not as long as (1) or (2), then let the cymbal fade out by itself.

James Tenney
6/16/65

Having Never Written a Note For Percussion (8/ 6/ 71)

Having Never Written a Note For Percussion is one of my very most favorite pieces (though I often wonder who **really** wrote it). The title refers to the facts that (a) the only piece I had written for percussion before 1971 was **Maximusic** -- a simply **verbal** score, and that (b) only one "note" is necessary to "notate" this piece. It was originally intended for any percussion instrument on which a sustained roll with the indicated dynamic variation is possible, and was intended to be played for an indeterminate length of time ("very long"), but I have since come to feel that the piece works best using tam-tam, and that it should last something between ten end twenty minutes. (8/6/71).

Scorecard No. 10: Having Never Written a Note for Percussion



Ron George
746 Stevens Ave.
Solana Beach,
CA
92075

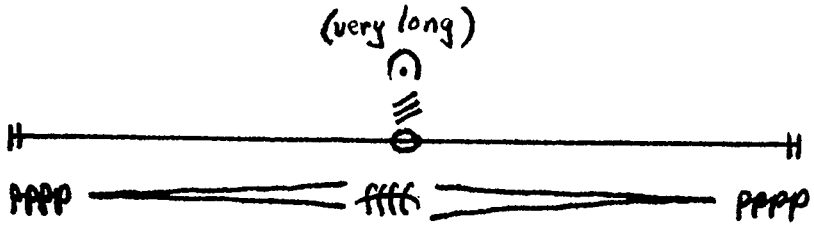
104

Produced at the California Institute of the Arts

Postal Pieces 1954-71
James Tenney
School of Music
California Institute of the Arts

HAVING NEVER WRITTEN A NOTE FOR PERCUSSION

for John Bergamo



James Tenney

8/6/71

For Percussion Perhaps, Or . . . .

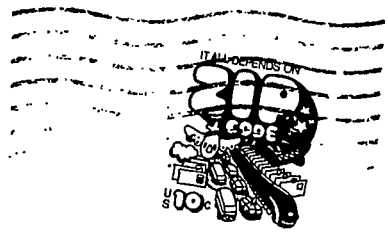
(night) is perhaps the most indeterminate piece I've ever written, and I think it best that it remain that way. (8/6/71).

Sincerely, James Tenney

Scorecard No. 3: (night)

Postal Pieces 1954-71
James Tenney
School of Music
California Institute of the Arts

Produced by Marie McRoy at the California Institute of the Arts



Ron George
746 Stevens Ave.
Solana Beach, Ca
92075

For Percussion Perhaps, Or . . . .

(night)

for Harold Budd

very soft

very long

nearly white

James Tenney
8/6/71

Pauline Oliveros --- Single Stroke Roll Meditation (1973)

The Single Stroke Roll Meditation is part of a series of work entitled Sonic Meditations (Available from Smith Publications, 106 E. Water St., Champaign-Urbana, Illinois). It may be performed by one or an ensemble of players. This meditation was composed originally for the Nexus ensemble of Toronto whose leader is Robin Engelman. There were six players. The first performance occurred at York University during the hexus festival July, 1973.

The meditation was inspired partly by my interest in the rudiment and partly as a reaction to the incredibly complex collection of instruments which hexus managed to amass on stage. The rudiment is foundational of course to good percussion playing. Cleanly executed it is a good sound. A continuing roll done by a single player on a carefully selected instrument, in a carefully selected place within a carefully selected space will begin to produce interesting changes in quality or timbre. Different partials will be amplified or cancelled by the feed back from the echoes of the space. With an ensemble the composite sound of different rates, intensities and qualities produce an overall subtly shifting sound, hypnotic in its effect.

At the time my instruction to hexus was "choose one instrument which you like. Perform a single stroke roll until "it rolls." There were many underlying assumptions. The single stroke roll would govern the piece. Roll until "it rolls" meant to continue until an involuntary feeling occurred or until the roll seemed to continue without the players volition. Since the Nexus ensemble was devoted to improvisation such characteristics as speed and dynamics were left to choice. The result of the performance was quire a beautiful texture with interesting qualitative shifts but I felt that my instructions were very incomplete and I had not satisfactorily transmitted instructions which would bring about an altered mode of consciousness. I needed a set of instructions which would prevent the player from the distraction or temptation of conscious changes in dynamics, rate and quality. After many different attempts the instructions have evolved to the following: Each percussionist chooses a single instrument to be played with hands or mallets. Each percussionist must first imagine the sound of his or her instrument: the rate, intensity and quality of the single stroke roll. The actual roll must begin involuntarily as a result of imagining it. Then, the task of the meditation is to keep the actual roll matching the original imaginary roll for the duration of the performance. It should continue for 30 minutes or more for maximum effect.

Physiologically a motor impulse occurs with an image. If the player successfully imagines the sound of his or her instrument and maintains the imagination of it, the motor impulse should eventually start the roll. If then the volition or consciousness is continually

focused on maintaining synchronization of the imagained and actual roll the only changes which may occur will be of an involuntary nature. The result is a very organic kind of subtle ebb and flow in all of the sounding characteristics. The players seem to lock into a kind of body rhythm less perceptible than motor rhythm and only audible through such a translation process. Auditors seem to feel this music as productive of relaxed awareness.

RESEARCH INTO NEW AREAS OF MULTIPLE-PERCUSSION PERFORMANCE AND COMPOSITION

INTRODUCTION

In an effort to expand the potentials of multiple-percussion performance and composition over the past several years, I have developed a new type of multiple-percussion instrument which I call the percussion console. The concept behind the multiple-percussion console is fundamentally different from that of the traditional multiple-percussion setup in that:

1. The instruments are mounted in racks and on heavy adjustable stands which enables the player to use not only the normal playing area but also the area directly in front of the player as well as the area directly above the head.
2. The individual instruments, when mounted in racks and on the heavy adjustable stands are extremely compact allowing the performer much more control over a large number of individual instruments than has previously been possible. As a result of this, new technical and timbral resources have opened up large new areas of multiple-percussion composition and performance.

The purpose of this article is to briefly examine the percussion console, how it is constructed and played. Due to the enormous scope and complexity of this subject, Part I of this article deals only with one possible type of percussion console. In Part II, I will briefly discuss expansions of this console and some unexplored areas inherent in them.

PART I

A GENERAL ANALYSIS OF ONE TYPE OF PERCUSSION CONSOLE

The fundamental concept behind the percussion console, as was stated in the introduction, is to create a multiple-percussion instrument which utilizes all the space that is around the performer. This is accomplished by using 1) specially constructed racks and 2) heavy adjustable stands for mallet instruments. These racks and stands make possible very compact arrangements (groups) of individual instruments. These compact groups of individual instruments are arranged spatially around the performer and are formed into percussion keyboards. These keyboards and their spatial arrangement within the console is the heart of this instrument. Before discussing these keyboards in detail I will

give a brief overall description of the process of building a multiple-percussion console. To do this I will use Netty Simons' PUDDINTAME* as an example.

OVERALL CONSTRUCTION OF THE CONSOLE

The first step in the process of constructing a console is to do a detailed study of the score. Since the score to PUDDINTAME did not specify what individual percussion instruments were to be used I decided it could best be realized by using many varied individual instruments so that I would have a good variety of timbres and sound effects to work with. I selected the following instruments:

Tom-toms (4), snare drum, cowbells (2), temple blocks (3), wood blocks (2), triangles (2), antique cymbals (3), marimba, vibraphone, suspended cymbals (2), orchestra bells, bamboo wind chimes, pipe, chime notes (3), ratchet, flower pots (2), glass gongs (4), chimes, gong, maraca, flexatone, whip, auto horn, sirens (several), and boat whistle.

Next I arranged these instruments into timbral areas or groups:

Group I	Group II
marimba, vibraphone orchestra bells	tom-toms, snare drum, temple blocks, cowbells, triangle, suspended cymbal
Group III	**Group IV**
pipe, chime notes, ratchet, bamboo wind chimes, flower pots, glass gongs	whip, auto horn, sirens, Chinese gong, maraca, flexatone, boat whistle

With these groups there are three different timbral areas (Groups I, II, and III) and a miscellaneous group of sound effects (Group IV).

The third step was to combine these groups (excepting Group IV) into keyboards. A lower keyboard was formed by arranging the instruments of Group I in a tiered fashion (marimba and orchestra bells over the vibraphone). Group II was mounted in a rack, forming rows of individual instruments, and Group III was hung from the racks forming a bank of individual instruments. Although Groups II and III are separate keyboards, they combine to function as one large keyboard. Figure 1 shows the console for PUDDINTAME with two (upper and lower) large keyboards.

*Available from Merion Music/Theodore Presser Co.; recorded by Ron George and Jean-Charles François for CRI.

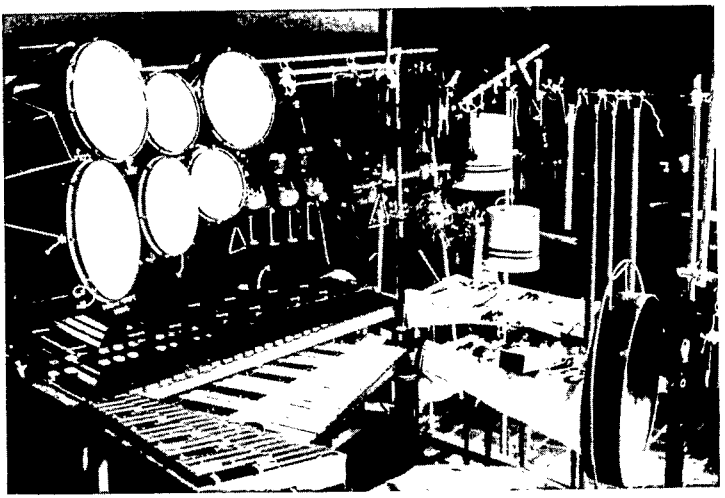


FIG. 1

Keyboard Placement Within the Console

In the complete console there may be from one to as many as five separate keyboards. Since there are clearly defined horizontal areas where the keyboards are located, their arrangement within the console is not difficult. These horizontal areas are layered from the floor to as high as the performer can reach as well as directly overhead (F.2):

Area I: Pedal keyboard

Area II: Flat level (normal playing area)

Area III: First elevated area

Area IV: Second elevated area

Area V: Third elevated area

An alignment on a vertical plane results from the alignment of two or more horizontal keyboards. It may be helpful to imagine this alignment as a hemisphere which extends in all directions (Area I is a special area for a pedal keyboard and is not part of this hemisphere) thus enabling keyboards to be extended to the right and left sides of the performer as well as being placed directly overhead (F.3).

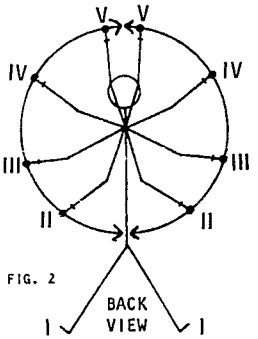


FIG. 2

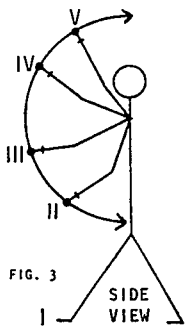


FIG. 3

Generally, in the complete console, the horizontal areas combine resulting in larger keyboards. Although Areas II, III, and IV are used in PUDDINTAME, the console contains only two keyboards. Areas II and III combine to form one large keyboard and Area IV is a separate keyboard.

Figures 4 and 5 are two views of another complete console which employs the hemispheric concept.

In this console, Areas II (vibraphone) and III (marimba) combine to form one large keyboard within which the vibraphone and marimba are separate smaller keyboards. In addition to being two separate smaller keyboards the gongs, orchestra bells, and chimes (Area IV) and glass bowl gongs (Area V) combine to form a second large keyboard. Again, as with PUDDINTAME, we have a console containing only two keyboards (upper and lower).

Keyboards: Types of Keyboard and Individual Instrument Placement

The three basic types of keyboards which may be formed are:

1. Keyboard of mallet instruments
2. Keyboard of smaller percussion instruments
3. Keyboard formed from a combination of 1 and 2

1. The keyboard of mallet instruments is the easiest of the three to construct. If we are using a vibraphone and marimba, each instrument is considered to be an already existing separate group with its sequential patterns (ascending and descending chromatic scales). All that needs to be done is to place one mallet instrument above another. This keyboard is usually placed in, but is not limited to Areas II and III (F.6).

2. Constructing the keyboard of smaller percussion instruments presents two basic problems: 1) finding the optimum position (placement) for the individual instruments so that sequential patterns can be formed, and 2) mounting these instruments in the desired position.

Placement of the individual instruments within the keyboards is the most complicated and difficult aspect of working with (learning how to construct and play the console) and writing for such an instrument. There are no clear answers or exact formulas to solving this problem but only probable methods of approach. Like any multiple-percussion instrument, traditional type or percussion console, the placement of the individual instruments within the total instrument is a process of solving various artistic and logistic problems and depends entirely upon the type of instrument being built and how it is to be used.

Mounting an individual instrument or a group of instruments and arranging these instruments within the keyboard to form various

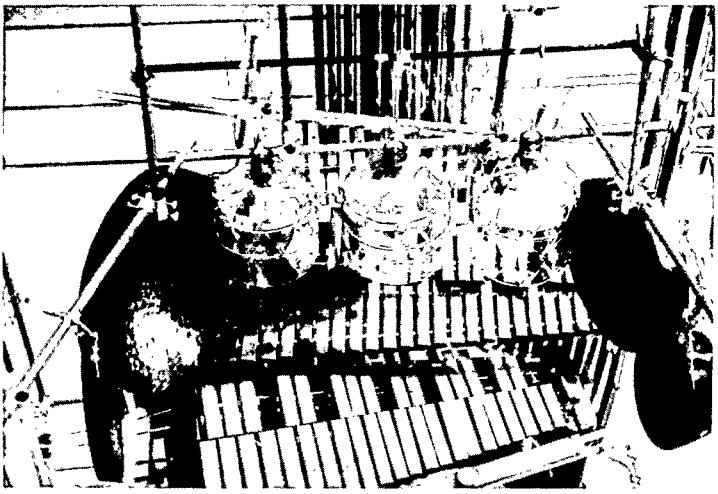


FIG. 4

Figs. 4 and 5. Joe Julian's WINDOWS AND CLOUDS published by See-Saw Music

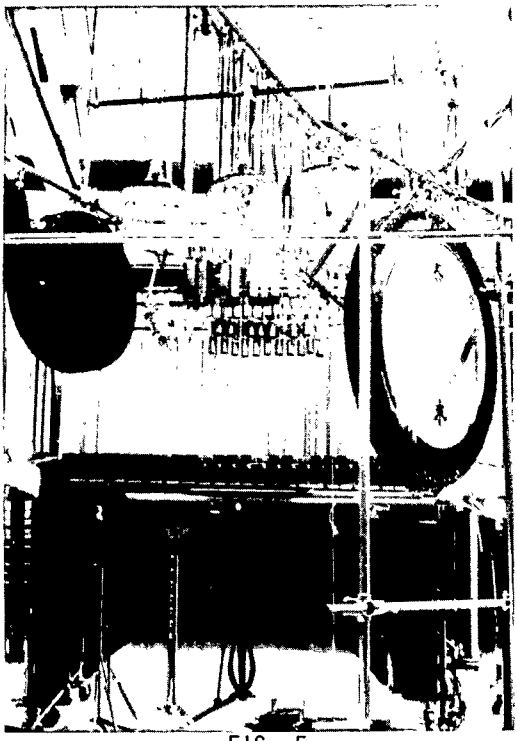


FIG. 5

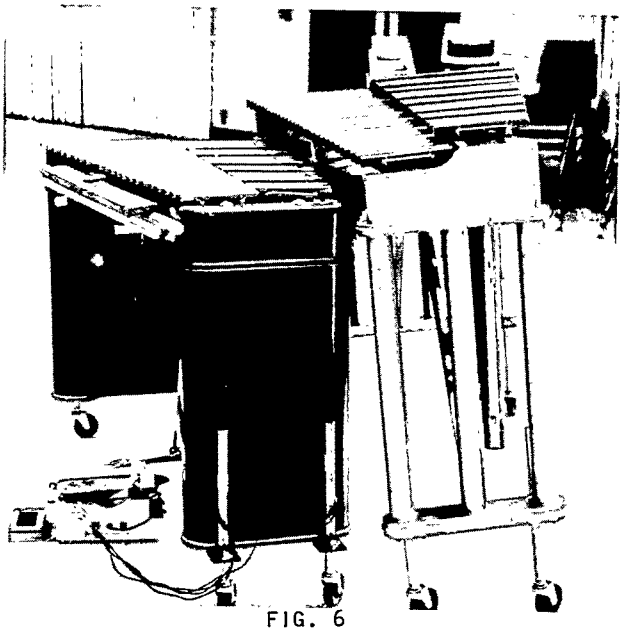


FIG. 6

patterns is one combined process. As one experiments with instrument placement one also experiments with various methods of mounting these instruments. For clarity I will separate these two processes. Mounting will be discussed in the next section. All that is of concern now is the fact that any individual percussion instrument can be mounted in any area or position desired.

The upper keyboard from the console built for my A BALLAD FOR NOTHING is an example of a keyboard of smaller percussion instruments. The individual instruments used in this keyboard are:

Tom-toms (5), snare drum, temple blocks (2),
wood blocks (2), cow bells (2), cymbals (2),
tam-tams (2), castanets (pair), sizzle cymbal

To form this large group of instruments into one unified keyboard it is necessary to:

1. Arrange the instruments into small groups
2. Form sequential patterns with the individual instruments within the small groups. These individual instruments become the "notes" of that particular group.
3. Combine these small groups into one unified keyboard

These three steps can be separate but usually are one combined process. I will separate the processes here though for clarity.

Arranging the instruments into small groups is primarily a matter of discovering, either through the compositional process or from study of a score by the performer, what grouping will best enable the work to be properly realized. Sometimes the groupings are selected for technical reasons by the performer and at other times for compositional needs (i.e., timbre groupings, etc.) by the composer. I selected the following groupings to satisfy both requirements.

Group I	Group II	Group III
Tom-toms (5)	Temple blocks (2)	Cymbals (2)
Snare drum	Wood blocks (2)	Sizzle cymbal
	Cowbells (2)	Tam-tams (2)
	Castanets (pair)	

Still keeping technical and compositional needs in mind I organized the instruments of each group into a sequential pattern so that:

Group I - Forms a horizontal series and has an ascending pitch scale from left to right

Group II - Forms a vertical series and has an ascending pitch scale from bottom to top

Group III - Forms a vertical series and has a descending scale from bottom to top

Figure 7 shows these three groupings within the total keyboard.

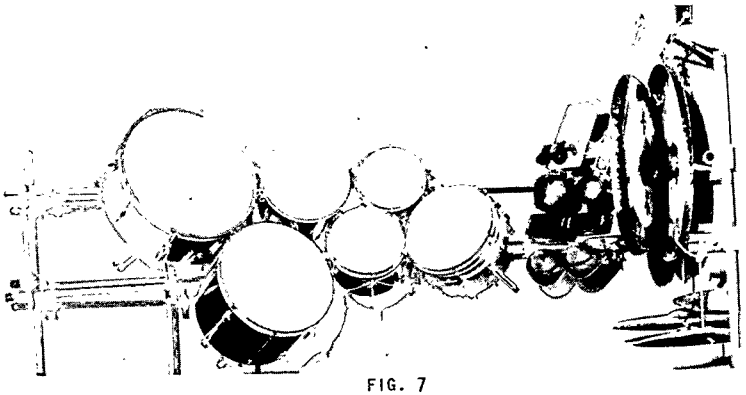


FIG. 7

Organizing the individual instruments within the small groups into sequential patterns and combining these small groups into a unified keyboard takes much study and planning. Even after the keyboard has been completed it will undergo many changes as better positions for instruments are discovered during either practice and study or the compositional process.

3. The third type of keyboard is constructed by combining mallet instruments with smaller instruments, following the same processes as before. Figure 8 is an example of such a keyboard built for Lucas Foss' ECHOI.

In this console the individual instruments are arranged in Areas II and III and combine to form a unified keyboard. There are individual instruments mounted in Area V but this is limited and does not form a keyboard. In this console the individual instruments are arranged as follows:

Group I: Vibraphone - Ascending chromatic scale from left to right

Group II: Skins (5), cowbells (2), tam-tam - The skins and cowbells form an ascending scale from left to right. The tam-tam is not part of this scale but is placed as part of this group for technical reasons.

Group III: Temple blocks (2), wood blocks (2), clave, pipes (3), triangle with attached beater - The temple blocks, wood blocks, and clave form an ascending scale from left to right. The pipes and triangle are mounted above the wood blocks and clave for technical reasons and have their own ascending scale from left to right.

Group IV: Bamboo wind chimes, cymbals (2), sizzle cymbal, antique cymbal - These do not form a keyboard.

Group V: Timpani, chimes - These do not form a keyboard.

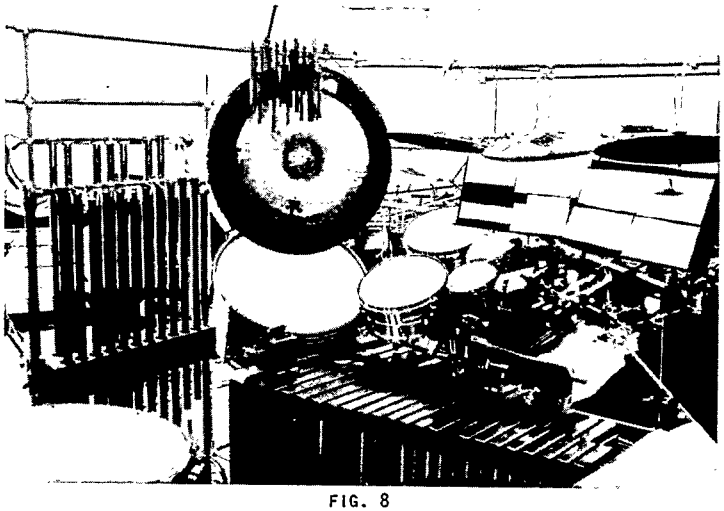


FIG. 8

CONSTRUCTING RACKS AND STANDS TO HOUSE THE CONSOLE

A rack is defined by Webster's New Collegiate Dictionary as "a framework, stand or grating, on or in which articles are placed." In the case of percussion racks the articles are percussion instruments. With the use of racks any individual percussion instrument or keyboard can be placed in any area or position desired. The materials used for these racks are:

1. 3/4" Steel Galvanized or Aluminum Pipe
Steel galvanized pipe, although much heavier than the aluminum pipe, is the most useful because of its strength. Aluminum pipe is used only where not much strength is needed.

2. Structural Fitting (Rack Master, Nu-Rail, or Speed Rail*)
No. 10 cross and No. 30B swivel are the most useful although at times others are helpful. The structural fitting used depends entirely on the type of instrument being built.

3. Laboratory Clamps (Swivel and Regular**)

The rack has three basic sections: 1) outer frames, 2) inner frame or mounting support rod(s), and 3) instrument mounts. These sections must have various adjustments in order to allow the individual instruments and keyboards to be mounted at the proper height and angle. They must have depth (adjustment toward and away from the performer), hori-

zontal, vertical, and angle adjustments. Not all of the sections of the rack require all of these adjustment potentials but at least one or two are usually necessary and at times all four are needed. With such adjustments any individual instrument or keyboard can be mounted at any angle or position desired.

Outer Frames

There are two outer frames supporting the entire structure. They are located at each end of the rack and consist of four separate parts:

1. A base (two horizontal pipes with a wheel at each end) connected by a vertical pipe. The four wheels make it very sturdy since there are no supports in the center of the rack (F.9).

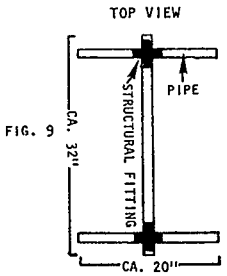


FIG. 9

2. Two outer support rods connected vertically to the base. The support rods can be of any height but I prefer approx. 78" (F.10).

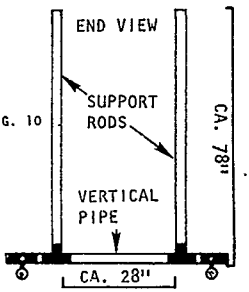


FIG. 10

3. Two adjustable cross pipes connected to the outer support rods. The adjustable cross pipes have vertical and angle adjustment. Two are used to give the inner structure strength (F.11).

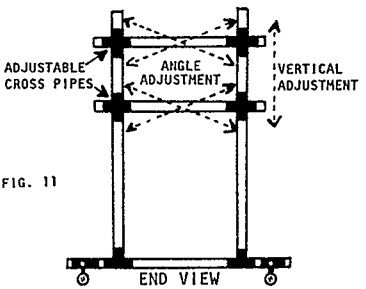
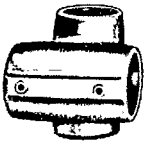


FIG. 11

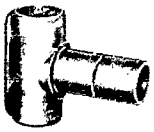
Angle adjustments are accomplished by combining a "cross"- with "swivel"-type structural fitting to produce an "adjustable" - type structural fitting (F.12a,b,c).

*Holander Mfg. Co., Cincinnati, Ohio
**Obtainable from any laboratory supply house.

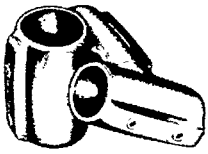
FIG. 12



a NO. 10 CROSS



b NO. 30-B SWIVEL



c NO. 30 ADJUSTABLE CROSS

4. Inner frame support rod connected to the adjustable cross pipes. The inner frame support rod has depth, vertical, and angle adjustment (F.13).

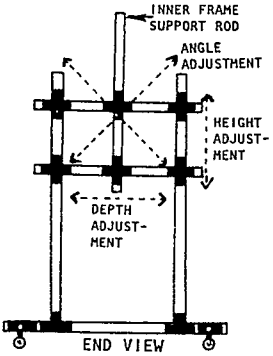


FIG. 13

Inner Frame or Mounting Support Rod(s)

The inner frame, where instruments are mounted, consists simply of one or two instrument mounting rods which are connected to the inner frame support rod. The inner frame has angle and vertical adjustment. Any length of mounting support rod can be used. The longest I have used is approx. 10' (Fs.14 & 15).

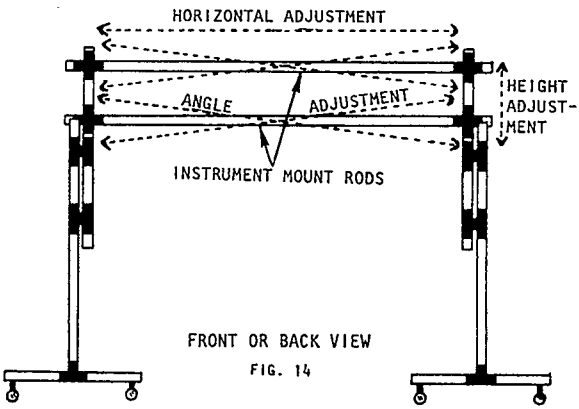


FIG. 14

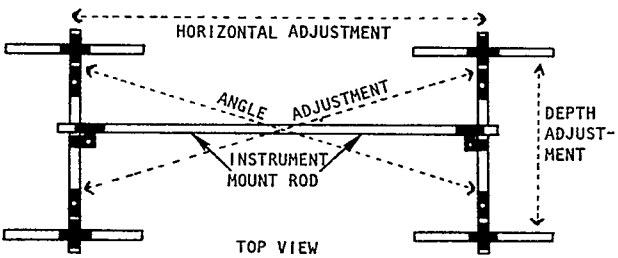


FIG. 15

Instrument Mounts

The equipment and method used to mount an instrument to the inner support rod varies greatly according to the type of individual instrument or keyboard being mounted and the type of console being built. Some methods which I have used are:

1. Structural fittings and aluminum pipe connected to the instrument
2. Chemical clamps and aluminum pipe or steel rod connected to the instrument
3. Rope for hanging and tying instruments to various instrument mounts
5. Combinations of the above

Rope and springs are very useful for some individual instruments since they allow the instrument to ring freely and prevent the impact sound from carrying into the rack. Usually impact sound is not a problem but on the occasions when it is, the structural fittings and chemical clamps must be insulated with rubber or thick felt.

Figures 16 through 19 show some rack construction and instrument mounts I have used.

The basic rack design I have described can easily be extended out to the side to allow the mounting of instruments on the left or right sides of the player or extended upward to allow larger instruments to be mounted. See Figs. 4, 7, and 20 for side expansion and Figs. 5, 17, 19, and 21 for upward expansion.

The preceeding is only a very basic description of rack construction. The actual building of the rack depends entirely upon the type of console being built.

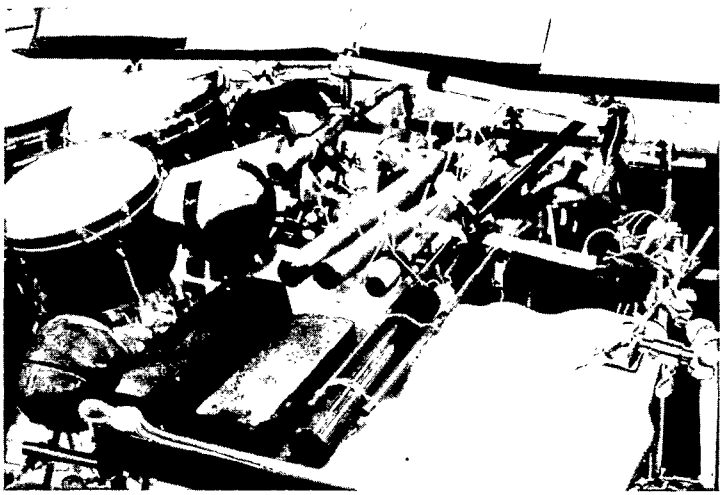


FIG. 16

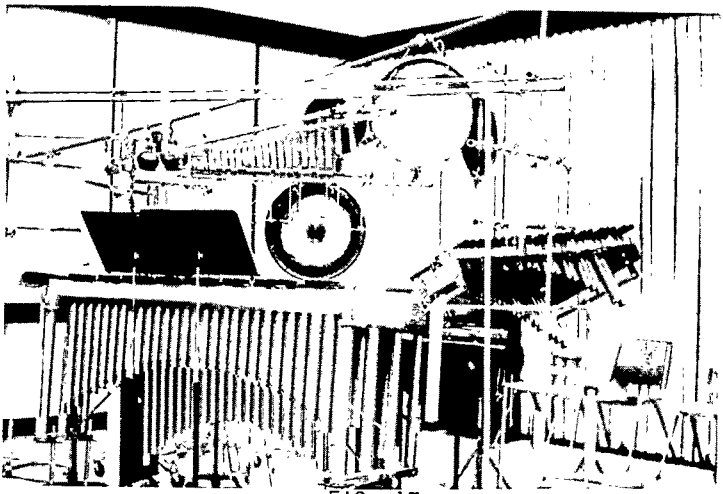


FIG. 17

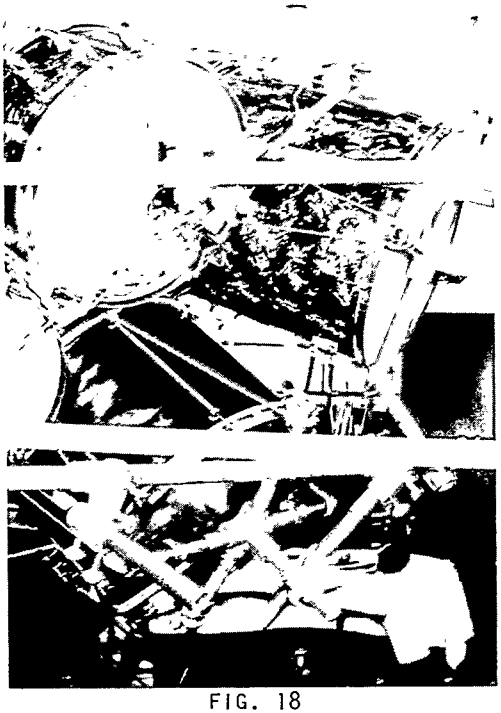


FIG. 18

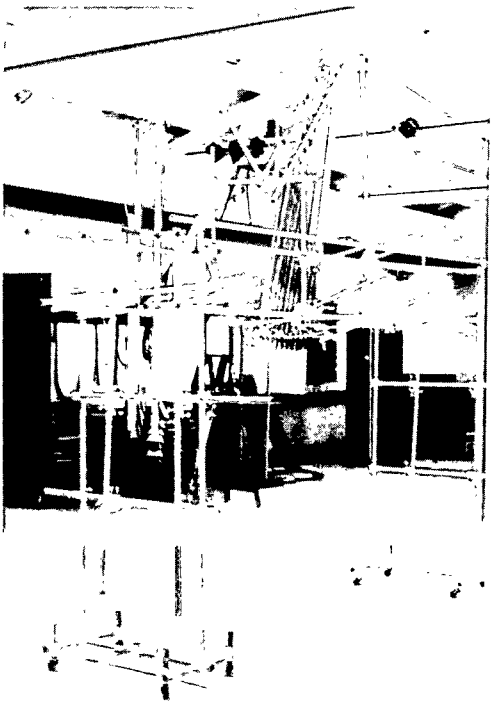


FIG. 19

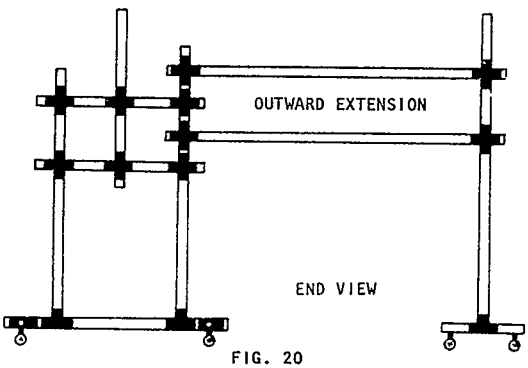


FIG. 20

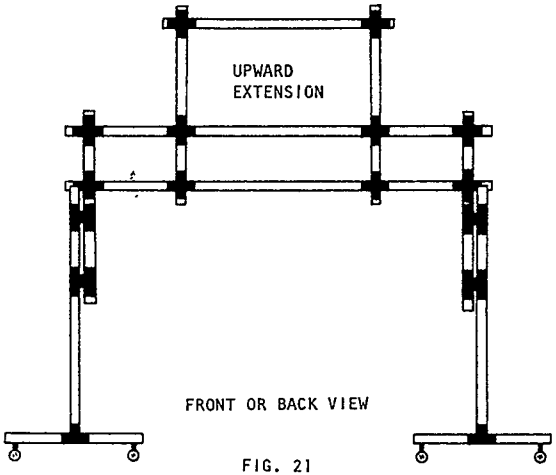


FIG. 21

Heavy Stands for Mallet Instruments

Heavy adjustable stands for mallet instruments are of two types:

1. Adjustable Legs - With this type, one can tilt the instrument only slightly because the instrument becomes unbalanced and will fall. See Fig. 6 for an example of this type.

2. Adjustable and Tiltable Stand - This stand allows the instrument to be raised higher and tilted at more of an angle which makes it definitely superior to the first type. This type can be constructed from structural fittings but the type* shown in Fig. 22 is simpler and more efficient.

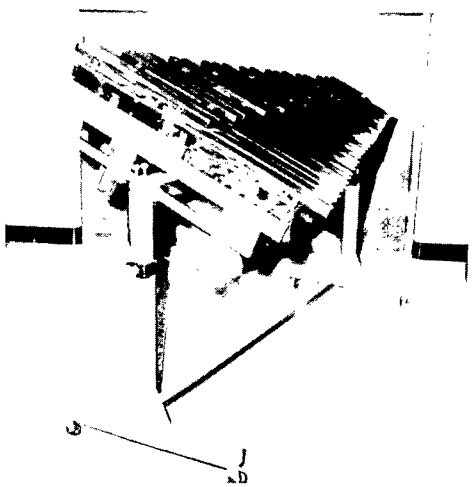


FIG. 22

*Stand designed and built by Plektron Industries, San Diego, CA.

PLAYING THE CONSOLE - AREAS OF ARM MOTION

When playing the console the areas of arm motion of the performer correspond directly to the horizontal and vertical alignment of the keyboards and are the primary motion to be considered when playing this type of console. There is very little body motion involved in playing in or between the four horizontal areas and the wrist motions remain the same regardless of the area being used. The following is an analysis of the arm motions employed in Areas II through V:

AREA II

Played essentially with a horizontal* arm motion. There is some vertical** motion involved but this is limited. The arms remain at all times in a horizontal position which corresponds directly to the horizontal position of this keyboard (F.23).

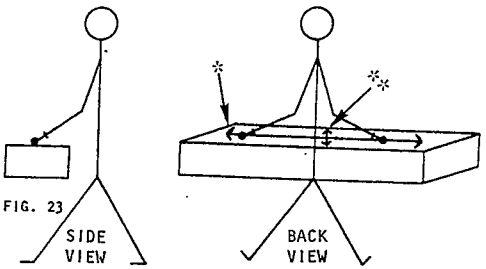


FIG. 23

AREAS III-IV

The arms are slightly raised. There is the same horizontal* motion involved in playing in these areas as in Area II however a vertical** motion is introduced when playing from one area to another (Fs.24 & 25).

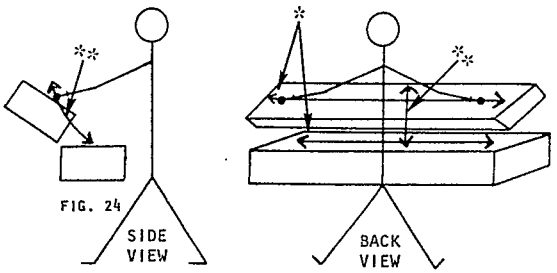


FIG. 24

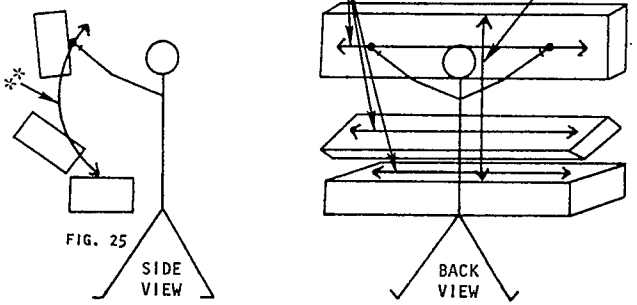


FIG. 25

AREA V

This area is played in one of two ways depending upon the type of individual percussion instruments mounted in that area.

A. The same techniques apply as in Areas II through IV (F.26).

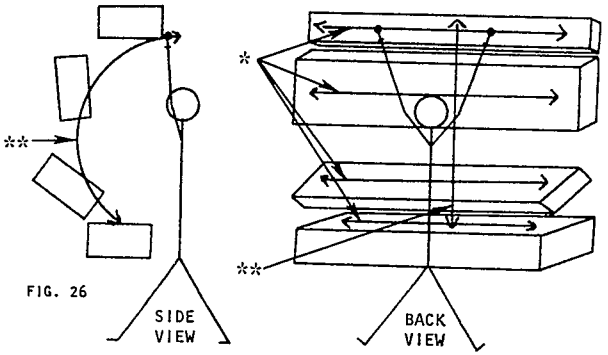


FIG. 26

B. All of the motions involved in the preceding areas are used, however the instruments are struck with the top of the mallet head instead of the bottom. Since the technique of striking from below is not part of percussion tradition, it requires a great deal of practice to have the necessary control (F.27).

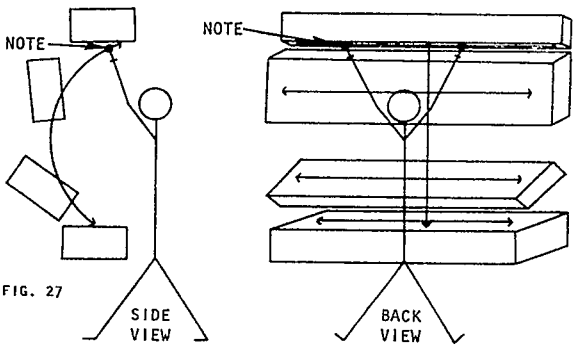


FIG. 27

The keyboards can be expanded to the left and right sides of the performer making a complete hemisphere with arm motions in all directions (F.28).

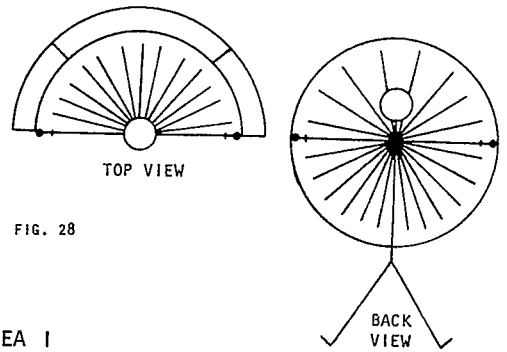


FIG. 28

AREA I

This area is used primarily for a pedal keyboard although at times individual instruments are placed there to be struck. This area is very useful since pedals can be connected to an extremely wide variety of individual (and groups of) instruments. (See Part II for a detailed analysis of the pedal keyboard.) When several pedals are used, the performer must be seated. This presents no special problem due to the compactness of the console (F.29).

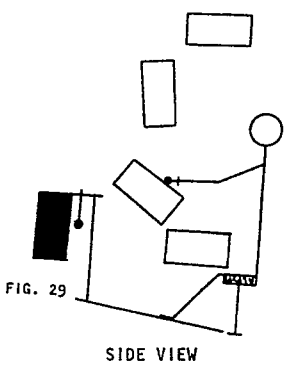


FIG. 29

The area in back of the performer is used primarily for the placement of instruments connected to the pedal keyboard and for individual instruments which are only occasionally used. See Figs. 5 and 6 for a complete console using Area I as well as Areas II-V.

WORKING WITH THE CONSOLE TO EXPLORE PERFORMANCE AND COMPOSITIONAL POSSIBILITIES

There are endless ways to work with the percussion console either to gain technical control or to expand its potential for compositional or performance needs. For the performer, working with the console presents no special problem but for the composer who wishes to explore the percussion console it can be problematical if a percussionist is not available. However, if the general concepts behind instrument placement and keyboard construction are clearly understood, it can be done. Most likely though, the console as envisioned by the composer will change greatly when it is built since there are endless possibilities for instrument placement which can only be discovered when the console is actually constructed.

The following are some suggestions for composers who wish to write for the percussion console but do not have a percussionist available or, who wish to work out the major portions of the piece before working with a performer.

1. Charts and Diagrams - These are essential if one does not have the actual instrument to work with. Their use can be most helpful in developing good instrument placement within the console as well as being a compositional tool. With this method the various combinations of instruments and keyboards can be examined and a visual image formed before the console is actually built.
2. Substitute Racks and Individual Instruments - A possible aid for exploring instrument placement is to use objects such as boxes, cans, boards, etc., that resemble the approximate size of the actual instrument. Such materials as coat racks, ladders, boards, etc., can be used to construct racks. Although an aural image cannot be formed from the above, instrument placement can be examined and a visual image formed.

When a console is available to work with the following can be helpful for the composer wishing to write for the instrument or a performer wishing to learn to play the instrument, either for an existing work or a work in progress.

1. Improvisation - Improvisation based on material and ideas from the proposed composition is an excellent tool for exploring compositional ideas and for learning to play the instrument. As the compositional ideas develop and control of the instrument improves, better individual instrument placement will be discovered. With this process the composer and the performer can develop an aural as well as visual image of the console which is most helpful.

2. Exercises - Writing examples or exercises based on material from the proposed work or already existing work further explores compositional ideas and will help the performer gain control of the instrument. This is most helpful in discovering where problems lie as well as developing an aural and visual image of the instrument. After the work has been written or if a console is being built for an existing work, the percussionist can extract material from the work and either vary it or use it as it is for exercise purposes.

3. Charts and Diagrams - These are useful here also.

4. Directly Experiencing the Console - It is very helpful for the composer to develop a feeling for the instrument placement and total layout of the console. The best approach is simply for the composer to play the console regardless of how crude the playing may be. From this, new and better ideas will develop as one begins to see what is and is not possible.

PART II

OTHER CONSOLE TYPES

INTRODUCTION

The uniqueness of the percussion console and any multiple-percussion instrument for that matter, lies in the fact that it is an open system. Unlike other Western instruments such as clarinet, piano, violin, etc. which cannot be changed to any great extent, a multiple-percussion instrument can be constructed in any manner or form desired to meet whatever needs the performer or composer has. There are an infinite number of ways to combine individual percussion instruments and groups of instruments and each new combination always suggests, if one examines the results closely, new possiblities for expanding the instrument and new methods of working with and writing for the instrument. The following are a few possible expansions of the previously discussed console.

THE COMPOSITE KEYBOARD

A composite keyboard is a keyboard within a console which includes a very large number of individual percussion instruments. This type of keyboard is an expansion of the keyboard of smaller percussion instruments discussed in Part I. An example of this type of keyboard within a console, was constructed for Robert Erickson's LOOPS for solo percussion (F.30).

This console consists of an upper keyboard (the composite keyboard) consisting of 36 individual percussion instruments, and a lower or pedal keyboard with three individual percussion instruments. The individual instruments in the upper keyboard range from a large bass drum (32 in.) to a small bell (2 in.). The pedal keyboard consists of a tam-tam, a button gong, and a Chinese gong. The individual instruments in the upper keyboard are arranged into six horizontal groups (I-VI), each group forming a scale from low to high, and five vertical groups (A-E) which do not form a scale (F.31). The diagram shows the hemispheric concept of instrument placement in the composite keyboard.

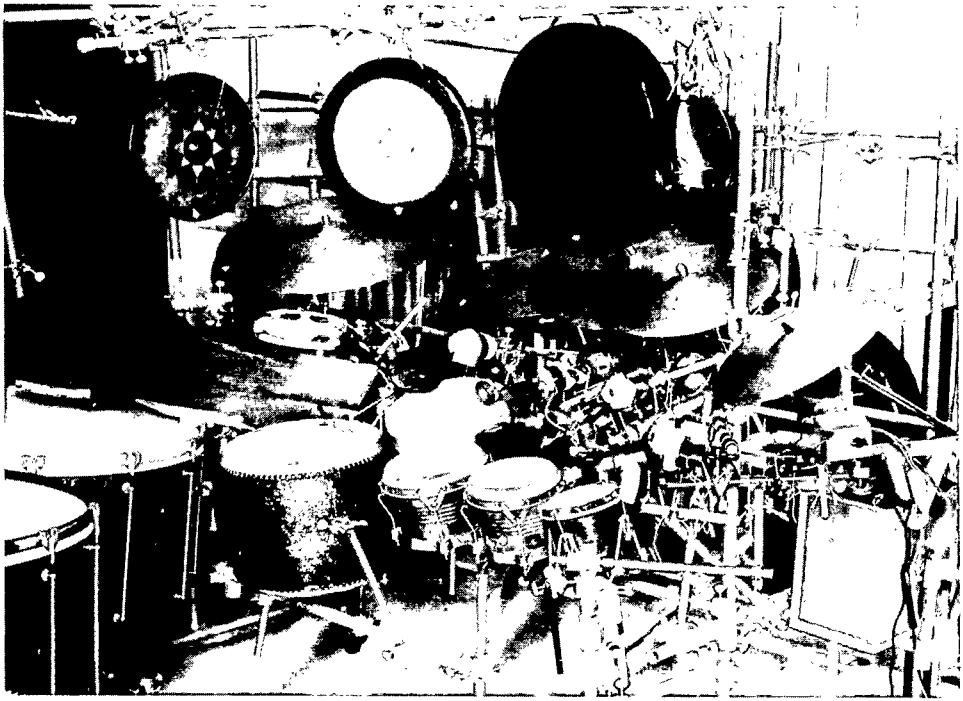
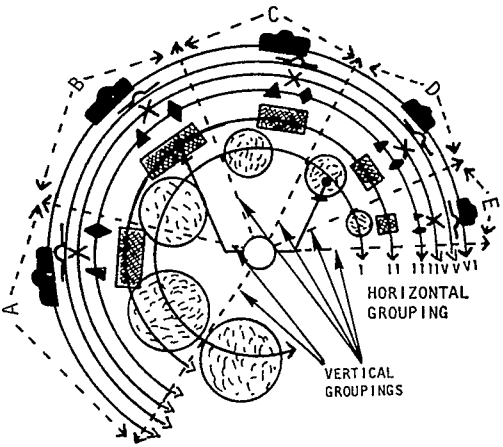


FIG. 30

Symbols in the diagram represent these instrument groupings:

- ♦ Ringing Metal
- ▲ Dry Metal
- X Rattles
- ~ Cymbals
- Gongs
- ○ Skin
- □ Wood



TOP VIEW

COMPLETE CONSOLE

FIG. 31

EXPANDED PEDAL KEYBOARD

In the pedal keyboard of the Erickson console, each individual instrument is connected to a separate pedal. This arrangement of pedals can easily be expanded. Many groups might be arranged within the pedal keyboard and each group played with only one foot. To explore this aspect of the pedal keyboard, I will use a total of six individual instruments arranged into two groups of three instruments. Group I will represent the group played with the left foot and Group II with the right foot. Each group will have an individual pedal connected to each instrument within the group and there will be four additional pedals in each group to enable the performer to play all possible combinations. Thus there will be a total of seven pedals in each group making a total of 14 pedals in the two groups. Figure 32 illustrates how each group works.

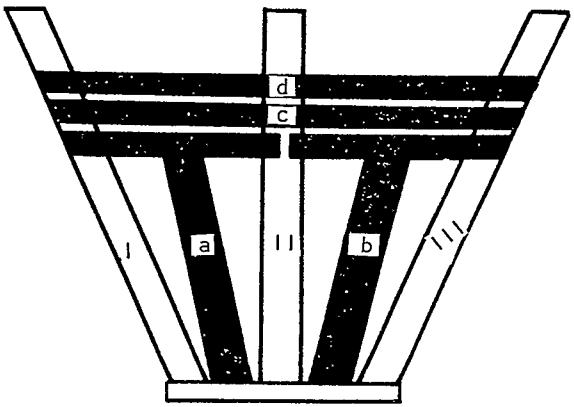


FIG. 32

Pedals I, II, and III are for the individual instruments

Pedal "a" gives a I-II combination

Pedal "b" gives a II-III combination

Pedal "c" gives a I-III combination

Pedal "d" gives a I-II-III combination

This pedal arrangement can accomodate groups of four or five individual instruments or more than one group for each foot. The major problem is that the pedal keyboard could easily become very complex and difficult to control.

Continuous Sound Production

Another area of the pedal keyboard that can easily be expanded is the production of continuous sound. Some possibilities are:

1. Continuous Sound on One Instrument

   a. Tremolo - Producing a tremolo on an individual instrument, i.e., gong or cymbal, will require a double action pedal with two beaters connected to the instruments. One beater will be activated when the pedal is up, the other when the pedal is down.

   b. Shake - Any individual instrument that can be shaken to produce a continuous sound, i.e., tambourine, maraca, castanet, can easily be connected to a pedal.

   c. Bowed Sound - Bowing a cymbal or gong with a bass bow is a relatively easy process but to reproduce this in the pedal keyboard is a challenging problem. This will require a wheel which has bow hair or a similar material stretched around the outer edge and a sophisticated wheel adjustment to allow proper tensioning between the wheel and the instrument to be bowed. It will require either a special mechanical linkage, to allow the wheel to turn smoothly with a single pedal, or a motor.

2. Continuous Sound with Two or More Instruments

   a. Two Instruments with Separate Pedals - This can be done simply by alternating the foot pedals.

   b. Three or More Instruments in Combination - Refer back to the section on grouping instruments within the pedal keyboard. With groups of threes, a sustained sound of six combined individual instruments can easily be achieved.

CONSOLE TYPE FOR MUSIC THEATER

The use of geometric shapes to create different console types is, except for the hemisphere, a totally unexplored area. The use of different geometric shapes will create very different types of arm and body motion and probably will affect the sound produced by the performer. The most obvious use of such consoles will be for music theater although it is possible that the different sounds which will be produced as a result of the various arm and body motions can be used as a compositional parameter.

The easiest shape to produce at this time is the sphere. The construction of a hemispheric shape previously discussed, can easily be expanded into a sphere to create a console in which the performer is totally surrounded by instruments. The performer, facing only one direction in the sphere, is dealing essentially with the hemisphere

although some instruments mounted behind can be struck without turning the body. To fully utilize this space, a circular body motion must be employed. The arm motions used in the sphere are essentially the same as in the hemisphere except that they are in all directions. The sphere, as with the hemisphere, will extend from Area II through Area V, leaving Area I free for a pedal keyboard. This pedal keyboard can form a circle around the outside of the sphere thus enabling the performer to play instruments connected to the pedal keyboard from any direction within the sphere (Fs.33 & 34).

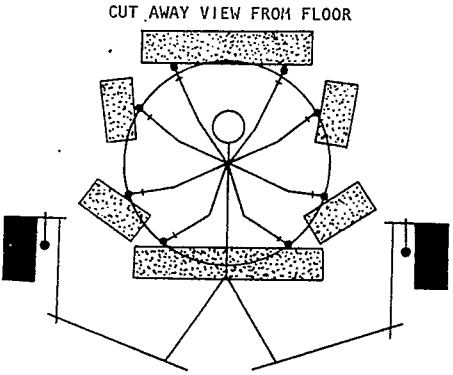


FIG. 33

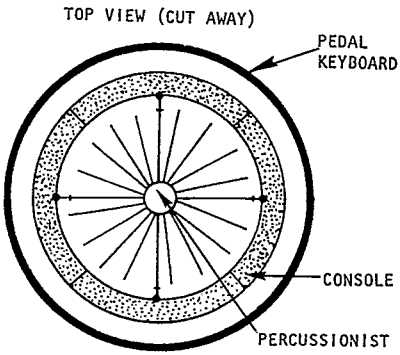


FIG. 34

Thus with the sphere, the motions of the entire body within a defined space have become an important parameter.

POSTSCRIPT

The percussion console represents only one possible approach to the difficult and complex problem of multiple-percussion performance and composition. Like any new instrument, while solving some problems, it has unique problems all its own. It is my hope that the percussion console is only the beginning of much-needed experimentation and research.

We would like to express our appreciation to these outstanding organizations in the music industry for their support of Percussive Arts Society, Inc. and hope they will continue to consider PAS as a worthwhile and stimulating force in the percussion world.

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