MUSIC FOR SOLO PERFORMER (1965)

for enormously amplified brain waves
and percussion.

The alpha rhythm of the brain has a range of from 8 to 12 Hz, and, if amplified enormously and channeled through an appropriate transducer, can be made audible. It can be blocked by visual attention with the eyes open or mental activity with the eyes closed. No part of the motor system is involved in any way. Control of the alpha consists simply of alteration of thought content—for example, a shifting back and forth from a state of visual imagery to one of relaxed resting.

Place an EEG scalp electrode on each hemisphere of the occipital, frontal, or other appropriate region of the performer's head. Attach a reference electrode to an ear, finger, or other location suitable for cutting down electrical noise. Route the signal through an appropriate amplifier and mixer to any number of amplifiers and loudspeakers directly coupled to percussion instruments, including large gongs, cymbals, tympani, metal ashcans, cardboard boxes, bass and snare drums (small loudspeakers face down on them), and to switches, sensitive to alpha, which activate one or more tape recorders upon which are stored pre-recorded, sped-up alpha.

Set free and block alpha in bursts and phrases of any length, the sounds of which, as they emanate from the loudspeakers, cause the percussion instruments to vibrate sympathetically. An assistant may channel the signal to any or all of the loudspeakers in any combination at any volume, and, from time to time, engage the switches to the tape recorders. Performances may be of any length.

Experiment with electrodes on other parts of the head in an attempt to pick up other waves of different frequencies and to create stereo effects.

Use alpha to activate radios, television sets, lights, alarms, and other audio-visual devices.

Design automated systems, with or without coded relays, with which the performer may perform the piece without the aid of an assistant.

Edmond Dewan, Technical Consultant

I think we would both agree that the kernel of **Music for Solo Performer** *is the performance of brain waves. If you accept that, I'd like to ask what sort of ideas you have about the piece as a whole.*

Well, the fact that it is a performance of live brain waves instead of a structured tape manipulation piece was a very crucial decision for me. It all happened when I was teaching at Brandeis. I had made the acquaintance of Edmond Dewan, a very imaginative physicist who was on the faculty at Brandeis but who was then working for the Air Force doing experiments with brain waves. They thought that certain pilots who were prone to epilepsy were blacking out when the speed of the spinning propellors got to a crucial point; I could be wrong about this, but I think it was sixteen times per second. When the sunlight would shine through the spinning props, it would lock on to something visual in the brain of the pilot. They had asked Dewan to try to investigate that, so he was doing experiments with brain waves. And it's very funny because he had offered his equipment to one or two other members of the faculty at Brandeis, suggesting that they might be interested in making pieces with brain waves, but no one took him up on that.

This was 1965. I had been at Brandeis for just a couple of years, and I was at a point in my compositional life where I didn't have any good ideas. I was conducting the Chamber Chorus and I had done some electronic music in Italy when I was on a Fulbright there, but I hadn't really found anything that interested me; I certainly didn't feel like composing instrumental music. Dewan described to me this phenomenon that had to do with visualization, that by putting yourself in a non-visual state, it would be called a meditative state now, you could release the potential of the alpha that is in your

head. It's a very small amount, but it would become perceptible, at least to an amplifier. The idea of it just struck me very strongly, probably more for theatrical or visionary reasons than for sound or musical reasons, because I didn't know what it was going to sound like. Actually, it doesn't sound like anything because it's 10 Hz and below audibility; it isn't a sound idea, it's a control or energy idea. And it's amazing because most of my colleagues at Brandeis said, "Oh, that's a wonderful idea. You ought to tape record it, speed the sounds of the brain waves up, slow them down, reverberate them, filter them"; they all wanted me to make a conventional tape piece with this idea. To realize that the electronics comes from your brain, from inside every person, that every person has a little electronic studio inside his or her brain, then ask you to make a classical tape collage piece that's cut and spliced just . . . well, they all urged me to do that. The reason you love violin music is that someone is doing the playing, it's not the timbre of the violin. That's in there and is a part of it, but that's not why music for instruments is interesting, it's because a person is playing it. So the poetic part of the piece was that at any given moment in time, some person, male or female, is sitting in a medical center with electrodes on his or her scalp, and an analysis is being done of his or her brain waves to determine whether he or she is going to live or die. This gave me terrific anxiety, you know, because all around me were compositional people who wanted me to use technique, all of the things that you learn—contrast, pacing, texture, things of that kind. I had to eliminate those in order to get at the poetry of the piece, which demanded that a solo performer sit in front of an audience and try to get in that alpha state and to make his or her brain waves come out, to emerge with enough energy to drive an amplifier and do the piece.

Now if I had composed a tape piece, it would have been just another tape piece except for using brain waves. On the other hand, there are composers who have done it differently; instead of making tape pieces with brain waves as source material, they use brain waves to control electronics. They're doing synthesizer pieces with alpha or other waves as control signals.

So I was in the middle of that. And the anxiety I had was the anxiety not to compose but to take the existing situation, the one that every doctor knows and every person having an EEG knows, and displace it, taking it right out of the hospital and putting it into the concert hall. Then it becomes art, or at least what I thought was art. I got a lot of criticism about that from colleagues of mine who found it a boring idea, who thought it didn't amount to anything because it was just brain waves. Alpha itself is below audibility; it's too low to hear as a pitch, but that high energy, those bursts of alpha, would come bumping through the loudspeakers, making the grille cloth on the speakers bump, and I got the idea of using that energy to couple the loudspeakers to instruments. I used gongs, tympani, bass drums, anything that loudspeakers could vibrate sympathetically. So the idea is that alpha, which is produced without the person making any physical motions except the opening and closing of the eyes, which you don't really have to do if you can non-visualize with your eyes open, the idea is that that small amount of energy . . . see, it takes amplification very, very seriously. When I thought of using the alpha energy to drive the percussion instruments, that was the point at which the idea became a piece, when it went into a musical realm.

There's a wonderful contrast. The performer is performing live but not only isn't he physically manipulating the sound-producing ele-

ments in the piece, he can't move. If he moves, he loses the alpha state and there is silence. Is that an element of the theatrical appeal?

I didn't think of it as such, but it did mean I could be very still in a musical performance. You know, most music is busy, the players have to move, the actions of a pianist, for example, are important, but in this piece electronics allows you to go directly from the brain to the instruments, bypassing the body entirely.

Most people thought the material was too simple, and I began to think I was some kind of charlatan. I suppose it appeared that I just took Edmond Dewan's brain wave apparatus and went into the Rose Art Museum and did a concert, but there was a lot of work involved in getting the medical equipment to work for music, the amplification system designed—I think we had sixteen channels—and the instruments chosen and deployed. Even doing all that, which is just as complex as doing any other kind of music, it just didn't seem enough, and I felt anxious. Now if I had decided to make a tape piece and gone through all those technical motions, I may have felt more comfortable, but I finally did what I thought was the most honest thing. I tried to be very accurate about what the piece really meant: one person, alone, sitting very, very quietly, releasing a flood of energy which permeates the concert space. And to me, that was a beautiful idea, much more so than making a tape piece.

I think that's clear when you consider some of the alternative suggestions you mentioned. Most of them focus on the "problem" that the material you're working with is sub-audio; you can either use it as a control for other things or you can speed it up to make it audible. Instead, you accept it as is and use it as an impulsive force

to play musical instruments.

Yes, but I also did those two things that you just said I didn't do. You see, one of the inaccuracies of the title is that it's not really for solo performer. You need someone to run the amplifiers, to pan the sounds around, to turn on one loudspeaker and then turn on another, and I've always, except once in Stockholm, done it with another player, an assistant. In the score that I wrote, I stipulated that someday, when electronics became what it's now become, you could have an automatic switching arrangement, such that so many bursts of alpha would be a code to a switching device, and the alpha could control itself without an assistant.

In the meantime you have someone to turn the pages.

Right, at that time we didn't have that sophisticated switching arrangement. Also, I had pre-recorded brain waves sped up into the audio range, and at certain times during the first performances I would have an assistant engage a switch so that as a burst of alpha came through, the tape recorder would be turned on and you'd hear a higher phantom version of the alpha. So I did use pre-recorded tapes, and I did use alpha as a control signal, but they were used as extensions of the idea and were not the essential idea.

This piece really has a theatrical flavor. How much of that had you done prior to this piece?

Earlier in Rome, in 1962, I had done **Action Music for Piano**, for which I had made a very elaborate score that described the gestures of the pianist, extraordinarily exaggerated movements of the hands

and arms and elbows. So when **Music for Solo Performer** came along, I was prepared to do that, to accept the theatrical, although when I use the word "theatrical," I feel cheapened somehow.

Because it isn't play-acting, it's real.

Well, in one sense, everything is theatrical. Do you know the . . .

Shakespeare saying?

"All the world's a stage"? No, I was thinking of the Borges story, **On Universal Theatre**. It's a marvelous story in which people ride bicycles, smoke, mail postcards; they don't do anything they wouldn't do otherwise, but they know they're doing it. If as you're doing everyday things, you think that they aren't everyday things, you'd be in the ultimate theatrical setting. So, in **Music for Solo Performer**, all I did was take the EEG situation as a whole and, by doing that, make a celebration of the event.

When the person is producing the alpha in performance, he or she is overcoming an obstacle, and the compositional mentality utilizes that in a positive way as a philosophical statement, the idea that the situation in the room is an extension of one's brain.

There are a number of paired oppositions in this piece when you start to think about it—the spatial distribution of sound controlled from one point, the performer producing sound by not moving, the unconscious control of sound. The more you go into the piece, the more strange twists you can find.

I don't think I would have done the piece if it were possible to

change the alpha by changing emotional states. One of the first things that anyone ever asks me is : "Can you change the quality of the alpha by having another thought, a different kind of thought?" They want to think that if you get angry the alpha will go up or if you get sad it will go down. And of course, that isn't the case at all; it just goes on and off, the 10 Hz pulses are irregular because it's difficult to maintain a perfectly meditative alpha state. Those bursts of alpha that go through the amplifier and drive the loudspeakers, the complexity of the signal and the fact that it is making the cone of the loudspeaker work to resonate objects, or membranes on a drum, or the cardboard in a box, those live, physical events are the composition of the piece to me.

I used to get letters from people asking about such things as formant structure and biofeedback and I just didn't know how to answer them because the piece isn't about that. I remember when I was in school it became very fashionable to regard music as a series of problems to be solved. The musical journals were filled with titles such as *"Pitch Problems in So-and-So,"* or *"Problems of This-and-That."* The only problem I have in composing is to get the imagery, the idea and sound-image right, and if I had tape recorded this piece . . .you know, there's a way to explain it in terms of accuracy. By tape recording it, you lose the life of the sounds because the dynamic range of tape isn't that good. Also, at that time we were concerned with letting sounds be themselves and it seemed to me that to cut and splice was not the way to let alpha be itself.

It's a matter of choosing not to control.

Yes, I remember we discussed the proportions that have existed in

previous music. The ideas of contrast and balance come from another place; they have nothing to do with alpha. It's so wonderful because the minute you say it doesn't, you find that you've done exactly that; I did have contrast between the gongs and cymbals and drums. Perhaps I chose percussion because I used to be a percussion player. I remember when I was young, studying drumming, I started practicing on a rubber pad and then moved to a snare drum. You didn't need anything else, you didn't need pitches. And after all, alpha's really a rhythm; scientists call it alpha rhythm.

It's low enough to be considered rhythm as opposed to pitch.

Yes, and although theoretically it is a continual pattern of 10 Hz, it never comes out that way because it stops when your eyelids flutter or you visualize a little and it tends to drift down a little bit if you get bored or sleepy. So I exploited that rhythmic idea and extended it to the drums. It was very natural for me to make a percussion piece; to have tried to make it a pitched piece in some way would have seemed bizarre and grotesque. It's funny, to me sharp contrast is a banal idea. If you look at a painting with contrasting foreground and background, it just doesn't seem right somehow. When you think about it, it is a very easy idea; if you don't know what else to do, you just do something different from what you did. It seems to me that the most interesting differences are small ones, slight subtle changes.

Differences that don't break the thread.

Right, it's trying to get the maximum information out of the least contrast. Those big emotional changes you find in a Beethoven sonata, for example, worry me. They seem childish; you're happy one minute and sad the next. And when people say that electronic technology is cold, they really mean that it doesn't have those self-indulgent emotional changes.

The elevator here at the Gramercy Park Hotel is an example. I go up and down it very often and I've timed the response from when you touch the button, a beautiful, light, touch-sensitive one, to when the door closes. It's usually from three to four seconds. And you'd be surprised how many people don't even want to wait that long; they think something is the matter and start pushing the button sharply and repeatedly. Now the time response of the elevator was designed by somebody, some very sensitive engineer or group of engineers who decided what would be a graceful timing, not too fast and not too slow, and generally the people who are impatient with it are not in a graceful state when they get in. I almost want to tell them that the elevator is more graceful than they are. The time response of that elevator, if you were to pay attention to it, if you were to surrender to it, would be therapeutic because your mood or feelings would change between the time you got into it and the time you got out; the ride down is very, very beautiful. I think if you let the elevator teach you something, you could step out of it feeling more graceful.