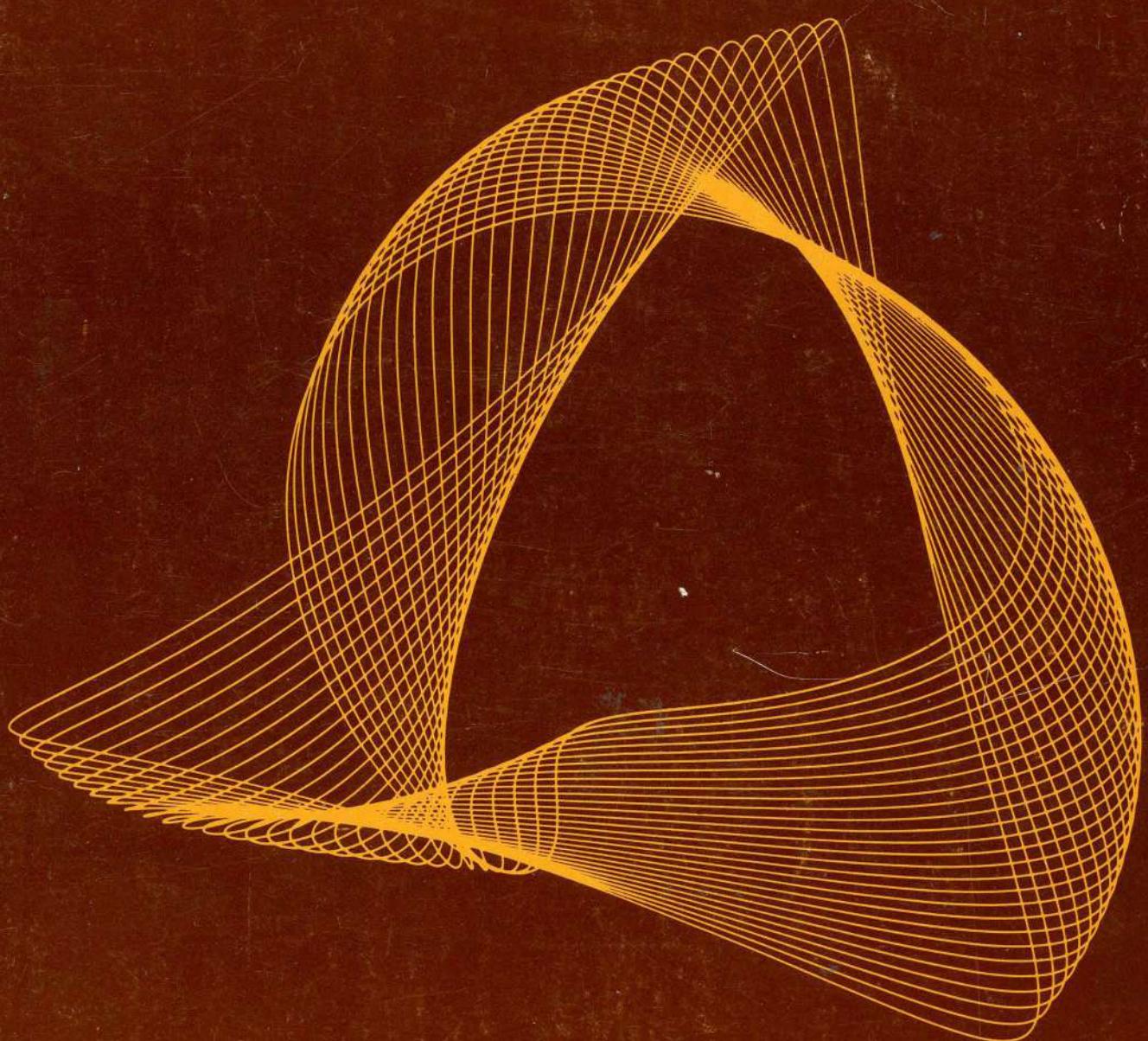


Electronic Music Review

No. 7 July 1968





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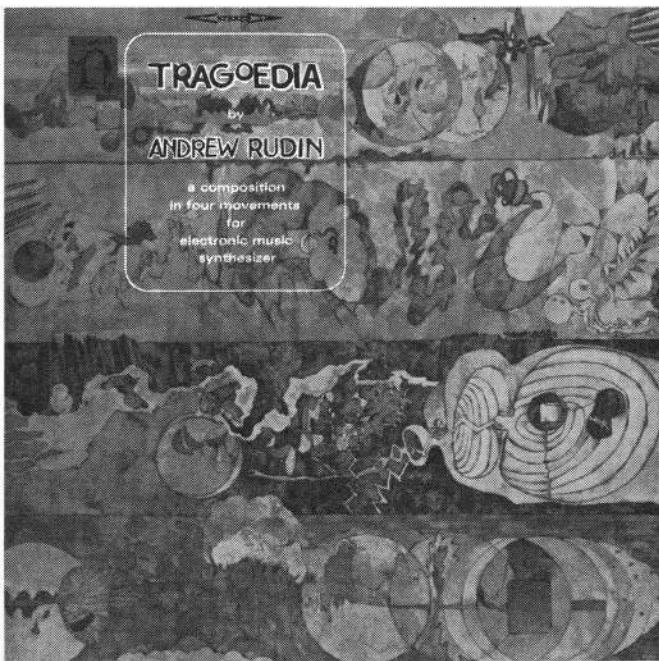
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Musical Happening (first issue). No. 1, September 1968. Arco Specialties, 3748 Van Ness, Dallas, Texas 75220. Subscription, 6 issues, \$1.00 (foreign, \$2.00).

Pellegrino, Ronald. *An Electronic Studio Manual* (with tape). 1968. Ronald Pellegrino, 35 Webster Park, Columbus, Ohio 43214. Softbound, \$8.50, + tape, \$3.50.

Pierce, John R. *Science, Art and Communication*. 1968. Clarkson N. Potter, Inc., 419 Park Avenue South, New York City 10016. Hardbound, \$6.00.

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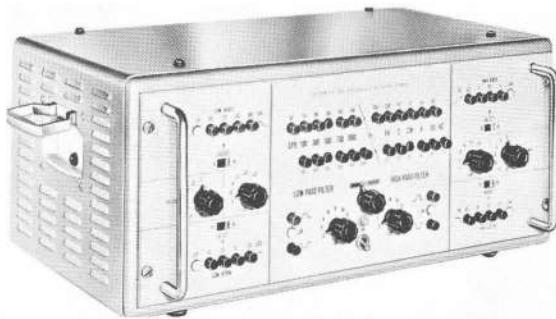
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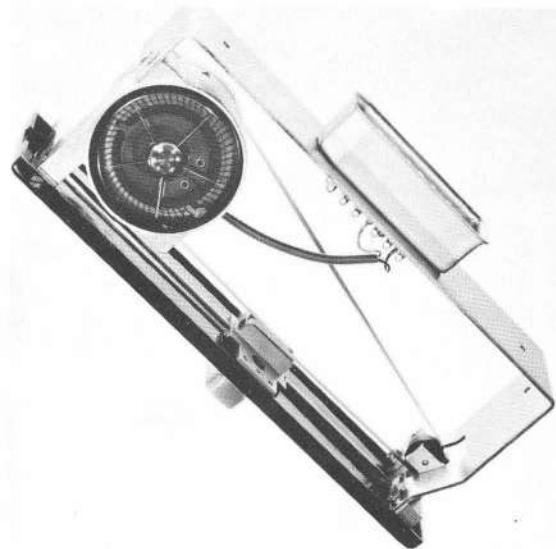
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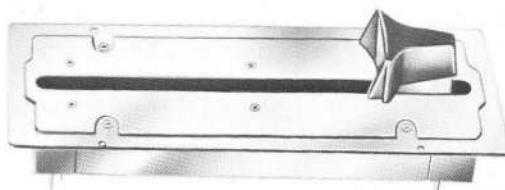


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It(')s Time

Roger Reynolds

Sounds, and recently silences, are reasonably well-understood by composers — empirically, at least. Structure in sonority and succession is also treated with some assurance (less as it diverges from well-established patterns and arithmetical supports). Time, however, is generally ignored (or is it avoided ?), and the result has been some unfortunately misplaced allegiances. Typical of these is the idea of symmetry or proportion in temporal structure. Whether in classical molds or predetermined, contemporary asymmetries, this idea depends upon the listener's ability to accurately estimate long periods of time, and to retain these estimates. But results of studies in time perception confirm intuitive suspicions of such architectural borrowings. A "symmetrical" musical structure is as unrelated to the experience of architectural symmetry as the wing in flight is to a "west wing" in function.

A perception, as opposed to a memory or an expectation, is an experience which seems totally in the present (no part of it seems "past" before the whole is finished). Its duration is normally 2 or 3 seconds, but in the case of small groups of stimuli it may extend to as much as 5 seconds, including, perhaps, 25-30 items. The most accurate estimation of time intervals themselves occurs at about 0.75 seconds, though, generally, short intervals are overestimated and long intervals underestimated. When one deals with numbers of minutes instead of seconds, errors become very large. The actual experience of time, then, is direct and accurate only in the very short term. Subjective judgments about it are affected by so many factors that generalizations can, at this time, do no more than indicate tendencies.

For example: is the duration to be judged filled (a continuous sound or homogeneous collection of sounds) or empty (its extremes marked by solitary impulses); is the judgment made by verbal report, by reproduction (where the listener activates what he believes to be an identical interval), or comparison (signal A is or is not equal to signal B); if the interval is empty, are the limits marked by events in the same sense modality (two sounds) or by different ones (one visual and one aural) (Sounds from different sense modalities are difficult to integrate for judgment.); is the signal heard against a background of noise and reproduced against a background of silence, or vice versa? All the above influences are further complicated by the effects of set (formed by the listener's experience, expectations, etc.) and by the voluntary or involuntary exercise of attention. (If two signals arrive at the brain simultaneously, the one which is attended to will appear to precede the other.) Short-term memory also plays an important part in our experience of time. But memories are vivid and accurate in direct relation to when (how soon) and in what order they are called upon.

This array of influences hasn't crippled listening in the past, and it might seem unimportant if we weren't interested in enlarging the range of musical experience. The idea of temporal proportions is symptomatic of vague thinking about time on the part of musicians. Large-scale periods can only be judged by referring to some internal or external chronometer. Heartbeat and breath rate can give clues but they are at best unreliable, varying according to one's state of health and emotion. But even when we determine relationships between periods of time by means of some "clock", the objective knowledge probably will not coincide with our experience of the time duration involved. In fact, some psychologists have suggested that the awareness of

time arises only from dissatisfaction with one's situation. If so, the better our estimations, the less involved we must have been during the experience (not a favorable relationship from a composer's standpoint). All experimenters draw attention to the fundamental differences between durations judged as unitary events and those judged with the aid of some "clock". We are frequently surprised by the evidence of objective time measurements, but although such information affects our evaluations after the fact, it does not change the nature of our experience in time.

Pulse, felt through regular recurrence of accent or seen as a conductor's gestures or a performer's actions, serves as a clock function. Identifiable elements (tunes, timbres, and rhythms) following familiar sequences also help to reinforce the artificial, countable symmetries in traditional forms; but a truly proportional experience in time is an almost hopelessly complex goal. If achieved, it would certainly bear no necessary relationship to numbers of bars or to seconds as measured by objective clocks. A structure which can be defended only in terms of some objectively intended symmetry or proportionality in time is probably quite meaningless.

Though each separate musical experience will have some set of temporal relationships (probably different for each listener at each hearing), one cannot imagine how they could be either very precise or dependable (reproducible). Of course one can skirt this issue by dealing in static or very gradually evolving pieces where the notion of proportionality is not relevant. Such objectively unitary experiences provide a quite different variety of stimulation, though the inevitable lapses or shifts in attention impose an intricate and indeterminate set of subjective contrasts (hence, proportions).

Though for practical purposes it requires very little time to absorb the basic spatial relationships and overall form of a stationary object, of a painting, the eyes perform hundreds of scanning motions in collecting the impulses from which the brain constructs a "picture". Music which stands deliberately still can do so either in the sense of striving to remain constant, as does La Monte Young's The Tortoise, His Dreams and Journeys, presenting hours of a carefully retained, uninterrupted sonority, or by mass textures such as the "timed mixtures" that I have used, where detail is indeterminate but where there are no overall trends. When music abandons its discursive character, the ear can "scan" in the same way that the eye scans a visual texture. If one does stop the flow, the stimulus should be complex, varied, or beguiling enough to stimulate and reward a search. There is a physiological basis for the requirement of variety, and this will be elaborated below.

* * *

Europeans and North Americans have strong ideas about time. To them it is a commodity that can be owned, bought, borrowed, stolen, and wasted. But in Japan, for example, it cannot be possessed. There is no way to say "my time", and the activity of work seems to be its own end rather than a means toward conserving or making use of "one's time". Without going into the sociological variations of outlooks on time, it is clear that they are many, and radically influential. On a more specific level, there are things to be said about individual physiological capacities.

Biological systems respond primarily to change. The ear quickly detects any change in auditory stimulation (including cessations) and routinely ignores the sameness of monotonous signals. During experiments with a totally uniform visual field, a third of the subjects experienced a complete cessation of visual experience: not a "blackout", but a void, an absence. The experi-

menter conjectured that perceptual mechanisms have evolved to cope with a differentiated field, and when they meet with uniformity there may be a temporary breakdown.

Another instance of the remarkable way in which receptors respond to extreme situations emerged from studies on visual fatigue. By attaching frames containing basic geometric figures directly to the surface of the eye, it is possible to study the effects of visual fixation. As expected, figures tend to fade after prolonged observation when the eye is unable to scan, and thereby to engage new receptor cells. (A similar phenomenon will later be observed in the case of the ear.) Of particular interest was the fact that portions of the visual figures fade in a precise and orderly manner, so that what remains is still definite, and usually a strong formal configuration. There was no immediate explanation as to why the fading should be complete and selective rather than involving blurs or capricious areas of the figures.

The mechanism of the ear is sensitive to intensity, frequency, and time, and is susceptible to several varieties of fatigue. It would be interesting to know in what way aural sensations vary with prolonged exposure, and whether one experiences orderly sorts of fading — fadings which remove complete segments of the total sensation, leaving partial but independently sufficient impressions.

Change is especially important in auditory experience. Those who lose their hearing relatively late in life complain not only of the lack of communication but that life seems to have lost its "ongoing" character. Experiment has illuminated this by showing that psychological time runs at quite different rates during noise than it does in relative silence. The comparatively high level of stimulation during noise apparently speeds the flow of subjective time, and the subjective reproduction in silence of a duration heard in noise will be considerably longer, objectively, than the original. This effect, produced by experimenters with white noise, would certainly change if a patterned sound were used, but auditory background apparently acts in some way as a calibrating monitor for our internal clocks. The same, incidentally, is true of temperature. Time runs subjectively faster at higher body temperatures, as, for example, during illness.

Even when the factors already mentioned are kept relatively constant, there is marked variation in the values of various thresholds (what level of sound is just audible, what is painfully loud, how long should a sound be to be heard as having a duration, etc.) from person to person and within the performance of individuals from day to day, hour to hour, and even within the span of a few seconds. If a group of five identical sounds with a loudness level close to the threshold of audibility is repeated several times in quick succession (taking, in all, 5 seconds), one may hear all, or some, or none at each trial. Tones of high frequency will tend to become subjectively softer as their duration extends, and may even disappear in time. Generally, it is necessary to constantly increase the power of a sound in order to maintain a uniform subjective loudness. These facts are relevant since our temporal judgments and the nature of our experiences with time are based to a large degree on the number and spacing of the events which demarcate or populate an interval. Of two objectively equal durations, the one which provides, in retrospect, the larger number of meaningful memories will seem longer. If we miss some events, our impressions are necessarily altered.

Sensations of time are guided by the tensions of anticipated change: the ending, alteration, or beginning of phenomena. In music there is usually a fabric of multiple strands or related events, but the ways in which their relationships are measured may not coincide. When one system of parameters is accepted, others may become difficult to integrate or even irrational. For example, in normal situations we can perceive pitch and loudness changes with one ear while sitting

motionless. If we are required to take account of left to right antiphonies, apparent or actual movement of sounds, we must use both ears, still remaining motionless. But if the patterns of spatial movement require us to identify up and down as well as shifts to left and right, we must be free to move, to change the orientation of our ears with respect to the environment. These phenomena are due to amplitude and phase differences (at high and low frequencies, respectively) resulting from the slightly different distance from the source to the right and to the left ear.

The set of a listener about to hear a piece of music — the momentary collection of his relevant experiences, capacities, expectations, physical conditions, and so on — may be the overriding factor in his response, yet there is rarely more than casual attention paid to it. Traditional rituals of dress, place, and decorum evolved because of the desirability of a common context (the concert situation), but we rarely consider how complex the effects of individual variations in set are, and almost never make attempts to influence it.

If an observer is presented briefly with an incongruity — a combination of events which his experience contradicts — experiments have shown that there are four categories of response: dominance, when clashing characteristics are altered so as to fit with one which is dominant, and accurately reported; compromise, when none of the objective facts is correctly retained, but all are altered to achieve an acceptable concurrence; disruption, when the subject simply rejects all facts and cannot report what happened at all; or recognition, where, in spite of the briefness of exposure, the objective facts are perceived and the subject reports a new (and for him unprecedented) event. These same conditions may well apply to aural experience.

In visual experiments, there has been speculation about whether one can respond to a symbol that he has not consciously recognized. There is considerable difference of opinion (particularly about the practical application, "subliminal advertising") but there is definitely a complex of dependencies, tendencies, and interactions during the brief time span within which recognition occurs. During this interval, characteristics which suggest undesirable items may be repressed, while others that suggest familiar and acceptable events will be weighted to confirm judgments in the subjectively positive direction.

One might attempt to influence set directly, supplying information about the duration of a work before it begins, marking the moments at which particular attentiveness is required, and so on. This seems a little crude, though there can be no doubt that acuity is much improved when one knows when a change (an event) will probably occur. Our extraordinary sensitivity to nuance in the performance of traditional music is due to the foreknowledge that massive familiarity provides. Other approaches such as lighting, disposition of seats, relative location of listeners and sound sources have been tried tentatively, but little systematic information about their effects has been collected. Some "happeners" have tried intimidation, but even the sympathetic observer rejects overt manipulation. It's a delicate area, no doubt, but well worth additional thought, for mental disposition not only alters the color of experience but can actually determine which objective facts we perceive and which we do not.

There is still disagreement among physiologists as to whether attentiveness increases the intensity of a perception or enhances the short-term memory of it, but the effects are sometimes decisive, even in the most basic situation. As noted above, if two signals reach the brain simultaneously (and this is not the same as saying that they occurred simultaneously in objective time), the one which is attended to — either consciously or unconsciously — will be perceived as occurring first. Similarly, the more intense of two objectively simultaneous impulses will appear

to take place earlier. This is part of the mechanism of apparent motion, whereby the brain interprets several stationary stimulus points (either aural, visual, or tactile) as a single moving stimulus.

Even more striking is the evidence uncovered by Dr. Paul H. Peon: If a series of clicks are sounded near a cat's ear, matching impulses will travel up the ascending nerve paths to the auditory regions of the cortex; but when a fish is held in front of the animal's nose, and the clicks continue, the related impulses stop. Since the cat's attention is focused on the fish, it apparently turns off or diverts the nerve paths earlier concerned with the clicks. Not only can the brain ignore or suppress information to which it is not willing to attend, but it can actually prevent associated impulses from being transmitted.

A normal person, viewing a reversible line drawing, will experience a periodic alternation of impressions as to whether the figure advances or recedes. Although the initial period between shifts (caused by the saturation of one perception and the involuntary substitution of another) may be 5 seconds in the extreme, the rate of alternation gradually increases as fixation continues. Again, one would like to know more explicitly what occurs for the listener who is subjected to a complex but unchanging sound. Personal experience with extremely prolonged or incessantly repeated sounds suggests that there are periodic fluctuations in what aspect of the sound one is paying attention to.

If one concentrates on a train of signals, its elements are retained in the brain for approximately 5-6 seconds, while elements of an unattended series remain for only 1-2 seconds. Since we cannot attend to more than one sequence at a time, there are definite limits to the sorts of multiple sequences that can be "comprehended" simultaneously even in the best of circumstances. There is, in addition, an increment of time (1/6 of a second) taken by each shift in attention. This means that very rapid alterations in auditory attentiveness are not only fatiguing, but make the material literally "unintelligible". Yet some forms of attentiveness require no conscious effort, and when motivation is high, one can perform remarkable feats of perception. Talking at a party, in the midst of a dozen other conversations of varying speeds and intensities, the noises of dishes, background music, traffic, and so on, one can catch the sound of his own name from across the room.

To achieve even rudimentary control over patterns of time experience, it is useful to frame some general categories of time experiences. In Blind Men for chorus, brass, and percussion, I use three varieties: traditionally conducted sections, in which length is definite; "timed mixtures" which are not conducted, and consist of composite impressions made up of a large number of individual but similar elements (each player works independently with similar aims, but never calls attention to himself); joining these two primary kinds of sections are "links", or single events with some natural limitation on their durations (the capacity of one breath, the decay time of a struck object, the time required to reach consensus in some kind of joint task, etc.). The conducted sections provide familiar temporal sensations for any experienced listener to contemporary music. The conductor's beat and other temporal sound patterns provide foils against which the passage of events can be measured; but one has, on first hearing, no clue as to their durations. A continuously changing texture of events is employed so that each primary element is within the durational range for perceptions (up to approximately 5 seconds). In short, the conducted sections concentrate on the small temporal dimension, while the overall is "clocked".

Timed mixtures are all precisely the same length, 60 seconds, but during them no clock functions operate. There is change, but no trends develop. There is no more reason to attend to one thing than another, and one is released from the obligation to uncover dependencies or relationships.

After the first few timed mixtures, the listener may become aware of or guess their objectively equivalent length. (All conducted sections are much longer or shorter than one minute and all links are shorter.) If so, he may notice that their apparent length differs according to the way in which they are populated with more or less interesting aural experiences.

The natural processes which form the links, once initiated, are not interfered with. They project — because of our previous experience with such systems — a particular sensation of time: a variable, and to some degree indeterminate, and yet an anticipated duration. Like the timed mixtures, they involve expected endings, in contrast to the conducted sections about whose durations nothing is known. Links are also passive like the timed mixtures in that their processes are orderly and do not require constant attention, but they tend to generate temporal awareness as one's expectations are played off against the endurance and skills of the performers.

The factors cited above are only a small fraction of what is involved in shaping our individual experience of time, but they should be sufficient to make one thing clear. The tendency to seek absolute information on auditory or perceptive capacities, and to achieve foolproof (controllable) performance conditions — even with the aid of computers — is unrealistic at this time. Even assuming a uniform, high level of motivation for all listeners, what is physically possible for one will not be for another. Increasing precision in the control of traditionally oriented musical stimuli (more or less ideal, unchanging sound objects projected at the listener from one direction) does not imply a complementary increase in control over the listener's response. The composer's range of concerns should be enlarged. There are many perceptual capacities to be explored, and from my own standpoint, interest in notational procedures and performer-group dynamics remains secondary to the importance of changing and enlarging the repertoire of the individual listener's responses, through far more complete knowledge of how they come about. The way in which a sound is made is, in the end, incidental to how it sounds to the individual listener.

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A Variable Speed Tape Drive

Walter Carlos

VFO, which stands for Variable Frequency Oscillator, is the name usually given to a device commonly found in larger electronic music studios. This device consists of a sine-wave oscillator of good stability that operates in the 30-120 Hz range, a power amplifier that can supply 50-100 watts AC power at 70-110 volts, and an appropriate switching and metering unit. The latter (Fig. 1) is used to connect the oscillator to the input of the amplifier, remove the normal power feed to the hysteresis-synchronous capstan motor of the tape recorder whose speed is to be controlled, and reconnect the motor as the load across the amplifier's output. In this way, the oscillator's frequency, and not the power company's nominal 60 Hz, determines the tape recorder's speed, which can now be adjusted to values other than 7.5 or 15 ips, within limitations set by the particular machine. In practice, a range of $\pm 50\%$ is commonly obtained.

When the VFO technique is combined with the more usual practice of half and double-speed copying and mixing, virtually the entire continuum of all possible effective tape speeds is available. Pitch and tempo variations of original electronic and acoustic materials may be controlled with convenience and, if the oscillator is accurately calibrated, with precision.

In sel-sync work with certain real-time performances of electronic or acoustic materials, it may be desirable to work at a speed somewhere between 7.5 and 15 ips (the former being too slow for proper rhythmic "feel", the latter too fast for exacting articulatory demands). In such a case, the VFO will provide a range of workable speeds with which to drive the multi-track tape machine.

In my own work, both of the above requirements suggested the purchase of a VFO for my studio. Since I use Ampex 300 and AG-440 tape recorders, it was important that the VFO be powerful enough to drive these machines without attendant wow or flutter, and also that it conform to Am-



FIG. 1.
COMPLETED VFO CONTROL UNIT. OTHER
SCHEMES, SUCH AS RACK PANEL MOUNTING,
ARE POSSIBLE.

pex's connections for their own abortively priced motor-drive-amplifier-oscillator. Price was a consideration. So was the fact that I already owned a fairly stable audio oscillator which performed well in the 30-120 Hz range. Thus, I decided it would be expeditious to construct my own unit.

The first decision was that of power amplifier. I knew that high-power audio amplifiers could be used with success. Investigating several recording studios, I discovered that Heathkit, Bogen, and Dynakit power amplifiers were frequently used and were dependable. I purchased the Dyna Mark III-70/A, a wired tube amplifier, 60-watt continuous output power, with a 70-volt output tap. The transistor power amplifiers available in this class might be good alternatives, except they are trickier to connect and may not be able to supply full voltage at the motor's impedance. The conservatively-rated Mark III has ample power for all Ampex capstan motors.

All interconnections between the oscillator's output, the amplifier's input and output, and the cable from an eight-pin Jones connector to the Ampex (other connectors must be used for different tape machines), are located within a small aluminum sloping-panel cabinet, approximately 5" square. Here are also located an AC voltmeter to measure the voltage being applied to the capstan motor, a switch for convenient alternation between normal line and VFO drive functions, and an adjustable shift-lock control to preset voltages in the VFO position so that, at a convenient output setting of the oscillator (maximum), the proper voltage (approximately 95 volts in VFO position) can be fed the capstan motor without undue loading and clipping in the amplifier, or stalling or vibration of the motor.

The schematic I used is shown in Fig. 2. It can be easily adapted to most particular needs. I used an expensive Simpson voltmeter for accuracy, which has a scale from 0-150 volts, but perhaps a less expensive meter would be satisfactory. The level-set pot is an Allen-Bradley 2-watt molded unit. The switch is a rotary in steatite (ceramic) by Switchcraft. The whole project, including cables and connectors, cost well under \$140 and involved a single evening's work to assemble.

For convenient operation, the small cabinet is best located within reach of both the tape transport and the oscillator. The power amplifier can be remotely located for best ventilation. An auxiliary remote power switch for the amplifier could be installed in the small cabinet. In the LINE position, the amplifier sits unterminated on either input or output, but the Mark III is stable enough to sit that way without thermal or other runaway.

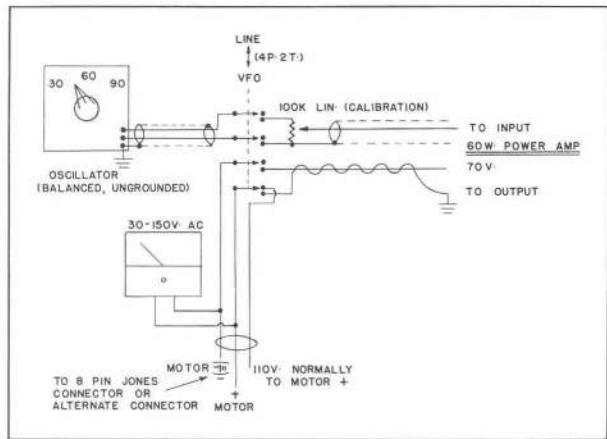


FIG. 2.
SCHEMATIC OF VFO INTERCONNECTIONS.

The oscillator should be warmed up for 15-20 minutes before use to ensure stability. The unit should not be left unloaded by the motor while in VFO position for more than a few minutes or possible damage to the power amplifier may result. A conservative frequency range for extended time usage should be employed. I usually restrict myself to 45-85 Hz, but a smaller motor may permit a broader comfortable range.

Some Problems and Prospects in Copyrighting Electronic Music

Paul Strok Adler

Copyright Protection in General

To put the discussion of copyrighting electronic music in perspective, it may be useful to give a brief review of the copyright law and its application to traditional musical compositions.

A. Under the present law, copyright in a published manuscript or score is secured by "publication" with "notice" of the claim of copyright. The notice consists of the word "Copyright", or the abbreviation "Copr.", or the letter "c" within a circle [©], followed by the name of the person claiming the copyright and the year of publication, placed on the title page or the first page of music. (The symbol © is used in order to secure international copyright protection under the Universal Copyright Convention.) Since American law is quite strict about formalities, the notice must not only follow the statutorily prescribed form, but must appear in the statutorily prescribed place. Omission or misplacement of the notice may lead to loss of copyright.

What constitutes "publication" could easily take an essay by itself, but as a guiding principle it is sufficient to say that a general, unlimited distribution, typically such as, but not necessarily limited to, sales of the printed score, is a publication. The mere circulation of a manuscript for consideration by publishers is not a publication.

B. As a general rule, publication with notice, not registration, is the prerequisite to copyright protection. Thus, registration of the composition in the Copyright Office is not appropriate until the work has been published. (When a published work is registered, two complete copies of the best edition of the work then published must be deposited in the Copyright Office.) There is one exception to this rule. Certain classes of works, including musical and "dramatico-musical" compositions may be registered as unpublished works if no copies have been distributed for sale. If copyright is sought for an unpublished work, deposit of copies and registration in the Copyright Office do become prerequisites to obtaining protection. (In this case one complete copy of the work must be deposited with the Copyright Office.)

Although registration is not a prerequisite for obtaining copyright protection for published works, it is a prerequisite to the filing of a suit for infringement. Upon registration, the copyright owner receives a certificate of registration. In a lawsuit for infringement this certificate will be treated as prima facie evidence of the facts stated in it. (These facts include authorship of the work, ownership of the copyright, citizenship of the copyright owner, title of the work, date of publication, and date of registration.)

C. Before a composition is published, or registered as an unpublished work, it may be protected under the common law of the States. This common law copyright is lost, however, once the work is published. Common law copyright protection exists in perpetuity rather than being limited to the statute's 56 years (an original 28 year term and a renewal term of 28 years). It also

protects a work against unauthorized performance without regard to whether the performance is in public or for profit. (Under the statute, the performance right for non-dramatic musical compositions is limited to public performances for profit.) Otherwise common law protection is similar to that provided by the statute. However, the benefits of the statute, e.g., its provision for minimum damages and the certificate of registration are, of course, not available.

Electronic Music

(Although computer music is part of the broad category of electronic music, limitations of space, and the somewhat different legal problems attendant upon copyrighting computer music, compel me to forego consideration of the problems presented by computers in this article.)

A. The Problem of "Copies"

1. The most difficult copyright problem facing the composer of electronic music is that it has been typically held that a recording is not a "copy" of the work in which copyright may be claimed. The Copyright Office does not accept records (or tapes) for deposit and registration with the Office. This will be changed if the pending bill for copyright revision is passed.

At the present time, if a composer composes directly onto tape, without making a "readable" score (i.e., a score with conventional notation designed to more adequately represent the tones produced by electronic methods, but which can be read by a person trained to read such notation) he may be held not to have reduced his work to a "copy" within the meaning of the Copyright Act. This rule is rooted in a 1908 decision of the Supreme Court, applicable to piano rolls, rendered under the predecessor statute, but viable today and extended *a fortiori* to such modern technical advances as records and tapes.

The thrust of the Court's argument in this early case was that in order for there to be a "copy" of a musical composition it was necessary to have a written or printed record of the composition in an intelligible notation. A piano roll, thought the Court, did not fit that requirement. It is worth noting that the Court did not determine that a piano roll could never be a copy, only that it was not one under the statute.

The Regulations of the Copyright Office reflect this theory. These Regulations state that musical compositions are registerable "in the form of visible notation" and that "[a] phonograph record or other sound recording is not considered a 'copy' of the compositions recorded on it, and is not acceptable for copyright registration...."

2. In the face of this difficulty, what avenues leading to registration are open to the composer of electronic music? There are a number of approaches which may or have been taken and, undoubtedly, the ingenuity of electronic music composers will lead to many more. The following discussion is not intended to suggest that the methods considered are the only ones available.

a. The composer might submit a narrative statement of the mechanical adjustments necessary to produce the sounds of his composition (which dials are to be turned, how many turns, their direction, etc.). In some ways this may be the simplest of the alternatives available, but it is also probably the least accurate. Copyright will protect only what has been described. To the extent that the description provided does not precisely describe the collocation of sounds sought to be copyrighted, to that extent some of the actual sounds of the piece will not be protected.

b. A second possibility is to submit a score of the work. If an adequate system of scoring can be developed for the various electronic devices used to produce this music, it will have the

advantage of being in a form traditionally acceptable to the Copyright Office. Although the Copyright Office will accept non-standard scoring, preparing a score is apparently so difficult, and ultimately inadequate to the task, that composers of electronic music have, by and large, avoided it.

There has been some suggestion that the answer to the dilemma is to "fake" a score, but that is a solution more apparent than real, and the reason lies in the nature of copyright protection. Its core is literally protection against copying the discrete work in which the right is claimed. If a musical composition exists only in the mind of the composer, how is he to prove that it has been infringed by another? In the more specific case of electronic music, how is he to prove that the music on his tape, protected only by the "faked" score, is actually represented by that score? If the work that the composer is trying to protect is different than the work deposited, then the composer is going to have a hard legal row to hoe if he ever goes to court.

A "faked" score that does not follow traditional forms of notation faces an additional problem. The submission of seemingly random lines, for instance, may bring queries from the Copyright Office. The Office will want to know how it is to determine that this is a fixed work of "authorship" rather than a random collection of lines from which no single musical composition could be repeated or played. Once the "faked" score has to start having "meaning", however, it becomes less "fake" and more "real", and the composer is again faced with all the difficulties inherent in the "legitimate" scoring of electronic music.

It should be noted, however, that the mere fact that a system of scoring is complex and technical, and the training necessary to understand it correspondingly difficult, does not make it unacceptable to the Copyright Office. Indeed, the fact that only the composer can understand the score would not make it unacceptable for deposit and registration.

c. A third method for obtaining copyright protection is to make an oscillogram of the composition. This may be done by playing a tape of the work into an oscillograph. The resulting "picture" of the electrical impulses recorded by the machine would be an exact representation of the sounds produced by the piece and would be capable of being "read" just as a traditional score would be. This gives it advantages over both of the previously suggested approaches. The Copyright Office has accepted such submissions. Indeed, it has accepted a seismogram as a copy. The drawback is obvious, of course. The equipment would be expensive and unwieldy for a composer to have around his home or studio.

The various methods of creating copies of the composition discussed in (a.) through (c.) above would be registerable in the Copyright Office in Class E "musical compositions" or (if appropriate) Class D "dramatic or dramatico-musical compositions". (The Copyright Act provides that in applying for registration of a work the applicant shall specify to which of thirteen enumerated classes the work belongs. The statute further provides that an error in classification does not invalidate or impair copyright protection, nor are the thirteen classes intended to limit the subject matter of copyright as defined in the statute. Failure to fit the work into one of the enumerated classes, however, may, in fact, result in a refusal to register it.)

d. The previous suggestions have all followed "traditional" approaches. One rather unique, and, as far as I know, untested, approach has been suggested. It is to make a sound movie of a tape machine playing the electronic piece and then submitting the movie for deposit and registration in Class M ("motion pictures other than photoplays"). Similarly, a non-sound film could be made of an oscilloscope (the oscilloscope performs the same function as an oscillograph,

except that the electrical impulses are projected onto a screen). The resulting motion picture would also be submitted as a motion picture other than a photoplay. Under present Copyright Office policy, the film would not be acceptable as a copy of the musical composition, but if it is accepted as a motion picture other than a photoplay, the classification would seem immaterial.

This approach has the advantage of resulting in an accurate reproduction of the specific sounds sought to be protected, but, again, would require a considerable amount of bulky and fairly expensive equipment.

B. The Problem of "Copies": Copyright Revision

Under the revised copyright bill passed by the House, and awaiting action by the Senate, "copies" are defined as "material objects" (other than phonograph recordings, which are defined separately) "in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device." A work is considered "fixed" in a tangible medium of expression "when its embodiment in a copy or phonorecord ... is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration". "Sound recordings" are defined as "works that result from the fixation of a series of musical, spoken, or other sounds, but not including the sounds accompanying a motion picture or other audio-visual work, regardless of the nature of the material objects, such as disks, tapes, or other phonorecords, in which they are embodied."

Copyright protection, under the proposed statute, subsists "in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, whether directly or with the aid of a machine or device". Works of authorship are defined to include "(2) musical works, including any accompanying words" and "(7) sound recordings".

There have been suggestions that the revision bill gives only limited protection to composers of electronic music. This conclusion is based on the theory that electronic music composers will be able to obtain copyright protection for their works only as sound recordings with just the limited rights provided under the statute for copyrighted sound recordings. (Under the revision bill the owner of a copyright in a sound recording receives only the right to reproduce and distribute copies of the work, and the right to reproduce only the actual recording he has made. Another person may make an independent recording of the identical sounds as long as he does not "dub" the original.) But this argument ignores the statutory language. Copyright protection, it should be remembered, subsists "in original works of authorship fixed in any tangible medium of expression". Thus, an electronic music composition, fixed in an appropriate tangible medium of expression, such as a tape, would be entitled to protection as a "musical composition", not as a "sound recording", and the limitations on copyrighted sound recordings would not apply. This view is supported by the Committee Report which accompanied the revision bill to the floor of the House.

C. The Problem of "Notice"

At the outset I indicated that the notice requirements of American law are both technical and strictly observed. However, though the form of notice is provided for in the present statute for all classes of works, the proper place for the notice is specified only for books or other printed publications, periodicals, and musical compositions. (For certain classes a short form of notice is permitted and in those instances alternate places for putting the author's name are set out.)

Thus, if a score is submitted (whether using traditional or non-traditional notation), the notice should go on the title page or the first page of music as provided in the statute. If a narrative statement of the mechanics of producing the sounds of the piece is submitted, then the proper place for the notice would appear to be on the title page or the verso of the title page.

There are no provisions in the statute setting out the proper place for a notice in the case of motion pictures, oscillograms, or the like. A notice placed under the title or on the first reel of a motion picture should be sufficient to protect the picture. In the case of an oscillogram (which is essentially a strip of tape or paper) notice along one margin or side of the tape which bears the lines which are a record of the electrical impulses captured by the machine would appear to be sufficient (but in keeping with the spirit of the present Act, and the judicial decisions dealing with the copyright notice, it would be wise to place the notice at the beginning of the tape rather than somewhere in the middle or at the end).

The guiding principle is that the notice should be easy to read and easy to find. It should properly perform its function of notifying any user that there is a claim of copyright protection.

This is essentially the theory underlying the House revision. Although the proposed new law would continue to require notice and specify its form, it is less specific when it comes to placement. Thus, the bill provides that "The notice shall be affixed to the [published] copies in such a location as to give reasonable notice of the claim of copyright." The Register of Copyrights is authorized to prescribe by regulation examples of "specific methods of affixation and positions of the notice on various types of works that will satisfy this requirement, but these specifications shall not be considered exhaustive". (However, the proposed new law does set out both a specific form of notice and a specific place for notice in the case of phonograph records.)

D. The Problem of Joint Authorship

Although not now considered to be a problem by composers of electronic music, joint authorship is likely to become one as the field grows and as the economic and other professional rewards for electronic music compositions increase.

Joint authorship is an area of the copyright law which has engendered a considerable amount of confusion even with conventional works. Although the problem can arise in a number of different ways, the focus here is on the situation where the composer has worked with various technicians in order to produce a finished piece.

There is no definition of joint authorship in the present law, but the revision bill defines a joint work as "a work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole". No definition of "author" is provided, but the Committee Report makes it clear that notions of originality already developed under the existing law are intended to be incorporated in the new statute.

Under present law, and probably under the revised law, if the composer alone contributes the "creativity" which results in the composition, and the technicians perform merely the technical functions (e.g., the turning of dials, the feeding of tape), then it seems fairly clear that the composer is the sole author of the work. (Sharing in the design of a machine which produces electronic music does not, of itself, mean sharing in the authorship of works produced on it, any more than a builder of pianos is a joint author with those who compose on or for the instrument.)

The problem of joint authorship would seem to be less acute with electronic music than with com-

puter music, for in the former case the composer typically works directly with the sound producing machinery and tapes while in the latter case the composer may be working in conjunction with programmers whose contribution to the composition might be sufficiently creative to suggest that they share in the authorship of the music.

Conclusion

The most formidable legal problem facing the composer of electronic music today is that he may be held not to make "copies" of his work capable of being copyrighted. There are several ways of getting around this limitation, but they are all attended by difficulties which seriously impair their usefulness.

The proposed revision of the copyright law would solve at least this problem by recognizing that tapes, and the like, are "copies" of works capable of being copyrighted as musical compositions. However, the chances for passage of the bill by the Senate now appear to be ended for this Session. Because legislation does not survive a Congress the next Congress will, in theory, have to begin all over again. Congress's failure to pass a bill this year would be a major setback for the forces of enlightened revision.

Tube Filters

Robert Erickson

Tube filters are inexpensive, useful, controllable, homemade devices. They are especially valuable for spectrum shaping, and work well at low pitches. They may be used at either input or output end, and lend themselves to electronic performance situations as well as studio applications. They can be the basis for several different musical instruments; I am now building a set of them into a "noise organ".

All of my work with tubes has been empirical. My materials have been discarded cans, plastic sewer pipe, and miscellaneous pipe salvaged from junkyards. No special mechanical skills are required for making these filters. One needs only sharp ears, patience, and a great deal of pipe.

This report deals with filters at the output end, as loudspeakers. However, they also work well at the input end, using a microphone in place of a loudspeaker. There are certain difficulties associated with microphones in tubes, but experimentation should yield useful results.

Using a cylindrical tube about 4' long, with a diameter of about 2 1/2", a small speaker is attached at one end, its diaphragm facing into the tube. The rear of the speaker is completely sealed. If one uses this tube as a speaker it will resonate just as a closed pipe: at its fundamental and harmonics, regardless of the program. (A closed pipe produces only the odd-numbered harmonics. If the speaker diameter is smaller than that of the pipe, so that air can escape from both ends of the tube, it is an open pipe, which speaks one octave higher and produces a complete harmonic series.) Noise, tape hiss, the environment — anything at all is converted to the pitch and timbre of the tube. Whatever program passes through the tube will be heard in its entirety, but program materials which happen to coincide with the fundamental or harmonics of the tube will be reinforced. The tube will have a top cutoff and a bottom cutoff, depending upon its length and diameter. It can be thought of as a sort of comb filter passing the fundamental and harmonics. Every tube passes many frequencies, not just its fundamental, and sometimes not its fundamental at all. Perhaps it is best to think of a single tube as passing a chord consisting of harmonics of that particular pipe. This may be helpful to those oriented toward electronic filters, because most electronic filters pass single frequencies or bands, not a harmonic series.

Various spectra can be created quite easily by varying the length/diameter ratio. The tube described above will give a fair fundamental, good seventh, tenth, and twelfth harmonics, and a great many of the higher harmonics. In practice the spectrum will have many valuable small nuances, since the various harmonics will speak strongest when excited by the program material.

Using another tube with the same fundamental pitch, only narrower, say 1" in diameter, there will be a very different spectrum: a much stronger twelfth, and more and stronger higher harmonics, even up to the sixteenth, 24th, and, if the tube is quite long, 32nd harmonic. Such a richness of harmonic development is usually associated with the sounds of musical instruments, and indeed, tube filters produce sounds which have that sort of instrumental richness. Very thin, long tubes will develop high harmonics strong enough to overpower the sound of the fundamental, and are very beautiful.

Construction is quite easy. Masking tape and/or duct tape may be used to tape discarded cans together to make long tubes. For a smoother tube, plastic pipe comes in diameters from 1" to 6", but the larger diameters are quite expensive. Stove pipe and galvanized iron gutter pipe are also useful, but naturally more expensive than discarded cans.

The speaker is attached tightly to the end of the tube, again using tape. To seal the rear of the speaker, a can or a cut-down can is useful. Duct tape will make an airtight seal. It is also advisable to seal the rear of the speaker when inserting it into an open pipe, allowing about 1/4" of air space between the speaker and tube, so that the tube can speak easily as an open pipe.

The tube is tuned by playing a tape of random sounds or white noise, adding or subtracting cans until the pitch is close to that desired, but flat. The top of the tube is cut off with tin shears until it is almost in tune, just a hair flat. Then a narrow slot is cut in the top of the tube for fine tuning. This slot can be covered with duct tape to the proper length for accurate tuning. Another good tuning device is a tuning collar from another slightly larger can or out of a soft metal such as aluminum. One can make a long collar to produce a tube which is tunable over a fairly wide range; however, if there is an appreciable change in the length of the tube, the timbre will also change. Both fixed and variable tubes are valuable.

Tubes of a smaller diameter produce less sound, and one can sometimes make a better impedance match to the surrounding air by adding a small flange, flare, or bell (this will produce small changes in the spectrum). Funnels of various sizes are excellent for this purpose, but other shapes can be cut from soft aluminum sheet and are less expensive.

Tubes may be made into an array. The noise organ I am constructing will use tubes ranging in pitch from 32' C to soprano high C, and in several length/diameter ratios. Controlled by a keyboard and pots, and having ranks of different types of pipes, it will in fact be a sort of organ of filters, with a wide range of timbre possibilities. Closed and open pipes are in diameters from 3/8" to 8". Lengths are from a few inches to 16'. My noise organ has the same difficulty in its high range as do regular organs, and I am doubling and quadrupling some higher pitches to balance out the strong bass end. Compound pipes (see any book about organ building) are easy to make, and can produce more complex timbres, including inharmonic mixtures.

Another sort of array is a loudspeaker system. I hit upon it by chance when I connected together a set of filters and discovered that they covered a large part of the audio spectrum rather evenly. I set about constructing a speaker system of tubes. This has been in use for several months, although it still needs a very top end and some extra long tubes for the deepest bass sounds. At present it fades at about 12,000 Hz but, nevertheless, it has a remarkably good sound, surpassing the usual monitor speakers a composer is forced to use. The special characteristics are: very good bass, better than boxes and single horns, with excellent transients (usually muddled in boxes); a very open sound, transparent and lifelike, responsive to the tiny nuances in the detail of instrumental sounds (often missing from other types of speakers); efficiency, making possible the use of 10 and 20-watt amplifiers; power, depending upon the size of the system; economy, because even though many speakers are used they can be quite inexpensive; very low distortion, better to my ears even than the sound of horns.

The drawbacks are obvious. The system takes space, and many tubes must be used to average out the spectrum. My stereo system now has eleven tubes on each side of the bass, and ten on each side of the mid-range. The bass tubes range from 5' to 14' in length, and from 3" to 6" in diameter. The mid-range tubes are from 14" to 36" in length and from 3/4" to 3 1/2" in di-

ameter. The bass end will be extended to twenty tubes on each side and a treble end of fifteen or twenty per side will be added.

The response is smooth to the ear, probably due to the averaging effect of a number of tubes, and because the tubes are relatively thick in relation to length, with therefore a lower Q than thin tubes. Also, all of the tubes are closed pipes, and closed pipes with speakers at one end do not produce as sharply defined fundamentals as open pipes, unless they are very thin. Moreover, all the large diameter pipes are made from discarded cans, and the numerous bumps where they are taped together probably help them to speak more harmonics than would a smooth tube.

Most important is the averaging effect. This is apparent with even three or four tubes, where the fundamentals already tend to disappear and merge into a broader response.

Whatever the reasons, the system, even in its current state, sounds remarkable, and twenty or thirty musicians have listened with delight. Composers who need high quality monitors ought to consider building such a system. The cost should be well under \$200.

Reviews

I've been asked to review records here and, since I've been shot down in these pages myself and so am not as immune as most critics, I accepted — with trepidations. To cover the trepidations, I asked for a preface to my first review, and this is it. I had planned a long essay on The Critic's Role and all, but to leave a little room for the records, I'll limit myself to one preparatory remark, and let the reviews themselves open my bag of prejudices.

In electronic music, since the record often is the music, record reviews must often be music criticism, and music criticism is a literary, not a musical, exercise. It adds or detracts nothing to or from the music; it just flutters around it. What I mean to say is: don't leave the testing of your lightbulbs entirely to a moth. The best the moth can do is try and make an entertaining flight and draw attention to the light. Making and listening to music is central; criticism is peripheral. All this should be self-evident, but I'm compelled to say it again before I begin my flight. Everyone recreates as he listens; these reviews are my recreation of events that, fortunately, exist for you to examine, yourself.

"The United States of America". Columbia CS-9614.

This LP is the first to be issued and promoted (by Columbia as part of their "Music of Our Time" campaign) as Electronic Rock. Joseph Byrd seems to be the generator of the group, and the Electric Violinist doubles on ring modulator. The album lists "electric harpsichord, electric drums, electric bass and electric guitar" as well as electric violin and "electronic music". That should be enough electricity to make electronic rock — but it doesn't happen. Electronic is a way of thinking, not just plugging-in, and this group (The United States of America, no less) thinks straight pop. The circuitry serves only to produce the familiar bubble-glissandi ornamentation that weaves around, but never enters, the music. The motor and melody are still straight rock; the new electronics are wrapped around the rock like colored foil.

The fuel for this music is still acid, not AC. The whole LP has a very strong acid sound: a wide range of sonority and dynamics, some quite lovely songs and some very bad trips with Bosch and belladonna; the new price of drugs is acknowledged ("The cost of one admission is your mind.") in some horrendous imagery — sung through the ring modulator fuzz box. Like the Beatles' and Stones' LPs that came before it, this record is a whole show; it opens and closes with what used to be called a Production Number: a three-ring Ivesian sound collage of everything plus calliope. Every cut is a different departure, and that's the problem: the music seems to go away from you instead of coming at you or into you, and when it's over, you can't remember a thing. But, while it's going on, it's always interesting, sometimes lovely, and sometimes bitterly funny.

Unlike the groups that have influenced them, the USA haven't found a personality of their own yet, something to bring it all home. They're depending on the electronics to lend an overall color to their work, but the color is painted on, not dyed in; they won't, or don't yet know how to, let it generate content. What they've got to do is let the ring modulator light their fire, instead of fluttering around it like my metaphorical moth.

The Zodiac by Mort Garson. Elektra EKS-74009.

Any LP that's labeled MUST BE PLAYED IN THE DARK discourages me from playing it at all. I once experienced an unpleasant levitation listening to Kontakte in a totally dark room: about

midway in the piece, I found I was hovering up at the ceiling. I don't know how this happened, but I've avoided listening to anything in the dark since then. In a well-lit room, then, this LP sounds a little silly. Obviously, by chickening-out, I'm missing the full effect.

There are a dozen cuts on this record — something for everyone — so, being born in March, I played "Pisces" first and found I was by nature a Peaceful Person: "Pisces playing the pipes of peace, painting people with promise..." — which seems about as accurate as most horoscopes, considering what I'm doing here. If you can stand all that alliteration, you'll find the music behind it (by Mort Garson) surprisingly good pop, in a wide range of styles. There are some electronic sounds in it (the instruments are credited to Paul Beaver); they're minimal, but very well integrated. I expect this is one of those Soundtracks for Mind Movies which Elektra is so fond of. The trouble is, my mind movies aren't Talkies yet.

"Electronic Music III": Thema (Omaggio a Joyce) by Luciano Berio; Animus I by Jacob Druckman; Piano Music for Performer and Composer and Six Preludes for Magnetic Tape by İlhan Mimaroglu. Turnabout TV-34177.

This LP has a theme: Transmutation Through Electronics. Each of the three composers takes a "natural" instrument (Berio, voice; Druckman, trombone; Mimaroglu, piano, guitar, organ, clarinet, and rubber band) and changes its voice in composition — not always for the better. The best is Berio.

I first heard Homage to Joyce in 1960 or 61, in a broadcast, and I've remembered it ever since. It's clear and beautiful, and dramatic. The moment the tape composition enters, after the Joyce text has been read (unaltered), is a great one, a very theatrical event. In this recording, the necessary stage-wait between the reading and the tape has been drastically shortened, and so the effect is reduced, but it's still hair-raising.

The piece is a classic — not because it's old (1958 is "old" in electronic music) but because it's so good. It has the same exact weight and balance as Varèse's Poème électronique (also 1958), the same perfect length (eight minutes) and the same sense of reserve-of-riches, exactly placed in time. The bubbling "Bloombloombloombloom" and the repeated "lonely, so lonely", have a sensuousness of sound lacking in Stockhausen's vocal work, Gesang der Jünglinge, composed two years earlier. The German piece is angular and a good deal less loving — but then, the setting of the texts are quite different: one's in bed and the other is in a furnace. (The Italian's in bed and the German is in the furnace — providing some kind of musical-historical illustration, I do believe.)

After Thema, the other pieces on this record all seem too long and somehow unpleasant in a profound way. Both the Druckman trombone piece and the Mimaroglu piano piece made me unhappy — not constructively unhappy, just feeling bad. The piano piece is particularly harsh: a battle between Man and Machine in which, like Druckman's piece, the man loses. More musical-historical illustrations, I guess, and you could say I'm on the losing side, so I've lost my objectivity about these works. Also, I always have a hard time with serial (or post-serial or pointillist or whatever) work, and these pieces sound serial to me: clumps of notes separated by indeterminate silences. (I mean: beep-pause-beadle-pause-beadlybeep-long pause.) I have to have something else to get me through all those holes, and the synthesizer alone just does not give me enough klangfarben to make it worth the bumpy ride. Druckman does some very skillful things with it: wry little joking back and forth with the trombonist — but when the Machine finally tires of playing with the Man, and literally stomps him to death in a din of metallic slamming and screaming, I want to go back to Molly Bloom's bed.

I'm not reading something into this that isn't there. Both pieces are described by their authors in terms of battle. In both, there are moments of real interest, particularly when the man and machine initially collide — but they're brief, and the fight is fixed.

Mimaroglu's piano piece might have been subtitled Shoot the Piano Player, but he doesn't quite do that; he has him end up imitating the Machine. In his Six Preludes, which complete side two, he goes on with these imitations, and I find it remarkable how he can make all the different instruments sound like the same synthesizer. I can remember when it was the other way around: the RCA Mark I trying to sound like a dance band. But the last Prelude is a surprise: totally unlike the others, it has a spoken Turkish poem over the oscillators, and the melody of the voice over the sine waves is lovely. I suppose I welcomed it after all that inhumanity-to-man, but I also welcomed the unbroken line of it. I have to prefer Berio's whole egg to the scattered Grape-Nuts in these pieces, and — being a Pisces — I have to prefer peace to a war without survivors. This LP has more war than peace in it, but, on the other hand, that's telling it like it is, isn't it?

Silver Apples of the Moon by Morton Subotnick. Nonesuch H-71174.

This is the first LP of electronic music I ever heard talked about by people who were not Electronic Groupies. A proper lady in New Haven recommended it to me, as did an improper Head in New York. So I got it and sat down with it and became discouraged by the first side: more Grape-Nuts synthesizer. I turned it over and hoped for better times, but Part Two started out the same way. Then something began happening — a sound like a nervous foot tapping underneath the perfect surface. Someone (was it me?) was impatiently drumming his fingers. The tapping grew, the drumming advanced, a bass-octave motor started up in the right speaker — and for eight minutes (the magic number) a great beating, zapping, rhythmic exercise went on. (I mean "exercise" in the sense of muscular repetition.) It sustained and built in a slow, exactly controlled crescendo, a kind of New Bolero (I like the Bolero). At the peak, great warbles appeared overhead and a skipping white-noise cymbal pattern darted in and out of the croaking, snapping motor. There was no overlaid melody; it was inside the rhythm. Then suddenly, it all fell away, leaving just the low note of the octave beating, then just the original foot-tapping, and then it all evaporated into random twittering, and I was back where I started. But I wasn't the same.

I played the first side again, right away, and I just began to see the whole piece — all the Apples — as a Work, even with the lumps in the serial which always give me trouble. It's a beautiful record, very clean and crisp; it seems to glitter with precision, but it's not cold chrome — there's a good deal of wit in it. I found there was a kind of preview of the rhythm, toward the end of side one (I hadn't identified it as any kind of coherence the first time, being severely serial-sick by then), but it was hilariously disjointed, and collapsed on take-off like a garage-roof airplane.

I expect I'll wear out those eight minutes of grooves on side two before I've scratched side one. When you know what's on the second side, it takes great discipline to start at the beginning. But — if you haven't heard it yet — do it, because it all belongs together.

Nonesuch commissioned this work for LP publication. It's worth a lot more than a dollar-ninety-eight, and I hope they all make money on it; and I hope (probably vainly) that other companies will start commissioning works in the same way so we can have a rain of Apples this year.

"New Sounds in Electronic Music": Night Music by Richard Maxfield; I of IV by Pauline Oliveros; Come Out by Steve Reich. Odyssey 32160160.

"Extended Voices": She Was a Visitor by Robert Ashley; Solos for Voice 2 by John Cage; Chorus and Instruments II and Christian Wolff in Cambridge by Morton Feldman; Extended Voices by Toshi Ichyanagi; North American Time Capsule 1967 by Alvin Lucier; Sound Patterns by Pauline Oliveros. Odyssey 32160156.

"A Second Wind for Organ": Improvisation Ajoutée by Mauricio Kagel; Mesa, for Cybersonic Bandoneon by Gordon Mumma; For 1, 2 or 3 People by Christian Wolff. Odyssey 32160158.

Columbia has been trying to catapult itself into the 20th century of late, dragging the old repertoire along ("Berlioz, the Drug Addict! He took psychedelic trips," says a recent Columbia ad for the Symphonie Fantastique). Odyssey is Columbia's poor-relation label (as Nonesuch is to Elektra and Turnabout is to Vox), and these three Odyssey discs are part of M.O.O.T. (Music of our Time) and MOOT is "What's Happening, the Now Sound!" (another Columbia ad). All this foofarah, of course, makes any adverse criticism instantly reactionary. Reactions:

I listened for new sounds in "New Sounds in Electronic Music", in vain (by now, I don't think there are any left), but found two good pieces and one not so. Steve Reich's Come Out is an interesting looking cut — very dense and regularly patterned, and it sounds like it looks. The Sonic Material ("Now" for sound source) is a looped spoken phrase: "Come out to show them." When I say it's looped, I mean an endless loop; it's too long by half, but it's a tribal chant — a very Now form, according to McLuhan, who is also a member of MOOT — and you're not supposed to use Western clocks to measure Eastern time.

The voice-loop is split onto two tracks, and as the piece goes on (and on), one channel lags behind the other, turning the voice into a very rhythmic instrument. (This lag also causes three nice upscale-and-down phasing effects when the piece is played in mono.) As the lag between tracks widens, and more voices (the same loop) are added to the mix, the phrase turns into "Cuma Tish Odem": "Cuma" is the spoken chant, "Tish" is a guiro-like rasp, and "Odem" becomes a honking horn note. Towards the end, so many voices come in that it all sounds like a cloud of hornets. There's no dynamic range at all, and the rhythm changes are so slow that the needle could lock in a groove and you wouldn't know it for half an hour, but if you're able to abandon yourself to it, it will take you into a very non-European time experience. It bothered me that it just faded out at the end, but I guess, since the piece was made for a civil-rights rally, it had to Go Marching On.

Richard Maxfield's Night Music is more like a long day in an aviary. The piece is more or less continuous, non-stop heterodyne warbling, and it's oddly muffled throughout. Like Reich's piece, it just fades away after a while. The piece was originally used for a dance, and it would work for that because the warbles are strongly rhythmic, but by itself, it's too long and doesn't go anywhere at all.

Pauline Oliveros's I of IV illustrates one of those Laws we are supposed to be overthrowing: Ten Minutes of a Fast Rhythm is Longer than Twenty Minutes of a Slow Rhythm. I of IV, although it takes up all of side two, is not too long, it's just right. This piece is slow and very spacious, atmospheric and very beautiful. The action is at the extremes: very high glissandi going way up inside your head, and a low motor rumble in the bass, and I suggest you turn the bass and treble all the way up when you listen to it. Like Maxfield's piece, this is all generator heterodynes — sounds from beyond 20 kHz, difference tones, laid down with crossed tape-echo between channels (a figure 8 circuit loop between tracks) and a long delay (of several feet) between record and playback heads. This technique always results in a vast stereo space being created —

a real cathedral — but it only works with legato glissandi (I mean, slow continuous frequency changes) and it's impossible to edit — there are no holes at all — so this had to be a Real Time piece. There must have been a cumulative exhilaration in doing it straight through — a sense of expanding power in control, and this comes through — particularly the power, which appears in the form of a megawatt pedal tone. Over this are laid the long, lovely tuning wails which develop in the foreground and move slowly back into infinity. The piece is at once delicate and strong, not afraid of the new-old cliches of tape-echo ping-pong and outer-space whooees, and very moving: a beautiful slow voyage in vast spaces.

The other two *Odyssey* LPs are not All-Electronic, but one is All-Singing: "Extended Voices". The best pieces on this one are not electronic, and of these, the best is (again) Oliveros's Sound Patterns. The piece is short, exuberant, funny, and very well-recorded. It is "electronic" in the composer's attitude towards her material, in this case an excellent choir who shout, sigh, pop, click, and hiss. Again, the piece sounds like it was fun to do, and it's good to hear.

The two little Morton Feldman pieces, Chorus and Instruments II and Christian Wolff in Cambridge, are also for unwired choir. Both are unvarying Minimal Feldman: one has chimes and a tuba, and the other doesn't. I tend to doze off in a series of Edison catnaps during the indeterminate pauses, but both pieces are lovely — the one with instruments being particularly fine.

Robert Ashley (The Wolfman) has an unwired piece called She Was a Visitor which irritated me because I couldn't hear what the choir was doing behind the willowy-voiced Speaker, who stumbled through his part (his whole line is "She was a visitor", repeated over and over). I know he's necessary to the piece, but it would have been better if his part had been put on a tape loop, like Come Out — but then, you couldn't perform it, and that's the name of this particular game. I like Ashley better when he's going out of his head in his Altec nightclub.

From these little pieces, we go into the Now Sound, which, as far as I can tell, is Old Distortion. I've got nothing against distortion; after all, a square wave is a distorted sine wave — but over a period of time, it's fatiguing to listen to, because my mind won't stop trying to sort out the hopelessly tangled harmonics in it. John Cage's Solos for Voice 2 has the maximum Now in the form of voices who-ing and ah-ing against plastic pickup sheets. (You can hear the effect by clamping a cup over your mouth and trying to sing.) This, and a lot of howling and screaming and unprogrammed circuit noise, is about it. It's the sort of tape someone does for the Center Halloween Party every year. To me, Cage is the seventh of Les Six; I know I'm supposed to take him seriously, but I always hear him joking, no matter how seriously I read him.

Toshi Ichyanagi's Extended Voices extends, like the Cage, into tedium. The voices are extended so far that there is little point in using a choir at all — except that this is a performance piece. I hope there is a great lot of stage theatricality that is obviously lost in recording. What we get is just residual super-fuzz (the kind that comes out of an overloaded ring modulator) and slide-whistle clowning.

Alvin Lucier's North American Time Capsule 1967 has a good title and the most interesting sound of all the pieces — for five minutes; unfortunately it runs ten. The basic sound is like that you get from Robert Robot the Mechanical Man when you run the serrated plastic ribbon that grows out of the toy's back over your thumbnail (except Lucier's Robert Robot is a Vocoder — made by Sylvania, not Hasbro). This, and fast-tuning white noise, is about all that's inside the time capsule. It may hold an accurate record of our communications morass for future archeologists, but to me it sounds like nothing more than Sunday on the Citizens' Band. Oddly, it's better

heard in mono, because the eight tracks — reduced to three sound points in stereo — only confuse an already confused issue.

Whenever a piece seems too long to me, I play it over again, hoping patience will be rewarded with a hidden organization unfolding. It seldom is. There's some mechanism in my head that goes into fail-safe past five minutes of undifferentiated noise, and Gordon Mumma's Mesa is 23 minutes of undifferentiated noise. Mesa is one side of the third Odyssey, "A Second Wind for Organ", and I have the impression that the only reason it stopped after 23 minutes is because 23 minutes is the optimum limit for an LP side. After I sat through it the first time, I had the feeling I'd been listening to one loud tone for two days. That's why I played it again, and now I can't stop the buzzing, Doctor.

I first heard this piece on TV, accompanying a Merce Cunningham dance called "Place". Being non-technical, and having spent time in California and Mexico, I thought the Place was a Mesa — flat as a table top — and the music seemed to work well. It reproduced the Warhol decor of silver lamé pillows lazily floating around the stage, and it left the dancers alone to do their thing, unhampered by a beat. On a record, it simply represents a synthesis of an acoustic recording of an amateur Gagaku orchestra tuning up, forever. The texture of the single sound is unrelievedly burry, and the piece is interminable, going on into reaches of lost time that Steve Reich never dreamed of. Maybe this is the point, and maybe it succeeds; one man's drone is another man's sonata in this wilderness. But, though I like Gagaku, I can't de-Westernize myself enough to accept this kind of low-speed teeth drilling as a musical experience — or any other kind of experience I would wish for.

The other side of this LP, the non-electronic side, is great. David Tudor (who played the Cybersonic Bandoneon in the Mumma piece — or rather, he played the Bandoneon and Mumma wrung it through the Cybersonic) is here in full control (or full out-of-control) of two different unwired organs, and both — one huge and echoing and one small and wheezing — are marvelous sounding. Both pieces on this side are wildly funny (oh, I see, all he likes is funny music) and both are very well-recorded.

Mauricio Kagel's Improvisation Ajoutée is true Grand Opera, with maniacal hoots and laughter, offstage crashes, a disorganized claque, and coughing fits. "I'll huff and I'll puff!" shouts one of Tudor's assistants, and the piece tries to blow your bass-reflex down.

For 1, 2 or 3 People, by Christian Wolff, was performed inside and out a Baroque organ on separate tapes, which were later mixed. There are startling slams and avalanches of untuned air, faint pweeps and calliope hoots, Donder-and-Blitzen hoofbeats with sleighbells ringing, and total demolition towards the end, from which the old organ emerges, still wheezing and clopping. The sound throughout this side is the best: full and clean, even in the densest parts. The contrast with Mesa makes a strong case for moving air as a Continuously Viable Sonic Material (which is Now for Don't Throw the Baby out with the Bathwater). There are still worlds of sound you just can't get out of an aluminum box, no matter how exotically you Dymo-label it and how many mesas it contains. David Tudor & Assistants should be credited with a fine realization of these pieces, since realization in this case can represent anywhere from half to all of the composition.

"Silver Apples" by Danny Taylor and Simeon. Kapp KS-3562.

I don't know if this is Son of Silver Apple or not. These Silver Apples are two rock musicians named Danny Taylor and Simeon (— just Simeon; Silver Simeon, I guess). Or rather, the album

notes tell me, "Silver Apples is an organic mechanism" composed of the two. Taylor plays the Taylor Drums, a vast expanse of traps and cymbals, and Simeon plays the Simeon, a vast expanse of wires. The Simeon, as far as I can tell from the pictures inside the album ("Full Color Souvenir Inside!") is composed of nine Lafayette sine/square generators, a Gibson Maestro unit, and some Army-Navy radar surplus. In order to turn the nine generators into a Simeon, Simeon pasted black tape over the Lafayette label and re-marked the dials — and the photographs were reversed, so that everything reads right to left ("FFO-NO") — but I'd know them anywhere because he didn't cover the switch labeled "WAV FORM" — which is Japanese for Wave Form. You have to be a compulsive killjoy like me to point all this hankypanky out, but it illustrates that even in rock, the Synthesizer Mystique is with us. "The bass oscillators are played with the feet," we are told, leaving Simeon's hands, elbows, and knees free for Lead and Rhythm Oscillators. While tromping on the bass and elbowing the rhythm, Simeon also plays flute and sings. Truly an Organic Mechanism.

(The Gibson Maestro, if you're not familiar with it — and there's no reason you should be, since it's designed and marketed for pop musicians by Gibson, who made the first electric guitar [and we all know what that instrument led to] — is a bass-octave generator, primarily; it does other things too, and there are two different units. I think Simeon uses the reed unit, and this is odd, because if he'd used the rhythm unit, he could have done away with six of his generators and freed his extremities for something more interesting. In fact, with a little additional circuitry, he could have done away with Taylor. But then, there wouldn't be anything very impressive about one Apple sitting on stage, doing nothing while all that rhythm rolled out of a few little boxes.)

The result of all this organic mechanizing is interesting the first time, dull thereafter. (The album Instructions read: Play Twice Before Listening; I played it twice and stopped listening.) The main attempt here is to generate electronic rock rhythm — something no one has done before, that I know of. On Lovefingers, the Simeon and the Taylor do manage to get together and have a success, but the beat throughout the LP is metronomically dull: all the cuts are chants (one is a try at making rain) and all the lyrics are full of weaving-waving, flying-floating, and Seashells by the Seashore. The Taylor tomtoms beat heavily along, and the redundant Simeon rhythm generators seldom depart from a steady ding-dong doorbell.

This LP is one more step towards something that's coming, and it's interesting for that reason. I don't know if these Silver Apples fell off Subotnick's Apple tree or not; there's no acknowledgement on the album, except to Yeats, who started it all with his Silver Apples poem. But, if they did, they fell far afield. Subotnick's rhythm — that eight minutes of it — is an organic mechanism, a powerful, witty, swinging machine, finely made. I doubt he could perform it, but I don't care; I can buy it for two dollars and take it home with me. I hopefully imagine one of the reasons for the restricted rhythm of the Simeon is the need to perform live. But they had no such restrictions on this recording (it's obviously multi-tracked and overdubbed).

On stage, the Apples probably make a mind-blowing impression — drums, wires, light, twirling dials, and Simeon's flailing hands, elbows, knees, and feet — but on record, without something to look at, the poverty of invention becomes increasingly evident as the cuts multiply. On stage, I've heard incredible walls of sound come forth from the minimal efforts of a few pale children, and the contrast between what you saw and what you heard was enough to blow all your cool judgment fuses on the first bar. A lot of this is pure level: you can't record (let alone reproduce at home) 0-120 dB attacks, and rock LPs are fourth-carbon copies of the stage sound, even when they try for it, as they do in the Holding Company's new Columbia LP, "Cheap Thrills"; when

you witness these five people doing their Combination of the 2 on stage, you're sure you're not going to survive it, but all the record can do is stir faint memories of that sound. So some groups (like the Doors, a live-assault group onstage) turn to something else on records: detail, perfection, technique, even thoughtfulness, which makes them eminently re-playable. If the electronic rock people (and some electronic not-rock people) are going to succeed on record, they'll have to accept this difference; if you accept it, one is not better than the other: I don't like to listen to records in a room full of people, and I don't want the Holding Company live in my living room. I of IV is singular, Combination of the 2 is plural. Either we accept that, or take time out to develop new instruments and performance skills to bridge the gap. But these groups aren't likely to have the patience or to take the time to acquire these things. Right now, it's jump-in time, or ready-or-not-here-we-come. I expect the Very Next Thing will be The Finley: four hundred Eicocraft solid-state burglar alarms, wired in series and played with Finley's nose.

— Tod Dockstader

"The New Music": Rimes pour différentes sources sonores by Henri Pousseur. Victrola VICS-1239.

In his excellent article (a transcript of one of his lectures) published in EMR No. 5, Henri Pousseur outlines the development of his thinking during some years of work in various electronic music studios, and the parallel but different course being pursued at the same time by such composers as Berio and Stockhausen.

It is very interesting, in the light of this article, to be able to hear a work of about ten years ago which exemplifies a particular phase in the composer's development, and coincides also with the foundation of the (then) new studio in Brussels.

Rimes makes its intention clear in the title, and explores a large number of possibilities inherent in the idea of mixed sound sources. Apart from the obvious contrast between performed, "human" interpretation and "frozen", prerecorded synthetic sounds on tape, the music can present, for example, the imitation (rhyme — rime) of one sort of sound by the other — a genuine pizzicato in combination with plucking sounds achieved electronically, or drum-like and bell-like sounds in rhythmic harness with live sounds of the same type. Alternatively a complete break in tonal palette can be aimed at, and the use of strings enhances this aspect because string sound is a particularly "alive" timbre whose electronic equivalents (so far) are usually not at all like the model, whatever the measuring instruments seem to say. Similarly, the considerable use of filtered and modulated noise on the tape throws into prominence a type of sound which cannot (again so far) be achieved by acoustic instruments, though some of them are roughly drum-like.

One matter is difficult to assess if one has not heard a concert performance of the piece (and I have not); that is whether the spatial relationships are correctly presented on a normal stereo disc. In concert performance the loudspeakers are meant to be placed at front and rear, and this dimension is difficult to give in two-track stereo, which tends to emphasize left/right relationships more than near/far. At times, when listening, I found it difficult to separate timbres which I think would probably be perfectly clear in the concert hall. Finally, on the subject of recordings in general, it might be said that, since the whole point of this piece is the contrast between the immediately created and the predetermined sounds, recording the whole and fixing both halves in an immutable mold is bound to kill the idea stone dead. But this can be said of any instrumental recording to a greater or lesser degree, and whether or not the presentation is exactly as the composer would wish, this is a very good, well-articulated perform-

ance, in which the transparent small orchestral ensembles can be heard with great clarity.

The first movement opens with percussion (including melodic instruments like glockenspiel and vibraphone) and strings, but the texture is gradually penetrated by electronic sounds, primarily noise-derived, and altered recordings of sounds similar to the live ones. The balance is subtly adjusted so that the electronic sound threatens to dominate the instrumental, and then slowly retreats. A fine climax of strings with "chords" of noise spectra and live taped percussion sounds leads to a calm ending, like a pool returning to normal after a disturbance.

In the second movement the instrumental shapes are larger, richer and more fragmented, and the formal structure is opposite to that of the first movement. Deceptively smooth noise patterns peel off their velvet gloves and become increasingly complex and aggressive. The instrumental ensemble enters and eventually dominates the tape, the small, scattered groups barking and yammering across the texture. The electronics could easily be made to overpower the instruments through sheer weight, but this is avoided partly by restrained writing and partly because the most telling sonorities are given to the instruments anyway.

The third movement is entirely instrumental (I think, but I may have been deceived), and forms a kind of coda, returning gradually to a mood reminiscent of the end of the first movement: calm and lyrical with touches (dare I say) of Webern.

In another age Rimes might have been a Divertimento. Much of the music is charming and witty, particularly the capricious setting of long notes and chords (some of them backwards) against tiny arabesques, staccatissimi, and fragmented bubble-chains of noise. If one can think of it as any kind of contest (and no doubt Pousseur would not wish us to), the instruments have it, since they propose the argument, continue and expand it against electronic counter-proposals, and have the last word. But the contest is friendly, and for sheer integration of material the work is very remarkable. Referring again to the thoughts expressed in Pousseur's lecture, it is clear that not long after the composition of Rimes his ideas altered a great deal, and his approach to the instrumental/electronic melange would now be quite different. But as an example of a particular genre and an important period in a developing composer's work, the piece has great interest, and also a great deal of delightful sound. Its aggressions are civilized ones, and in many places it aims at and achieves real beauty.

Since the disc also contains some notable instrumental pieces (Stockhausen, Penderecki, Brown) it is well worth adding to one's library.

— Tristram Cary

Silver Apples of the Moon by Morton Subotnick. Nonesuch H-71174

Morton Subotnick is to be congratulated for this beautifully sounding composition. I admire Subotnick's taste in sounds, and his ear in selecting and balancing them. The result is one of the "prettiest" electronic compositions released on record to date.

Much of the formal organization is right and proper. One has the feeling that this is a composition: integral and complete, and not a mere stringing together of sections and sounds. All this is to the good. But the surprise comes when one attempts to listen with concentration to the entire record, from beginning to end. My opinion, which comes from five such sessions over three months, is: I'm sorry, but Silver Apples is a bore. Perhaps 31:30 is just too long a duration for

a single electronic composition in this style and density; or perhaps, more likely, the Buchla-designed synthesizer contains certain operational "traps" which are avoided only with great difficulty. I am referring to two problems. The first is the definite lack of any sense of performance. The phrasings and articulations are not particularly expressive; they either sound inflexible and mechanical, or aleatoric and unimportant. Pretty little "glissandi" tones of sine and sine-like waves dance about in a cloud of constant-perspective reverberation (Fairchild reverberation, I think). They neither recede into very heavy echo, nor emerge in razor-sharp dryness. Nothing shapes towards or away from tension or release. All is euphoric and pleasant, but never musically compelling — sort of like the 20th century equivalent to late 19th century salon art.

Secondly, the sequencer, the heart of the Buchla System, is to my ears simply over-used, and overly depended upon to make the composition move. And move it does, with a dull peck-peck-peck-peck of sixteenth notes, rhythmically accurate and, as any performer will admit, perfectly deadly. The bulk of side two is the finest example of this sort of hangup. The album is worth buying and listening to just for this.

Despite these comments, I sincerely do recommend this record. In all fairness to the very talented Morton Subotnick, Silver Apples of the Moon is perhaps described best as a poor performance of a fine composition. More of this sort of music, instead of the usual "cop-out" style one is accustomed to finding of late, would be very healthy for the field at large. I still am looking forward to a convincing marriage of performance practice with the new electronic musical art, but this may be my own hangup.

"Electronic Music / Musique Concrete; A Panorama of Experimental Music, Vol. 1": Omaggio a Joyce by Luciano Berio; Visage V by Luc Ferrari; Artikulation by Györgi Ligeti; et al. Mercury SR2-9123 (subsequently released: Limelight LS-86047 & LS-86048).

Mercury Records should be given a great deal of credit for this release. One can only hope that the indication that other volumes are to follow is correct. The present two-record set presents American record audiences with their first comprehensive look into the electronic music which was coming out of Europe about ten years ago, and represents some of the finest pioneering efforts of that era. It is from these sincere musical attempts to control artistically the relatively awkward facilities of the "classical" studio that the state-of-the-art "wonder machines" of the present developed.

I am amazed that, although most of their various routines and methods are painfully obvious, these composers were able to give us viable musical shapes and forms, even idiomatic phrasing and ensemble feelings.

If, indeed, the album contains any deficiencies, they probably are:

(1) The electronic expressiveness available at all of these studios at that time, i.e., classical tape manipulations (editing, speed shifting, retrograde, manual motions of the tape, manual filtering, mixing, etc.) is, from today's vantage point, very limited, and its own characteristic sound pervades all of the music produced with these techniques. Spot-checking through the album reveals a great deal of similarity between all of the compositions, and rather undesirable types of homogeneities within each piece.

(2) Probably as a result of the same studio limitations, the majority of the music on the album has

a long drawn-out feel; it all too often moves in adagio, or even grave. I find that the spaces and balances between moments of tension often exceed justifiable proportions. Certain kinds of rapid manipulations were simply not idiomatic at this stage of growth of our new musical offspring.

As a result of this, the album is not likely to demand rehearsals in its entirety. Yes, there are favorites that you will want to play again and again, but long steady doses might best be recommended to members of the "turn-on" generation — so much here is wonderfully psychedelic in the best sense of the word.

My personal favorites happen to be: The Berio Omaggio a Joyce, perhaps the only masterpiece on the record. Here structure, technique, and idiom are totally integrated. One has the feeling of a performance, not a mere haphazard reading or collage. Ferrari's Visage V, while slightly overlong, has a rollicking good-natured sense of humor to it, and nicely avoids much of my "adagio syndrome", maintaining a real continuity and contrast, with a great many musically exciting moments. Ligeti's Artikulation: I like the phrasings in this one particularly. There is a finely controlled shaping to them, be it intentional or accidental. The overall form of the work is weak, perhaps, but fortunately, it is not too long. Again, in contrast to so much ultra-serious electronic music one finds today, the work's sense of humor and buoyancy (atypical of Ligeti) is highly refreshing. Also, the stereophony is truly integral to the piece and forward-looking.

All the cuts on the album are very cleanly recorded and pressed, the jacket notes are good, and the conservative packaging is modestly attractive. It is certainly a necessary addition to any representative collection of music in this medium, and leaves one eager to hear more recent works by the composers included.

Incidentally, thanks are in order to Mercury for the manual sequencing of the sides.

— Walter Carlos

Omniphony I by Tod Dockstader and James Reichert. Owl ORLP-11.

The rock and roll critic for New York's Village Voice, Richard Goldstein, recently published an editorial on criticism, in which he noted that one no longer opines as to what is good or bad; one merely "puts the pieces in perspective". Substance, he says, doesn't intrigue us, but we react to style, and we no longer can point out the difference. "Both, we exult, are the same." Style being equatable with technique (almost 1:1), electronic music in this respect is precisely like rock and roll. There are no standards but there is style. Or shall we say, style/technique. Lots of it. I might add that in any fast-moving artistic medium it has always been the same, and those who have tried to point out content have usually been laughed at. Content is what gets talked about a hundred years later. Style is always chic, always now.

Listening to this monumental opus, put together over a 4-year stretch by two composers (if we may still meaningfully use that term), I found myself floundering in this very problem. What is its content? Can it be described in any useful fashion —? Because to define content means to set up standards as to what is right and what is wrong. There are aspects of Romantic-period-music in this work, in its size and scope and its grandeur, in its use of portentously significant thematic material recurring in new and cyclic forms, even in the spread of its five movements, which forcibly suggest the late symphonies from Mahler through Shostakovich. Is this "right"? And is the clear influence of a kind of television music, via Reichert, to be thought of as a matter of content? And how about the unmistakable sounds of the Moog Synthesizer, which this listening

ear picked up with no trouble at all? Not content but style/technique. Styles, in the plural. Forget about content for the time being, a half century or so. Electronic music isn't yet good or bad in any permanent way; there are no parameters for judgment except the old ones that no longer necessarily apply. So it sounds like addled Beethoven? Maybe so. Why not? Or like scrambling eggs — perhaps even better.

Omniphony I then, is a new and large-scale synthesis of various style elements and techniques, and that, for me, is its importance, both as to technical competence and in the listening. Its originality is in its approach, which is unusual. To begin with, a series of electronic "cell" sounds, ideas, produced by Tod Dockstader, a lone-wolf electronic composer of considerable experience. Some are purely synthetic, others are derived from "live" sound. Then a parallel composed series of instrumental parts, for standard musical instruments, contributed by James Reichert to match the electronic cells. This instrumental music, played "live" from score, was recorded in a special session not as any sort of final "piece" but as further generative material with which to "compose" on tape. Only then was the work itself undertaken, using the original cells and their instrumental counterparts as equal working material, subjecting both to further extensive treatment in the usual ways, including synthesis via Moog. Both the cells themselves and their untreated instrumental counterparts are heard along with the variously altered forms.

Out of this material, the five movements are built — Romantic fashion. Thus, the dominating upward arpeggio of the first movement (electronic and in "live" instrumental form) reappears in the last movement, like the "motto" themes in Mahler, or the transformations of Richard Strauss.

The sound of Omniphony I is technically clean, clear, and full of interesting color and rhythm contrasts; I would say that it is "state of the art" in respect to cumulative distortion and background noise, those agonizing problems of earlier electronic music. We are never in any way aware of the dubbing process, the third or fourth or nth generation copying. Over such a long span, too, the five movements maintain a high degree of continuing interest, an achievement in itself. The thematic cells are not difficult and impress themselves on the ear with very little trouble; the contrasts between the electronic and "live" versions of the same idea (treated or untreated) become increasingly prominent as one listens further — the idea is a good one and well worked out. The conservative movement layout, not unlike a super-symphony, helps to control this large sound outlay, giving it the time-tested shaping that holds many big orchestral works together, more or less, over their hours of length. An imposing opening allegro with a species of slow introduction, a slow movement, a scherzo, an impressive finale a la Tchaikovsky Pathétique — they are all suggested here, and to good impact. Again — why not?

My chief negative criticisms are two. First, too much of a muchness. The title gives that away. One would prefer a more modest shaping (and the same with Mahler!). Grandeur sometimes verges on pomposity, modernity becomes almost old-fashioned. One has to be very good to get away with pomposity these days.

Second, there is more of the traditional than one might think in other aspects of the work, and here is the remaining unsynthesis, not yet wholly digested in style. Mr. Reichert has had a high-level conservatory education and has turned out quantities of TV music. Is it a viable coincidence that, every so often, Gunsmoke or equivalent rears up in a pretentious cadenza, a taut passage of conventional commercial-modern? And how about that piano bit, two quick chords, which sound like an intrusion from the Grieg Concerto? For my ear, these legitimate stylistic derivatives are honest but not yet digested. No great criticism, in view of the monumental fact of this completed work.

This is a good composing team, one man out of a too-commercial background of professional music, the other out of the dreary life of the commercial recording studio, which is where the two met. Their acquired techniques are directly complementary and in the end they will iron each other out smooth. Maybe in Omniphony II, the Ultimate Synthesis?

— Edward Tatnall Canby

"A Panorama of Experimental Music, Vol. 2": Le Voyage by Pierre Henry. Mercury SR-90482; (subsequently released: Limelight LS-86049).

This is a magnificent work of art. It moves quietly yet brilliantly within one miraculous cycle of the Wheel of Life described by the Tibetan Book of the Dead, from death through reincarnation.

Henry has divided Le Voyage into seven sections and has further regrouped the sections which lie between the last breath of the dying man and the first breath of the reincarnated spirit into a Trinity: After Death 1 and After Death 2 (stage one), Peaceful Deities and Wrathful Deities (stage two), and The Coupling (stage three).

Breath is the symbol of life, and the listener is particularly aware of the movement of air throughout the first and last sections of the piece, an effect achieved in part by the synthesis of filtered bands of white noise. In the first section, Breath 1, the breathing of the dying man is forced and painful: the wretchedness of the body dominates the spirit and obscures awareness. The music gradually recedes to the calmness of death and the first section terminates in emptiness.

The spirit encounters the Clear Light in After Death 1 and 2. At first, the music depicts brightness, delicateness, awe. Wonder pervades, as if the spirit were peering over a great wall at a luminous garden. The music drifts into strangeness, though it is movement without displacement; all remains unchanged at the end of Breath 1. Breath 2 shows the loss of the Clear Light as the spirit longs to return to life and thereby only increases the distance from the calm. There is uncertainty and regret which announces the re-entrance of the self: the brightness, the glow, becomes ice, and the drifting becomes an aimless panic and ends sharply, far removed and hopeless.

The spirit encounters the Peaceful and Wrathful Deities (often represented in Tibetan tapestries), but does not realize that they are all one spirit, and that the one spirit is his own. The two sections are interwoven with radiance and terror, only separated by the element of time which the spirit clings to and which serves to torment it.

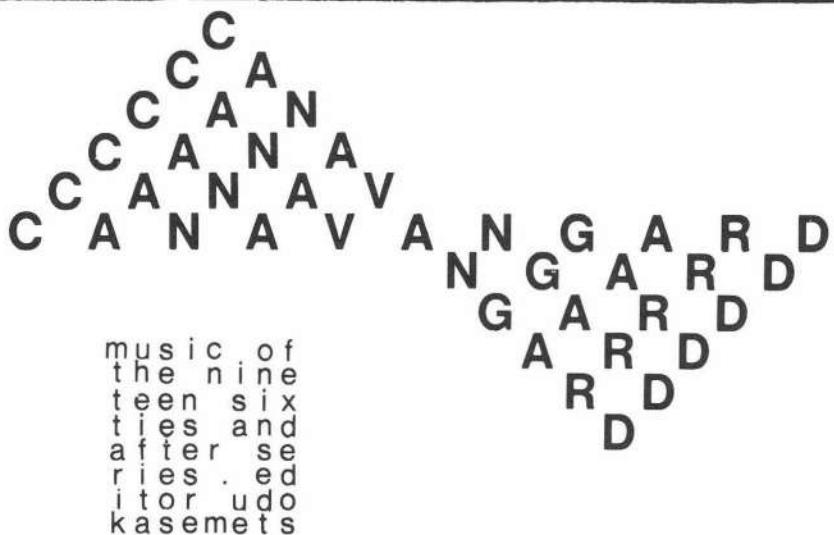
The Coupling is the stage of rebirth (metempsychosis) and is pervaded by an incredible pull, a sense of falling. The spirit has long lost the Clear Light and is condemned to be reborn into another body. Male and female forms appear in union and six wombs appear, each of a different color signifying a different being. The spirit rushes into the womb which signifies a desire for life, and re-emerges in Breath 2 as a wretched human being, who must again follow the wheel of rebirth; the music ends as it began.

Le Voyage is not programmatic music in the usual sense; it is more properly what is called "total environment". The scheme dictated by the Tibetan Book of the Dead is a fantasy, a parable, which serves to illustrate that which is not known, which cannot be communicated from one being to another by familiar means. It is from a lucid conception of this parable that a deeper understanding can emerge, and it is towards this end that Henry's music works so brilliantly, translating an ethereal concept into the realm of sound where space and time flow, recede, and unite.

It is music which demands a special sort of listening, a diligence above that which is lent to many works of art; Le Voyage can hardly be enjoyed unless the listener leaves behind him the impatience and tension to which he is normally the servant, and in this sense there is a "price for one admission" to the voyage. The music is a gem technically and spiritually.

— Jonathan Weiss

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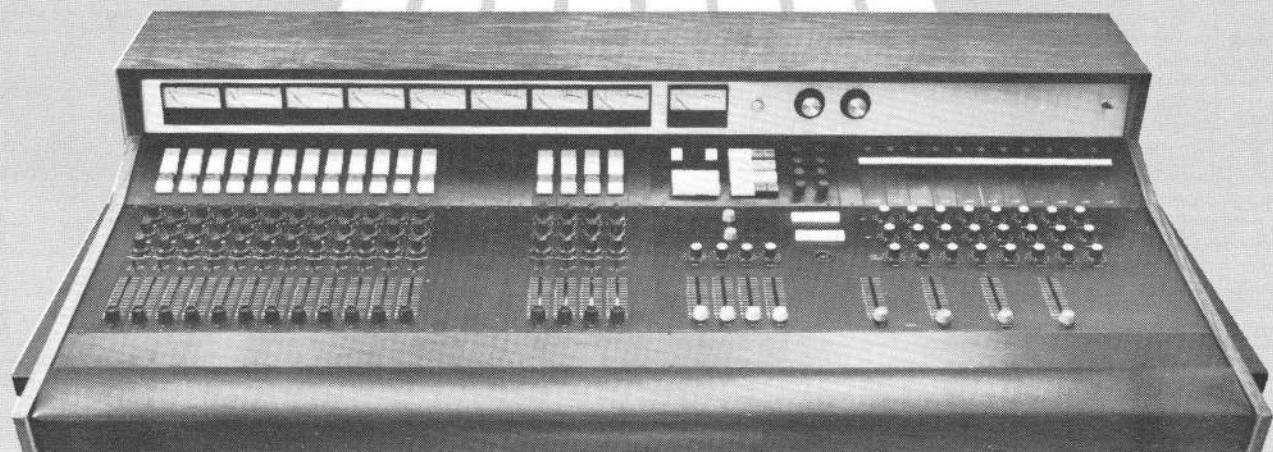
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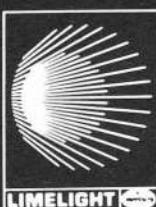


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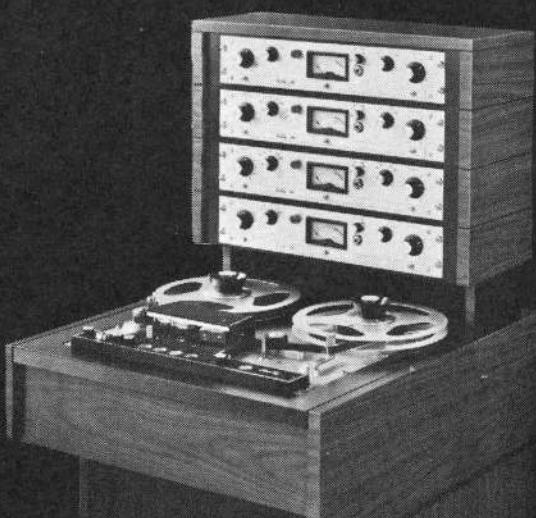
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