

16 November 1964

Mr. Robert A. Moog  
R. A. Moog Company  
Trumansburg, New York 14886

Dear Mr. Moog:

Thank you for your interested reply. I have a bell gate and a ring modulator, but I would be very interested indeed in trying out a bank of oscillators, as the Physics Department has just asked to have its audio generators returned for a lab.

In reply to your questions about my greatest needs at the moment, I am supplying the following list (you asked for it!).

1. An oscillator bank. Self-explanatory.
2. A band-pass filter. I have examined various types of commercial filters but cannot afford any of them. They seem to me to be overpriced, especially since I've been told that one can assemble a reasonable facsimile for about \$50. I have not been able to locate a schematic, however, and my math will not stand up to designing my own. Perhaps you know where I could obtain such a schematic or else a reasonably priced kit.
3. A Springer Zeitmasse machine. Dr. Schaeffer has seen one of these in Europe, but says it has only limited application. Basically it is similar to the Bell "Edispot". With it one can vary the pitch of a particular envelope without affecting its length or duration, because of the rotating multiple tape heads. I'd like to "see for myself."
4. A speed control device. I've read that an A.C. tape transport motor can be controlled by hooking up a sine generator, a 100 watt basic amplifier and a variable transformer. The generator supplies the 60 cycles and deviation from this will speed up or slow down the motor. I have a deck attached to a variable transformer, but as this only controls the voltage, I am unable to do anything more than slow a tape down. The range is very small and varies according to the friction involved. Usually, the best I can do is about a whole step (in pitch). Otherwise I am limited to octave transposition. This is a very real handicap. Perhaps you can advise me. It seems to me that if this is a practical manner in which speed control can be managed, someone ought to put out a packaged unit in which all these components are matched.
5. A Frequency divider. I've built one of these, but it has only a limited use because it has to be re-tuned for every other note.

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If a frequency divider and/or multiplier can be truly independent of frequency, this would be a useful instrument for thickening contrapuntal lines and building spectra from pre-existent sources. I'd like to see a unit that would contain both a divider and a multiplier which could be used interchangeably. Perhaps it could contain a control which would allow division/multiplication at intervals other than the octave.

6. Co-incidence and "Or" gates. I've seen diagrams of these in Electronics texts, but have not experimented with them as yet. I believe these could be adapted for use by electronic music composers. I'm only guessing, but I suspect that some of these instruments are already used in Music Synthesizer computers. These gates could be useful. For instance, if one has a rhythmic figure and wishes to add further sounds to it, the "and" gate will simplify the process. I don't know how you would do it otherwise, except by a long splicing process. New rhythms could be created from existing material by mixing tape loops through the gate. Only when they all strike at once will a sound be passed.
7. A sound-into-light device. Dr. Schaeffer has one of these but I did not have a chance to examine it. I have been trying to set up my own to use at a projected concert here at the college. Perhaps you can help me. It consists of a set of band pass filters which trigger small relays. The relays control a bank of colored lights which are focused on a mobile-like collection of hanging mirrors, which in turn reflect the lights onto a screen. The screen conceals the whole device, which is hidden behind it. This has nothing to do with the production of music, but it would give the audience something to look at during a concert. I have learned of an instrument called the "Audio-Color" made by CONAR (3939 Wisconsin Avenue, Washington, D. C. ), but I assume it is on a smaller scale than the one which I envision. I enclose a diagram of my idea.
8. A Rhythmic Instrument. I have seen diagrams of the Wurlitzer "Side Man" and the Baldwin "Tempo Mate" both of which are electronic organ accessories designed to supply drum and trap accompaniments in a variety of dance rhythms. I have also noticed a machine called the "Belloti Trinome" (Tang and Diner Inc. 2451 N. Sacramento Avenue, Chicago) which is capable of clicking out a variety of rhythms ("a rhythmic metronome"). I have also heard of a device called a "rhythmicon", an invention of the composer Henry Cowell on which any combination of pulses may be obtained. I would like to have an instrument combining all of these features which would supply a variable series of rhythms or a combination of rhythms at once. This instrument might consist of several electronic switches and might also include noise generators and bell-drum gates. There might also be inputs which would allow the mixing or substitution of exterior sound sources as well.

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9. A light-sensitive volume control. I have seen Dr. Schaeffer's "Hamograph" which accomplishes this. This is a device to control sound envelopes only. I believe that this instrument works in this manner: light-powered cells are arranged in such a way as to cut off an interstage tube by the application of a negative bias to the grid. An insertion between the light source and the solar cell reduces this bias (if that's the right term) allowing a sound source to pass. Dr. Schaeffer's device utilizes celluloid loops on which are pasted opaque pieces of cloth, shaped to form the desired envelope. I believe there might be patents applying to this instrument that might cause difficulties.

Finally, I am very interested in your seminar. I would like to offer the following suggestions based on my own experience.

1. Unless you have a great deal of money for this project, it might be wise to require the participants to supply their own cotton-picking tape. Free tape is just too much of a temptation.
2. I would consider operating at least two studios. Beginners in this idiom are often overwhelmed by the possibilities involved and consume great quantities of studio time.
3. I would encourage the participants to bring as much of their own equipment as they can for the same reason. Much splicing and editing can be done independently if one has his own recorder, thus saving studio time.

I would be very interested in participating in this workshop, should you care to consider me. As you know, there are several approaches to electronic music and you should include composers who represent the scientific computerized approach as well as the less learned but perhaps more practical side.

I am preparing a detailed and annotated catalogue of my compositions and the instruments I employ in my studio, which I will send to you in a few weeks. If you know of any interested parties, I would be much obliged for their addresses. I feel this account may be of interest especially to beginning composers as it traces my own development in this idiom.

Again, many thanks.

Sincerely yours,

Otto W. Henry  
Chairman, Dept. of Music

OWH:mr