Electronic music types and history

ElectronicMusicmay include tape music (existing only on tape, and played through loudspeakers), live electronic music (created on synthesizers or other electronic equipment in real time), musique concrete (created from recorded and subsequently modified sounds), or music which combines live performers and taped electronic sound. Although these types of music refer primarily to the nature of thetechnologyand techniques involved, divisions are increasingly blurred. Other terminology, such as computer music, electro-acoustic music, acousmatic music, and radiophonic music, has also come into use, more often to indicate aesthetic rather than technological preferences.

In the early 1900s the Italian Futurists, led by composer Luigi Russolo, envisaged a music created with noise and electronic " music boxes", and the first commercially available electronic music instruments appeared at this time. However, although visionary composers like Scriabin and Henry Cowell had dreamt of music created by purely electronic means, electronic music first became realistically possible when recording technology developed during World War II.

Several studios came into being in the 1940s and 1950s, and were associated with key figures and specific artistic aims. In France, sound engineer and composer Pierre Schaeffer formed the French Radio studio (RTF) in Paris, built around several tape recorders, microphones, and tape editing equipment. The principal techniques for creating music were the cutting, splicing, looping, or reversal of lengths of recorded tape. These tape manipulation techniques resulted in a kind of sound montage, painstakingly created from recordings of sounds from the " real world".

Schaeffer referred to the results as musique concrete, a term still in wide use today, especially in France. His first experiment in this new genre used recordings of the sounds of trains, and all his works of this time were brief sound studies with evocative titles, such as Symphonie pour un homme seul, composed in collaboration with his younger colleague, Pierre Henry. Schaeffer's practical experiments in electronic music composition were supported by his influential theoretical writings on the subject, and the studio of Henry and Schaeffer attracted several emerging composers, among them the composer Pierre Boulez.

In the late 1940s in Germany, Werner Meyer-Eppler, a physicist and Director of the Institute of Phonetics at Bonn University, first demonstrated a Vocoder, an analytical device which included a synthetic human voice. His theoretical work influenced the composers associated with the West German Radio studio in Cologne (founded 1953), who were concerned with the electronic synthesis of sounds, through the use of tone generators and other sound-modifying devices. The first director of the Cologne Studio, Herbert Eimert, was highly influential in his method of using total serialism as a basis of constructing electronic works. In this method all aspects of music, including pitch, rhythm, and relative volume were controlled by numerically defined principles. Electronic sounds and devices provided a suitable precision and control for the realization of this concept. By a process known as additive synthesis (see section on sound synthesis, below) composers such as Maderna and Stockhausen laboriously constructed short electronic pieces, derived entirely from electronic sounds.

In the later 1950s many electronic music studios were established in Europe, the most significant being the RAI studio in Milan, founded by Berio and Maderna, the Institute of Sonology in Utrecht, and the EMS studio in Stockholm. The division between musique concrete and pure electronic music was a largely European phenomenon. Although various studios arose at the same time in the United States, aesthetic distinctions were less important. In the 1950s in New York, composers Otto Luening and Vladimir Ussachevsky produced tape music from very basic studio equipment.

Their music transformed the recorded sounds of instruments and voices through tape manipulation techniques and simple reverberation units. In the late 1950s they became associated with the Columbia-Princeton Electronic Music Center, at which composer Milton Babbitt used a huge RCA computer, filling an entire room, to create music composed on similar serial principles to Eimert and Stockhausen in Cologne. His work Philomel (1964) was one of the first to be written for live performer and tape. The development of computing technology in the 1950s and 1960s led to the establishment of a number of studios specifically concerned with computer music at American universities and, to a lesser extent, in Europe.

During the 1960s and 1970s the Americans Paul Lansky and Barry Vercoe, among others, developed music software packages (computer programs specifically designed for the manipulation and creation of sound) which were freely available to interested composers. This tradition of software development at American universities has done much to aid the growth of computer music worldwide. The Center for Computer Research in Music and Acoustics (CCRMA) at Stanford University, in California, and the Institut de

Recherche et de Coordination Acoustique/Musique (IRCAM) in Paris, founded by Pierre Boulez in 1977, both made significant use of computers and remain influential centres of electronic music composition today.

The rapid development of computing technology, in the last 15 years or so, has brought about a revolution in computer music and electronic music in general. Computers are now more affordable, and computer programs which originally took hours to run can now be completed in a matter of seconds, or even in real time. Today, many universities have a computer music studio and several countries have national studios, devoted to the composition of electronic music. In addition, composers are increasingly working independently, in personal studios.