



The History of Electroacoustic Music in the Czech and Slovak Republics

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# The History of Electroacoustic Music in the Czech and Slovak Republics

*Libor Zajicek*

*It is extremely important to view the entire electroacoustic [music] development as it was influenced by the ideological conditions in our country at that time. It may be possible that this is in the view of the West a completely foreign experience; but the existing consciousness that creating electroacoustic music is prohibited, that it is classified as an "anti-state" and "anti-regime" activity, is a big stimulus for the creation and aesthetic of electroacoustic music [in Czechoslovakia] [1].*

The despondent situation described in this statement by Slovakian composer Roman Berger was referred to by each of the 24 other people I interviewed in the Czech and Slovak Republics during the summers of 1993–1994 [2]. The totalitarian political regime that controlled the former Czechoslovakia supported only what it interpreted as "social realism" in the arts. Electroacoustic music was considered a corruptive, Western art form that had to be constantly suppressed. However, if government officials were to claim that Communism was the savior and supporter of the people, Communists could not completely "shut down" and forbid the production of electroacoustic music; if they had, they would not have been supporters of the people.

Over the past 50 years, the political history of the former Czechoslovakia has been marked by alternation, with each successive decade, between relatively strict and liberal leaderships. The totalitarian 1950s gave way to the freer conditions of the 1960s. The 1970s, as a result of the displacement of the liberal-thinking Party Chairman, Alexandr Dubček, and the invasion of the Warsaw Pact armies under Soviet leadership in the late 1960s, were a decade of renewed constrictive rule, while the better years of the 1980s ended with the decisive overthrow of Communism during the November 1989 Revolution (as it is known in the Czech and Slovak Republics).

These conditions are reflected in the history of electroacoustic music. Although political obstacles are apparent, this history remains quite rich. In 1971, for example, Czech musicologist Dr. Eduard Herzog had already translated Pierre Schaeffer's *La Musique concrète* into Czech under the title *Konkrétní hudba* (Musique concrète) [3]. Festivals of new music were also organized in the late 1960s, with the International Seminars on New Music and the Exposition of Experimental Music providing superb and important forums for the dissemination of new domestic as well as international electroacoustic music. Czechoslovakian music competitions such as *Musica Nova* (1969–1970) were extremely important, encouraging not only friendly competition for better compositions but also a slowly emerging respect for electroacoustic music on the part of radio-station officials. Internationally, too, Czechoslovakian electroacoustic compositions have fared well in many compe-

titions, including the Italian Radio's *Prix d'Italia* as well as competitions held in Palermo, Paris, Ghent and Bourges. Remarkably, all of this activity originated from only a handful, at best, of centers and their studios.

In fact, facilities established for the production of electroacoustic music in only four Czechoslovakian cities—Plzeň, Brno, Bratislava and Prague—have been the major driving force behind the development of electroacoustic music in the two Republics. As was the case in many other countries, the studios in these four cities grew out of early experiments in electroacoustic composition in the recording studios of radio and television broadcast stations. Czechoslovakia's web of government-controlled radio broadcast stations was directed by officials of the Czechoslovakian Radio, located in Prague. Although conflicting versions of the facts and varying titles held by unofficial studios can sometimes indicate otherwise, only three official studios—i.e. studios established for the purposes of realizing commissioned, autonomous electroacoustic compositions—were established in the former Czechoslovakia: the Experimental Studio at the Radio Broadcast Station in Plzeň, the Experimental Studio at the Radio Broadcast Station in Bratislava, and the Audio Studio at the Radio Broadcast Station in Prague. All other studios were classified as unofficial; in other words, these were studios in which the production of autonomous (i.e. not composed as accompaniment for other media) electroacoustic compositions was not the primary objective, and composers had to work in semi-secrecy [4]. However, all electroacoustic production had to be cleverly disguised or restrained to prevent government closure of even the official studios.

## GENESIS

Electroacoustic music in the Czech and Slovak Republics unofficially originated in the private experiments of mathematician Antonín Svoboda in the years immediately following World War II. Upon his return from visits to the United States, Svoboda became interested in unifying early comput-

## ABSTRACT

The history of electroacoustic music in the Czech and Slovak Republics began with simple experiments undertaken by composers in the 1950s. Increasing activity and interest throughout the 1950s and early 1960s led to the First Seminar of Electronic Music in the former Czechoslovakia, which was held at the Radio Broadcast Station in Plzeň in 1964. Four government-sanctioned electroacoustic music studios were established in the 1960s under the auspices of existing radio and television stations. All other venues for electroacoustic production were clandestine; however, even the official studios were obliged to restrain and/or disguise composition—for both political and economic reasons—throughout their history. The fall of the totalitarian regime in 1989 replaced political obstacles with economic ones. Electroacoustic music in the Czech and Slovak Republics has nevertheless survived and continues to develop.

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ers with music. Specifically, he was interested in automated music such as Mozart's *Musikalisches Würfelspiel* (Musical Dice Game), K. 516f, in which measures can be freely interchanged to produce a stylistically coherent performance [5]. Although Svoboda's experiments did not immediately yield tangible results, a more significant offshoot came to fruition with the formation of professional relationships between Svoboda and the musicians and technicians he worked with, who were also personal acquaintances. Svoboda, composers Miloslav Kabeláč and Jan Rychlík, and musicologist Vladimír Lébíl [6] formed a union that would eventually lead to the official beginning of electroacoustic music in Czechoslovakia, with production in sanctioned studios.

Lejaren Hiller's visit to and lectures in Prague around 1960 were tremendously inspirational to composers interested in electroacoustic music [7]. The 1961 publication of a debate on electroacoustic music witnessed the growing interest in this genre among Czechoslovakian composers at the time. Along with Svoboda, five composers (Jarmil Burghauser, Svatopluk Havelka, Rychlík, Vladimír Šrámek and Václav Trojan) and two musicologists (Eduard Herzog and Lébíl) took part in this debate, which was published in the newspaper *Literární noviny* [8].

The first real progress was made at the meeting of the Society of Czechoslovakian Composers on 15 June 1961 in Prague, where a commission on electroacoustic music was formed by Havelka, Kabeláč and Václav Kučera (composers), Antonín Sychra (musicologist) and Svoboda [9]. The commission was to concentrate not only on discussions and debates of current developments in electroacoustic music, but also on cybernetics; hence, it was titled the Cybernetic Commission. The members were immediately aware of the fact that, in order to make any definitive progress toward the creation of electroacoustic music, a studio would have to be organized in either a radio or television station: the Society of Czechoslovakian Composers lacked the funding and knowledge required to organize and establish a studio from the ground up.

On 10 January 1962, the members of the Commission took a step toward founding a studio by inviting Lébíl and Kabeláč to join them. These two served as spiritual leaders in the Commission's campaign to establish electroacoustic music in Czechoslovakia. Among the im-

portant tasks Lébíl and Kabeláč took on was the aggressive pursuit of all potential relationships between the Commission and government-controlled radio or television stations.

In addition, Kabeláč gave ongoing presentations at Commission meetings based on his findings from visits to Pierre Schaeffer's studio in Paris during the 1950s [10]. These presentations fueled further discussion and debate.

In early 1963, Lébíl was elected Chairman of the Cybernetic Commission. At a meeting held on 11 February 1963—and at subsequent meetings in the early part of that year—the members of the Commission reached agreements about the instrumentation and facilities a future studio should contain, as well as the most suitable location for such a studio: the Radio Broadcast Station in Plzeň. The studios at this station had already been the site of successful experiments in stereophony conducted by the Výzkumný ústav rozhlasu a televize (VÚRT), the government-controlled Research Institute of Radio and Television [11]. The studios at Plzeň were new, state-of-the-art for their time and conveniently close to the capitol city of Prague and all of the important composers involved [12] (Plzeň is about 60 miles from Prague). In early March, the Commission's members inspected these facilities and conferred with the Plzeň Radio Broadcast Station's Director of Broadcasting, Bohumil Samek, and a technical engineer from VÚRT, Ladislav Janík. This first step signaled future cooperation between the Commission and VÚRT. On 20 June, another meeting took place, at which the members of the government agencies proposed that the studio be directed by government forces. The Commission disapproved, but nevertheless some progress had been made. At a meeting on 29 June, the state forces proposed that the studio not only be equipped according to the wishes of VÚRT, but that any research and music produced there be redirected to benefit VÚRT's research.

The next, and probably most important, step in the development of electroacoustic music in Czechoslovakia was the First Seminar of Electronic Music [13], held 3–7 May 1964 by the Commission at the studios of the Radio Broadcast Station in Plzeň. Its exclusive focus on electroacoustic music made this the first official seminar of its kind in Czechoslovakia. Fifty-seven people participated, ranging from composers to sound engineers to musicologists.

Lébíl inaugurated the seminar with a statement defining its vision, which was to focus on "the elementary methods of electronic music." Lébíl continued: "Intentionally, we want to avoid the problems of aesthetics. We do not want the seminar to be a speed-course on practical applications, nor an academic discussion, but [we do want it to be] about the unification of elementary technical and problematic issues, and . . . it [should] focus on questions of methodology" [14].

The seminar was organized according to presentations on specialized subjects. Attendees gave the following lectures (in the order in which they are listed): "Elementary Questions of Acoustics," by Antonín Špelda; "The Function and Description of Instruments in the Audio Laboratory," by engineer Milan Meninger; "The Composer in the Audio Laboratory," by Miloslav Kabeláč, Eduard Herzog and Bohumil Čipera; "Graphical and Symbolic Methods of Musical Notation of Electronic Music, Musique Concrète, and Music for Tape," by Vladimír Lébíl; "Music and Cybernetics," by Antonín Svoboda and Antonín Sychra; and "Problems of Spatial Reproduction," by Ladislav Janík [15]. In addition, Kabeláč made several presentations on compositional techniques throughout the seminar, and Slovakian composers Ilja Zeljenka and Jozef Malovec (of the Radio Broadcast Station in Bratislava) and engineer Ivan Stadtrucker (of the Bratislava Television Studios) spoke about the progress undertaken at their respective studios in a presentation titled "Slovakian Dusk." The seminar included discussions about and performances of some 25 electroacoustic compositions from various composers in the field throughout the world. Participants were able to experiment and compose short études with a wide range of new instruments [16,17].

The conclusion reached at the seminar was that an experimental studio should be established in one of the studios at the Radio Broadcast Station in Plzeň as soon as possible, preferably later that year. It was to be equipped with instruments provided by VÚRT [18].

Due to financial and administrative problems, electroacoustic composition at the Experimental Studio did not begin until January 1967. The first composition, Karel Odstrčil's *Konflikt 42*, was realized on 23 June 1967 [19]. Two sound engineers, Čestmír Kadlec and Václav Ježek, were hired to work full time at the studio, and *Konflikt 42* was

followed by two additional compositions in 1967 and 11 compositions in 1968. On the average, about 10 compositions have been realized at this studio each year, with a total of over 119 compositions produced to date. Due to the invasion of Czechoslovakia by the Warsaw Pact armies in 1968 and its subsequent political ramifications, the number declined during the mid-1970s, with an average of only four compositions produced per year during this period [20].

The primary motivation for the creation of some of these compositions was justification of the acquisition of a particular instrument: Communist officials who authorized a purchase often expected immediate production of a composition making use of the new equipment [21]. All compositions automatically became the copyrighted property of the Radio Broadcast Station, while composers received only small financial honoraria and meager royalties from their performances [22]. The primary dissemination of these compositions was through broadcasting by the Radio Broadcast Station during the more obscure hours of the evening, although live performances for small audiences at the studio or for larger audiences at various locations in Plzeň also took place, and were enthusiastically greeted [23].

The Experimental Studio, whose activities were primarily controlled by Prague composers (it could be said that it was essentially a Prague-controlled studio), has witnessed a decline of compositions in recent years due to the founding of the Audio Studio at Prague's Radio Broadcast Station. In 1994, only one composition—Spacil's *Hudba pro Plzeň* (Music for Plzeň)—was produced there.

I visited the Experimental Studio (Fig. 1) in 1993 and, with Kadlec's help, compiled a complete list of its equipment (see Appendix).

## DEVELOPMENTS IN BRNO

Other Czechoslovakian cities also contributed to the development of electroacoustic music, each providing unique input. Brno, in Moravia, was not recognized for its technological richness, but for its role as a center for the educating of composers interested in electroacoustic media. Brno's Brněnské elektronické studio (BES), like the studio in Plzeň, was established in the city's government-operated Radio Broadcast Station.

Among the 57 attendees of the seminar in Plzeň were two sound engineers



**Fig. 1. The Experimental Studio at the Radio Broadcast Station in Plzeň (1993). The studio was not exclusively used for the production of electroacoustic music, although electroacoustic music production was prioritized. Sound engineers from the station's other recording studios could borrow some of the experimental studio's instruments. After the revolution, Ježek departed to form a private radio station, leaving Kadlec as the only sound engineer.**

from the Radio Broadcast Station in Brno: Jiří Hanousek and Milos Sindelář, who had even visited the Plzeň Radio Broadcast Station prior to the First Seminar. Located about 150 miles southeast of Prague, Brno and its institutions had always possessed the luxury of being politically less "watched" than institutions closer to—or indeed within—Prague itself. During the 1950s, a new generation of composers became increasingly interested in all types of contemporary music, including electroacoustic composition. These new composers—Alois Piňos, Miloslav Ištvan, Rudolf Růžička, Josef Berg and others—were students at the Janáčková akademie muzických umění (JAMU), the Janáček Academy of Musical Art in Brno, which was gradually developing into a musically progressive university as a result of the presence of these students. Due to their liberal attitudes, students such as these manifested the greatest interest in electroacoustic music in Czechoslovakia. As a result of the growing interest in the genre in Brno and the inconvenient distance (about 200 miles) between Brno and Plzeň, the two sound engineers presented their own lectures at the studios of the Radio Broadcast Station in Brno during the latter half of 1964 [24]. Presentations were made using the radio station's existing instruments, which were all standard elements of a typical recording studio's technical equipment at that time.

Pressured by the expanding interest to establish their own studio in Brno, Hanousek and Sindelář approached the director of the Radio Broadcast Station with hopes of creating an independent studio. The director enthusiastically consented, with the understanding that the new studio would be located on the Radio Broadcast Station's premises. To this end, Hanousek was appointed director of BES and Sindelář technical director. BES began to operate in the autumn of 1964, and the first composition realized there was *Huprolog No. 1*, by Emanuel Kuksa, a 1-min étude [25]. Overall, the studio produced some 40 compositions until it closed in 1970 [26].

The invasion of the Warsaw Pact armies was especially destructive to this studio. In line with the social realism predominant in music at the time, a new Communist director of the Radio Broadcast Station pursued the liquidation of BES and its instruments. Arguing that electroacoustic music did not further social realism's goals, he finally succeeded with his plan in 1969–1970. However, several instruments—various tape recorders, microphones, etc.—were saved and appropriated by JAMU [27].

The consequences for the electroacoustic music scene in Brno were two-sided: the end of an established, productive studio also meant the creation of the first Czechoslovakian academic program devoted to electroacoustic music education and production. This pro-

gram single-handedly broadened the dissemination of electroacoustic music in Czechoslovakia.

JAMU instituted a graduate program in electroacoustic music on 1 September 1969 [28]. Students were accepted into the program on the basis of their interest in the subject and were expected to realize compositions at the rate of one per semester. From 1969 onwards, all of the electroacoustic compositions composed at JAMU were graduate student works. The program was taught by Rudolf Růžička. The instruments acquired from BES were installed in JAMU's studio, which was known as the Audio-Visual Studio. Due to the already liberal atmosphere of the music scene in Brno and the new establishment of the electroacoustic studio, students from all parts of Czechoslovakia were attracted to Brno's JAMU. Among them, some of the most prominent were Arnošt Parsch, Miloš Štedroň, Milan Slavický, Marta Jiráčková, Jozef Gahér and Jan Jirásek.

Following the 1989 Revolution, JAMU's directors hired composer Daniel Forró to accompany Růžička in teaching electroacoustic music and composition. Růžička continued to teach older techniques, such as electronic music and *musique concrète*, while Forró taught compositional applications of MIDI technology. JAMU's program was unique in the Czech and Slovak Republics because, following the events of 1989, Yamaha loaned JAMU several synthesizers rent-free, establishing an unprecedented cooperation between a university and a corporation. (For a complete list of JAMU's equipment as of summer 1993, see Appendix). Ironically, JAMU's graduate program in electroacoustic composition has recently ceased to exist—not as a result of political pressure, but due to a new type of problem introduced by democracy: insufficient funds [29]. These insufficient funds have provided JAMU's conservative administrators with justification for terminating the electroacoustic program and thereby discharging Růžička and Forró [30].

## BRATISLAVA

For several reasons, the history of electroacoustic music in Czechoslovakia may have its ultimate beginning in the capitol of the Slovak Republic, Bratislava. The first experiments in established studios took place in Bratislava [31]. Bratislava has always had the most professional and best-equipped studio in both Republics. Finally, Bratislava's international festivals

have not only made the city a great proponent of this genre, but have also secured it permanent renown.

Electroacoustic music in Bratislava originated in two sources: the Audio Studio at the television station and the Experimental Studio at the Radio Broadcast Station. In addition to conducting private experiments using Sonet tape recorders in 1958, Bratislava composers Roman Berger, Pavel Simai, Peter Kolman and Ilja Zeljenka joined engineers Ivan Stadtrucker and Jan Rucka in the studios—or the sound department—of the Television Station in Bratislava to realize the first electroacoustic experiments in Bratislava. With the inception of electroacoustic music, the sound department was referred to as the Audio Studio. These experiments began with the production of soundtracks for films during the late 1950s. The first successful score was for the movie *Šestdesiatpäť miliónov* (Sixty-five Million) and was realized by Zeljenka in 1961 [32]. The 20-min composition was created with basic instrumentation: one sine-wave generator, one ring modulator and four tape recorders [33]. Zeljenka also produced two notable electroacoustic études during this period: *Stúdia 0,2* and *Stúdia 0,3* (1962). Composers Jozef Malovec and Ladislav Kupkovic, who also worked on soundtracks for various movies, joined the studio in the early 1960s.

It is extremely important to note that all of the electroacoustic music realized at the Audio Studio was composed during obscure hours of the night in order to avoid arousing the suspicions of governmental officials and invoking their persecution (i.e. job terminations). In Roman Berger's words, "everything was done at night . . . everything was underground, in essence" [34]. The clever justification for composing this music was that it was intended to accompany films that were produced by the government. Remarkably, 47 compositions were realized at this studio during its brief existence [35]. Unfortunately, the Audio Studio's success was short-lived, dying out with the formation of a more sophisticated studio at the Radio Broadcast Station in Bratislava (the Experimental Studio) [36,37]. Due to the "illegality" of the genre, the number of electroacoustic composers was too few to support the existence of two studios in the same city.

The origins of the Experimental Studio at the Radio Broadcast Station in Bratislava date from 1964, when a "Sound Effects Studio" (Triková reže) was put into operation for the purposes

of realizing sound effects for genres such as Hörspiel [38]. In the following year, this sound effects studio acquired official status and was renamed the Experimental Studio. Peter Kolman was appointed musical director and engineer Peter Janík became technical director, with Ján Backstuber as Tonmeister [39].

In 1966, the production of electroacoustic music became an official part of the studio with the composition of Jozef Malovec's *Orthogenesis* [40], which was chosen Second Finalist at the First International Electronic Music Competition at Dartmouth College in Hanover, New Hampshire, in 1968 [41]. In the meantime, composers from the former television station studio gradually joined the Experimental Studio, leading to the inevitable move to a new location in Bratislava in 1968.

Since its opening in 1965, the Experimental Studio has changed its facilities five times. As a result of the move in 1968, the studio received its own recording studio, facilitating a steady increase in production from one composition in 1967 to seven in 1971. To date, the studio has produced over 120 compositions [42]. Today, the Experimental Studio is lead by Peter Janík. Juraj Ďuriš serves as sound engineer and program adviser regarding the orientation of electroacoustic music, Andrej Zmeček is sound engineer and program adviser regarding the orientation of experimental word and drama pieces and radiophonics, and Ernest Walzel is Tonmeister [43]. (See Appendix for a list of the equipment in use at the studio as of summer 1993.)

An important role of the Experimental Studio has been that of organizer of the International Seminars on New Music. Three successful seminars were held in Smolenice—a town located 25 miles northeast of Bratislava—from 1968 to 1970. Stockhausen, Kagel, Ligeti and Lutosławski were among the participants. These seminars were discontinued following 1970, and it was not until the recent Revolution of 1989 that the leaders of the Experimental Studio were once again able to take up a leading role in the organization of seminars and festivals. The International Forum of Electroacoustic Music, held in Dolná Krupá, is evidence of this renewal.

## PRAGUE

Perhaps the most curious history of a city's contribution to the growth of electroacoustic music is that of Prague. In some ways, Prague was the backbone be-

hind the emerging art form in Czechoslovakia. Pierre Schaeffer, Françoise Bayle and Guy Reibel visited Prague in 1966 to present lectures about their studio, l'ORTF, and electroacoustic music in general. In 1969, Gottfried Michael Koenig, Frits Weiland and Stan Tempelaars, from Utrecht University in the Netherlands, presented lectures in Prague on electroacoustics, the history and techniques of electronic music and analysis of existing compositions [44]. However, in other ways Prague clearly lacked other cities' sophisticated institutions and perhaps also their more liberal atmospheres.

The Electronic Studio at VÚRT in Prague was the biggest manufacturer of custom-built Czech and Slovakian electroacoustic instruments and was responsible for designing and equipping the Experimental Studio in Plzeň (see Appendix for a list of the studio's equipment in 1965). In addition, from 1965 to 1966, VÚRT's Electronic Studio produced 10 electroacoustic compositions. The most significant was Jan Hanuš's opera, *Pochodeň Prométheova* (Prometheus's Torch).

In 1970, the Audio Studio at Prague's music university, Akademie muzických umění (AMU) [45] was established in support of Kučera's compositional course. Engineer Václav Syrový and Ivan Kurz, a graduate student in composition, were placed in charge of developing and managing the studio. Although AMU's aim, like that of JAMU in Brno, was the pedagogic advancement of electroacoustic music, AMU's Audio Studio catered mainly to the faculty and their exploration of the new genre until 1980, when the first program in electroacoustic music was offered at AMU. After the demise of Communism in 1989, AMU was able to relocate to a new building—the newly restored Lichtenstein Palace—in Prague in 1993–1994, and the AMU Audio Studio has since been allocated more facilities, such as additional recording studios. Today, the Audio Studio has some of the finest facilities and digital instruments available, making it the most sophisticated studio among official or unofficial studios in both countries. Its facilities comprise a digital recording studio (Fig. 2) (see Appendix), a classroom, a production room, a dead room (anechoic chamber) and three laboratories/repair rooms. The general public is now able to rent use of the Audio Studio.

The filmmakers at Barrandov, Czechoslovakia's government-controlled film

studios in Prague, also became interested in the incorporation of electroacoustic music into film in the early 1970s. As a result, the studios were equipped with an electroacoustic studio, the Studio for Electronic and Experimental Sound, for generating sound effects. Only one autonomous composition was produced there: Zbyněk Vostřák's *Jedno ve všem* (One in Everything) [46].

Prague's Radio Broadcast Station—which had facilities at several locations throughout Prague—not only housed a primitive studio, "R-52," but was also the site of the Second Seminar of Electronic Music, held 14–16 June 1965. Its purpose was to educate people who were unable to attend the First Seminar of Electronic Music; there were at least 66 attendees at this event [47]. Unfortunately, one of the Radio Broadcast Station buildings, which happened to house R-52, burned down in 1969, taking with it any apparent hopes for the establishment of a professional studio in Prague [48].

However, after the political events in 1989, a studio was established in Prague: the Audio Studio at the Radio Broadcast Station. Its artistic director is Jan Jirásek, and the sound engineer is Antonín Němec. Thus far, only a few compositions have been realized there, but the studio has quickly achieved a technical standard comparable to that of other studios in the Czech and Slovak Republics (see Appendix for a list of the studio's equipment).

The acquisition of some of the studio's instruments resulted from an ironic twist of fate. During the Communist regime, political leaders built a congress hall for their annual meetings. These meetings were to be broadcast over the radio, which required expensive equipment from the West. After the Revolution, the congress hall became a venue for events such as concerts, and the equipment was transferred to the newly established Audio Studio at the Radio Broadcast Station.

"The goals of the Audio Studio are not only to provide . . . facilities for composers to realize compositions here," states Jirásek, "but also to give an opportunity to those professional composers to compose electroacoustic music who have never before worked in this genre" [49].

## STYLE

As was the case in many studios in the early stages of electroacoustic music history, music styles in Czechoslovakia were greatly influenced by the available instrumentation. Although composers in all of these studios realized and experimented in all contemporary styles, some styles used more than others characterized a studio's "sound." A great deal of copying of other styles occurred, which is typical of the beginning of any musical era.

The work produced in Plzeň's Experimental Studio can be characterized basically as *musique concrète*, which is de-

**Fig. 2. The digital recording studio at AMU in Prague (1993). (Photo: Václav Syrový) The digital recording studio is the control room for all of the electronic studios that together comprise AMU's Audio Studio. In addition to producing electroacoustic music, the Audio Studio staff is involved in recording the AMU students' concerts and recitals.**



pendent on processing and editing recorded sound sources. The most famous electroacoustic composition in the Czech and Slovak Republics is a concrete composition produced by the Experimental Studio, Miloslav Kabeláč's *E fontibus bohemicis* (1972), a monologue with background sounds. The composition exists in two versions—one in Latin, the other in Czech. The sources for the composition's text are a speech given at the funeral of Karl IV, from the *Czech Chronicles* by Kosmas (1045–1125), and a speech by Jan Hus (1372–1415). Due to the ending of *E fontibus bohemicis*, which was an appeal for liberation, the composition was absolutely not disseminated in any way during the 1970s and 1980s. Not until after 1989 was it broadcast once again.

BES, as its name suggests, was an electronic studio, while the Audio Studio at the Television Station in Bratislava produced musique concrète, electronic music and music for tape. Berger believes, though he cannot validate this hypothesis, that music created at this studio "was closer to that of the French musique concrète, because it [the music] was more influenced by some ethnic or psychological factors at the time" [50]. In other words, Berger believes that musique concrète was a far more sensitive style, and thus more appropriate than other electroacoustic styles were.

Bratislava's freelance composer Peter Machajdík combines electronics with improvisational techniques in live performances. In a recent performance at Intervention '94, the 1994 Berliner Festival Neuer Musik (Berlin Festival of New Music), Machajdík performed his composition *Intime Musik* with four other artists, David Moss being one of them.

Alois Piňos, a Brno composer, believes that the limited technical resources available to Czech and Slovakian composers of electroacoustic music have forced them to focus more on compositional processes and musical form.

It is my opinion that, despite the technical insufficiencies and Iron-Curtain dictates of the Communists' aesthetic of "social realism," Czech and Slovakian electroacoustic compositions tend to display the same characteristics of form, style, technique and aesthetics as their Western counterparts.

## AFTER 1989

The more opportune times of the new democracy have had a positive effect upon the electroacoustic music scene. Private studios such as Vítazoslav

Kubička's Štúdio Jakub have slowly sprung up. Operational since 1991, Štúdio Jakub maintains productions ranging from music for art shows, films and commercials to autonomous electroacoustic compositions [51]. Such a broad range of activities is indicative of the newly formed home studios for reasons of subsistence. Forró's studio, Forrotronics, though operational since 1983, still functions as both his private studio and a small, private educational studio for students of electroacoustic music [52]. Since the autumn of 1994, a modest electroacoustic music program has been instituted at the conservatory in Ostrava, northern Moravia [53].

Furthermore, public efforts to propagate electroacoustic music have once again reached the strength of the pre-1970s. The Czech Republic's established Společnost pro elektroakustickou hudbu (SEAH, the Society for Electroacoustic Music), 49 members strong, occupies itself with various activities related to electroacoustic composition. Its co-chairmen are Karel Odstrčil and R. Růžička. Having assumed the role previously held by Plzeň's Radio Broadcast Station, SEAH is now responsible for organizing Musica Nova. Brno's Exposition of Experimental Music has once again been held since 1990, serving as a festival of all types of new music [54].

With its strong musical roots and this renewal of activity, the Czechs' and Slovaks' electroacoustic future seems brighter than ever before. Hopefully, today's generation of electroacoustic music composers will display the same types of enthusiasm and determination as the older generation of composers did.

## APPENDIX: EQUIPMENT AT CZECH AND SLOVAK ELECTROACOUSTIC STUDIOS

Lists appear in the order in which they are mentioned in the text.

### The Experimental Studio in Plzeň

- 1 Tesla mixing console (24/8/2)
- 2 Tannoy speakers
- 2 Grundig speakers
- 1 Klark Technik Time Spectrum Analyzer
- 4 Dolby Systems, A-Type, Model 361
- 2 Studer A-80 tape recorders (stereo)
- 1 Studer A-80 tape recorder (8-track)
- 2 Revox PR99 tape recorders (stereo)
- 4 DAT Sony DTC 55ES
- 1 Sony SL-HF 950 Super Beta Hi-Fi

- 1 Sony Digital Pulse Code Modulation PCM-501 ES digital audio processor
- 1 Roland S-50 sampler
- 1 Roland SH-2000 sampler
- 1 Roland TR-808 drum machine
- 1 Fender piano
- 2 Peekel TF 824 filters
- 1 Brüel & Kjaer 5587 filter
- 2 Yamaha Q 2031 graphic equalizers
- 2 Yamaha EMP 100 multi-effect processors
- 1 Dynacord DRP 16 digital reverberator
- 1 Yamaha REV 7 digital reverberator
- 1 Yamaha SPX 90II multi-effect processor
- 1 Peavey Addverb digital stereo reverb/delay processor
- 1 EMT Compressor
- 1 Eventide 1745M digital delay
- 1 Macintosh Quadra 950; software: Protools, Soundesigner (DINR—Noise Reduction)
- 1 Atari 1040; software: C-Lab Notator version 3.1

### JAMU's Studio 1-11 in Brno

- 1 Atari 1040ST; software: CuBase, Notator 3.0
- 1 Roland W-30
- 1 Jolana Rytmatik Professional pulse generator
- 1 Alesis MIDIVerb III
- 1 Oberheim Matrix-1000
- 1 Tascam MM-1 mixing console
- 1 Yamaha MT 3x tape recorder
- 1 VÚRT Antares 2 synthesizer
- 1 VÚRT Programové Řízený Syntezátor (Program-Control Synthesizer)
- 1 Tesla BM 430 oscilloscope [55]

### The Experimental Studio in Bratislava

Today's Experimental Studio is made up of two studios (or rooms), A and B. Instrumentation in the two rooms is as follows:

#### Room A

- 1 Studer 904/A with Master Mix MX 644 mixing console
- 1 Studer A 800 MK III 16-track tape recorder
- Dolby A noise reduction system
- 2 Studer A 812 tape recorders
- 2 Studer A 807 tape recorders
- 2 Studer A 730 CD players
- 2 JBL 4345 monitors
- 1 Kurzweil K 250, version IV digital synthesizer
- 1 Macintosh SE
- 1 Opcode Studio 3 MIDI interface (SMPTE, MTC)
- 1 ARP 2015 synthesizer
- 1 APHEX dominator and exciter
- 1 Sennheiser VSM 201 vocoder
- 1 AKG-ADR 68-K digital sound processor

1 Lexicon PCM 70 digital reverberator  
 1 Yamaha SPX 90 II digital sound processor  
 1 Yamaha REV 5 digital reverberator  
 Room B  
 1 Studer Dyaxis 2+2 System: Studer Editech 4-channel digital audio production system and 62-min direct-to-disc recording system (VITC, SMPTE, MTC sync)  
 1 Macintosh IIfx 5/80 HD and Syquest  
 4 Studer A 80 RC tape recorders  
 1 Revox A 700 tape recorder  
 1 Studer 169 transportable mixing console (12/4)  
 1 Sony PCM 2000 digital audio recorder  
 1 Sony HF 950 Super Beta SL PCM 601 esD digital audio processor  
 2 JBL 4345 monitors  
 1 Studer mixing console (16/6/2)  
 1 Macintosh Quadra 950 (40 MB RAM)  
 2 Sample Cell II cards (2 × 32 MB RAM)  
 2 Mark of the Unicorn MIDI mixers  
 1 Mark of the Unicorn MIDI Time Piece II  
 1 Hewlett Packard LaserJet Printer 4M  
 1 Data Streamer Hard Disk ext. mem. (2 × 32 min. stereo); software:
 

- DigiDesign
- SoftSynth
- Performer
- MAX
- MacMix 3.2 (for Dyaxis)
- Studerbacker II (for Streamer)
- Soundesigner Mniv
- Soundesigner II (for Sample Cell) [56]

### The Electronic Studio at VÚRT (Prague)

1 VÚRT MS 1 manual synthesizer  
 12 Tesla BM 365 sine-wave generators  
 1 VÚRT white-noise generator with a 1/3-octave filter  
 1 VÚRT SRK-SG 1 white-noise generator  
 1 VÚRT ORF 1 fine-tune filter  
 1 VÚRT SRK-UH 1 low-pass filter  
 1 VÚRT SRK-UV 1 high-pass filter  
 1 VÚRT SRK-CH 3 universal filter  
 1 VÚRT ER 2 effect reverberator  
 1 VÚRT EM 2 effect modulator  
 1 VÚRT relay pulse generator  
 1 VÚRT CR 1 timing pulse regulator  
 1 VÚZORT mono tape recorder  
 1 Sander-Jansen SJ 103 mono tape recorder  
 1 mixing console  
 2 R 3 audio systems  
 4 VÚRT ZV 100 amplifiers 10 W  
 1 VÚRT ZI 010 indicating amplifier  
 1 Tesla BM 354 universal counter  
 1 VÚRT custom-built measuring reverberation chamber [57]

### The Audio Studio at AMU (Prague)

Digital Recording Studio:  
 1 mixing console (20/8/2)  
 Genelec 1031 A monitors  
 1 Digidesign Promaster 20  
 1 Apple Quadra 950, HD 440 Mb, 2 × 1.6 Gb  
 1 J.L. Cooper CS-1 controller  
 DINR (Noise reduction)  
 1 Tascam DA60 digital recorder  
 1 Tascam DA-88 (8-track) digital recorder  
 1 Studer D 780 digital recorder  
 1 Studer D 740 CD recorder  
 1 Studer A 80 analog tape recorder (19.38 cm/s) (7.5 and 15 in/s)  
 Dolby A/SR  
 1 AKG ADR 64K reverberator  
 1 Eventide H 3000 SE harmonizer  
 1 Eventide DC-1 de-clicker  
 2 Klark & Teknik DN 27A graphic equalizers  
 1 Klark & Teknik DN 60/RT 60 analyzer  
 1 Aiwa HHB Pro portable DAT  
 2 AKG K 1000 headphones  
 1 commercial record player, CD player and tape recorder  
 Electronic Music Studio:  
 1 Soundcraft Spirit AUTO mixing console (16/8/2)  
 1 Apple LC II : Pocode Studio MIDI interface; CD-ROM; software: J.L. Cooper—Spirit, MAX, Book of MIDI  
 Yamaha NS-40M monitors and PC 1602 amplifier  
 1 Sony DTC 77ES DAT  
 1 Fostex E-16 plus Yamaha YMC 10 synchronizer  
 1 Atari 1024 STF; software: Twenty Four, Notator  
 Analog synthesizers: 1 Korg MS-20, 1 Transcendent 2000  
 Digital Synthesizers: 1 Yamaha DX-5, 1 Korg DSS-1  
 Samplers: 1 Yamaha TG-77, 1 Yamaha TG-500  
 Effects:
 

- 1 Yamaha SPX 990
- 1 Korg DRW 2000
- 1 Korg DDD 1200 (dual delay)
- 1 Electro Harmonix vocoder
- 1 dbx 1531 X graphic equalizer
- 2 dbx 363 X noise gates
- 2 dbx 563 X silencers

 AKG K 400 headphones  
 1 commercial tape recorder [58]

### The Audio Studio at the Radio Broadcast Station in Prague

1 mixing console  
 1 Studer S 903 with Audio Kinetics MX 644 Mastermix

1 Studer A 820 multichannel tape recorder with Dolby A System  
 1 Studer A 80 tape recorder with Dolby A System  
 1 Studer A 807 tape recorder with Dolby A System  
 1 Studer A 807 tape recorder  
 1 Sony Betamax SL HF 950 with Sony PCM 701 processor  
 1 Sony R DAT  
 1 Yamaha Rev 5 digital reverberator  
 1 Yamaha Rev 7 digital reverberator  
 1 Lexicon PCM 70 digital processor  
 1 Yamaha SPX 90 II multi-effect processor  
 1 Peavey Addverb digital processor  
 1 Roland VP 70 voice processor  
 1 Yamaha R100 reverb processor  
 Monitors: Genelec 1022B Triamp, Nivox Model 4  
 1 Atari Mega ST 4; software:
 

- Steinberg Pro 24
- Steinberg Synth Works DX TX
- Steinberg Synth Works D 50
- C Lab X Analyzer
- C Lab Notator, Roland MC 500 MkII Micro Composer

 1 Roland KR 3000  
 1 Roland D 50  
 1 Yamaha DX-7 IID  
 1 Roland D 110  
 1 Yamaha TX-802  
 1 Yamaha TX-16 W sampler  
 1 Kurzweil 1000 SX string expander  
 1 Roland TR 626 Rhythm Composer  
 1 Steinberg SMP 24 SMPTE MIDI processor [59]

### Acknowledgments

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### References and Notes

1. Interview with Roman Berger, 9 July 1993. The beauty of these interviews with Berger and others was the detailed and insightful rendering of information that would otherwise never have been chronicled in published sources.
2. These interviews were conducted as research for my Master's thesis, "An Oral History of Electro-Acoustic Music of the Czech and Slovak Republics." In January 1993, Czechoslovakia separated into two independent countries, the Czech Republic and the Slovak Republic. Previous to this date, Czechoslovakia had existed as a union of the Czech and Slovak states. While the majority of the history outlined in this article belongs to the period in which Czechoslovakia existed as a single nation, I have chosen to refer to the "Czech and Slovak Republics" in my title because of the continuity of a distinction between the two regions.
3. Pierre Schaeffer, *La Musique concrète* (Paris: Presses universitaires de France, 1967); translated as *Konkrétní hudba* by Frantisek Tvrđy (Eduard Herzog) (Prague: Supraphon, 1971). Herzog found it necessary to use an alias to protect his identity as translator of this text.

4. Interview with R. Růžička, 6 July 1993.
5. Tomáš Svoboda, personal correspondence, 15 May 1994.
6. Interview with E. Herzog, 9 August 1993.
7. Herzog [6].
8. Ivan Poledňák, "Hudba, která se rodí v laboratorii" (Music Born in a Laboratory), *Literární noviny* (18 May 1961). (In Czech.) A roundtable discussion about electronic and algorithmic music and musique concrète. This is probably the most important documented indication of Czech and Slovakian composers' growing desire to acquaint themselves with Western electroacoustic music during this period. Unfortunately, half of the sources that I have found incorrectly list the publication date as 18 November 1961.
9. From the archives of the Society of Czechoslovakian Composers and Artists, Svaz československých skladatelů a umělců (SČSKU), housed at time of writing at the Asociace hudebních umělců a vědců (Association of Musical Artists and Scientists) in Prague.
10. Růžička [4].
11. Located in Prague, VÚRT had an Electronic Studio that engaged in both research and construction of electroacoustic instruments. For a short time, electroacoustic music was also realized at this studio.
12. Interview with C. Kadlec, 2 July 1993.
13. Lubomír Krch, "Štúdio pro elektroakustickú hudbu při československém rozhlasu v Plzni" (Studio for Electroacoustic Music at the Czechoslovakian Radio Broadcast Station in Plzeň), unpublished term paper (28 April 1979) p. 15.
14. M. Bláha and M. Mandík, "I. seminář elektronické hudby v ČSSR" (First Seminar of Electronic Music in Czechoslovakia), *Rozhlasová a televizní technika* 5, No. 4 (1964) p. 91. *Rozhlasová a televizní technika (RTT)* was VÚRT's official publication.
15. Bláha and Mandík [14] pp. 92–98. A Špelda was one of the most important acousticians of his day. His contribution to these early years in the establishment of Czechoslovakian electroacoustic music was repeatedly invoked by interviewees.
16. Interview with M. Mandík, 27 June 1994.
17. A complete list of the instruments used in the First Seminar appears in Bláha and Mandík [14] p. 90.
18. For a list of the instruments VÚRT provided, see Bláha and Mandík [14] p. 98.
19. C. Kadlec, "Skladby realizované ve studiu pro experimentální hudbu v Plzni" (Compositions Realized at the Studio for Experimental Music in Plzeň), unpublished index of compositions realized at the Experimental Studio in Plzeň.
20. "Skladby realizované ve studiu pro experimentální hudbu v Plzni" [19].
21. Interview with E. Spáčil, 1 July 1993.
22. Kadlec [12].
23. Kadlec [12].
24. Růžička [4].
25. Jiří Hanousek, "Výroba Brněnského elektronického studia čs. rozhlasu v Brně, 1964–1970" (Output of Brno's Electronic Studio at the Czechoslovakian Radio Broadcast Station in Brno, 1964–1970). Unpublished index of BES's compositions.
26. Jiří Hanousek, "Technická vymoženosti Brněnského elektronického studia čs. rozhlasu" (Technical Equipment of Brno's Electronic Studio at the Czechoslovakian Radio Broadcast Station). Unpublished index of instruments.
27. Interview with A. Piňos, 8 July 1993.
28. Růžička [4].
29. Interview with R. Růžička, 15 July 1994.
30. Interview with K. Odstrčil, 15 June 1994.
31. While the studios of the sound department of Bratislava's Television Station did not amount to an official electroacoustic studio, they did support the first electroacoustic experiments of any kind in Czechoslovakia.
32. Ivan Stadtrucker, "História jedného zvukového pracoviska" (History of a Sound Studio), *Slovenská hudba* 13, Nos. 9–10 (1969) p. 345.
33. Stadtrucker [32] p. 344.
34. Berger [1].
35. Stadtrucker [32] pp. 348–349.
36. Berger [1].
37. Stadtrucker [32] p. 347.
38. "Experimental Studio: Radio Bratislava," pamphlet (Bratislava: Edition Slovenský rozhlas, 1991).
39. Ján Backstuber, "Úprava snímok" (Processing Recordings), *Rozhlas a slovenská elektroakustická hudba* (The Radio and Slovakian Electroacoustic Music) (Bratislava: Metodicko-výskumný kabinet československého rozhlasu, 1989) p. 188.
40. Interview with J. Malovec, 10 July 1993.
41. Dr. Milan Adamčiak, booklet notes, *Elektroakustická hudba*, twenty-fifth anniversary double compact-disc recording of electroacoustic music realized at the Experimental Studio.
42. This figure is taken from a list of compositions realized at the Experimental Studio in Bratislava given to me by Juraj Ďuriš in 1993.
43. Interview with J. Ďuriš, 9 July 1993.
44. G.M. Koenig, personal correspondence, 19 November 1994.
45. As is the case with many sound studios, AMU's Audio Studio actually consists of several studios.
46. Interview with Pavel Pitrák, manager of the Sound and Editing Department at Barrandov, 15 July 1994.
47. M. Meninger, "II. seminář elektronické hudby v ČSSR" (Second Seminar of Electronic Music in Czechoslovakia), *Rozhlasová a televizní technika* 6, No. 4 (1965) p. 126. An account of the second seminar held at Prague's Radio Broadcast Station in Karlín, a suburb of Prague, from 14–16 June 1965.
48. Odstrčil [30].
49. Interview with J. Jirásek, 6 August 1993.
50. Berger [1].
51. Vítazoslav Kubička, personal communication, 24 January 1994.
52. Interview with D. Forró, 16 July 1994.
53. Jaromír Návrat, personal correspondence, 3 September 1994. This program is absolutely in its infancy.
54. *Mezinárodní hudební festival VI* (Exposition of Experimental Music VI), Brno; program notes.
55. I compiled this list with R. Růžička's assistance.
56. This data is compiled from "Experimental Studio: Radio Bratislava" [38] and a list of instruments that Zmeček wrote down for me in 1993.
57. List compiled from M. Bláha, "Štúdio elektronickej hudby Výskumného ústavu rozhlasu a televízie" (Studio of Electronic Music in the Re-

search Institute of the Radio and Television), *Rozhlasová a televizní technika* 6, No. 4, 98–103 (1965); J. Vitek, "První úspěchy studia elektronické hudby VÚRT" (First Successes of the Studio of Electronic Music at VÚRT), *Rozhlasová a televizní technika* 6, No. 3 (1965) p. III; and J. Vitek, "Zařízení k prolužování a zkracování Zvokových snímků" (Extending and Contracting the Sound Recording), *Rozhlasová a televizní technika* 6, No. 2, 33–42 (1965). (The latter article discusses problems of extending and contracting the sound recording without influencing the pitch height and presents solutions offered by the Time Regulator, a tool developed at the Electronic Studio at VÚRT.)

58. List compiled by V. Syrový, personal correspondence, 20 November 1993.

59. List compiled by J. Jirásek, summer 1993.

60. *Elektroakustická hudba* [41].

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*Author's Note:* Unless otherwise stated, articles published in the following journals are written in the languages indicated:

*Hudební rozhledy:* Czech

*Hudební věda:* Czech

*Hudobný život:* Slovakian

*Opus musicum:* Czech

*Rozhlasová a televizní technika:* Czech

*Slovenská hudba:* Slovakian

For clarity, I have used the official names of all studios in the following, although other names are sometimes used in the documents themselves.

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## Discography

Although most studios, to this day, have not been successful in producing an anthological CD of their output, the Experimental Studio at Bratislava has had the resources to produce two. In addition to the twenty-fifth anniversary double CD mentioned above [60], the staff has recently released a follow-up entitled *Elektroakustická hudba, Slovensko 1989–94*. As the title indicates, this single CD is a compilation of compositions realized at the Experimental Studio in recent years. In addition, personal releases are slowly emerging. One that I am aware of is Vlastislav Matousek's *Shapes of Silence*, which was recorded at AMU and produced by Awika in Switzerland. Sampling the sounds of Tibetan bowls and other percussion instruments, Matousek creates a minimalist aesthetic. He refers to this work as "transcendental music for silent meditation."