

SYNTHESIZED SPEECH MUSIC by CHARLES DODGE

IN CELEBRATION

Realized at the Columbia University Center for Computing Activities and the Nevis Laboratories

SPEECH SONGS

Realized at the Bell Telephone Laboratories

THE STORY OF OUR LIVES

Realized at the Columbia University Center for Computing Activities and the Nevis Laboratories

The compositions recorded here are a product of work with computers in synthetic speech, song and vocal sounds and were created between 1972 and 1975. The music was realized on two different computer music systems and takes advantage of, and attempts to extend and explore their features. The system employed to realize SPEECH SONGS was created at the Bell Telephone Laboratories for research in synthetic speech and speech communication. Since the system was not designed for musical purposes, its limitations were severe and its musical use a great (and often rewarding) challenge. The system used for IN CELEBRATION and THE STORY OF OUR LIVES was designed with the expressed purpose of creating synthetic musical voices, and was therefore much better suited to the task at hand. As with any high technology project, there was extensive collaboration in the production of the works. Thanks go to Joseph Olive, who designed the system at Bell Laboratories and taught me to use it, and to Kenneth Stieglitz of Princeton University and Howard Eskin, Richard Garland of Columbia University, who with the late Godfrey Winham and the composer contributed to the system now (1976) operating at the Columbia University Nevis Laboratories.

THE COMPOSITIONS

IN CELEBRATION was composed during the first half of 1975. The composition is an attempt to capture the spirit and structure of the Mark Strand poem and to render it in a musically coherent way. The poem has a two-part structure divided by the second occurrence of the phrase "You sit in a chair." The two parts of the poem may be distinguished from each other by the different degrees of passivity attributed to the "you," the person to whom the poem is addressed. In the first part, a completely passive person devoid of both emotion and ability to act is addressed. The second part, while carrying on the tone set in the first part, does mention unalloyed emotions such as "joy" and "a celebration" as well as a possible solution to the situation, however contradictory the solution might appear.

The setting portrays the change of emphasis between the parts of the poem. In the first part of the composition there is a variety of types of articulation, including spoken, whispered, pitched and glissed phrases, and a variety of textures from solo to choral. There is a rapid succession of types of treatment of words, and a prevalence of textures in which more than one type of articulation is heard together.

In the second part, the increase of definiteness and resolve is represented by isolation of the various types of articulation. The listener hears the different and contrasting types of articulation in successive phrases, but not simultaneously.

SPEECH SONGS (1973) is based on poems which are designed to entertain in a light vein. Laughter at new music concerts, especially in New York these days, is a rare thing; and it has been a source of great pleasure to me to hear audiences respond with laughter to places in all four of the SPEECH SONGS. Some places which listeners find particularly amusing are: the almost mechanical repetition of the pronouns in Song #1; the repetition of phrases in Song #2 where successive repetitions sound unpredictably either human or electronic, as though the voice were not quite sure either; the ambiguous moment in Song #3 when "Which was fake" may be understood either as a question or as modifying the "tiny ear;" and the elaborate chorus of glissing voices in Song #4 where the text is merely numbers.

THE STORY OF OUR LIVES (1974) is an operatic dialogue for male and female synthetic voices. It was the first composition for which the Columbia University computer speech synthesis system was employed.

The dramatic situation may be pictured as one in which a couple is sitting on the couch in their living room reading a book which is the story of their lives. As they read the book, they become obsessed with what they believe is the emptiness of their lives, and as the composition goes on, they fantasize ways of getting out of their predicament.

The characteristic texture for the first stanza is based on the two voices singing their lines in parallel octaves. The rather loose rhythmic coordination at the syllable level results in heterophony. These passages are interrupted by solos and by choruses which are comprised of multiple copies of the two voices. The obsessive repetitions were intended to convey the feeling that the couple is trapped.

Stanzas two, three and four are sung by the male voice with an occasional answer or comment by the female. His speech is interrupted from time to time by passages from the book which are sounded in an unreal voice-of-the-book. The three final stanzas return to textures similar to the opening stanza but with continuing interruptions by the book voice which comes to dominate at the end. At certain places near the end, the human voices imitate the book voice. The title suggests soap opera and a bow to the electronic organ chords of the old radio soaps is taken with the electronic glissandi which separate the two final book speeches.

SPEECH SONGS was completed while on a Guggenheim Fellowship, IN CELEBRATION was completed while on a CAPS grant, and THE STORY OF OUR LIVES was commissioned by the National Endowment of the Arts.

-Notes by Charles Dodge

CHARLES DODGE (b. Ames, Iowa 1942) studied composition at the University of Iowa, Aspen, Tanglewood and Columbia University. He numbers among his teachers Richard Hervig, Darius Milhaud, Arthur Berger, Gunther Schuller, Chou Wen-chung, Jack Beeson and Otto Luening. He studied electronic music with Vladimir Ussachevsky and computer music with Godfrey Winham.

Dodge won his first (of four) BMI Student Composers Awards and his first (of two) Bearns Prizes while still an undergraduate. In 1970, with his mastery of computer music already well along, he became assistant professor of music at Columbia University, and the same year his *Changes* and *Earth's Magnetic Field* appeared on Nonesuch Records. In 1971, he began research in computer-synthesized speech and vocal sounds at the Bell Telephone Laboratories, and continued to work there in 1972-73 on a Guggenheim Fellowship. A second Guggenheim, in 1975-76, provided the opportunity to begin creative work in interrelating vocal syllables and video image synthesis.

In the fall of 1975 a color video tape of **THE STORY OF OUR LIVES** was created in which a male and female actor mouth the words to the synthesized tape while they act out the motions and feelings of the couple. A full range of video synthesis techniques was employed to extend the visual images of the actors in ways analogous to the audio extensions of the voices. The tape was created at the WNET-TV Lab in New York in collaboration with video artists Bill and Louise Etra. Dodge's *FOLIA* and *EXTENSIONS* may be heard on CRI SD 300.

THE PROCESS

The works on this disk are called computer music because the sounds were created numerically in a computer before reaching magnetic tape and loudspeakers. The computer did not compose the music. However, it was only used as a sound synthesis and analysis medium. In order to hear the sounds which are represented in the computer as successions of numbers it was necessary to attach a digital-to-analogue converter to the computer. The converter transformed the succession of numbers into a fluctuating voltage which was recorded directly on to audio tape.

The technique used to create the synthetic voices is called speech synthesis-by-analysis. For this method of speech synthesis, only those words, phrases and sentences which have been spoken into the computer previously (via an analogue-to-digital converter) may be synthesized. First the digitally-recorded speech is analyzed by programs which extract the attributes (parameters) of the speech for short time segments (.01 sec.). From these parameters the speech may be recreated in a form which resembles the original recording very closely. But for musical purposes the parameters are most often altered before synthesis.

It is possible, for example, to change the natural pitch contour of the speech into a melodic line or to change the speech speed without altering the natural pitch level. The variety of musical patterns which may be created from the analytic parameters is limited only by the composer's imagination.

Most of the speech sounds on the recording were created by changing the pitch and duration attributes of the original on resynthesis, but for a few, the resonances (the formants) of the speech were altered as well. The voice of the book in **THE STORY OF OUR LIVES** was created by replacing the program which simulates the sound of the human vocal cords with one consisting of 64 sine tones glissandoing at different rates. All the textures in which more than one voice is heard were obtained by mixing the synthetic voices together digitally.

I would like to acknowledge my additional gratitude for assistance at various stages of this enterprise to Max Matthews, Cecil Coker, Sandra Pruzansky, Dana Lichty, Mark Strand, and Vladimir Ussachevsky and the Columbia-Princeton Electronic Music Center.

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Produced by Carter Harman

THIS IS A COMPOSER-SUPERVISED RECORDING

(Original liner notes from CRI LP jacket)