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Geneva By-Pass

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GENEVA BY-PASS

Along the N 1a Highway, the lush Swiss countryside is broken up by a series of long claustrophobic tunnels. The Geneva By-Pass project is a competition entry that proposes to physically improve and aestheticize the motorist's transit through three subterranean passages by using sound and light to emphasize the kinesthetic experience of travelling.

While their well-designed mouths do much to ease the transition from outside to inside, the experience afforded by the interior of the tunnels is quite austere and harsh, especially in such sudden contrast to the Swiss landscape through which the roadway passes. It is the aim of the Geneva By-Pass project to develop a treatment of the tunnel interiors that would mitigate their austerity by softening their visual/audio noise levels while enhancing the traveller's kinesthetic experience. Light and sound are perfect media for such a situation because

they do not introduce any barriers or other impediments to one's drive along the road. Presently it is technologically impossible to produce actual Silence with "anti-noise" wave forms, and that is NOT the objective. Instead, this is a proposal to use the vehicular noise trapped in the tunnel as a "raw material" in order to make kinesthetic sense of the driver's underground passage, to re-qualify that huge noise, and to make acoustical "sound fields" from the traffic noise. The Geneva By-Pass seeks to improve the conditions of the way we live by changing qualities of our "surround," not only aesthetically but also physically, actually altering and improving the environment we've made for ourselves. The perceptual quality of the tunnel is the result of the dynamic behavior of sound when restricted by confined

space. It is important to understand, however, that the acoustic volume of the tunnel is not simply a matter of cubic measurements. Each cavity has its own modes of sympathetic vibration that must be measured in terms of time, not in spatial dimensions.



Geneva By-Pass has been developed by a relationship of the time of the sound to the time of the tunnel. The behavior of the acoustic cavities, indoors or out, needs to be understood in terms of time and time envelopes. Whether the particular result is made by simple phasing of cycles, or the phasing of intervals, or

ter of architecture. The Geneva By-Pass project is essentially sound architecture by propelling attention from one boundary of the space to the next. The viewer is obligated to move through the linear space in order to

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the phasing of events, each and every work relies upon the match or coincidence of the active time of the sound with the passive time of the tunnel. The peripherally confined, frontal nature of sight makes it a perceptual relative of painting, while the 360 degree "scan" of hearing resembles more the three-dimensional charac

integrate what is heard with the strictly visual notions of what space is—the area in, around, or between—while becoming astonishingly aware of a sensibility that deals with light, space, and sound as material, as solid evidence of being.

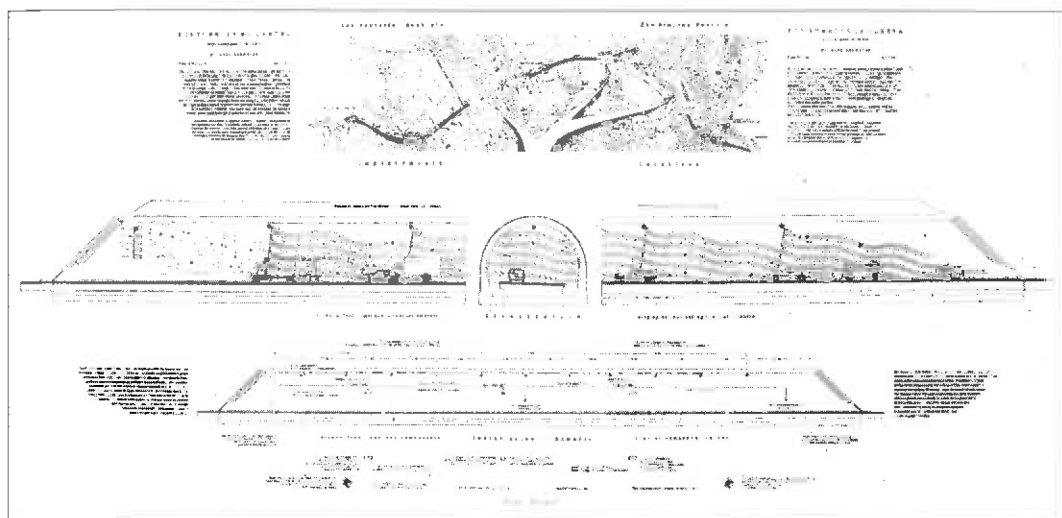
1.0 Theoretical Vision

Upon entering the tunnel the motorist will first become aware of a single fifty-centimeter-wide band of continuous lights chasing down the length of each tunnel at a rate equal to the speed limit. (The rate of the "chase" would be adjustable by manual override to suit overall traffic conditions.) The driver would also notice that the car had become enveloped in an omnipresent slowly cycling, purring hum, like that of a two-propeller aircraft or a finely tuned road machine. This steady, soothing sound will be penetrated by the sound of the "slipstream," a nearly "white" noise whose sound content or "color" would never be quite the same because it would be adjusted to the varying vehicular content in the tunnel. Influenced by the speed of the moving lights, the motorist would steer the vehicle through an invisible but fluid field of sound that would "cushion" the experience through the tunnel. The travellers would not be aware of the fact that the

presence of the "white" noise was actually reducing the sound pressure level inside the tunnels. This would be a subliminal result, but it should contribute considerably to stress reduction for the drivers. Two types of sound effects will be generated within the tunnel. The first would be a "standing tone," a steady and all-pervasive, masking group of tones that would "qualify" each tunnel. The purr in one tunnel would become the warble found in the next, while the third might be dominated by a prevalent pulse. The second mode of sound treatment involves the use of experimental technology called ACTIVE Noise CONTROL, which has recently been developed for use in reducing the noise level in air-conditioning ducts and industrial exhaust stacks. Considerable research and development work is needed since the ACTIVE Noise CONTROL is still a nascent technology. In this theoretical version, the lighting in the tunnel would be

keyed to an external environmental sensor. The layout of the fixtures inside the tunnels would be changed to eliminate the flicker in the driver's peripheral vision imposed by the present intermittent "skip" lighting layout. This band of chasing colored light is responsive to external conditions and linked





to the overhead traffic signal lights. If a red light-stop emergency condition exists inside one of the tunnels, the chase will stop with all fixtures lit, in a full white-light, stationary mode. Ideally, the lighting system will work as a subliminal traffic regulator. At proper speed, if you entered in a lighted zone, the zone would travel with you through the tunnel; your vehicle always staying within the light. Consequently all sequences of events—the passive sound mask, the active sound mask, and the light chase—will occur at a rate equal to the speed limit, thereby acting as a subliminal guide to all the drivers traversing these subterranean spaces.

2.0 Practical Vision

ACTIVE Noise CONTROL was tested in tunnels in Los Angeles and San Francisco with great success. The technology was then taken to the Geneva By-Pass, but due to the greater length of the tunnels, an untenable number of control devices were needed to successfully

reduce the noise level. Research continues with this technology to produce a viable solution for this site. In the practical version, now under construction,* externally produced tones coexist and interact with vocal tones derived from several types of unaccompanied music similar in character to music by Josquin des Prez.

The tunnels will be filled with voices in a simple fashion: a multiple CD player will be connected to a group of constant duty high output audio-amplifiers powering a string of weather-resistant loudspeakers hanging from the ceiling at fifty-meter intervals, beginning and ending one hundred meters inside the mouth of each tunnel. The (singing voices) will play continuously, but their loudness

will be adjusted automatically to match the loudness level of the traffic noises. The audio system will play the music, but in an irregular sequence to keep the experience fresh and developing for the regular traveller. In the Geneva By-Pass, the user behaves sculpturally, probing the sound field as a "Moving Viewer," in this case driving at seventy mph through instead of around volumes, apprehending physical conditions and spatial percepts as unique as thick or thin and active or inactive space. Acoustics itself becomes a perceptual field. The Geneva By-Pass has examined, exposed, and enlarged our understanding of sound as a means for producing an art of spatial percepts free of encumbering artifacts.

*As a result of the 1994 elections, this project, after an extensive competition process and research on the specific acoustics of the site, was terminated.