

develop design criteria for the entire system. "Nobody had any idea of what the architecture of rapid transit should be," he says. It was like trying to determine what a modern office building should be if the last one were the Woolworth Building."

Emmons made what seems, at least in retrospect, a daring choice of a leader for his research team: Christopher Alexander, the young British architect-mathematician, then just arrived at Berkeley, who has since become a leader in the

attempt to bring the design process into line with the cybernetic revolution (see "A City Is Not a Tree," April and May 1965). Alexander and his group studied the transit systems of New York, Chicago, Philadelphia and Toronto; talked with a cross section of those involved in transit, from administrators to janitors to passengers; consulted a number of behavioral scientists; and fed their findings through computers.

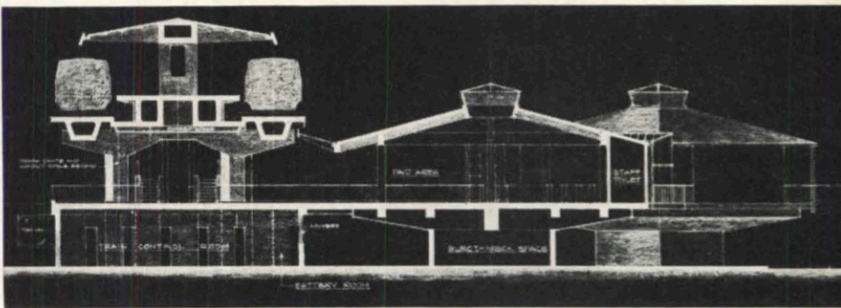
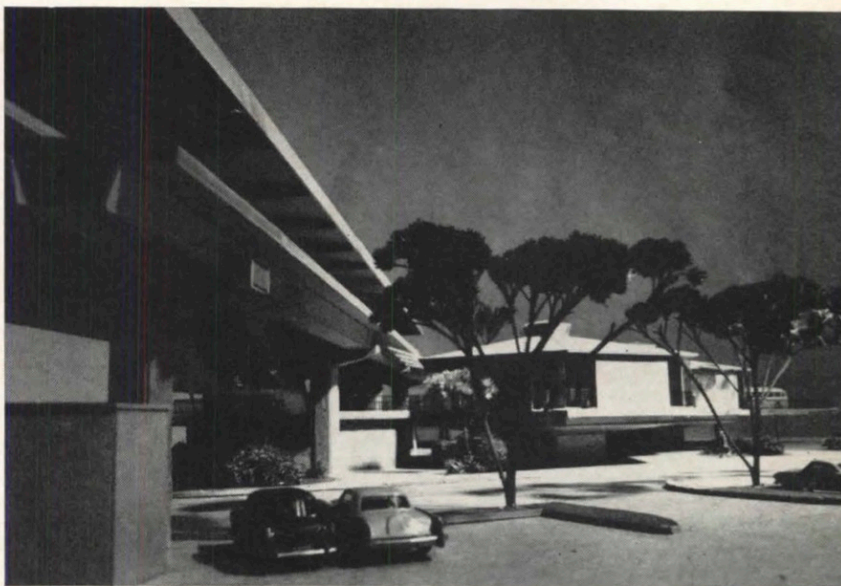
The output was a list of some 500 root requirements for transit

design — neither specifications nor performance standards, but what Alexander called "relational characteristics." Examples: people should not have to sit touching strangers; a passenger should encounter as few obstacles as possible between the time he enters the system and the time he reaches his seat in the train; there should be no dead-end station corridors where a woman could be trapped.

The research had been underway about a year, and had cost nearly \$100,000, when it was

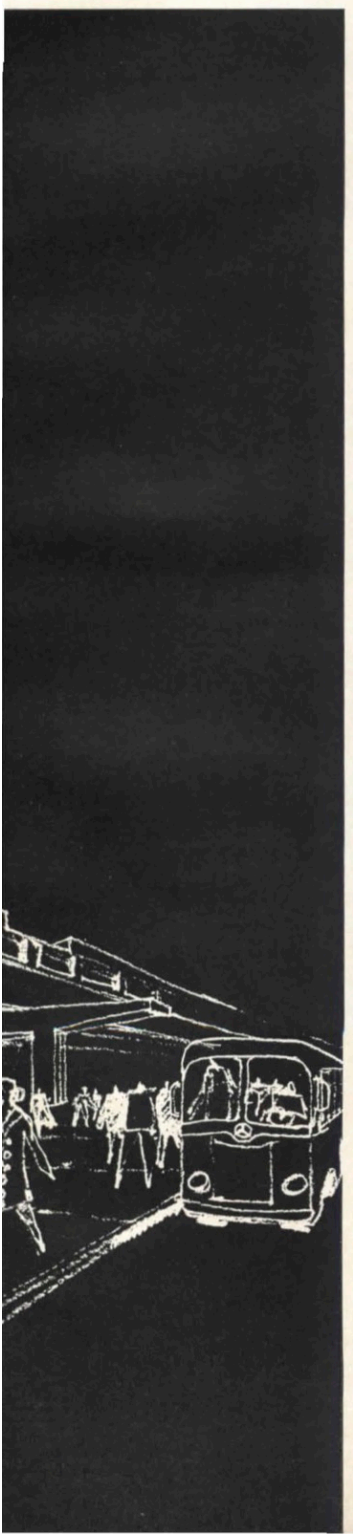
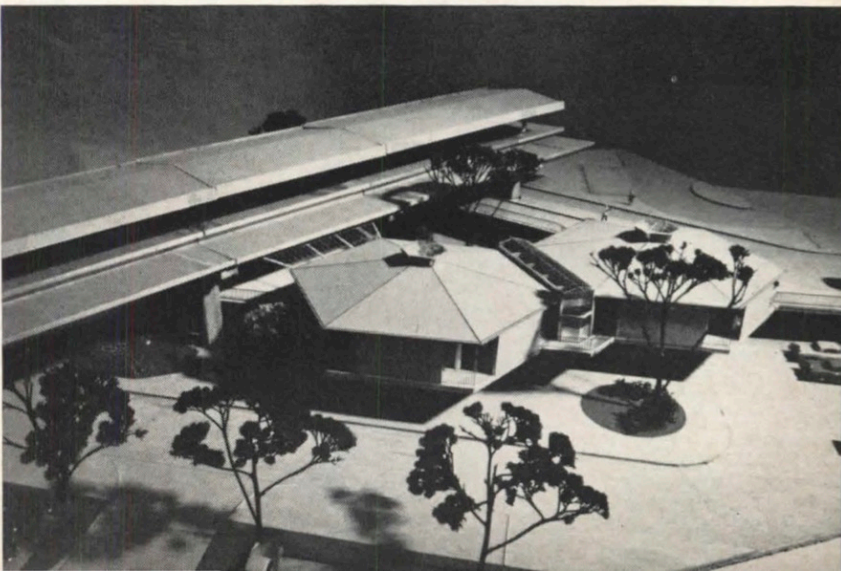
abruptly halted by BART and the engineers. They had seen Alexander's list of requirements, and had dismissed it as a "joke book."

According to Alexander, the engineers rejected his work because it dealt with basic relationships, rather than numbers. The relationships were so basic, in fact, and so simple to talk about, that BART couldn't believe they had any value, in Alexander's view. Alexander feels BART and the engineers were not interested in anything except



In preliminary station designs, sampled on these pages, BART has drawn a wide variety of responses from its multitude of architects. For midtown San Leandro, Masten & Hurd and Joseph Esherick & Associates sought to match the strength and scale of the elevated line structure. The ground-level concourse is encased in glass on two sides and left open at the ends, where patrons enter under the tracks. Escalators to the platform above are exposed and exploited in the design.

For the North Berkeley station (right), Architects Kitchen & Hunt stayed in scale with the surrounding bungalows, rather than with the track. The concourse is split into two separate hexagonal buildings, corresponding with the split in function specified by BART: one is the "free area" that anyone may enter without charge, the other the "paid area" for paid-up patrons. They are joined by skylit turnstiles.



The name of the game is engineering, and the rules for design are fixed well in advance

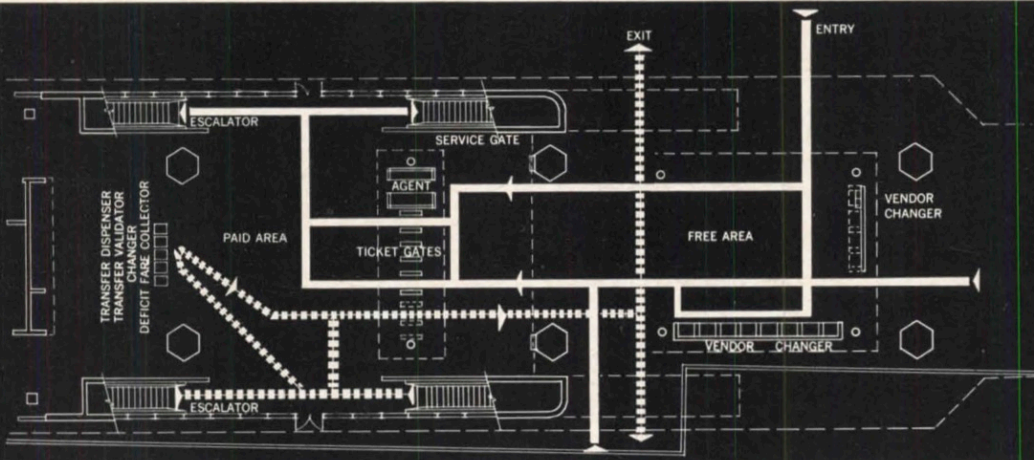
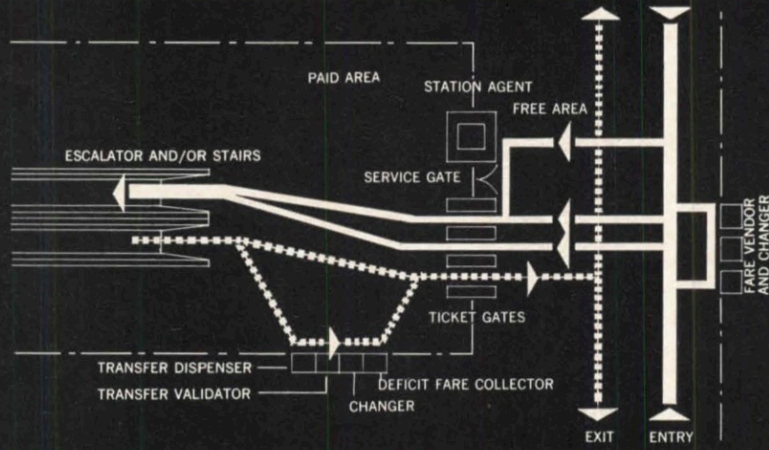
expediency and cost estimates. According to the joint venture's Walter Douglas, Alexander's work was rejected because "it couldn't be focused into the decision making process." Says Douglas, "We were never enthusiastic about what could be accomplished by sociologists and psychologists and people of that nature. We have always been enthusiastic about what could be accomplished by such people as lighting consultants and acoustical consultants."

As these words indicate, the

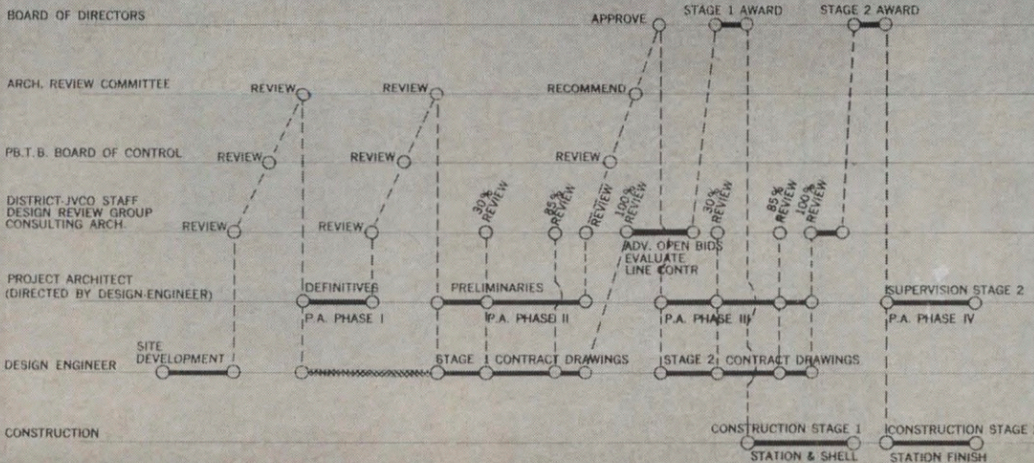
wedding between Alexander and the hard-headed engineers of BART was far from an ideal match. Emmons, the man in the middle, says that "a lot of good information came from the research, and that most of it was incorporated into the *Manual of Architectural Standards*, a 201-page document developed by Emmons' office as a guide for the architects designing the individual stations.

But many of the station architects interviewed by the FORUM interpret the incident as the

decisive encounter in a struggle over basic design philosophy, from which the engineers emerged the winners. At issue, they feel, was the question of whether BART's architects would be permitted to engage in truly conceptual design, or merely serve as cosmeticians for concepts already established by the engineers. "The name of our game is engineering," Stokes answers flatly. "Engineers have to be in the lead. Ours is a systems approach that brings architecture into all the other con-



STATION DESIGN REVIEW PROCEDURE
TWO STAGE CONSTRUCTION



Right, two further variations: For a light industrial area in El Cerrito (top), DeMars and Reay have bowed out the platform area to accommodate the escalators, freeing space in the ground-level concourse. For the Ashby station in Berkeley (bottom), where height was a problem, Wurster, Bernardi & Emmons made the entrances understreet tunnels and sunk the lofty, glazed concourse below grade.

Left, Emmons' office supplies architects with the diagrams such as the one at top, showing all of the essential station elements and desirable circulation paths. This one is for a suburban station in the morning: thus, the major flow is to the trains and the minor (dotted lines) from them. The center diagram shows how such a program was interpreted in the plan of the San Leandro station. The bouncing balls in the bottom diagram represents the steps a two-stage station design must go through.