

*Spaceships, a "people wall," trips through yesterday and tomorrow  
—here's how the World's Fair wonders will work*

**By John P. McNeel**

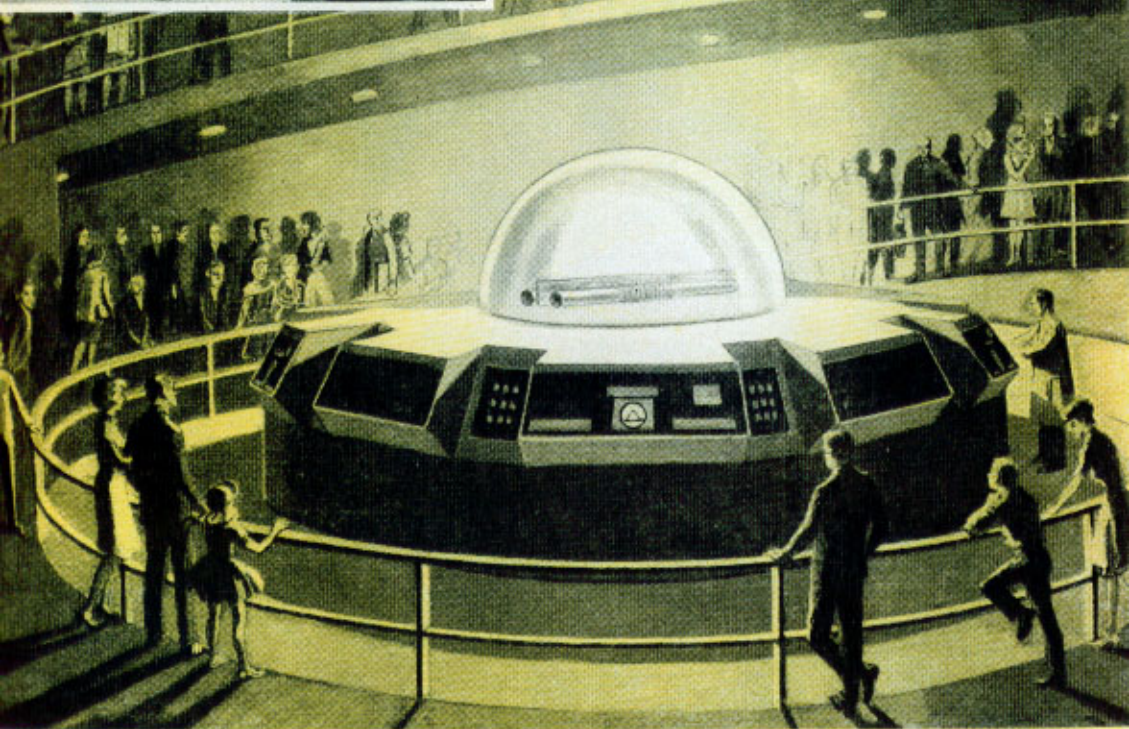
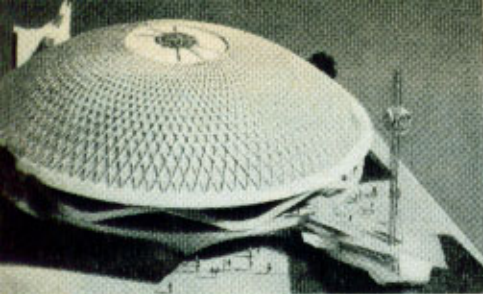
**H**IGH OVERHEAD, the slim, elegant shape of a space ferry vehicle moves slowly into sight of awed spectators waiting below. It changes course slightly as it nears an orbiting space station; tension mounts as the two vehicles maneuver for the delicate docking procedure.

Gradually, the space between them narrows as the ferry points its tapered nose toward the docking aperture. One false

move at this point in an actual space rendezvous and the two vehicles might bounce apart in a disastrous collision, damaged beyond repair or skewered into wild orbital paths.

But all goes well as the ferry makes a bull's-eye thrust into the docking aperture at one end of the space station and is locked into place.

The space procedure just described is



**THERMONUCLEAR FUSION**, simulating the awesome power of the sun, will be demonstrated publicly for the first time in GE's unique domed pavilion

realistic enough to be a true rendezvous. Actually, it is a simulated rendezvous at the New York World's Fair, due to open on April 22.

Space travel is only one of the scientific and industrial marvels you'll be seeing at 1964's biggest show on earth.

At Flushing Meadow, in Queens, N.Y., you'll see an actual demonstration of thermonuclear fusion, the awesome power of the sun that makes the atomic bomb look like a firecracker.

Man's future settlements on the moon, his exploration of the planets, a journey to the heart of a living cell, and research at the bottom of the sea are only a few of the dazzling exhibits that will be on view.

Billed as the world's first billion-dollar extravaganza, New York's glittering global show will present the visitor with

enough scientific and industrial wonders to dazzle the mind and beguile stay-at-homes for years to come.

Exhibits and pavilions, now being rushed to completion on the same identical 646 acres which held the 1939 World's Fair, are roughly divided among five categories: Industrial, international, federal and state, transportation and a lakeside amusement area. Some 150 pavilions include exhibits from nearly 40 foreign lands, two dozen states, the federal government, major religious denominations and scores of industrial corporations.

The Hall of Science, located in the transportation area, will be the home of the space docking show, as well as a dozen other exhibitions, including the Atomic Energy Commission.

Meticulous care is being taken to insure

absolute authenticity in the space show. "We're not doing final mock-ups on the ferry vehicle or the space station until the last minute," says George Bunker, president of Martin-Marietta Corporation. "The vehicles will be as near the real thing as we can make them, and we will keep the craft up to date if the technology changes while the fair is still in progress."

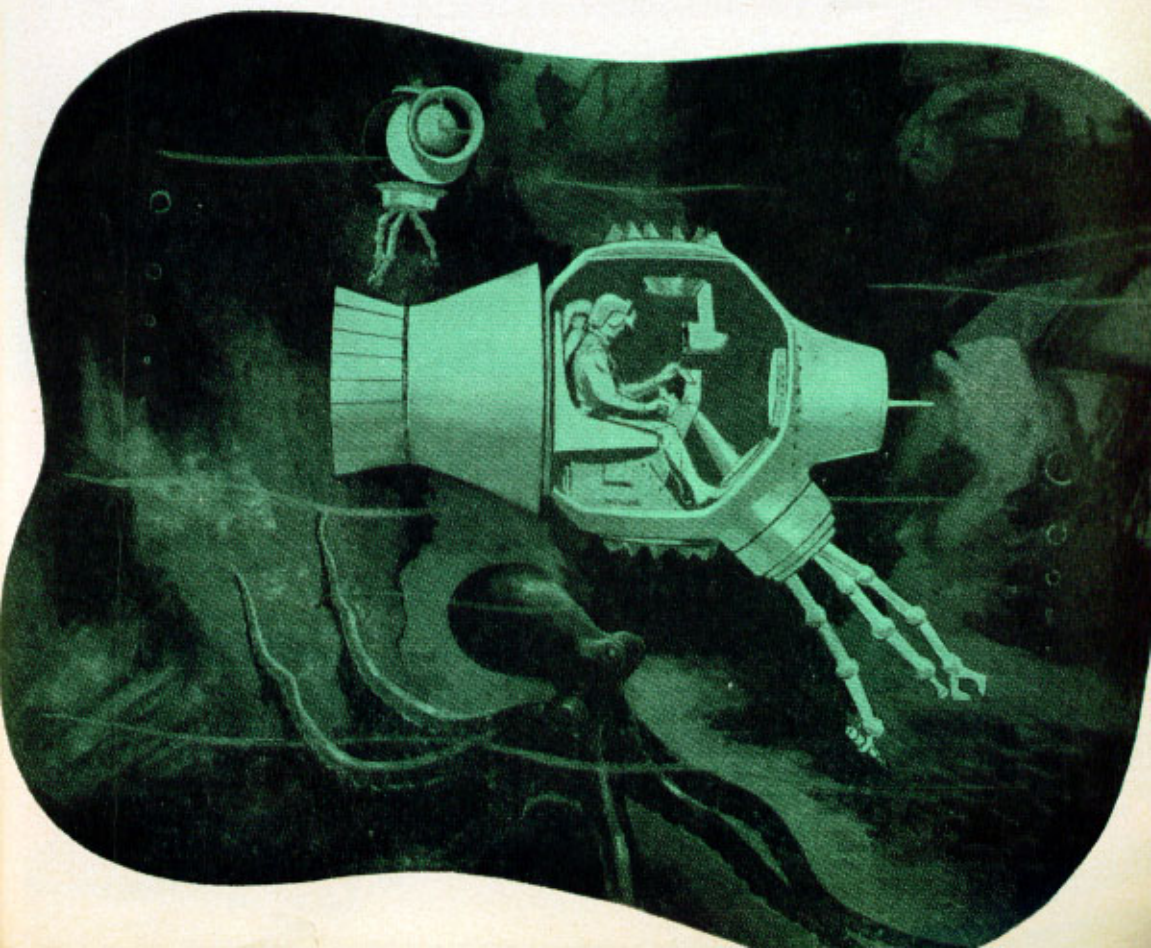
The ferry vehicle will be the exact size and weight (about 2200 pounds) of the capsule which is expected to perform an actual space rendezvous procedure in the Gemini program, possibly in a year or two, or while the fair is still open. The five-ton orbiting space laboratory also will be an exact replica.

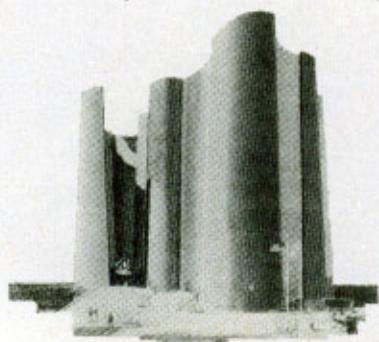
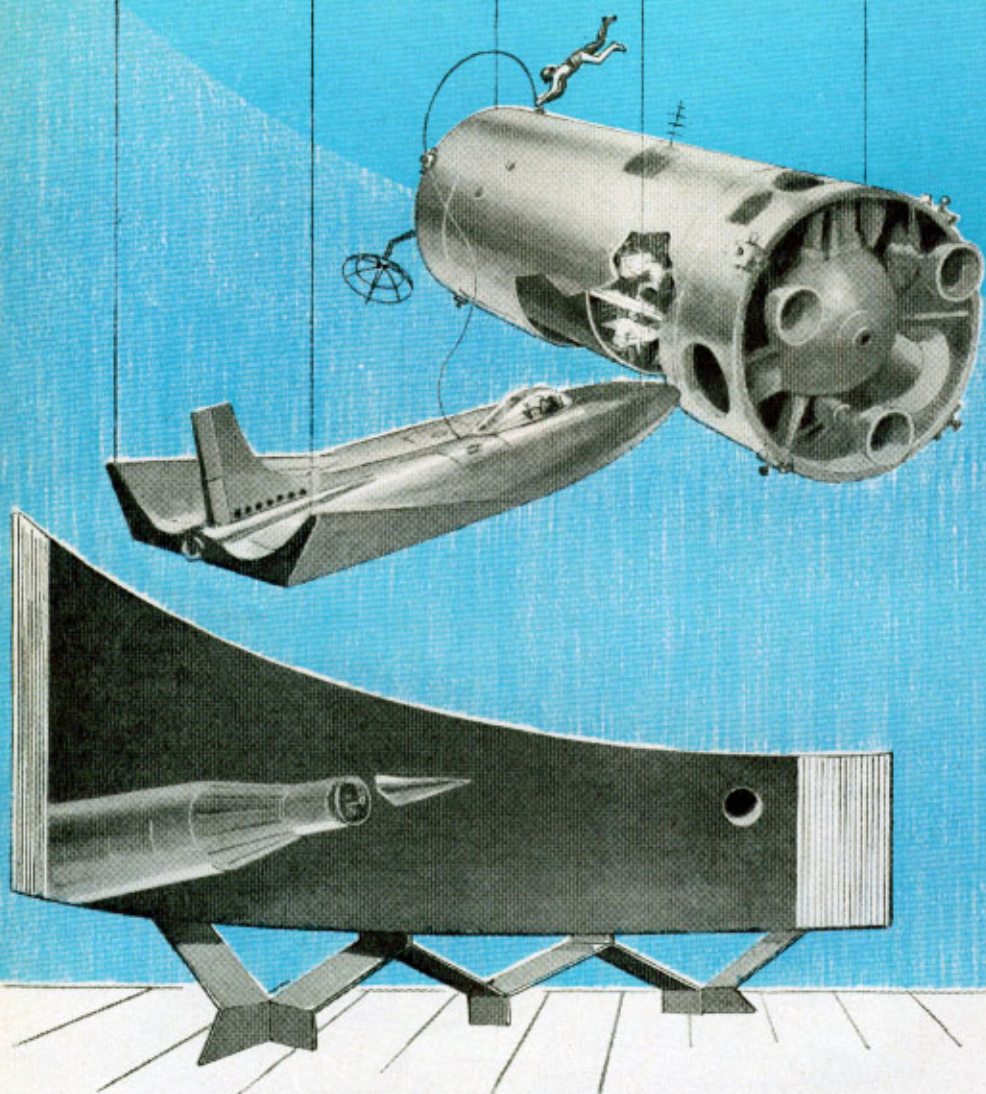
The company and its design firm, Gardner Displays, are in close consultation with the Air Force and the National Aeronautics and Space Administration on design details.

They will probably use such gimmicks as rear projection screen materials or smoked plastic to show operations inside the space lab. As the ferry docks, lights go on inside the floating space station. You'll see three-dimensional spacemen walking up the walls, performing scientific chores. Other astronauts may emerge, floating on tethers, to work outside the station. A tricky arrangement of traveling cranes and invisible cables does the job (see illustration on next page).

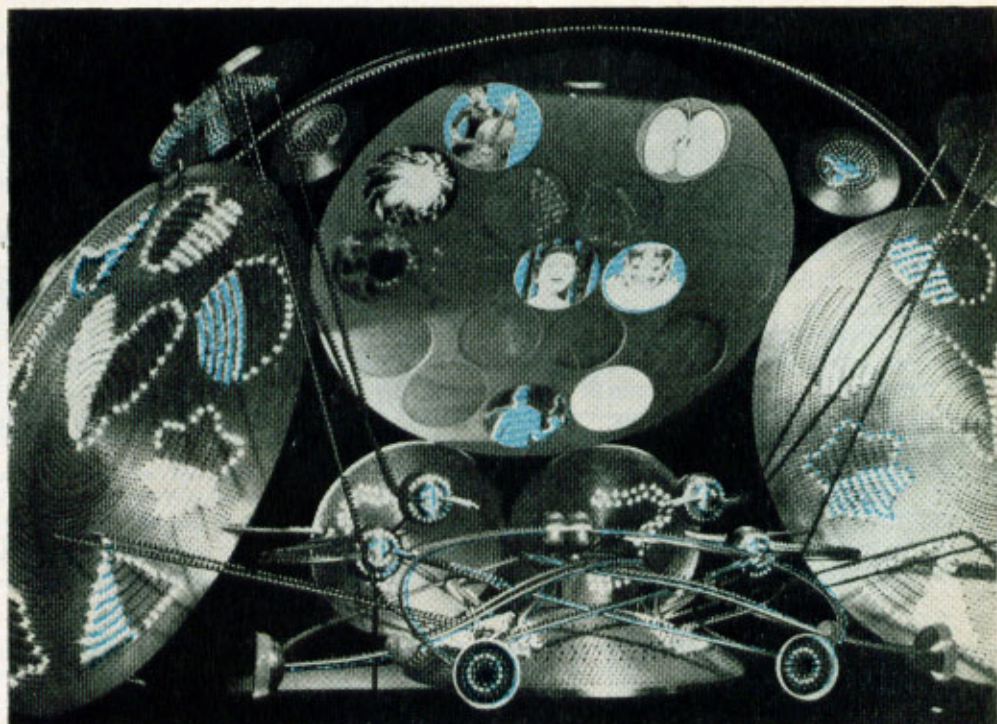
In the AEC's "Radiation and Man" exhibit, you'll be able to "make" atoms, or what look like atoms. By manipulating knobs on a "black box" you can trace the electronic paths of any given atom by projecting a strob light on a screen. Also in the AEC corner is a scaled-down children's museum; parents will never make it through the four-foot-high door, but they will be able to keep track of their

**GENERAL MOTORS** is showing a new version of its 1939 hit, Futurama, which will treat visitors to a peek into the future, including deep ocean exploration





**HALL OF SCIENCE** headliner will be a simulated rendezvous in space between a transport ferry and an orbiting space laboratory. Part of the sequence of events, including the blast-off of the booster rocket and the re-entry phase, will be shown on a giant curving screen. Actual docking procedure will take place high overhead in the 80-foot-high second floor of the hall. Slated to be a permanent feature of the city park which is to be built on the site of the fair, the Hall of Science will present a dozen major exhibits besides the space show



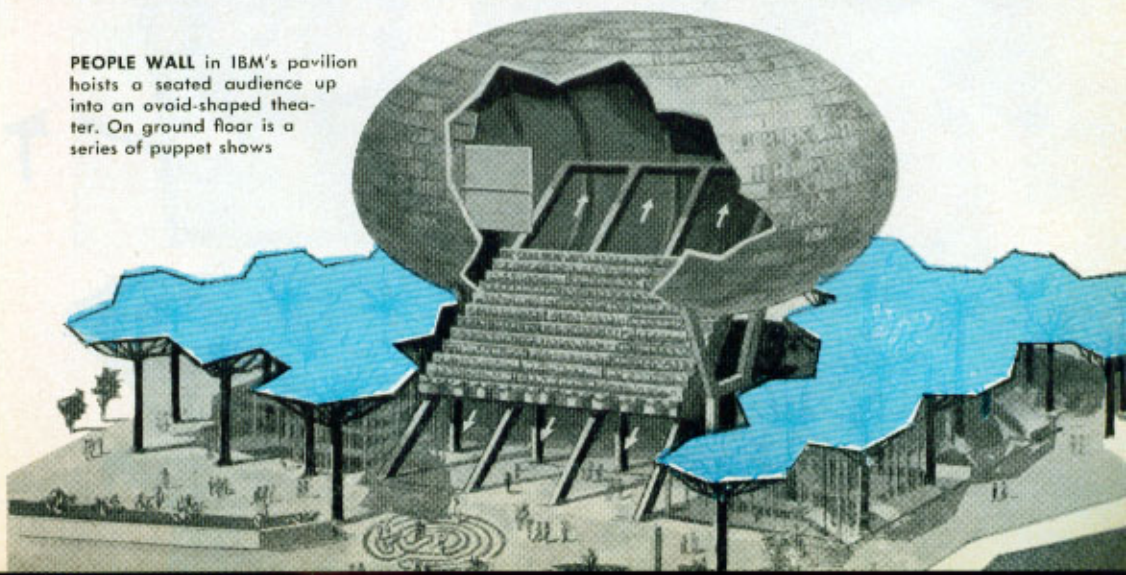
**HOW THE BRAIN** processes impulses from the eyes and ears into the miracle of sight and sound is demonstrated by this brain model in the Hall of Science

offspring on three television screens in an adjoining room.

A giant Rube Goldberg-like contraption 24 feet in diameter and 12 feet high dominates another space in the hall—Upjohn's human brain. Flashing lights speed along tubes and wires between huge aluminum disks, each studded with tiny lights. This weird creation illustrates how two highly important human senses—

vision and hearing—are handled within the brain. Most of the disks represent the topbrain, or cortex. Electrical impulses are shown traveling from the creature's "eyes", through the optic chiasma into the two halves of the visual cortex. Here the signals show half an image (an opera singer) before they're carried into an area of the upper brainstem where two halves are merged into a single complete image.

**PEOPLE WALL** in IBM's pavilion hoists a seated audience up into an ovoid-shaped theater. On ground floor is a series of puppet shows



Hearing is demonstrated in a similar way.

In other areas of the Hall of Science you'll see experiments illustrating problems in biology, mathematics, chemistry, physics, color notation, aircraft landing systems and diagnostic techniques.

During ideal weather conditions, you might not have to go any nearer the fair site than the Washington Monument or Boston Common to see one nighttime spectacular. A gigantic tower of light, throwing 12 billion candle power of light into the heavens is now being assembled for the Electric Power and Light exhibit. The right kind of cloud layer could reflect this powerful beam for hundreds of miles.

In fact, fears have been expressed that such a beam could blind pilots on the approaches to nearby LaGuardia and Idlewild Airports. Also, naturalists were afraid the light may confuse migrating birds, or attract them into a danger zone under certain atmospheric conditions.

Elaborate testing has allayed most fears. But, if a pilot radios in that "that damn light's blinding me," the beam can be doused instantly from switches at New York airports.

An ornithologist from Rutgers University will be on duty every night. If he feels the light is endangering bird life all he has to do is cut the power source.

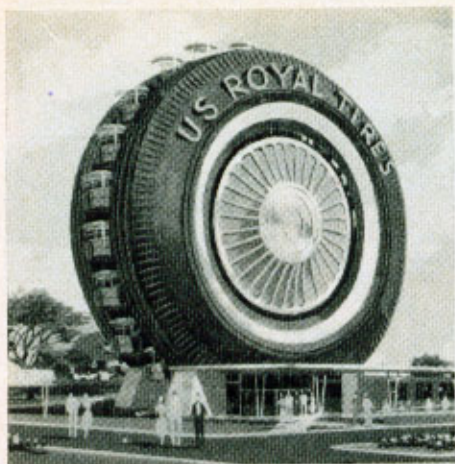
Where other shows peek into the past as well as into the future, GM is keeping its eye strictly on the crystal ball, and the future it sees is a rosy one indeed.

"We're in the mobility business," says GM Vice President William L. Mitchell, "not the space business. We're going to show people new frontiers right here on earth."

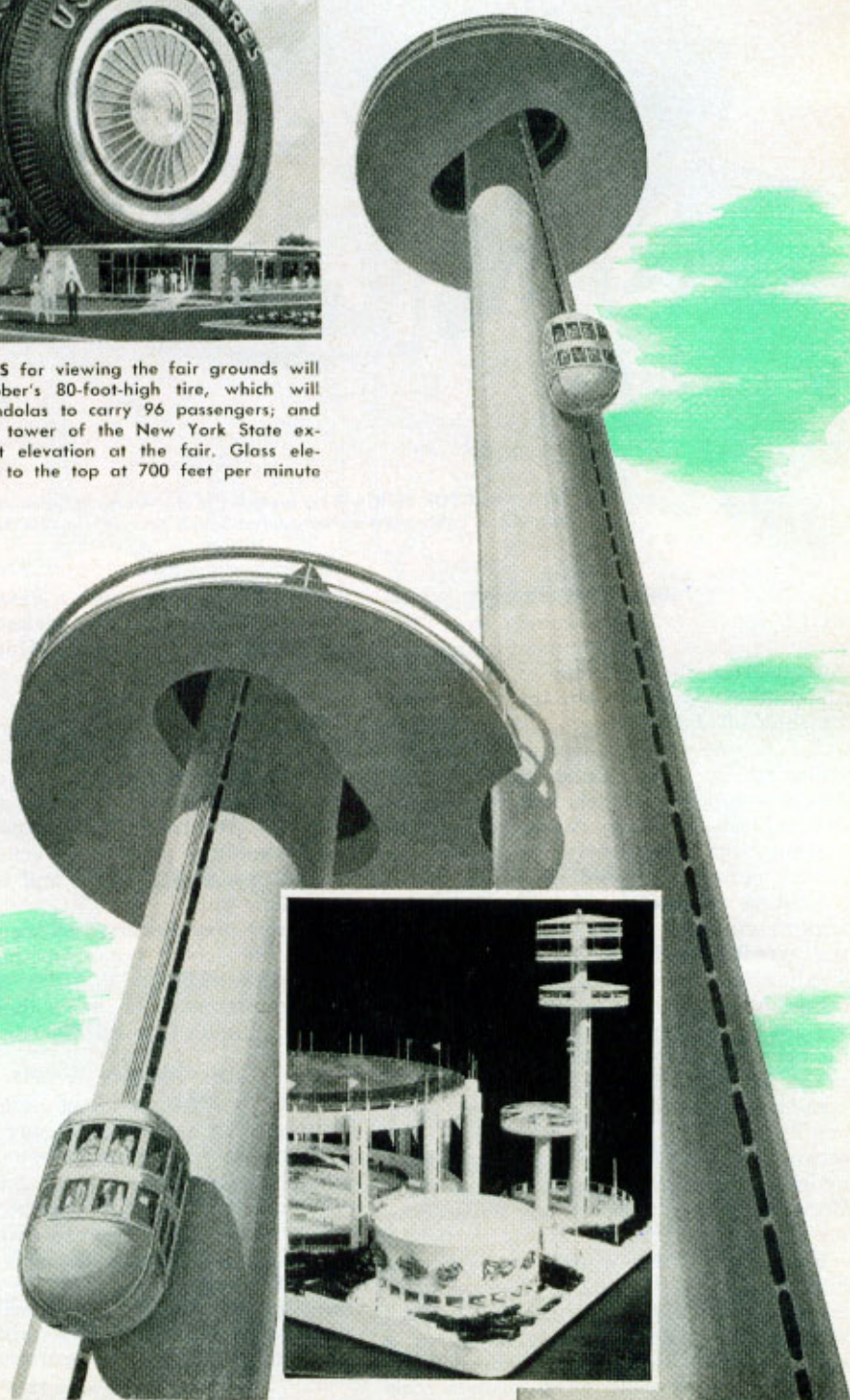
Visitors at the rate of one a second (70,000 a day compared to 1939 Futurama's 28,000) will board comfortable contour chairs for GM's ride into the future. You'll start by approaching earth in a space cap-

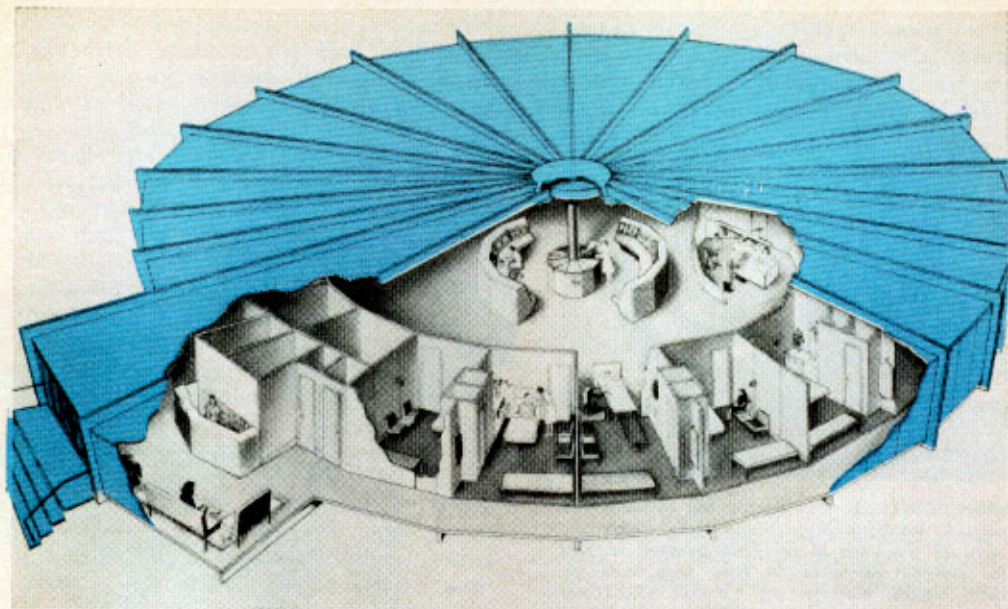
**ANIMATED CAVE MEN**, who move and "talk" in amazingly realistic fashion, were made at Walt Disney's studios for Ford's journey into past and future





**HIGH POINTS** for viewing the fair grounds will be U.S. Rubber's 80-foot-high tire, which will have 24 gondolas to carry 96 passengers; and the 226-foot tower of the New York State exhibit, highest elevation at the fair. Glass elevators shoot to the top at 700 feet per minute





**TREATMENT FOR SICK** will be provided in the Atomedic (atom-age medicine) hospital, a lightweight air-transportable unit designed for use in emergencies

sule, past an uninhabited moon on which weird lunar crawlers move over the moon's surface. You'll move through the Aurora Australis and come to earth in an all-weather port cut into the permanent ice shelf off Antarctica.

You'll see atom-powered submarine trains sailing under the ice shelf to keep the base supplied; watch fantastic crawling vehicles crossing Antarctic terrain; and see huge tunnels being bored into the ice for permanent buildings.

Visiting explorers will leave the polar area to enter an underwater world, past the wreckage of an old three-masted whaling vessel, and journey out into the deeps. An aquacopter, a two-man undersea craft with claw-handed arms, inspects the ocean floor for mineral deposits. Drills probe for ocean-bottom oil.

In an underwater recreational area, you'll see resort hotels secured to the ocean floor. Behind over-sized windows undersea vacationers dance, eat and play. Undersea sports vehicles and aquascoters glide eerily by with fishing parties.

From this water-world you'll plunge into the depths of a jungle where a road-building vehicle five stories high and as long as three football fields is laying a multi-laned highway through the wilderness. Through tunnels bored through rock

walls you'll emerge onto a desert plateau where advanced farming techniques have made the arid land bloom. Here farmers manipulate irrigated croplands—by push-button—from an office.

From here you'll enter a suburban wonderland where futuristic houses show the prosperity and affluence to come. Past the suburbs looms the city of the future, with elevated traffic lanes, moving walkways, landing pads for vertical-takeoff aircraft, recreation plazas and transportation centers.

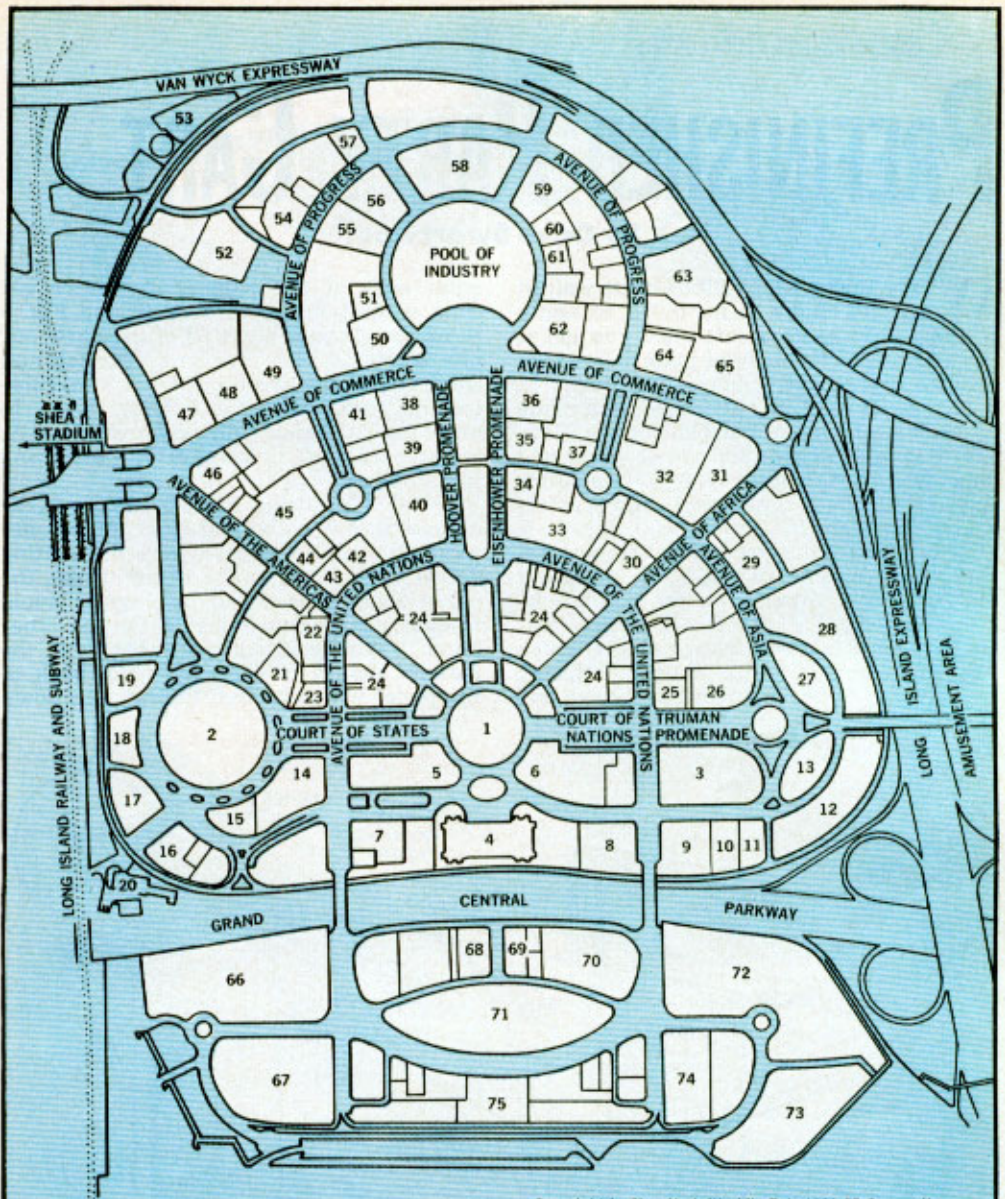
Walt Disney Enterprises won't be officially represented at the fair, but the man who created Mickey Mouse is exercising a decisive influence on more than one exhibit, including General Electric and Ford.

### Redblooded Robots

In GE's 200-foot Progressland dome, visitors enter a unique six-staged theater. Each stage will present a story or vignette describing progress in electricity from 1890 to the present. The stage platforms are arranged in a gigantic wheel shape, with the six audience sections revolving around them. Disney magic is evident in the "human" figures which will animate the stories. Electronically-controlled on a programmed tape, the figures are eerily

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## World's Fair

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human as they go about ordinary household chores, saying lines as they move realistically inside plastic skins.

"It's a weird sensation to shake the hand of one of these figures," says GE's Fair Manager Steven Van Voorhis. "It actually feels like a flesh and blood person; interior lights warm the substance to flesh temperatures. And, if one of them were accidentally cut open it would 'bleed' red from the hydraulic fluid operating it."

GE's actual flash of fusion power is set up in a huge concrete bunker on the ground level of the pavilion. Now being built in the company's Schenectady laboratory, it will be disassembled and brought to New York on flatcars. So bulky are the parts that one wall of the lab will have to be knocked down to get them out.

For a millionth of a second, under a transparent dome, the sun's tremendous power will be reproduced for all to see. The mechanism consists of a quartz tube containing a plasma of deuterium gas. Current is supplied from banks of capacitors, generating a magnetic field which "squeezes" the plasma to temperatures of approximately 20 million degrees. The deuterium atoms "fuse", converting matter into energy according to Einstein's classic equation,  $E = MC^2$ .

Because any atomic demonstration is likely to generate public fears, GE had to get clearances for the fusion exhibit from not only the fair authorities, but also the AEC, the N.Y. State Atomic Authority and the U. S. Department of Labor. Radiation, however, is not a hazard in such experiments because fusion, unlike fission, does not produce radiation fallout.

### Magic Skyway

For Ford Motor Company, Disney created a "magic skyway." The 12-minute ride will take you in new Ford cars through the world of the cave man, the present, and into the world of tomorrow. Visitors will step on a moving platform to board the cars, which move along at the same speed. In a moment you'll be whisked into the "time tunnel" which steers through the shadowy world of our savage ancestors. Dinosaurs fight it out as you ride along; animated cave men create fire, paint pictures on cave walls and develop a significant new means of locomotion—the wheel.

You approach the "city of tomorrow" through another time tunnel. Riding a serpentine highway seemingly miles above the city, you'll view a huge panorama of moving lights. The changing patterns of a

mighty super-highway system glide by underneath. Cargo rockets, headed for distant space stations, whoosh past in the distance.

The 1964 convertibles in which you'll ride are propelled along a track equipped with more than 1100 drive wheels. A 12-foot platen mounted under each car is in contact with drive wheels. A unique braking system works separately from the electrically-driven motors; they're automatically in the "on" position until power is applied. Thus, if the fair has a power failure, the cars would brake to a halt.

### Audience Taken for a Ride

The audience at IBM's odd-looking, ovoid-shaped theater will not only get a show, they'll also get a ride. Visitors will file through elevated walkways to a "People Wall" where they take seats in the 12-tiered seating section. Holding 400 at a time, the mechanism is then drawn up into the overhead theater by hydraulic action.

Along the dome wall of the theater are nine screens which, with music and narration, demonstrate the techniques of computer and information handling operations. The language of modern computers, binary mathematics, will be explained in simple, easy-to-understand terms.

In other areas, IBM's show designers, Charles Eames and the late Eero Saarinen, have set up puppet theaters to illustrate such concepts as miniaturization, computer logic and data processing. One puppet will impersonate Sherlock Holmes. The great detective is on the trail of some of the most dangerous (and gifted) criminals he's ever encountered. Their crime? In some mysterious way the thieves have made off with an entire railway train. This time, however, Holmes and the faithful Watson have a weapon the criminals didn't count on: a modern computer. The master detective solves the crime without ever stirring from his Baker Street home.

In Bell Telephone's airy, floating wing pavilion, visitors will relax in contour chairs with built-in sound systems; they will be taken through the world of communications, from the primitive skin drum of prehistoric man to the complex worldwide systems of today—and tomorrow.

In one area, a visible speech translator will analyze speech sounds by showing a breakdown of the human voice on a TV screen. One gadget will actually take your voice apart and put it back together again.

Federal and state exhibits will be grouped more or less in their own separate area. New York State will boast the highest point in the entire fair, a 226-foot tower; high-speed glass-enclosed eleva-

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## World's Fair

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tors will give you a moving panorama of the Fair as you shoot to the top at more than 700 feet per minute.

West Virginia will present the world of the stars as "seen" through giant radio telescopes. A huge dome will project an astronomer's "window on the universe" to dramatize the work of the Greenbank Radio Observatory.

Major religious denominations have set up attractive pavilions, including the Vatican, the Protestant Council, Christian Science, the Mormons and Dr. Billy Graham. One of the world's most famous pieces of sculpture, Michaelangelo's *Pieta*, which has never before been permitted to leave St. Peter's Basilica, will be one of the Fair's highlights.

And all these wonders are merely a sample of the fair's offerings. Fabulous as they are, they'll face stiff competition from scores of other exhibits.

You'll see yourself on color TV at the RCA show . . . be matched (by computer analysis) for an ideal foreign Pen Pal at Parker Pen . . . take a ride on U.S. Rubber Company's 80-foot revolving tire . . . visit the exotic pavilions and sample the cuisine of Asian and African lands . . . see a full-size replica of Columbus' flagship, the *Santa Maria* . . . ride on the closed-loop monorail set up by American Machine & Foundry . . . watch the daredevil antics of the Auto Thrill Show.

### Global Symbol

You'll have a convenient rendezvous spot at Unisphere, the giant, 250-ton, 140-foot high symbol of the fair's global impact. Tilted on an axis identical with the earth's, the U.S. Steel Company's giant world takes the place of the 1939 fair's Tylon and Perisphere.

If by mischance you become ill at the fair, you'll get top medical treatment in the fair's own hospital of the future, the Atomedic (for atom-age medicine). The lightweight aluminum air-transportable unit is designed for use in emergencies. The circular structure has 22 wedge-shaped rooms, serves electronically cooked frozen foods, is equipped with a nurse-to-patient TV circuit and uses only paper sheets, gowns, drapes and uniforms.

To soothe tired feet, Greyhound will be on hand to wheel you around, either in public or private conveyances.

And if you get plumb tuckered out, you can always take a nap, for a fee, at the Simmons Mattress show. They'll give you a private room and set the alarm to wake you when your time is up. ★ ★ ★

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