Revolutionary Restaurants
How they perfected going in circles while you eat
By Charles W. Ebeling

The Jie Jiang Tower hotel in Shanghai.

Around 1950 John Graham, Jr., a Seattle architect best known for large shopping centers, proposed a tower with a restaurant on the top for the new Aia Moana shopping center in Honolulu. The tower soon changed to a 23-story office building, and a restaurant high up in an office building was nothing new, but this one would be different. Graham later recalled that his partner, Jim Jackson, suggested that the restaurant be made to rotate, so that diners could enjoy the entire panoramic view, from the mountains to Waikiki.

It was an intriguing idea, but not a simple one. How could it be managed? At first glance the way to do it seemed to be to install the restaurant in a separate round casing on top of the main building and rotate the entire structure. But that introduced serious engineering problems. The load to be carried would be excessive, as would the forces created by wind. The alternative was to rotate only the dining area, keeping the peripheral walls, the ceiling, and the central service areas stationary. This approach would have its own challenges, including figuring out the speed of rotation people could handle while dining and stepping on and off rotating areas.

Graham’s engineers proceeded to design a 16-foot-wide go-chained turntable, ring-shaped like a doughnut. Unlike smaller turntables and merry-go-rounds, it couldn’t be powered from a central shaft, for the center of the ring wouldn’t be rotating. Rather the doughnut would be mounted on flanged wheels riding on a circular track under its flooring. Food would be prepared in a kitchen on the floor below and elevated to the immobile central service area by a dumbwaiter. La Ronde opened in 1951, and in 1954 Graham obtained the first U.S. patent for a revolving restaurant.

The Ala Moana project was the world’s first, but Graham’s second revolving restaurant was what really popularized the concept. During the planning for the Century 21 Exposition, Seattle’s 1962 World’s Fair, the fair’s chairman, Edward E. Carlson, suggested erecting a tower with a restaurant on top. His inspiration came one night during a visit to Stuttgart, Germany, when he and some friends were dining in a restaurant atop the 712-foot-high Stuttgart Tower. The chimmeylike structure was built of reinforced concrete with elevators inside that provided access to a mainlevel barrel-shaped restaurant. It didn’t revolve, but Carlson was tremendously impressed with its spectacular view of the old city. He brought back postcards of the tower to show his colleagues working on the fair plans. Eventually they decided that such a tower could not only become a symbol for the Seattle fair but also remain long after the exposition.
ended, John Graham was retained as the architect. When shown a rough sketch of
the proposed tower, without hesitation he said, "Let's make the restaurant revolve."

He designed a disk-shaped restaurant similar to the one at Ala Moana, but this one
would ride at the top of a tall, slender tower, rather than a bulky building. Up there
a five-story structure would contain the restaurant, mezzanines, observation deck, and
elevator machines. To shade the windows, he designed a large "hatio" disk to
eclipsing the restaurant deck. Above the five-story structure a needlelike spire rose
to increase the tower's overall height to 605 feet, making it the tallest building west of
the Mississippi. It inspired the name Space Needle, and the revolving restaurant was
called Top of the Needle, and then Eye of the Needle. The structural design had to be
more complicated than that of the Stuttgart Tower, since the 94.5-foot-wide revolving
restaurant extended far out from the slender central column.

Stacks of design sketches piled up as the unique shape gradually took form. The
restaurant was located 500 feet up, and it was several times the size of the Honolulu
one. Two glass-windowed elevators, riding on the outside of the column, carried as
many as 32 people each at up to 800 feet per minute, averaging just 43 seconds to
reach the restaurant level. The turntable was a 14-foot-wide ring that traveled on a
125-ton wheel-and-track system. Built by the Western Gear Corporation of Everett,
Washington, it was fully assembled and tested at the plant, then disassembled and
shipped to Seattle. It was so finely balanced that it required only a one-horsepower
motor. It made one complete 360-degree revolution an hour. The speed was barely
noticed by waiters and guests as they stepped between the stationary and rotating
areas.

The last place you'd expect to find one
is in Pyongyang. It has three-and-seven
more left unfinished.

On opening day everything
worked well except that the
continuous rotation confused
waiters and guests. Harry
Mullikin, who was in charge of setting up the restaurant, commented, "When the
waitress went into the kitchen she would come back out with no idea where her table
had gone. Guests had the same problem. They would get up to go to the restroom but
when they came back they couldn't find their tables." The dining area was eventually
divided into four zones, with a color code for each. That still didn't help guests who
discovered that the purses and bags they had left on the stationary windowsills by
their tables were no longer there. A change to slanted sills was recommended for
future rotating restaurants. Overlooking such small annoyances, diners were
capivated by the constantly changing panorama of the Cascades Mountains, Puget
Sound, and downtown Seattle. During the fair the 240-seat Top of the Needle served
3,000 meals a day. The original restaurant was later redesigned and reopened as
SkyCity in 2000.

With success in Seattle, new towers with revolving restaurants began to spring up
across the United States and around the world. By the turn of the century there were
more than 100 major installations in 40 countries, three-quarters of them built by the
Mackon Corporation, of Oxford, Connecticut. The company's property includes a
restaurant, 1,510 feet up in the CN Tower in Toronto, Canada, the tallest tower in the
world, and the Top of the World restaurant at 532 feet on the Stratosphere Tower in
Las Vegas. Each of the turntables must operate to very high standards. According to
Mackon, "it is called upon to function flawlessly for many years with minimum routine
maintenance. And it must rotate so smoothly, so quietly, and so imperceptibly that the
patrons are virtually unaware of the motion, except, of course, for the slowly changing
scene."

The floors of Mackon's doughnut-shaped turntables ride on underlying steel
frameworks of circular and radial beams carried on casters that are specially designed
to eliminate frictional vibration. They are propelled by a unique friction drive that
consists of an annular metal strip attached to the framework and two stationary rubber
drive wheels pressing against either side of the strip. Mackon has built restaurant
systems that measure from 20 to 140 feet across. Most of them revolve once an hour,
but some have variable speed drives. It has been reported that a fear of the
restaurants increases the speed at lunch-time to encourage faster turnover of guests.
They apparently grow restless when they arrive at a view they've already seen.

One of the first rotating restaurants abroad was the Revolving Bintang Restaurant, on
the eighteenth floor of the Federal Hotel in Kuala Lumpur, Malaysia. It opened in 1983
and is still going today. A second one in Honolulu, the Top of Waikiki, opened in 1985,
and it too remains in service. Many of the restaurants are, like the Space Needle, at
the top of towers overlooking unusual scenery. Among them are the 529-foot Skydon,
at Niagara Falls, San Antonio's 750-foot-tall Tower of the Americas, the 628-foot
Calgary Tower in Canada, and the 626-foot Danube Tower in Vienna. When the 620-
foot Post Office Tower in London (now the Telecom Tower) opened to the public in
May 1983, the revolving restaurant on its thirty-fourth floor, the Top of the Tower,
instantly became one of London's most popular tourist attractions. On October 31,
1971, a bomb exploded three stories below. No one was injured and no one was
found responsible, but authorities eventually decided to close the tower to the public.
The restaurant closed in 1982.

Rotating restaurants got a boost in 1987 when the Hyatt Regency Atlanta Hotel and its
architect, John Portman, introduced a hotel atrium concept with one at the top.
Passengers riding in glass-enclosed elevators passed through the atrium roof into the
blue-domed restaurant. It was a smash hit, and atriums with revolving restaurants and
cocktail lounges began to be included in new Hyatt Regency hotels around the world.

In 1994 a 672-foot-tall tower topped with an observation deck and revolving restaurant
was erected in Baghdad, replacing a communications tower destroyed in the Gulf War.
It was named the International Saddam Tower; the name was dropped when the moment
American soldiers occupied it in 2003. In Kuwait the 1,220-foot-tall Liberation Tower,
completed in 1998, following the country's liberation from Iraq, also has a revolving restaurant. It is Kuwait's second. The first one opened in 1979 on top of a huge water tank within the 613-foot-tall main tower of the nation's water-storage system.

Probably the last place you would expect to find a revolving restaurant is in Pyongyang, North Korea. The city has three of them atop hotels, and the still-unfinished Ryugyong Hotel, 105 floors high, is supposed to have seven revolving restaurants, but major structural problems and lack of funds caused it to be abandoned in 1992. Today the massive building sits empty, its many restaurants immobile.

The novelty of revolving restaurants may have worn off in the United States. No major restaurant has been built since the Top of the World in the Stratosphere Tower in Las Vegas, which opened in 1966. But the concept continues to flourish in Asia, Africa, and the Middle East, where it remains a powerful symbol of technological and economic progress. By the end of the century the original La Ronde restaurant in Honolulu had closed to be replaced by an office, leaving the SkyCity restaurant in the Space Needle as the oldest one still in operation. After 45 years it is still a big tourist attraction, drawing some 300,000 visitors annually. In April 1999 the Seattle Landmarks Preservation Board recognized just how much of an institution the Space Needle with its SkyCity restaurant had become. It designated it a official historic landmark.

Charles W. Ebeling is a retired industrial engineer who writes often for Invention & Technology.

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