



WORKOUT MACHINE

The gyroscope-like device being demonstrated **at right** is the Orbotron, a tri-axle exercise machine patterned after a NASA training simulator for astronaut orientation in the microgravity environment of space. It is marketed by Orbotron, Inc., Carlsbad, California; more than 1,000 units are in service at health clubs, theme parks and other entertainment facilities.

The device was invented by Chris Altare, president of Orbotron, after he was able to study the NASA system. Altare was not interested in a weightlessness simulator as such; his primary interest was developing an exercise machine that would provide maximal physical benefits with minimal effort and eliminate the boredom associated with some types of exercise. "The Orbotron creates a sensation of weightlessness as does the NASA system," Altare says, "but the Orbotron is really a human-powered workout machine, unlike the NASA air-powered system."

A typical Orbotron workout takes only three to five minutes. The device has three orbiting rings corresponding to roll, pitch and yaw. The user is in the middle of the inner ring, support-

ed by hand grips and foot restraints. Human power starts the rings spinning and the user can move in any direction. The mid-region of the stomach remains in the center of all axes; this, says Orbotron, eliminates any feeling of dizziness.

Orbotron provides a "full isokinetic and isometric workout" designed to tone and firm all major muscle groups, in particular the abdominal muscles. Company literature describes the operation of the device:

the user to receive up to 1½ times his body weight plus 1½ times the mass of the rings. Retoning and tightening the internal walls of the stomach is achieved, causing the stomach cavity to shrink."

A study of the Orbotron by the Department of Exercise Science, University of Southern California, reported that all of the 12 volunteer subjects (six male, six female) improved in all strength categories after eight weeks of five to seven minute workouts. The report



"The mass of the three rings at static rest is approximately 800 pounds, plus the weight of the human body. As the machine moves, dynamic forces of orbital motion cause a consistent change of the static and dynamic weight of the person inside the rings. It causes

concluded that "the Orbotron will improve aerobic capacity (cardiorespiratory fitness level). In addition, one can expect to find substantial improvement in both strength and endurance."