

## FLIP celebrates birthday

**June 23, 1965**

Three years ago this month (June 22, 1962) a strange looking ship, 355-feet long, was launched in the Willamette River from the Gunderson Brothers Shipyard in Portland, Oregon.

The ship, which gave the appearance of a huge floating log with a small cabin attached to one end, had been christened with the rather academic name of Floating Instrument Platform. Although the name was official, the initials were soon adopted and the vessel became widely known to the public through magazine and newspaper articles as FLIP.

Her ability to convert to a sort of "stable fencepost" in the water by switching from the normal horizontal position to a vertical position and back again was the measure of her public interest.

Today FLIP is a familiar sight in San Diego Bay, operated by the University of California's Scripps Institution of Oceanography and berthed at the city's B Street Pier. She is viewed by thousands of San Diego visitors each year riding the harbor excursion boats which make a special swing close to the pier to give the tourists a good view of the Navy-gray ship with the University of California blue and gold stripes painted on the hull.

The FLIP "Spar Buoy" concept was developed by the Scripps Marine Physical Laboratory under the direction of Dr. F. N. Spiess, MPL Director and at that time Acting Director of Scripps Institution of Oceanography; Dr. Frederick H. Fisher, marine physicist; and Dr. Philip Rudnick, physicist and mathematician. Construction was financed by the Office of Naval Research which had a specific need for a stable open-sea platform from which to conduct research in the field of physical oceanography-primarily underwater acoustics.

Construction of FLIP, which took only six months, was under the direction of Captain Earl Bronson, the present Officer in Charge. Almost a month to the day after launching, builder's trials were begun at Dabob Bay, off the Hood Canal in the Puget Sound area. She was accepted on August 6 and arrived in San Diego for operations on August 15, 1962.

Because of its exceptional vertical stability and the simplicity of design and operation, FLIP's capabilities have far exceeded her design criteria.

In the past three years there have been 24 expeditions conducted by FLIP during which she has spent some 180 days at sea and has completed the transition from horizontal to vertical and return 67 times. Although designed with an endurance capability of two weeks at sea, one operation in the Gulf of Alaska of 45 days was completed. During this operation, 1,800 miles from San Diego, FLIP was vertical for 27 consecutive days.

While on station in the Gulf of Alaska, continuous gale-force winds and seas offered ample opportunity to evaluate FLIP's capabilities. In 35-foot waves, vertical oscillation was measured at less than 3 inches!

Since FLIP has no motive power of her own, she is towed in the horizontal position to the area where she is to be "flipped". The tow line is cast off and the FLIP crew floods the ballast tanks that make up 85 percent of her length. As these fill with water, the prow begins to rise in the water. For about 15 minutes, the change is almost imperceptible: the prow gradually rises; the stern gradually sinks. Then as the tanks fill, the whole 50 feet of the

prow abruptly lifts from the ocean surface in a matter of a few seconds. FLIP is then in the vertical position, her up-and-down motion limited to only a tenth to a twentieth of the wave height.

In the past three years, FLIP's applicability has continually widened as the advantages of a stable platform have been realized. So far, operations have encompassed studies in wave attenuation, sound propagation and bearing accuracy phase fluctuation, microthermal recording, ambient noise, seismic wave recording, wave pressure and acceleration measurements and measurement of internal waves by means of a thermister chain. There have also been other studies of a more classified nature.