

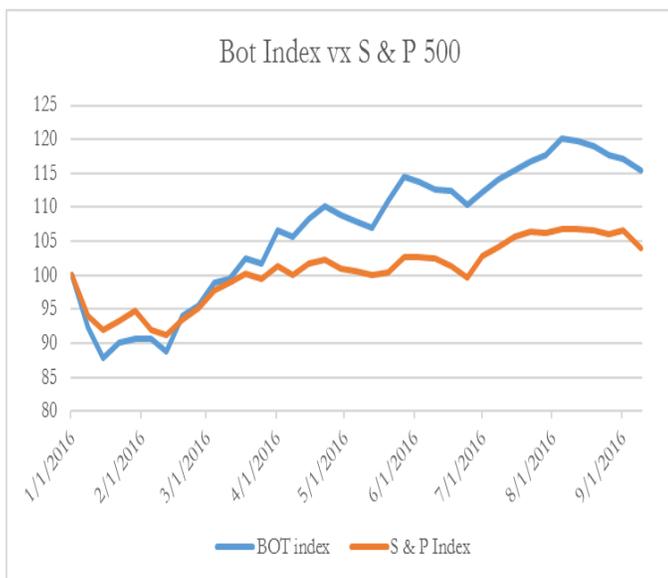


The Bot Brief

There is no force on earth as powerful as an idea whose time has come!

Victor Hugo

Weekly Newsletter on Robotic Research and Investment Review 9-09-2016



The BOT Index is an unweighted reflection of the major public companies that are involved in robotics relative to the broader S & P 500. Currently, it is comprised of 30 corporations which are broken into categories including (1) users of robotic equipment in the production phase of product development, expansion or distribution; (2) creators of mechanical robots; (3) drone manufacturers; (4) 3-D printing; and (5) artificial intelligence. The Index is international in scope with 20 U. S. based concerns, 5 Japanese companies and 5 European entities. As the industry evolves and the scope of robotic application expands, the technicians at Balcones Investment Research will make modifications to the Index' components. For a list of the current BOT Index representatives, please contact BalconesInvestmentResearch.com.

Breaking the underperformance of four consecutive weeks, the combined performance of the thirty stocks that comprise the Bot Index declined, but not as much as the S & P 500 this week. Prefaced by a major downturn on Friday, the S & P 500 fell 2.39% for the week, while the Bot Index gave up 1.41%. Four Bot names declined over 4%, one of which was AeroVironment, Inc who was the prior week' heavy loser. The only notable winners included 3D Systems who bounced back from a terrible prior week and Omron Corp. and Ekso Bionics who rose 3.36% and 2.06% respectively.

Undersea Opportunities: Only Through Robotics!

Much has been written regarding mankind's future as robotics have become mainstream in so many facets of our lives. The biggest debate, however, revolves around the employment picture and whether there will be a major reduction in the need for 'human' labor. Certainly, specific areas of our economy will feel the impact of this new source of production. Generally, however, it will be the dirty, dangerous and demeaning jobs that will be the easiest to supplant humans for machines. There is one robotics area, however, that represents a huge bright spot in both positive employment and for mankind's 'greater good'. This is a subject that The Bot Brief has championed since its creation and one that is relatively indisputable in its potential contribution to society.

As you know, almost seven tenths of the earth's surface is covered by oceans. This is an inhospitable area for man, however, not as much for robots. Man has used the oceans for travel and as a fishery for centuries, however, only in the past 150 years has the ocean bottoms been explored. As noted in the enclosed photograph from the Oceanographic Museum in Monaco-Ville, early attempts at 'altering' humans

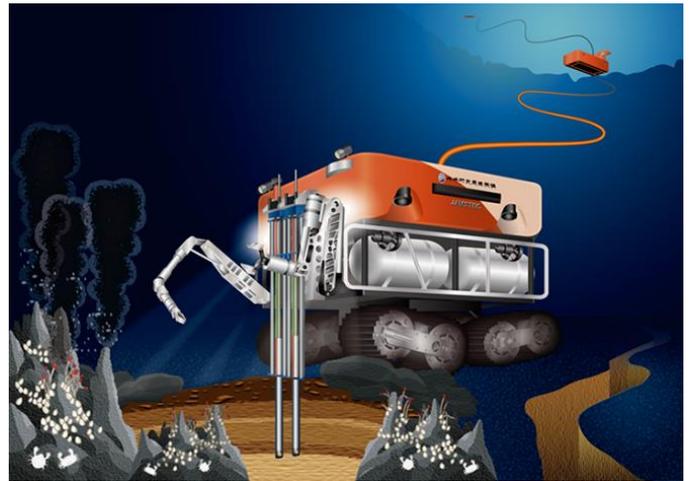
for underwater investigation were cumbersome and limiting. While we have made significant strides in technology, the undersea world and its treasures still remain much of a mystery.



Leading the charge to employ robotics to ‘mine’ the useful resources of the oceans are well-known research entities such as Woods Hole Oceanographic Institute in the U.S. and the Japan Agency for Marine-Earth Science and Technology (JAMSTEC). Considerable progress in the area of the commercial opportunities of oceanographic mining has been made as robots are starting to scour the oceans’ floors. In addition to physical discoveries, however, knowledge on such subjects as climate change and astronomical behavior, as it involves tidal alterations and the earth’s crust/mantle are becoming recognized and evaluated.

Last year JAMSTEC coordinated a joint agreement with Nissan and Topy Industries to develop an advanced ‘**robot crawler**’ to collect research mineral samples. Specifically targeted was an area within Japan’s exclusive economic zone (EEZ) that had high potential for marine mineral resources

and hydrothermal deposits. The **rovers represent a dramatic leap forward in visual and traction mobility that will ‘drastically enhance the efficiency in underwater operations.’** Earlier this year, JAMSTEC uncovered rapidly growing hydrothermal vent chimneys that were rich in sulfide compositions similar to high-grade ore such as copper, zinc, iron and lead and also with trace elements of silver, cadmium, antimony, barium, bismuth and gold. The agency concluded that ‘the cultivation of mineral resources from submarine sulfide chimneys could...**open a new window to obtain submarine mineral resources at low exploration cost and low environmental burdens in the future.’**



JAMSTEC’S New Undersea Rover Venture

On August 26 of this year, JAMSTEC announced that it had made a discovery of ferromanganese nodules in a region of its exclusive economic zone at a depth of 5,500 meters. The nodules contain cobalt, nickel, copper and molybdenum and were found in a region that was already rich in iron crusts. The agency is excited about the density of the field and the commercial opportunities that could be provided to a country that has dearth of natural resources. Japan’s lead in the application of robotics as a solution to a number of Japanese demographic issues will be essential in the extraction of these undersea opportunities.



Within Japan's EEZ, ferromanganese nodules

Clearly, man's limitations in oceanographic study and exploitation will ultimately be overcome by the utilization of robotic means. The prospects for employment and the scientific advancement in the fields of medicine, aquaculture, environment, energy, transportation and a realm other areas that will benefit mankind are immense and will serve as a positive springboard for robotic sentiment.

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Balcones Investment Research can be reached at its website BalconesInvestmentResearch.com and is headquartered in Florida; with offices in Texas and North Carolina, United States.

Photos from The Mirror.UK, Monaco Oceanographic Institute, JAMSTEC.