

## Electronic Shadows

The U.S. electronics industry continued its vigorous growth in the first half of 1999, according to figures released by the Electronic Industries Alliance, a trade group. Factory sales totaled \$244 billion or 9% more than the same period in 1998, based on preliminary data. This was slightly less than the 10% growth in the first six months of 1998 and in line with the growth of the industry over the last five years.

The fastest-growing sector, telecommunications equipment, expanded at an 18% annual rate, a speedup from the previous year's 14% and well above the medium-term trend of about 12% per year. But other major sectors showed signs of slowing. The key computer sector grew by only 5%, much less than last year's growth rate of 21% and considerably slower than the 15% rate that computer makers had long come to expect. The slowing reflects the sharp declines in computer prices and weakened demand from Asia. Industrial electronics was essentially flat for a second year in a row, which could be a warning signal that American industries' appetite for automation is sated, at least for the time being.

Whether these slower sectors foreshadow problems for the electronics industry as a whole depends mainly on the course that the American, and global, economy takes in the next year. Electronics is already one of the leading U.S. industries, with the electronic and electrical equipment sector producing some 10% of all manufactured goods. If the industry can sustain this year's growth rates, that fraction will continue to expand, despite the shadows.

—Eric J. Lerner

### Where the Jobs Are

Employers of industrial physicists range from large multinational corporations to small businesses. They number in the hundreds. However, only a small group of these companies employ significant numbers of physicists. This was the conclusion of a recent survey by the American Institute of Physics (AIP). Nearly half of the Ph.D. physicists working in industry are employed by

#### Largest 20 Employers

Raytheon Corp.  
IBM  
Lockheed Martin Corp.  
Lucent Technologies  
Boeing Co.  
Eastman Kodak Co.  
Science Applications International Corp.  
General Atomics  
Hewlett-Packard Co.  
Northrop Grumman Corp.  
AT&T  
Schlumberger Ltd.  
Motorola Inc.  
Rockwell International Corp.  
Seagate Technologies  
Osram Sylvania  
Maxwell Optical Industries  
Varian Associates  
Xerox Corp.  
3M Co.

53 companies, according to data gathered. Just 20 companies employ 30% of these industrial physicists, and another 33 companies employ an additional 15%.

The leading employer of industrial physicists was Raytheon Corp., followed by IBM Corp. and Lockheed Martin Corp. Raytheon topped the list as a result of acquiring parts of Hughes Aircraft and Texas Instruments. In 1996, the top three employers were IBM, AT&T, and Lockheed Martin. The only addition in 1998 to the list of companies that employ the largest number of industrial physicists was Osram Sylvania. General Electric, Ford, Dow Corning, and NEC were among the next group of large employers.

These findings emerged from a 1998 survey of professionals who belong to at least one of the 10 organizations that make up the AIP. Over 15,000 members were sampled and received questionnaires that were mailed out in April 1998. The response rate after three mailings was 62%. About 1,100 of the more than 9,250 respondents who provided salary and employment data have a Ph.D. and worked in industry. The remaining respondents include Ph.D.'s working in academe, government or national labs, master's or bachelor's recipients, and retirees.

—Raymond Y. Chu and Amanda Benedict