will be a major focus of the "new" AT&T. It will probably introduce some work station products (including executive work stations, management work stations, and communicating word processors), which will be compatible with a new local networking scheme—one that will probably be baseband and in line with IEEE standards. Western Electric will finally be goaded by AT&T top management to move into state-of-the-art PABX equipment, says the study.

**Voice processing.** Voice store-and-forward services will be placed into operation by AT&T, which will claim that they are "enhanced" services. AT&T may also produce stand-alone, voice store-and-forward systems. Later in the 80's these systems and services will add speech recognition capability.

**Visual communications.** Although AT&T will continue to promote its Picturephone Meeting Service as a substitute for travel, it isn't expected to grow.

**Electronic yellow pages and information vending.** The ever-lower costs of electronic components and systems will erode the profitability of many markets related to transmitting or processing information, the study notes. But markets related to the ownership or provision of information will remain potentially very profitable. AT&T is interested in the information vending market and could present a competitive threat to other major publishers such as Time, Inc., and McGraw-Hill.

**Data communications equipment.** Although several types of data communications equipment, such as modems, will tend to be either absorbed into terminals or rendered unnecessary by digital networks, the data communications market will remain large and AT&T will remain a major participant in it.

**Impact on computer and timesharing companies.** Despite the howls of trade associations, the study predicts that AT&T will enter both the computer timesharing industry and the computer manufacturing business, and will become a significant participant in each industry. AT&T's computer revenues may be in the several-billion-dollar range by 1990, but, says IRD, the company will not threaten IBM's dominance of the market any more than, for example, Burroughs does.

The IRD study—entitled *Telecommunications Market Opportunities—Impact of the AT&T Settlement* (IRD Report No. 190)—is $1285 from International Resource Development, Inc., 30 High St., Norwalk, CT 06851; (800) 243-5008. A free description and table of contents is available.

### Consumers like practical electronic products, too

According to a recent study by Venture Development Corporation, a trend towards a "new practicality" is presently underway among the buying public—a trend that could have significant long-term impact on a wide range of electronics manufacturers.

The results of a national survey of "upscale homeowners" by VDC shows that of the five products attracting the greatest interest, three are related to home security or environmental control: 27.6 percent of the respondents are "very interested" in an intrusion detection/burglar alarm system; 24.1 percent in home heating/cooling system efficiency monitoring and control; and 21.6 percent are interested in an automatic set-back thermostat.

VDC notes two possible factors behind the new practicality of consumers. First, with lingering inflationary and recessionary pressures, consumers are extremely money conscious. While some consumers have always been out to "save a buck," the new sensitivity to higher energy costs seems to cut across all socio-economic lines. Second, the study finds that homeowners have become much more committed to their present dwellings. Extraordinary interest rates along with the high price of new and existing homes have slowed the process of "trading up" to larger homes as families and paychecks grow. Homeowners therefore appear more willing to invest in permanent equipment to improve home security and energy efficiency.

The practicality of consumers is also reflected by their interest in different home information services. While accessing remote data bases and performing various computations had some appeal, consumers were most interested in performing transactions. The appeal of electronic funds transfer and the remote purchase of different goods and services is fairly high, providing they are competitively priced.


### Argon ion-beam bombardment used in VLSI packaging

For its high-density, multilayer packages for VLSI bipolar chips, Honeywell is now using both ion-beam milling and electroplating to produce copper fine-line electrical conductor patterns with etched lines that are 10 microns high by 10 microns wide and with 10-micron spaces between the lines.

"The problem has been walls that sloped too much, causing a decrease in conductor cross-sectional area that results in a decrease in electrical conductivity," stated Chuck Speerschneider, Honeywell section head. "We've improved the slope of the side walls from 45 degrees to 75 degrees, making them more nearly vertical. Now the cross-section area of the conductor approaches a rectangular shape, and electrical conductivity is maximized."

The electroplating method uses both conventional copper selective plating and ion milling. The milling removes the metalization through argon ion-beam bombardment, a technique that is gaining in popularity because it does not leave wet chemicals or contaminants on the specimen, according to the company.