



Degrees, Jobs, and Salaries Increased in 1978

Bachelor degrees in engineering awarded in 1978 are up 15 percent over the previous year, according to a survey recently completed by the Engineering Manpower Commission of the Engineers Joint Council. Degrees awarded to all minorities continued to rise in number. Another study showed that 75 percent of the bachelor degree graduates had made employment decisions on or before their graduation date. A third study showed that salaries for experienced engineers are up 18 percent since 1976, while salaries for engineers employed by the federal government advanced 30 percent on the average, for comparable lengths of experience, over the two-year period.

Degrees

The 1978 degree study entitled "Engineering and Technology Degrees—1978" includes 296 U.S. colleges offering bachelor or higher degrees in engineering. There were 46 091 bachelor degrees awarded in 1978 as compared to 40 095 in 1977. Bachelor degrees in engineering awarded to blacks increased 9.5 percent. Women receiving baccalaureate degrees in engineering, although still low in number when compared to men, increased 67 percent over the previous year. Master degrees are down 3 percent, while doctorates fell more than 8 percent.

Substantial increases in degrees awarded were noted in aerospace, agriculture, chemical, computer, civil, electrical, industrial, mechanical, marine and petroleum. Decreases were noted in degrees awarded to ceramics and engineering science graduates.

The 1978 survey "Placement of Engineering and Technology Graduates" notes that while 75 percent of bachelor degree candidates had made employment decisions, only 5 percent had no offers or plans, an improvement of 3 percent over the previous year. Thirteen percent are returning for graduate study, and 7 percent were considering job offers or had other plans.

Jobs

Seventy-seven percent of the master degree recipients and 81 percent of the doctoral degree graduates were employed as of their graduation date. Although a high percentage of doctoral graduates were employed as of their graduation, 10 percent had no offers or plans. Only 3 percent of the master degree graduates had no offers or plans at the time of their graduation.

Eighty-two percent of the four-year technology graduates and 65 percent of the two-year technical graduates were employed as of their graduation.

Salaries

Salaries for newly employed engineers, one year or less since attaining baccalaureate degree, are up 17 percent, according to the 1978 salary survey conducted by the Engineering Manpower Commission. Increases of 20 to 30 percent were recorded in the South and in New England, bringing them closer to the northeastern, central, and western regions of the country.

Looking at the salary increases from another viewpoint, large companies (5000 or more employees) experienced increases of 18.6 percent from 1976 to 1978. Medium-size companies (500-5000 employees) were up 17 percent over the same period, while small companies increased their salaries by 7.6 percent.

Electrical and electronic equipment employees were granted increases of 23 percent, while chemical and petroleum employees were granted median increases of 18 and 19 percent, respectively.

The report, entitled "Engineers' Salaries—Special Industry Report 1978," contains responses from more than 1000 employers and includes rates for more than 179 000 graduate engineers. Salary data cover all industry groups, government, and education.

These surveys and other related materials are available from the Engineers Joint Council, 345 East 47th St., New York, NY 10017.

Improved TASI-E Increases Long Line Capacity

AT&T has announced plans for its newest generation analog time assignment speech interpolation system

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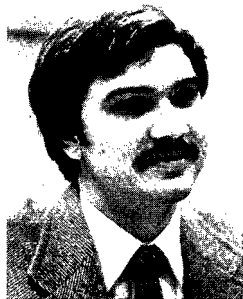
(TASI-E). TASI-E exploits the fact that speech is present in a two-way circuit less than 40 percent of the time. It takes advantage of the breaks in speech and allows portions of other calls to share available facilities. Better utilization of long lines cuts down the number of long lines needed both for national and international calls, thereby effecting a savings estimated by Irwin Dorros, Assistant Vice-President, Network Planning (AT&T), of half a billion dollars between 1983 and 1990.

Speech interpolation systems have been used since 1959 when such a system was introduced between New York and London, doubling the line capacity of the undersea cables. Because of its enhanced technology, TASI-E has been shown to be economical not only in international service, but also on domestic routes of 1000 miles and more.

The new TASI processes voice signals in a digital format and then converts them to an analog format for transmission. This version is more flexible and economical because of advanced integrated circuits and computer and digital technology. It will be deployed on a trunk group basis, and will be able to increase the facility capacity of these trunk groups by a factor between 1.5 and 2.4.

Cornell Named Outstanding Young Engineer

Eta Kappa Nu, the national electrical engineering honor society, named Dr. **Ronald G. Cornell**, a supervisor in the Exploratory Telecommunications Services Department at Bell Laboratories in Naperville, IL, outstanding young engineer in the United States. The Society annually honors an engineer under 35 years of age who has had a bachelor degree for 10 years or less. Dr. Cornell's current responsibilities are to establish new electronic switching system architectural concepts and features associated with the "telecommunications network of the future."



Laser System From Boston to DC

The Bell System has proposed to construct the world's longest laser-powered telecommunications system linking Washington, DC, Philadelphia, New York, and Boston. When completed the system would carry up to 80 000 simultaneous calls on beams of light. Hair-thin glass ribbons manufactured by Western Electric in

Atlanta would transmit voice, data, facsimile, and visual communications.

Robert W. Kleinert, President of AT&T Long Lines, told a news conference on January 11, 1980 that the system would represent a milestone in the evolution of a nationwide telecommunications network. Kleinert said the first leg of the system would go into operation in 1983 and the second in 1984 completing the 625-mile linkup. AT&T and eight Bell companies in the affected area filed for the plan jointly with the FCC. Since the eight companies can pool their requirements for additional circuits and build a single system, the plan is economically feasible. If each company had to construct separate facilities the plan would not be justified economically. As envisioned, Kleinert projects a savings of nearly \$50 million by 1990.

The system uses digital rather than analog technology and would connect 23 super capacity, all digital telephone switching offices in the seven states and the District of Columbia. These electronic switchers, called the No. 4 ESS, are capable of handling up to 550 000 calls per hour. This is expected to improve data communication in the heavily industrialized Northeast Corridor. Studies are underway to examine the possibility of using lightwave technology on routes as far west as Chicago and as far south as Miami.

All but 97 miles of the 1/2 inch diameter cable will be placed in existing Bell underground conduits, resulting in further savings.

The Bell System first commercially tested lightwave technology in Chicago in 1977 and currently has similar systems in Orlando, FL; Phoenix, AZ; Sacramento, CA; Monroe, CT; and Lake Placid, NY. The other Bell System units involved in the project in addition to AT&T are: Chesapeake and Potomac Telephone Companies of Maryland and Washington, The Diamond State Telephone Company, The Bell Telephone Company of Pennsylvania, New Jersey Bell Telephone Company, New York Telephone Company, The Southern New England Telephone Company, and the New England Telephone and Telegraph Company.

Telecommunications Legislation

The Commerce Committees in both the House and the Senate have produced new working drafts of telecommunications legislation. On December 13, 1979 the House Subcommittee on Communications sponsored a bill to amend the common carrier title of the 1934 Communications Act. The entire committee backs this new bill, H.R. 6121. This bill confines itself to the telecommunications area. It does not address cable TV, broadcasting, or frequency management, issues which caused the defeat of the previous legislation.

Major provisions of the measure include the following. The Bill:

"finds that competition shall be relied upon to the

maximum extent possible to determine the availability, variety, quality, and cost of telecommunications services and facilities; opens all intercity markets and services to competition."

"Deregulates all intercity services and carriers except for 'dominant carriers' (AT&T at present), except for the provision of basic telephone service which will continue to be regulated as it is today; provides for an access charge for use of a local telephone company's facilities by any intercity carrier; creates the national telecommunications pool and other safeguards to offset any significant increases in costs of rural telephone service brought about by increased competition."

"Modifies conditions imposed on AT&T and Western Electric by the 1956 consent decree which prohibited them from participating in unregulated activities; requires AT&T to establish fully separated subsidiaries for offering any unregulated service or product; and deregulates all terminal equipment and establishes in statute a customer's right to connect his own terminals."

AT&T rates the current bill as a big improvement over the former one. The Senate draft was not finished by the year end recess.

Baruch Study Spurs Development of Industrial Innovation

After a year and a half study, the Baruch Commission, headed by Assistant Secretary of Commerce for Science and Technology Jordan Baruch, recommended a nine-pronged plan to spur industrial innovation in the United States. The plan encompasses technical information transfer, technical information increases, improvement in the patent system, clarification of antitrust policy, aid to the development of small innovative firms, improved federal procurement, improved regulatory climate, facilitation of labor management adjustment to innovation, and maintenance of a supportive attitude on innovation throughout the administration. The recommendations omitted the question of tax incentives. These are to be taken up in the context of a major tax overhaul next year.

In 1981 four Generic Technology Centers will be set up at universities or other private sector sites to develop and transfer generic technologies. Jointly financed by industry and government, these first four will cost between 6 and 8 million dollars in 1981.

The President will seek legislation to establish a uniform governmental policy towards exclusive licenses. The government will retain the patent but the contractor will obtain exclusive licenses in fields of use he chooses to specify, and in which he agrees to commercialize the invention.

The National Science Foundation will increase its Small Business Innovation Research Program by \$10 million in 1981.

The proposed support of industrial innovation will cost \$55 million in 1981. Senator Adlai Stevenson, Jr.

questions the administration's good faith in its commitment to spurring innovation by pointing out that a \$1 billion bailout is slated for the geriatric Chrysler Corporation. In contrast, \$55 million seems but a pittance.

House Focuses on Industrial Innovation

Speaking on the floor of the House on December 13, 1979, Rep. George Brown noted the recent surge of activity in industry, the Administration, and Congress on the problems of innovation and productivity. Brown proposed a coordinated approach to develop the appropriate incentives to encourage linkages between good ideas and people, between institutions in the R&D enterprise, and between R&D innovation and productivity policies and national objectives. Brown's Subcommittee is undecided over whether or not to introduce a bill to create an independent National Technology Foundation to promote technology and coordinate elements within the federal sector involved in innovation, university-industry linkages, high-technology small business, technical information and data acquisition and transfer of technology and information to the private sector. Rep. AuCoin proposed tax incentives to companies that contract with universities to finance basic research.

Telecommunications Standard Announced

Interim Federal Standard 1033, "Telecommunications: Digital Communications Performance Parameters" has been published by the General Services Administration. This standard defines 26 digital communication performance parameters. Each parameter provides a means of specifying a particular aspect of telecommunication system performance in quantitative terms, from the point of view of the digital services provided to the end users. Collectively, the parameters describe all aspects of telecommunication system performance of major interest to end users. The parameters can be applied to all types of digital telecommunication systems. The standard does not specify particular numerical values for the defined parameters. Associated standard measurement methods are being developed for a separate proposed Federal Standard (FED-STD-1043).

Interim Federal Standard 1033 is intended for optional use by Federal Departments and Agencies pending completion, publication, and Federal Government acceptance of an American National Standard now being developed by Technical Committee X3S35 of the American National Standard Institute. The issuance of this standard on an interim (optional) basis is intended to achieve two objectives:

- 1) provide Federal agencies maximum flexibility in selecting initial applications;
- 2) improve the standard by means of feedback from such trial applications.