

# Pictorial Encyclopedia of Modern JAPAN

**REVISED  
EDITION**



**Gakken**

# **Pictorial Encyclopedia of Modern JAPAN**

A decorative graphic consisting of several concentric circles, with the innermost circle being solid black and the outer ones being thin white lines, located to the right of the word 'Modern'.

## **Pictorial Encyclopedia of Modern JAPAN**

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# PREFACE

Japan's technology, industry, business practices, traditional culture—indeed, its very way of life—have become the subjects of intense curiosity as the nation's impact on economic and international affairs makes itself increasingly felt.

As a step toward satisfying that curiosity we have presented here in broad perspective a book that we confidently hope will furnish the general reader with a good close look at those and other aspects of modern Japan. Facts and figures are on every page, and graphs, charts and tables fill a long section at the back of the book. However, it is chiefly through the medium of pictures that we have tried to present the people and industries of Japan, for in keeping with our original intention, we wish to show what the Japanese are like and to show how Japan's industries reflect and influence the everyday life of the nation.

Like ancient Rome, Japan's industry was not built in a day but is, rather, the product of management efforts and hard work spanning an extended period. The industrial structure was formerly one based on heavy chemicals, with huge complexes for steel, petro-chemicals and other industries located around the nation. Subsequent to the two oil crises, however, there has been a shift, so that the processing and assembling industries, by incorporating innovative techniques brought about by the introduction of high technology, have become the mainstream.

The transition from industrial midget to economic giant has resulted in both progress and problems, and it is these that the pictures and text are intended to convey, in the hope that the reader will thus have a clearer understanding of how Japan and its people, like the rest of the world, are coping with and contributing to the development of the modern age in which we live.

Akira Kubota  
Richard De Lapp

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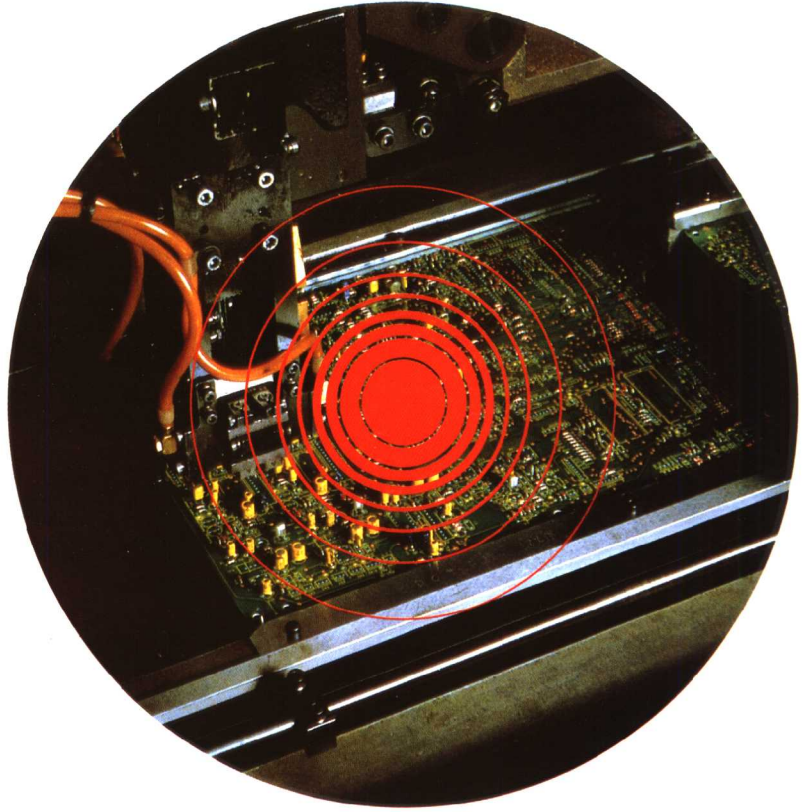
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# JAPANESE INDUSTRIES





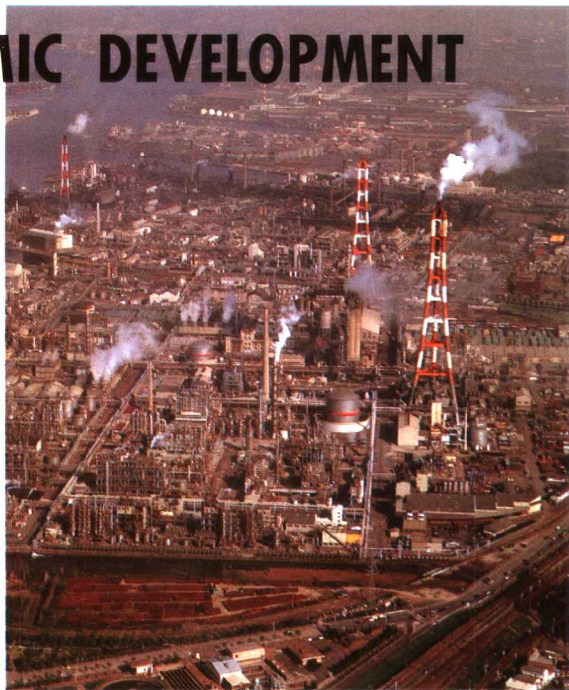
# JAPAN'S ECONOMIC DEVELOPMENT

Until around 1965 the label "Made in Japan" carried a connotation of "cheap" or "inferior". Then came the oil shocks of the '70s, bringing major policy changes to Japanese industry, which at that time was 99% dependent on imported oil. The industrial pattern moved from heavy chemicals to industries requiring fewer resources such as the knowledge-intensive industries of electronics, biotechnology, new materials, telecommunications, precision instruments, machine tools, and the trendier ones of apparel and sound equipment.

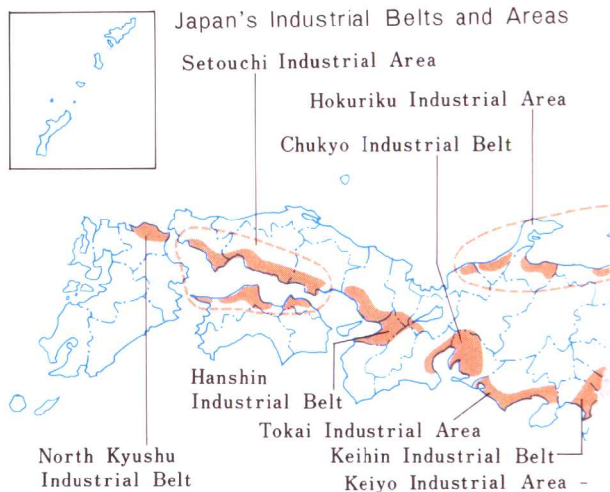
Japan's industrial products today are totally unlike those of 20 years ago. Areas in which Japan particularly excels are in applications and production, a fact attested to by their internationally competitive edge.

In electronics, biotech and other fields, basic technology is but a step behind America's; yet even here applications and production technology give the nation a worldwide reputation for excellence.

Present problems besetting Japan's economy include competition from developing nations, resource conservation abroad, and trade friction, all of which call for cooperation among the developing and advanced countries of the world.



▲ **North Kyushu Industrial Belt** Developed as a heavy chemicals area, with flourishing industries in steel, cement, glass. (Yahata Complex)



▲ **Robots at work in a Japanese Factory** NC machines, robots and other industrial machinery are at the basis of Japan's industrial development.

## ● TECHNOPOLIS

Japan has a number of huge industrial areas (see map), each carrying out important functions. But due to overcrowding, soaring prices for industrial land and other factors, an innovative, intensive pattern of new industrial areas called "Technopolis" is being developed. By attracting non-polluting topline industries, encouraging migration from the cities and promoting regional economic development, the hope is that the Technopolis concept will create a harmonious blend between modern industries and the environment.





▲ **Keihin Industrial Belt** In numbers of factories, workers, output, this is Japan's foremost industrial area, producing goods in every field. (Ogishima Complex)



▶ **Hanshin Industrial Belt** Japan's second leading industrial area. Diverse and export-oriented products include rubber, textiles, matches, bicycles. (Sakai Complex)

▼ **Chukyo Industrial Belt** Japan's foremost cloth producer. Cars are also a leading industry. (Nagoya Complex)



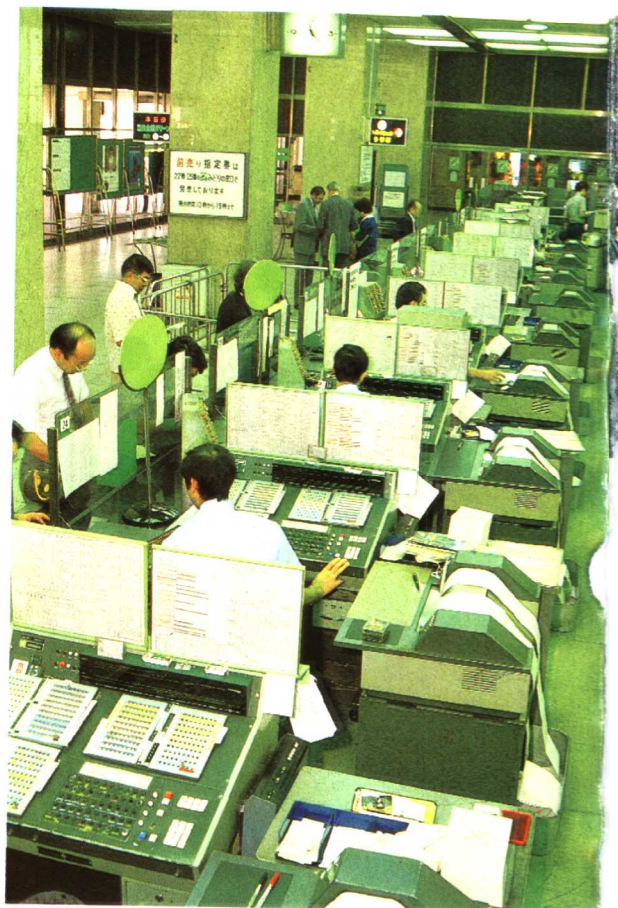


# COMPUTERS

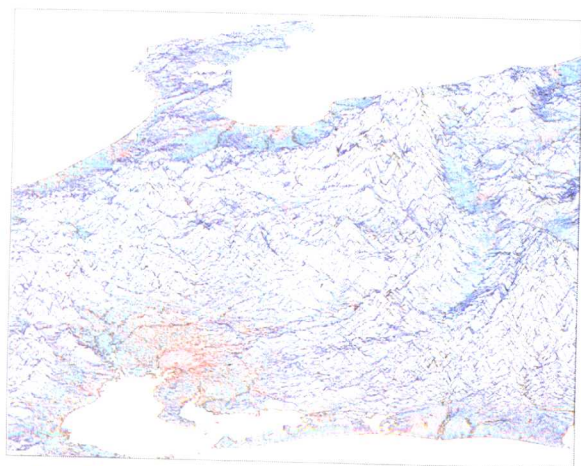
## MACHINES THAT TRANSFORMED INDUSTRY

The computer, developed in America in 1946, has been used for census-taking and missile-tracking, handling huge amounts of data and displaying an awesome ability in complex and enormous calculations.

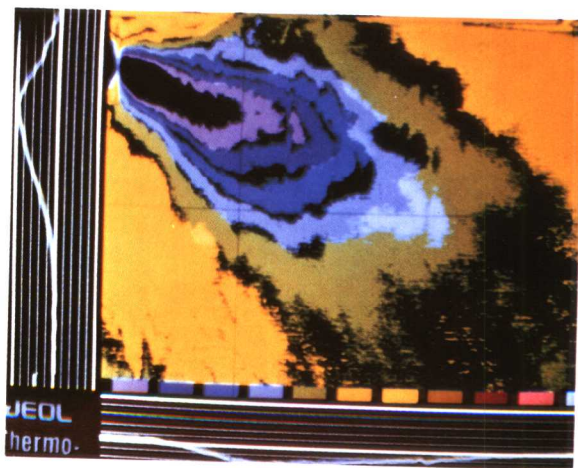
The development of the IC and the LSI miniaturized computers and improved their capabilities. Used in every field, computers have brought about big changes in society. They are so common in watches, thermometers, TV sets, VCR s, washing machines and cars that new products not using them are increasingly hard to find. Computer banking is now as commonplace as the use of credit cards. In business, they daily collate information from branches to main offices, analyzing and processing it to aid in management and decision-making. Assisted by advances in computergraphics, designers collaborate directly with them, while in factories, robots and NC (Numerically Controlled) machine tool systems engage in various tasks. In medicine, too, equipment such as the CT (Computerized Tomography) scanner has become a necessary tool in the diagnosis of disease. No longer just an indispensable tool, the computer is rapidly finding its way into the educational system to prepare the next generation in its use and operation.



▲JR's Ticketing Service The JR group companies (the post-privatized Japanese National Railways) have terminals throughout the country to make seat reservations and issue tickets, all controlled by a computer. The system, initiated in 1960, has grown to handle car rentals, hotel reservations and group tours. Such automated systems are now also spreading among airlines and hotels.



▲Map Making Using data fed into computer, cartographic machine draws map on film or paper.



▲Room Temperature Distribution Effectiveness of air conditioner is checked by computer. Uses are in R&D.

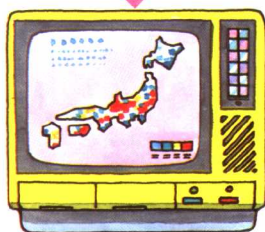




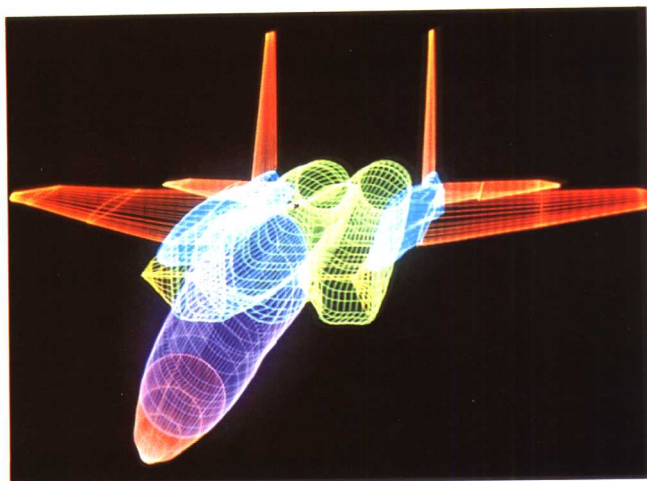
▲ **Robot Examiner** Computer-controlled robots test the A.T.M.(Automatic Teller Machine). They work 24 hours a day and perform four times as much work as a man does.



▲ **Computer-controlled Car** Pre-programmed with the route, the computer responds to oral commands, shows the way, warns and questions by voice when necessary.



▲ **Automatic Weather Station** There are 1,313 of these stations nationwide. Each automatically sends data to the computer in the Meteorological Agency. Collection of data from all stations takes only 10 minutes.



▲ **Computer-aided Design of Aircraft** Each part is assembled as a picture on the computer screen. The designer can correct and/or change the data while watching.

## ● MICROCOMPUTER USES

Without our realizing it, life has become computerized. Items pictured here are but a few of the places where micro-computers are at work.

- ◀ (left) Microwave oven cooks using data on card
- ◀ (center) Watch can remember 50 telephone numbers
- ▼ (below) Keyboard memorizes and plays melodies
- ▼ (bottom) Thermometer shows temperature in 1 minute





# INFORMATION NETWORK SYSTEMS(INS)

Aided by advances in scientific technology, various industries have made rapid gains in products and information exchange so that an advanced information society is now at hand. Playing a major role is the INS, which will gather telephone, digital, facsimile, picture and other transmissions, link home and business to large computers, and utilize satellites to overcome distances, furnishing these services at low cost.

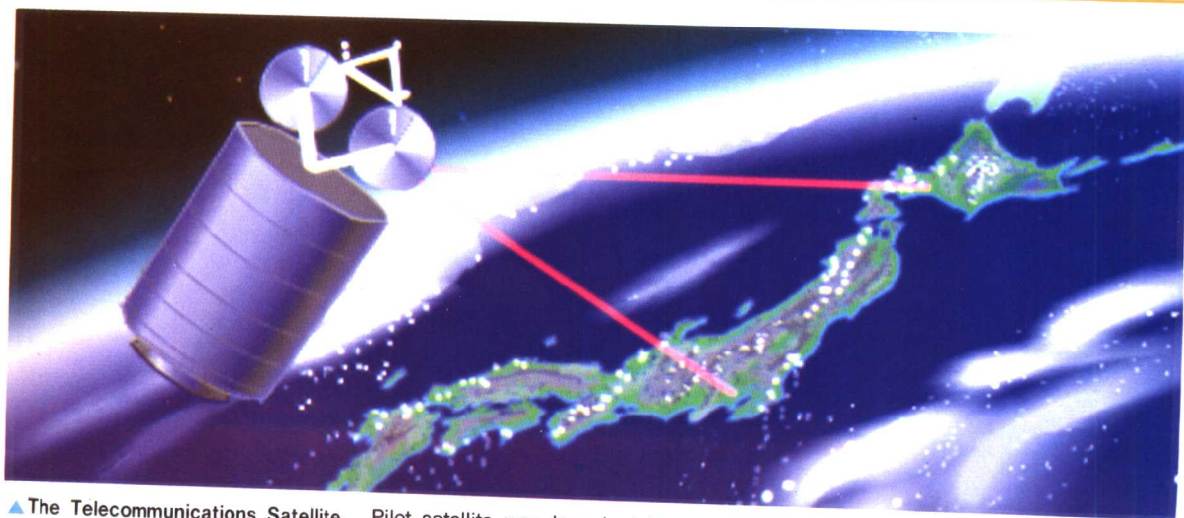
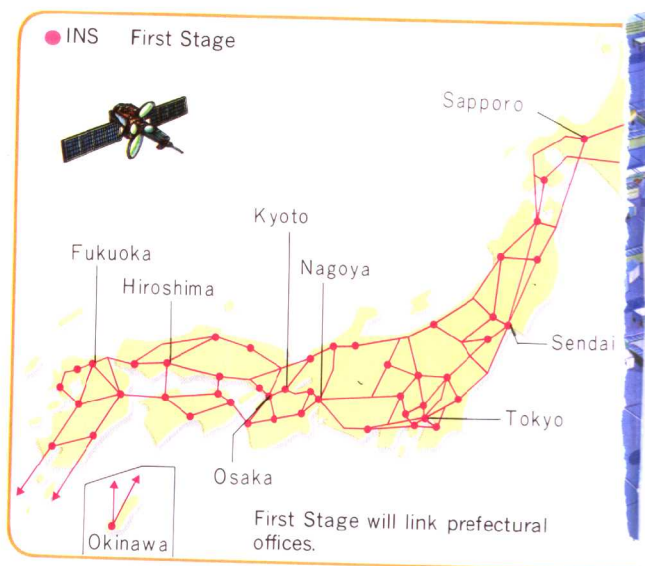
The system will link maker to consumer trends, and efficiently manage shipment, delivery, sales, inventory control, production planning and other operations by computer. Once banking services are added, billing will also be automatic. Called VAN (Value-added Network), the system will operate between business and industry.

Another system, LAN (Local Area Network), will link computers and word processors at workers' desks to a central computer so that data and storage devices can be shared.

When widely in place, such systems will eliminate voluminous paperwork, greatly shorten transaction time between business and industry, and shift pencil-and-paper deskwork to keyboard and display screen, while business meetings via TV and working at home via computer will be common.

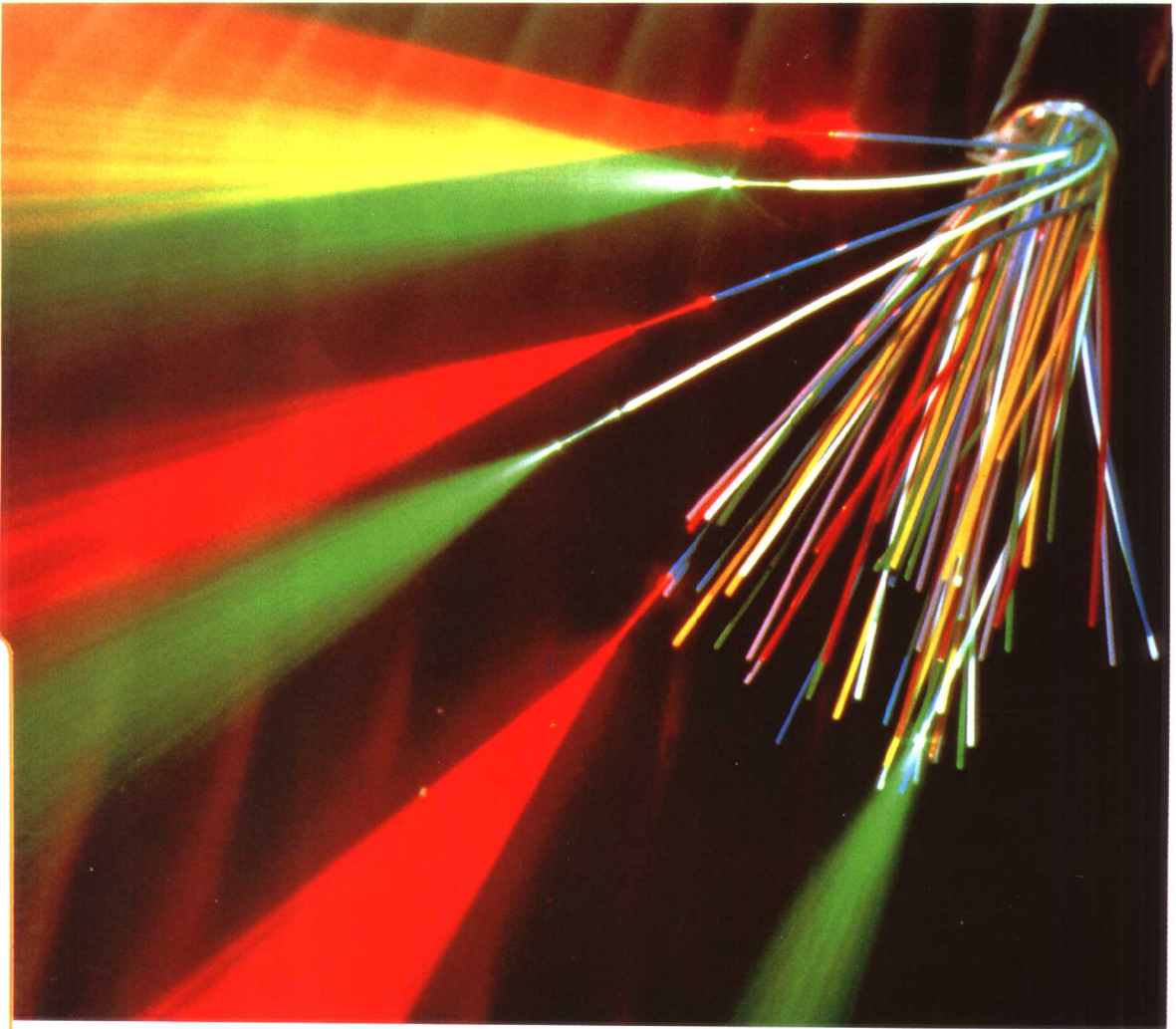


▲ **Securities Firm Information System** Links center's computer to terminals in subscriber's office or home to furnish up-to-the-minute information.



▲ **The Telecommunications Satellite** Pilot satellite was launched in 1978 but ended in failure. Subsequently re-launched.





▲ **Light Fiber Cable** A laser beam laden with information passes through a glass fiber only 0.1 mm in diameter. Such cables are widely used in every field.

▼ **Office Automation devices**



▼ **Televised Conference** Sound and picture transmissions enable widely separated offices to hold meetings as if in the same room.





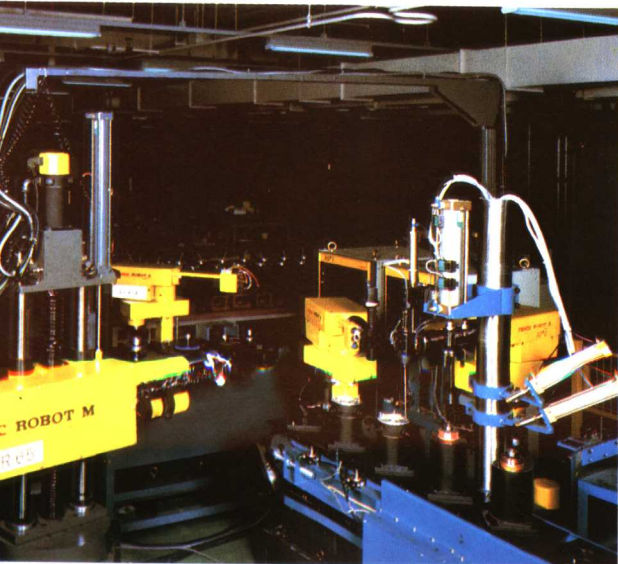
# FACTORY AUTOMATION

The advent of micro-electronics has enabled man to program industrial robots to perform a wide variety of sophisticated tasks. In turn, this technological advance has intensified the trend toward factories run by computerized robots producing a multitude of high quality goods in mass quantities.

Factory automation is highly advanced in Japan. Reasons include the dearth of a menial labor force due to the homogeneity of the people, and the high wages paid to workers. Toyota, Nissan and other auto makers are good examples, but the prime one is the Fanuc Corporation's factory where materials once delivered to the warehouse are programmed out as needed for manufacturing and assembling into finished products. All deliveries of materials and parts are done by unmanned conveyors, enabling the plant to operate on a 24-hour basis and relieve humans of drudgery and hazardous work.

Even in such an "unmanned" factory, however, man is still there, for it is man who must create and input the programs for the robots. His place has simply shifted from the workfloor to the central control room where he oversees the entire production process.

▼ **Assembly Cell** After one robot takes parts from unmanned conveyor and sets them in designated spots, another robot assembles them.



▲ **Manufacturing Plant** Robots and NC units all lined up. Unmanned conveyors in central aisle bring materials as needed and take finished items to automated warehouse.

Assembly Plant

Manufacturing Plant

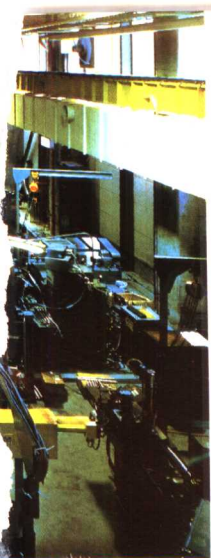
Assembly Cell

Manufacturing Cell

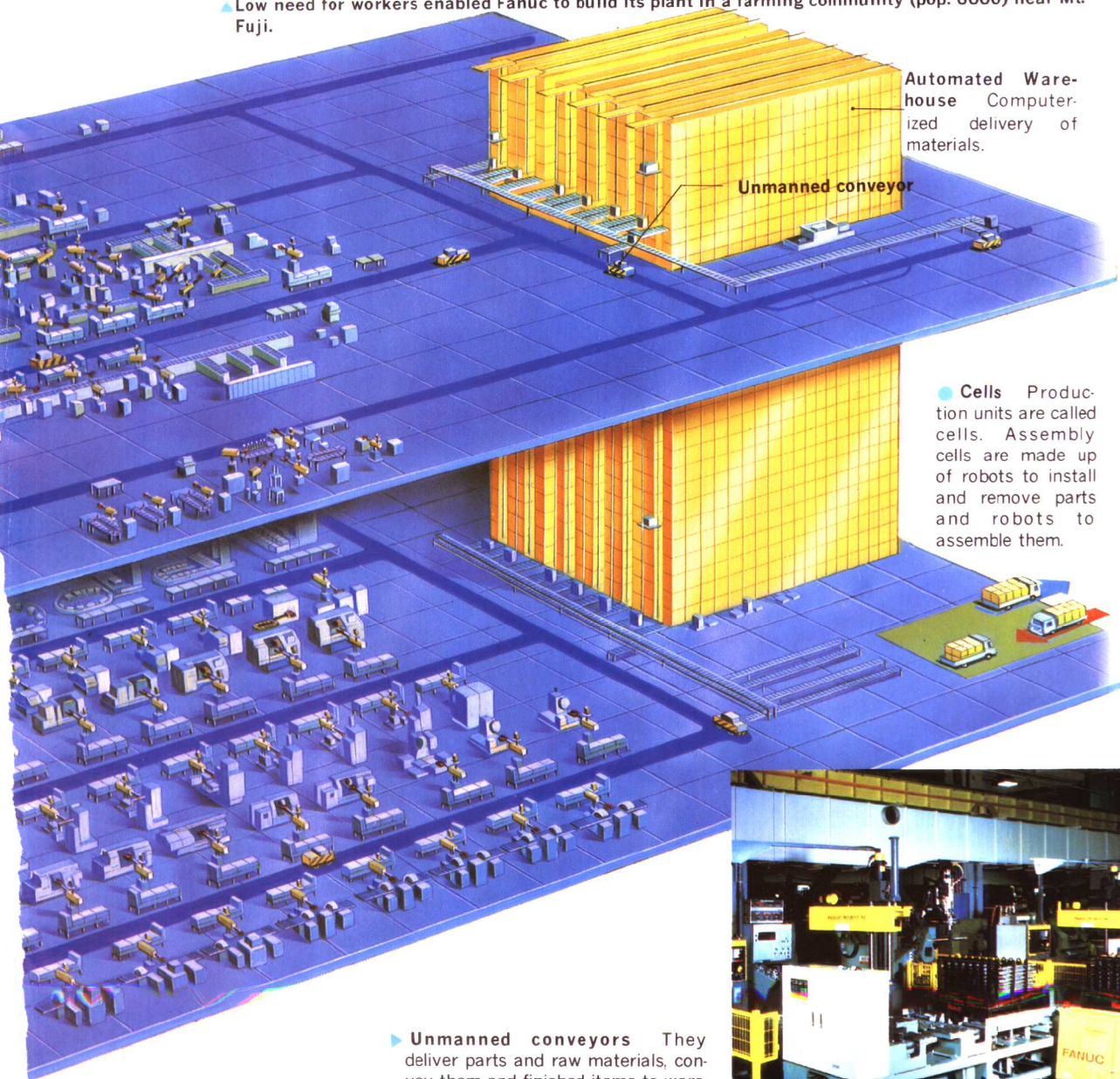


▲ **Central Control** is in overall control.





▲ Low need for workers enabled Fanuc to build its plant in a farming community (pop. 6000) near Mt. Fuji.



► **Unmanned conveyors** They deliver parts and raw materials, convey them and finished items to warehouse.



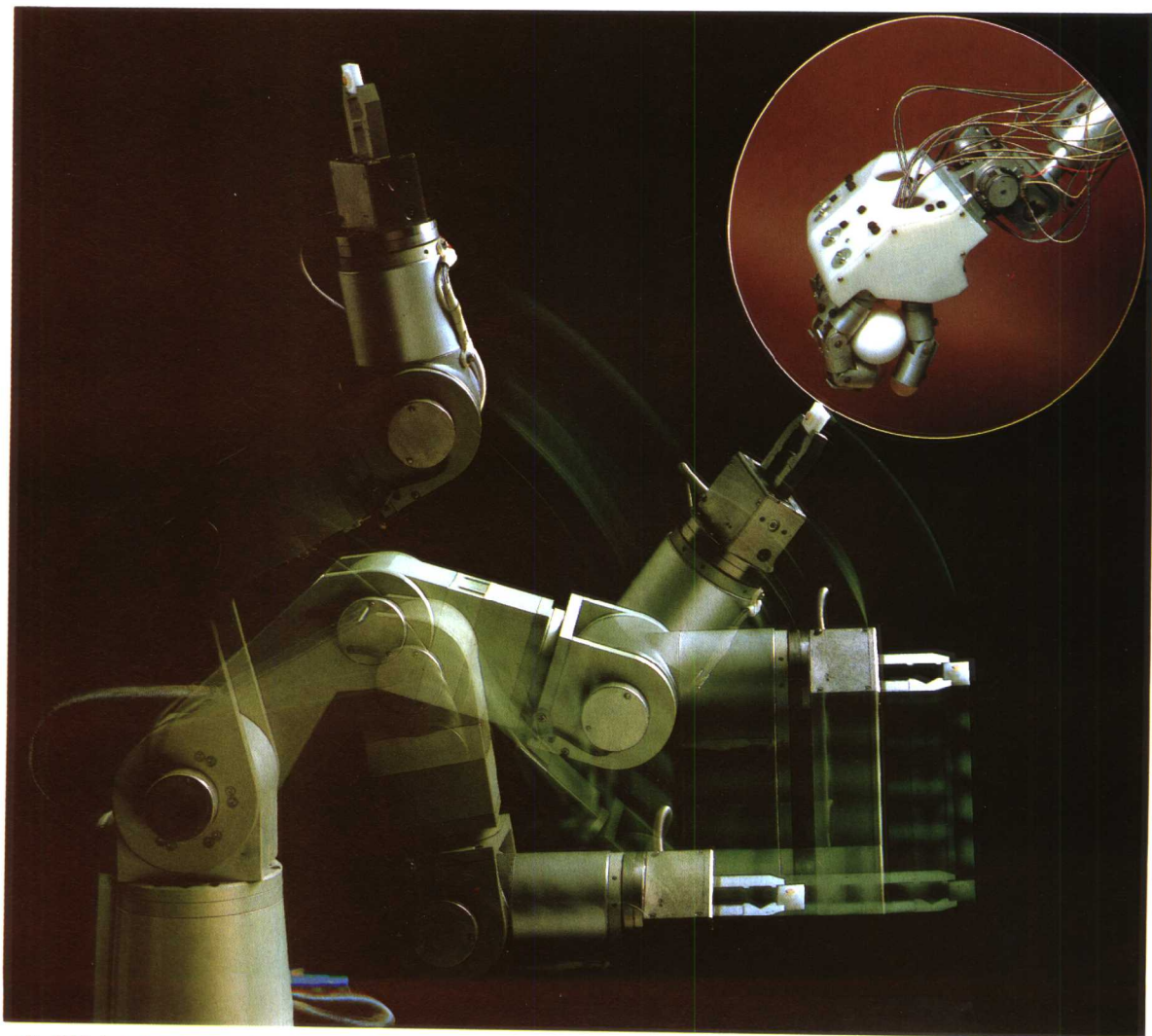


# INDUSTRIAL MACHINERY INDUSTRY

Japanese industry and industrial machinery more or less developed in tandem. In basic research and technology, Japan is a step behind America and Europe, but in applications and production, especially in mass production techniques, the nation's technology is at the forefront worldwide. Supporting it is industrial machinery.

Reaping the results of rapid advances in electronics technology are a number of devices which, in Japan, are referred to as "mecha-tronics" (*mechanism + electronics*). Representative examples are NC machines and industrial robots.

Such devices have had a strong impact, and have widely automated production facilities in Japan. In offices, electronic applications have changed the nature of many office machines, as computers, once used primarily for calculating now handle word and information processing. Factories have their industrial robots, offices their electronics equipment, all helping to automate work and make it more efficient. The same forces are at work in many other industrial sectors.



▲ **Multi-jointed Robot** Able to grasp extremely small objects and move them to designated places with precision.

▲ **Robot Using Shape-memory Alloy** Movement is like that of human muscle. (inset)