Gearing up to improve Europe's competitiveness in advanced information technologies, among other areas, the European Community's Twelve are aiming at a single market by Dec. 31, 1992

EC '92: status report

If fully implemented, the single market could increase the EC's gross domestic product by 5 percent a year

Lights burn late these evenings at the Brussels headquarters of the Commission of the European Communities, their executive arm. Technical and administrative officials are busy shepherding the 12 member states into a single market by Jan. 1, 1993, the most ambitious plan since the 1951 Treaty of Paris established the European Coal and Steel Community. That was the first of today's three European Communities, known collectively as the European Community (EC), which have different economic concerns but an identical membership.

Much should be gained from the Twelve's fusion into one market of more than 320 million consumers, one that will let goods, services, people, and capital move freely within the EC. Many economists and industrial leaders believe that the single market could restore European leadership in such vital industries as electronics, in which Europe has been losing ground for the last 10 years or so. The Electronics International Corp. (EIC), a New York and Paris-based research organization funded by the French Government for the study of worldwide trends in electronics trade, reported last year that 1988 alone saw a net global import of $33.1 billion worth of electronic goods into the EC, versus only $1.5 billion in 1979. The imports included everything from data-processing equipment to passive components [see illustration, opposite]. If the trend continues, the net electronics import into the EC could reach $50 billion in 1994, according to EIC projections.

(It is worth noting in passing that both the EIC and the Washington, D.C.-based Electronic Industries Association use U.S. Department of Commerce data. Both organizations define the source of a product as the country in which it is manufactured, even if the manufacturing facility is owned by a company based in a *different* country. However, because of the European emphasis of EIC data and the U.S. slant in the other statistics, the data may not be readily correlated.)

In a 1988 study for the Commission ("The European Challenge 1992—The Benefits of a Single Market"), a group of economists headed by former Commission Director Paolo Cecchini estimated the total annual gain to the 12 member states from attaining this goal at some 200 billion 1988 European currency units (ECUs), or about 250 billion 1988 U.S. dollars. This would amount to an increase of about 5 percent of the Community's gross domestic product, the study estimated. "The biggest of its kind in the world, this large market without frontiers is an invaluable asset which can help restore our firms to economic health and a strong economic position," said Jacques Delors, president of the EC's Commission in his introduction to that body's February 1989 publication, "Europe without frontiers: Completing the internal market."

As yet, the movement of goods, services, people, and capital among the Twelve is anything but free. While tariff barriers among them have largely been abolished, nontariff barriers remain. Witness the endless truck lines at border checkpoints awaiting paperwork for the handling of differences in value-added taxes among the different states. Note, too, the incompatibility of telephone and credit cards, computer plugs and terminals, and even power plugs and sockets. (And remember also that the Twelve are not all of Europe, which at last count numbered 33 nations.)

Electronics = sovereignty?

Spearheading the drive to a unified European market is electronics—the technology behind such growth areas as infor-

Gadi Kaplan Issue Editor

Evolution toward unity: a chronology

April 18, 1951: Treaty of Paris, establishing the European Coal and Steel Community (ECSC), is signed by representatives of France, West Germany, Italy, Belgium, the Netherlands and Luxembourg. It goes into effect on Aug. 25, 1952.

March 25, 1957: Treaties of Rome, establishing the European Economic Community (EEC) and the European Atomic Energy Community (Euratom), are signed by the six signatories to the Treaty of Paris. At the same time a treaty is signed between the Six and Austria, Denmark, Norway, Portugal, Sweden, Switzerland, and the United Kingdom, which are shortly to become the European Free Trade Association (EFTA). EEC and Euratom treaties go into effect on Jan. 1, 1958, and the EFTA treaty on May 3, 1960.

May 4, 1964: The Six take part in the Kennedy Round of the multilateral General Agreement on Tariffs and Trades and agree to reduce its tariffs (except on agricultural products) by 35–40 percent, more than most of its trading partners' cuts. The agreement goes into effect on June 30, 1967.

April 8, 1965: The Six sign a treaty merging the executive arms of the ECSC, EEC, and Euratom. Accordingly, on July 1, 1967, the European Council replaces two councils plus a High Authority, and the European Commission replaces three commissions.

July 1, 1968: The Customs Union—removal of all customs duties between member states of the European Community (EC)—is complete.

Jan. 22, 1972: Treaties of Accession to the EC by Denmark, Ireland, the United Kingdom, and Norway are signed, going into effect on Jan. 1, 1973, for all but Norway, expanding the member states to nine. Norway's citizens rejected the treaty in a referendum by a narrow margin.

October 1973: The Yom Kippur War of Egypt and Syria with Israel sparks the Arab oil embargo, followed by the quadrupling of oil prices by the Organization of Petroleum Exporting Countries. As a result, the EC, which imports 63 percent of its fuel, goes into economic disequilibrium.

Dec. 9–10, 1974: The European Council is born. Comprising heads of State or Government, it is to meet three times a year (later reduced to twice a year) to discuss European, as well as non-European affairs.

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mation processing and telecommunications, which are seen by industrial and political leaders as major contributors toward nations' standard of living and economic competitiveness. Even with modest growth, electronics industry sales worldwide are expected to be between $600 billion and $700 billion this year. Some believe that backwardness in these technologies may jeopardize a country's sovereignty.

Such dangers were not even dreamt of by the founders of the European Community. Politics counted for at least as much as economics in the mid-1950s, when French Minister of Foreign Affairs Robert Schuman first proposed a European organization to manage coal and steel production and consumption [see "Evolution toward unity: a chronology," below]. After decades of what Wisse Dekker, chairman of NV Philips' supervisory board in Eindhoven, the Netherlands, sees as a "political phase" in the communities' development, "European industry, as time developed, came very much under fire. . .especially from the Japanese," he told *IEEE Spectrum* in late January.

So Dekker and other industrial leaders felt the need "to do something to revitalize European unification," he said. Together with Pehr Gyllenhammer, chairman of Sweden's AB Volvo, and Giovanni Agnelli, chairman of Italy's Fiat SpA, he drafted a plan entitled "Europe 1990—an agenda for action," which became a catalyst for the process. Moreover, Dekker initiated the formation of the Round Table of European Industrialists, which eventually included 40 representatives of "all the biggest industries in Europe," in Dekker's words. Their agenda: identifying specific management strategies and conditions for the revitalization process. This pushed forward the now-famous White Paper published under the aegis of Lord Francis Arthur Cockfield, then commissioner for the internal market. Presented on June 14, 1985, to the Council of Ministers [see "The three and the five: how the EC works," p. 24], it proposed some 300 directives that the governments of member states would have to negotiate and accept to bring about a truly single market.

Welcomed enthusiastically by politicians and citizenry alike throughout the Twelve, the document sparked a drive toward lifting the dozen nations to a level of economic strength and vitality on a par with those of the United States and Japan.

Electronics trade balance, in millions of U.S. dollars*

Area	U.S.	W. Europe†	Japan
Data processing[1]	8 970		4 870
Automation and industrial data processing[2]	1 950		700
Services and data-processing software[3]	1 800		----
Office automation[4]		80	2 220
Telecommunications[5]	120		1 470
Consumer electronics[6]	430		7 040
Professional electronic equipment[7]	2 200		650
Measurement and instrumentation[8]	1 050		190
Medical electronics[9]		160	230
Active components[10]	560		1 700
Passive components[11]	420		1 160
Total	17 260		20 230

*Arrows show the 1988 *net* flow of trade. Source: Electronics International Corp.
† Comprising the European Community's Twelve and the European Free Trade Association's Six.
DEFINITIONS:
1 Computers, microcomputers, peripherals, terminals.
2 Robots, CAD/CAM, digital control systems, industrial computers, industrial control equipment, etc.
3 Systems engineering, software and packages, consulting, processing services.
4 Electronic typewriters, word-processing systems, copying machines, etc.
5 Switches (public or private), transmission terminals. 6 Radio, TV, hi-fi, VCRs, magnetic tapes, etc.
7 Mobile radio, professional radio-TV, radar equipment, navigation aids, etc.
8 Logic analyzers and scientific equipment, measuring instruments, process-control equipment, test equipment.
9 Medical imaging, pacemakers, diagnostics and monitoring systems.
10 Tubes, discretes, ICs. 11 Resistors, capacitors, connectors, printed-circuit boards, etc.

Why 1992?

Why 1992? Dekker's original plan targeted first 1990, and then 1991 as Philips' 100th anniversary. But in the end, following some wrangling, Cockfield's target of 1992 stuck. Subsequently, the formation of the internal market by the end of 1992 was enshrined in the Single European Act of 1986, which amended and complemented earlier Community treaties.

The watchwords are harmonization, efficiency, and practicality. They apply across the board—to the development and implementation of unified or "harmonized" technical standards for all member states, as well as to reductions in product costs thanks to economies of scale and shortening of the product design cycle (time from design to manufacturing). Furthermore, research in such vital areas as the information technologies is being directed toward tangible contributions to the EC's competitive standing.

Theodor Irmer, director of the Interna-

April–December 1974: The European Council establishes the European Monetary System (EMS), to go into effect on March 9, 1979. It has four main components: a European unit of account (EAU) at the heart of the system; an exchange and information mechanism; credit facilities; and transfer arrangements.
June 7–10, 1979: The citizens of the Twelve for the first time directly elect members to the European Parliament (410 members, till then appointed).
Jan. 1, 1981: Greece becomes the 10th member of the European Community. The European currency unit (ECU) replaces the EAU in the EC's general budget.
Feb. 2, 1984: The Council of Ministers adopts the European Strategic Programme of Research and Development in Information Technology (Esprit).
Sept. 4, 1984: The Joint European Torus for research into nuclear fusion for power generation is inaugurated in Culham, the United Kingdom.
June 14, 1985: The Commission presents the Council of Ministers with the White Paper by Commissioner of the Internal Market Lord Francis Arthur Cockfield, a review of the status of the common market within the European Community, highlighting its shortcomings and specifying actions that would overcome them and yield a single market by Dec. 31, 1992.
Jan. 1, 1986: Portugal and Spain join the EC, bringing the number of member states to 12.
Feb. 17 and 28, 1986: The Single European Act, which amends the Paris and Rome treaties to help the Twelve reach the goal of a single European market, is signed in Luxembourg. —G.K.

tional Telegraph and Telephone Consultative Committee (CCITT), Geneva, Switzerland, told *Spectrum* in late January that the CCITT had set in motion a process that "has already shown significant results in meeting the challenge [of] producing standards faster and more efficiently [than] we did before." He cited the standards for the 64-kilobit-per-second integrated-services digital network (ISDN) as having been developed in a timely fashion in about four years in the early 1980s, and he contrasted it with the standardization of videotex in the late seventies, which failed "mainly because it was simply too late."

In manufacturing, leading European companies such as Swiss-Swedish ABB Asea Brown Boveri, West Germany's Siemens AG, and Philips are consolidating and reorganizing. ABB, for one, which owns many companies in EC territory, is allocating more resources to automation and environmental control than before. Siemens is concentrating on telecommunications, medical equipment, computers, factory automation, and semiconductors [see "Outlook," p. 57]. Philips has drastically reorganized its operations in different countries. For example, according to Dekker, as early as 1982 the company replaced its National Organizations, which were responsible for all the products made within one country, with International Production Centers, which have profit responsibility for a product regardless of where it is made, allowing large production runs.

For research, the Single European Act states the overall objectives of EC actions as being "to strengthen the scientific and technological basis of European industry and to encourage it to become more competitive. . . ." To this end the Community set up a multiannual Framework Programme, within which at least four major projects have come to the fore: Basic Research in Industrial Technologies for Europe plus European Research in Advanced Materials (Brite/Euram); the European Strategic Programme for R&D in Information Technology, now in its second phase (Esprit II); R&D for Advanced Communications Technologies for Europe (RACE); and Special Telecommunications Action for Regional Development (Star)[see table, p. 38].

Furthermore, the 12 EC countries, together with Turkey and the six members of the European Free Trade Association (EFTA)—Switzerland, Austria, Finland, Sweden, Norway, and Iceland—have established the Eureka program, which coordinates European research toward a large home market for European high-technology companies.

There are caveats. A review of Esprit conducted by an independent seven-person board, headed by Eduard Pannenborg, retired vice chairman of the board of NV Philips, determined in May 1989 that although Esprit addressed such significant areas as microelectronics, software technology, and information processing, it was "premature to identify a direct causal relationship at this stage between Esprit and Europe's competitive performance, vis-à-vis its major rivals, the USA and Japan." The board noted that, among other things, "too much of the technological advance has been in niche areas with limited potential for future market exploitation." In technical standards development, however, Esprit elevated European companies "from followers to leaders" in, for example, manufacturing automation and data compression, the board concluded.

In areas other than information technology, one success cited concerns a pilot plant in Sardinia that turns sulfur from power plant exhaust gases into marketable sulfuric acid, opening up a possible multibillion-dollar market.

By press time, only about half the 300 or so directives in Cockfield's White Paper have been fully implemented by the member states, including several that pertain primarily to electrotechnology. In fact, so much remains to be done that few experts, if any, believe the goal would be fully met by the target date of Dec. 31, 1992. Paradoxically, however, all the uncertainty about Eastern Europe and the prospect of a unified Germany are spurring France and West Germany to urge a faster approach to political and monetary, in addition to economic, unity—a proposal Britain's Margaret Thatcher predictably opposes as over-hasty. Let Philips' Dekker have the last word: he sees the current activities as an "irreversible process," with a dynamic of its own, that in time should bring desirable results. ◆

The three and the five: how the EC works

The European Community will embrace three communities cooperating through five institutions. The communities aim at improving the combined economy of the 12 member states and at raising their inhabitants' joint standard of living in harmony with individual national economies. The institutions help the communities work toward that goal.

The communities are:

- **The European Coal and Steel Community (ECSC), established 1952 to create a common market for coal and steel.**
- **The European Economic Community (EEC), established in 1958 to create a common market through a gradual reconciliation and union of economic policies.**
- **The European Atomic Energy Community (Euratom), established in 1958 to expand the member states' energy resources and raise their standard of living by developing nuclear power.**

The institutions are the European Parliament, Council of Ministers, Commission, Court of Justice, and Court of Auditors.

- **The 518-member European Parliament (or Assembly) sits in Strasbourg, France. It reviews and suggests amendments for legislation proposed by the Commission and Council, especially any that would impact the budget. It also makes sure that the Commission faithfully represents the communities' interests. Of its members, France, West Germany, Italy, and the United Kingdom elect 81 each; 60 come from Spain, 25 from the Netherlands, and 24 each from Belgium, Greece and Portugal; 16 come from Denmark, 15 from Ireland, and 6 from Luxembourg.**
- **The 17-member Commission meets once a week in Brussels, Belgium. As the communities' executive arm, it guards the treaties, initiates policy, and defends the communities' interests in the Council. Its members are each much like a minister in an individual country, being responsible for one or more portfolios in areas of Community activities represented by a Directorate General in Brussels. An example is Directorate General XIII for Telecommunications, Information Industries, and Innovation, headed by Frenchman Michel Carpentier.**
- **The 12-member Council of Ministers meets in Brussels. It is made up of national government representatives of ministerial rank, one from each of the Twelve. Twice a year the heads of state convene, accompanied by their foreign ministers, in what is known as the European Council. The Council of Ministers issues *regulations*, *directives*, *decisions*, *recommendations*, and *opinions*. *Regulations* apply to and are binding in all member states, *directives* only to specific states, leaving the ways of implementation to those states. *Decisions* may be addressed to a government, an enterprise, or a private individual, and they are binding only on those addressed; *recommendations* and *opinions* are not binding. A weighted voting system is used.**
- **The Court of Justice, which meets in Luxembourg, is composed of 13 Judges assisted by six Attorneys General. It ensures that the implementation of the Treaties is in accordance with EC law.**
- **The 12-member Court of Auditors, provisionally located in Luxembourg, handles external audits of the Community's general budget and the ECSC's operating budget. Internal auditing is the job of each body's financial controller. Revenues are derived largely from EC customs duties and value-added tax and are spent largely on agricultural support.** —*G.K.*

Source: "Working together—the Institutions of the European Community," Emil Noël, Luxembourg, Office for the Official Publications of the European Communities, 1988.