

corporation fell by 3.9 per cent in the last quarter to \$1,900 million. Net earnings fell by a smaller proportion, by \$1.6 million to \$249.2 million for the quarter. By all accounts, this is the first decline in the company's gross income for more than a decade. Although it has been something of a phenomenon that the shares should have fallen by \$12 each, this represents only 2.5 per cent of their value on the New York Stock Exchange. Those who retain their faith in IBM are also heartened at the way in which the overseas business has continued to grow—in 1969 as a whole, overseas earnings increased by \$62.4 million to a total of \$933.9 million.

The signs of IBM's dominance in Europe are all too plain to see. For example, it is estimated that just under half of the 22,000 general purpose data processing computers in Europe have been manufactured by IBM, with other American manufacturers accounting for a sixth of the total. This is the estimate of EDP Europe Report, a fortnightly newsletter first published at the end of 1969. It is estimated that of the United States computer manufacturers operating in Europe, Honeywell and NCR each have rather less than 3 per cent of the market and that Univac takes about 4 per cent of it. The chief markets for IBM machines are in Britain, France and West Germany. Control Data has done well in West Germany and France. Burroughs is strongest in Britain. Honeywell seems to have most of its strength in Britain and West Germany.

SATELLITES

Measuring Skynet

from a Special Correspondent

Christchurch, Tuesday

A CLUSTER of buildings, hardly more substantial than the beach huts they overlook on the Hampshire coast, houses instruments which are measuring the performance of Britain's first military communications satellite 22,300 miles away. The Signals Research and Development Establishment in Christchurch is delighted to boast about the performance of both the satellite, in synchronous orbit over the Indian Ocean, and its monitors. The satellite, built by Philco-Ford of the United States and launched on November 21, has been flawless—impressively so, say SRDE men, who know from American experience how satellite behaviour can disappoint. The station, they also say, is more advanced than any except those owned by Americans, and is perhaps even better than that. Over a distance of 22,300 miles, the measurement of where the satellite is has been accurate to 30 metres—and the chief cause of error is the lack of more precise information on the speed of light and on exactly where the SRDE is on the face of the globe.

The Skynet satellite, a cylinder five feet in diameter, is more complex than the satellites now in commercial service. It is designed to work with two sizes of ground station, large and small, and has accordingly two independent pathways through its repeater. At the SRDE site in Christchurch, a 40 foot dish built by Marconi, and a smaller, much publicized transportable dish called IDEX, are both used to send signals up to the satellite, testing its capacity to keep both paths separate. Ironically, it seems to be the military rather than the commercial communicators who are develop-

ing the kind of light simple terminal that could bring television to primitive villages. The IDEX, its transmitter air-cooled, its receiver uncooled, can be set up by two men in 45 minutes and can be transported by Land Rover or helicopter.

Pride of place in SRDE's Skynet measuring exercise is a 6 foot aerial which measures the intensity of the microwave flux received by Skynet. Even the US Air Force, which holds the ministry's hand in the Skynet project, does not have such a monitor. But as the British are paying for a contract placed by the Air Force with an American company, their need to be assured of value for money is perhaps the greater. The total cost is £18 million for a package which includes two satellites and two launches from Cape Kennedy.



A general view of IDEX

The first signal from the satellite was caught on December 12 and since then monitoring has been continuous. The signal is amplified and brought in by cable to the test laboratory where it is split into three. The purpose of the test is to measure how the satellite is behaving in its new environment and to estimate its length of life (hoped to be three years). The crucial time will come in March and October, when the satellite will be for a time encased in the Earth's shadow. As the first round of tests has been completed, the satellite is being used more and more for Royal Air Force communications. It will be joined in orbit later this year by another, and the two will give the Ministry of Defence more flexible and reliable links than it now gets from high frequency radio.

The completed Skynet or network will have nine Earth stations from Britain to Singapore, including two in ships and two ready to be flown where needed. The bureaucratic relationships involved in Skynet are complicated and dominated by the United States. The SRDE helps MOD with research and development in telecommunications and the US Air Force has allowed MOD a place in its own military satellite programme. Skynet, although Britain's own, will work with the US Defense Satellite Communications System. Why these

two should work separately from non-military communication did not seem to interest anyone involved. Military codes are still the only guarantee of secrecy and when future satellites, not many years from now, have 48,000 circuits or more, it will be hard to believe that the military have that much to say to one another to justify the sole occupation of a valuable parking space in equatorial orbit.

CERN ACCELERATOR

No Room for the Ring?

THERE is a danger that the discord over the siting of the proposed 300 GeV CERN accelerator may cast a shadow over the role of West Germany in European scientific collaboration. In German eyes, the issue revolves around the glaring imbalance between the economic and political influence of West Germany, whereby the Federal Republic shoulders the largest financial burden in European scientific ventures and yet has no important European project on its soil.

A meeting is being held in Geneva on January 28 and 29 between ministers of the six countries backing the accelerator. France will be represented by M. Robert Schumann, the Foreign Minister, and West Germany by either Dr Leussink, the Science Minister, or Dr Walter Scheel, the Foreign Minister. The need for such a meeting became clear when the CERN Council felt unable to reach a decision on the siting of the accelerator at its December meeting. On December 11, the West German Government made it clear that the Federal Government would have to reconsider its allegiance to the project if the German site at Drensteinfurt near Munster was not selected.

The CERN Council has always maintained that the location of the accelerator must be decided on scientific grounds alone. The West German view, however, is that any of the five sites put forward by the participating countries is suitable. (Switzerland is excluded from the auction.) It is pointed out that none of the important European scientific centres is in West Germany—the IAEA is in Vienna, Euratom in Brussels, ESRO in Paris, CERN in Geneva, the FAO in Rome and Dragon in England. Another point that is likely to be discussed in Geneva is the absence of German as an official language at CERN; at present, only English and French are official languages.

Superficially, the West German Government has a fair case, and the CERN Council might well have selected the Drensteinfurt site in any case. But the whole concept of scientific cooperation is placed in jeopardy once a major partner starts trying to impose political decisions on a joint scientific project, and the French Government clearly regards the issue as one of many crises of confidence within the European community. Many other joint projects are in the pipeline—the giant computer project involving Siemens, ICL, CII, Philips and Olivetti, and the Franco-German plan for a joint telecommunication satellite among them—and both the French and German Governments are keen that the impasse over the accelerator should not impair the climate of scientific and technological cooperation. Another collaboration recently announced between France and West Germany is for the construction of a trainer aircraft to replace the twin jet Fouga Magister. This could pave the way for closer ties between the air forces of the two countries.

CHANNEL TUNNEL

Is there a Light at the End?

THE outcome of the competition among three international groups of companies with plans for financing the Channel Tunnel project will probably be a merger. According to a spokesman for the Channel Tunnel Company Ltd—a member of one of the groups—talks have been going on for some time and are now in their final stages. The British and French Ministers of Transport were expected to choose one of the three proposals by the end of last year, but it now seems that their decision is likely to be whether to accept a combined plan.

The initiative for joining forces came apparently from Mr Richard Marsh when he was Minister of Transport. As early as October 1968, he said in reply to a parliamentary question that the three groups were being asked to revise their original proposals and added that they were invited, "should any of them prefer to do so, to combine for the presentation of fresh proposals". Since then, competition has gradually changed into cooperation. Although the talks have not yet reached a conclusion, there is said to be little likelihood that they will break down.

Still more planning will be necessary if the British and French Governments accept the group's proposals. The first stage will be for the group to make another study of the economics of a Channel Tunnel—including revised estimates of the traffic it would carry—to "bring the thing up to date", as Mr Fred Mulley, Minister of Transport, said in Parliament on November 11, 1969. This will take two years. Only then will the final decision be made about whether to go ahead with building the tunnel. There is thus still time in theory to consider alternatives such as a bridge, some kind of combination of bridge and tunnel or even a dam.

Plans for building the rail terminals, however, are already well advanced, with Cheriton in Kent chosen as the British site. The exact land requirements are not yet known, and there will be no compulsory purchase of land until the final decision on whether to bore, but in the meantime the Ministry of Transport is keeping in touch with the local authorities.

TOBACCO

Smoking over Peak

THE latest collection of statistics put out by the Tobacco Research Council (*Statistics of Smoking in the United Kingdom*, Research Paper 1, fifth edition) show that tobacco consumption in Britain is now slightly below the peak of the early sixties. The consumption of tobacco among men is now in fact lower than at any time since the early twenties. According to an analysis of a survey carried out by the Tobacco Research Council, consumption per adult male in 1968 was 8.8 lbs per year, representing a steady decline since the annual consumption of 10.6 lbs per head in 1960. The peak of tobacco consumption in Britain seems to have been in 1945 when consumption worked out at 12.5 lbs per head per year. The end of the Second World War probably explains the decline in tobacco usage, which amounted to only 9.3 lbs per head per year in 1950. If men are smoking less, however, there seems no consistency in