COUNCIL OF EUROPE
CONSEIL DE L' EUROPE

CONSULTATIVE ASSEMBLY

COMMITTEE ON SCIENCE AND TECHNOLOGY

Sub-Committee on Data Processing

EUROPEAN COMPUTER INDUSTRY

(Rapporteur: Mr. Lloyd).

HEARINGS WITH INTERGOVERNMENTAL SCIENTIFIC ORGANISATIONS
(CERN, ELDO, ESRO, EUROCONTROL, OECD) AND COMPUTER
HARDWARE MANUFACTURERS, PARIS, 12 and 13 OCTOBER 1970

I.   SIEMENS
II.   HONEYWELL-BULL
III. COMPUTER TECHNOLOGY LIMITED
IV.   SAAB

Notes prepared by the consultant expert

19.856
01.43/228.1.

Introduction

1.   This paper deals, first, with the computer aspects of the various companies, and then with the general issues of interest to have emerged from the discussions.   For various reasons, such as the lack of time, the variety and vagueness of many questions and replies, and perhaps the unwillingness to disclose too much company information, we did not get as complete and systematic a <u>factual</u> picture as we would have liked from the sessions themselves.   Hence the information to have emerged from the sessions, and the opinions expressed, are supplemented with information obtained from other sources.

Despite the fragmented nature of the information, which we obtained from the sessions, it must be pointed out that they were interesting and that the company representatives did their best to answer questions from the Sub-Committee.

I.   SIEMENS

2.   Siemens began doing R&D on computers in the mid-fifties, and brought out the "2002", a machine of its own design, in 1958-59.   Of the 43 "2002" machines sold, 14 went to Siemens itself (according to C. Layton), or about a third.   This was succeeded by the "300" series, which has emerged out of the "3003" computer.   The "300" series was introduced in 1963-64 and are essentially process computers, but the "3003" (now outdated) was meant for commercial data processing.   By 1964 IBM had announced its "360" series, and Siemens was stuck with an out-of-date and never very successful model (as far as commercial EDP was concerned); after negotiations with several companies, Siemens signed two agreements with RCA, for the exchange of patents and know-how, and for the commercialisation of the RCA Spectra 70 computers by Siemens as the Siemens system "4004".   In 1967 Siemens took over Zuse which had developed the world's first electronic computer.

3.   The Components Group of Siemens (there are altogether six product groups) produce, among other things, ferrite core memories, transistors, and integrated circuits.   "About two thirds of output go into data processing, communications and industrial process control equipment", declares the Components Group in the 1968-69 annual report.

Siemens has also started manufacturing peripheral devices such as high-speed printers, magnetic tape storages and disk files.   With its strong position in telecommunications (it invented the Telex system), Siemens manufactures and sells successfully teleprinters, data display units, data switching systems, modems for data communication over telephone lines, etc.

4.   Siemens has a strong position in process control and on-line, real-time applications.   It has had important contracts, for example,. from the Federal Railways and from Luftansa. Siemens's claim that practically all the traffic computers now being used in Europe are Siemens products is probably true.   Thus, even in the UK, an important Greater London Council contract for the automation of traffic control in central London valued at £759,000 and including two central processors (Siemens "300" series), I-0 and data transmission equipments, was awarded, in August 1970, to Siemens, despite two British tenders from Plessey and GEC-Elliott (Computer Weekly, 13.8.70).

5.   The Data Systems Group employed, in September 1969, 21,000 people, but. this includes telecommunications.   The number .involved in data processing, from R&D,. software, manufacturing to sales, is 10,000 according to information obtained at "Hearing" or about 3.5% of Siemens's total.

In the fiscal year to September 1969, Siemens either leased or sold computers valued at more than 500 DM, or \$136m.   To date, Siemens has delivered more than 1,200 installations, valued at \$600m.   Annual deliveries, by value, have been increasing at some 30% p.a.   The computer business, together with the electronic components and telecommunications businesses, has been growing faster than the total business.   Meanwhile, Siemens's share of the German computer market rose from some 2% in 1960 to 14% in 1970.   (Market presumably refers to the annual sales by value.)

Although in the fiscal year to September 1969, computer deliveries accounted for only 5% of Siemens's total sales, computers must be getting a much higher share of total capital expenditures.   The data systems technology centre which is being built at Munich Perlach and which will. become, it is claimed, Europe's largest centre for the development and marketing of data systems, will represent an investment programme of some 500m DM over a period of years.   In 1969, Siemens's total fixed capital .outlays totalled 900m DM.

6.   Siemens entered EDP not for the sake of diversification, but because it considered computers as an essential tool, essential to the whole of its business if it was to remain competitive.   Computers for industrial use were central to their whole line of business.   Moreover one thing leads on to another, the sales of process control computers may bring in business computer customers, the technology and the electronic components were already there.   But since commercial computers were less essential to Siemens's existing markets than industrial computers, it was decided to take what was considered the cheapest way, i.e. manufacturing under RCA licence, while at the same time increasing in-house manufacturing content and technological capability.

./.

Siemens's advantages lay in its reputation with its customers, with some of whom it has had links for three or four generations and with its intimate knowledge of a wide range of industries.

Siemens therefore believes that ability to survive in face of IBMC ; nds not so much on size, but on the provision of detailed services and suitable package deals to well-known customers.

7. Siemens's computer business is about to break even in terms of profitability, after allowing for R&D expenses. R&D in the computer group amounts to 10-15% of turnover, about twice the average for the company as a whole. The Siemens representative at the "Hearing" claimed that, although computer R D is subsidised, financially, by the other divisions, the spin-off from computer R&D benefits all other divisions, so that, technologically, the data processing division is subsidising the others. Siemens takes a long term view towards profitability. "It was necessary to have EDP technology in our line. We don't talk on a money first basis."

8. The limits to the expansion of Siemens's computer activities are set

(a) by the shortage of skilled labour, and computer specialists, and

(b) by the organisational problems associated with too fast a growth.

Hence 30% p.a. is the ceiling.

9. Siemens is not particularly enthusiastic about European co-operation. They would favour European companies buying each other's peripherals, standardisation of software and hardware interfaces, but "We intend to stay independent". The computer business is probably seen as an integral part of their total business.

, (Other points are dealt with in the general section.)

II. HONEYWELL-BULL (formerly Bull-General Electric)

10. In May of this year, General Electric (GE) and Honeywell announced their intention to merge their computer activities, GE retaining, however, its time sharing business. The transfer of Bull-GE to Honeywell has now been effected after the French Government gave its approval. In this note only Bull-GE is dealt with, however, since not much is known about the likely effects of the merger. Most of the data is from the consultant's own research.

./.

11. In 1963-64 occurred the famous "affaire Bull".   Bull, which
was then the only French owned computer manufacturer of importance,
and, together with ICT, the only European company which had been
able to stand up to IBM, ran into financial difficulties in the
course of 1963.   The crisis was accelerated by the action of
the French Government, which had refused to allow Bull to proceed
to a European loan and delayed the granting of credit by the
Credit National.   (The government was probably hoping to exert
pressure on Bull in view of a regroupment of the French computer
activities, and did not foresee the gravity of the situation.)
GE of the US then offered to take a 20% participation in Bull.
Bull agreed, but the government vetoed the US solution, and
imposed a French solution, which consisted essentially of
forcing Bull to issue new shares at 50 FF per share (at a time
when the lowest quote had been 150 FF on the Bourse a few weeks
earlier) to a new group, which, in return for 20% of the capital,
was to gain 2/3 of the Board.   The State was also to give
assistance to Bull, including the guarantee of new credits, R&D
contracts of 30 to 45m FF annually for the next five years, and
some preferential purchasing.   Meanwhile negotiations continued
with GE, and four months after rejecting GE's offer of a 20%
participation, the government agreed to a 50% participation
which ensured effective control to GE.   Two new subsidiaries
were formed.   Cie Bull General Electric was 51% owned by GE and
49% by Bull, which became a holding company.   Societe
Industrielle Bull GE (SIBGE) was owned 49% by GE and 51% by
Bull.

12. In 1967 there was an increase in capital to which Bull was
unable to suscribe.   This resulted in the two subsidiaries
being 66% owned by GE, which was the case until Honeywell took
over GE's stake.

13. The failure of Bull in 1963-64 cannot be attributed to a
deficiency in technological capability.   The Gamma "3", introduced
in 1952, was the first computer in the world to use germanium
diodes instead of conventional electron tubes, and thus was
ahead of IBM's "604", its most advanced machine.   The Gamma "60",
developed around 1956-58, was the largest computer at the time,
and embodied a feature which was to be generalised only with
the advent of third generation computers, i.e. multiprogramming.
Bull went through a period of extremely rapid expansion between
1953 and 1962, employment rose from 3,000 to 13,000 and the
company ran into serious organisational difficulties, due mainly
to the management methods inherited from the days it was a small
firm.   A few errors were made, and unless one is IBM, one cannot
afford to make mistakes in the computer field.

14. Between 1964 and 1968 inclusive, Bull GE made losses
in each year, which totalled $103m during the period (BGE &
SIBGE).   The Gamma "140" and "145", which had been under
development before GE took control, were scrapped, leading
to the departure of many engineers and salesmen. Employment
in France declined from 13,000 in 1963 to 10,388 at the end
of 1969.   R&D intensity, which was 14% of turnover in
1963, is now 8% in terms of manpower.   It would seem clear
that European firms in difficulty do not automatically find a
panacea in American management and cash.

15. Our interlocutors at the session were reluctant to say
why GE did not turn the tide.   It is known, however, that
errors in management and bad communications provide the main
explanation. Bull was, and is, bigger than GE's computer
operation at Phoenix, and GE did not have much experience of
international operations and of managing a large division of
this size.

16. What is the turnover of Bull-GE?   In 1968 that of BGE
was 659m FF and that of SIBGE was 336m FF.   Adding the two
figures, however, may involve double counting.   A machine
which SIBGE sells to BGE is included in SIBGE's turnover,
but is counted again when BGE sells it to a customer.   As
an estimate, the combined turnover in 1968 might be 800m FF.

     Assuming, however, that combined turnover in 1968 was
995m FF (i.e. that there is no double counting), this means
that turnover increased by 116% in the 5 years 1963-68,
which compares with an increase of 210% in the 5 years 1958-63.

17. In 1969, Bull GE (and GE's computer business as a whole)
made a profit for the first time for a long time.

18. Why did GE then sell out its computer division to
Honeywell?   According to our interlocutors, 10% of the world
market is necessary to be profitable in the computer field.
Since, for anti-trust reasons, it would have been difficult
for GE to be the buyer, it chose the role of seller.
Expansion by takeovers is preferable to expansion by internal
resources alone, because of the client base, which usually
remains faithful and is expensive to win over from another
firm.

19. Bull GE manufactures the very small GE "50" and the
medium "400", Italy the "100" and the US the large "600"
series.   Bull GE also produces many conventional peripheral
devices.

III. <u>COMPUTER TECHNOLOGY LTD.</u>

20.   The representative of this company provided the most
interesting discussion during the sessions.   He did not,
however, describe the activities of his company, and the
following relies primarily on the memorandum by Computer
Technology Ltd. to the Sub-Committee of the House of Commons
of the UK.

21.   The company was founded in 1966.   The two major
institutional shareholders are Technical Development Capital
from the UK and European Enterprises Developments, the
European venture capital company set up by General Dovot.
Computer Technology Ltd was proud of the fact that the
company is "European-minded".   "42% of the shares are held
on the continent." The company is only beginning to sell in
France, however.

22.   The company's strategy was to go into areas where there
was as yet no domination from established manufacturers and
where there was growth potential.   It chose to avoid head-on
competition with giants like IBM in the general EDP field and
Digital Equipment Corporation in the mini-computer sector.

The company plans that its principal market will be in
computer utility systems (i.e. systems based on the use of
communications facilities to inter-connect enquiry terminals,
which may themselves be computers, to a central resource, which
may be an information retrieval system or a powerful computing
facility).   The company will provide either total systems or
major sub-systems.   Its products will include message handling
and concentrator systems, terminal and data acquisition systems,
and computers which will be used mainly for data concentration,
data base management and peripheral control.

23.   The present range consists of the Modular One.
Modularity means that the computer can be assembled rather
like a Meccano set, because all the pieces fit any of the
other pieces.   Different computer configurations can be
provided from one basic set of devices.   The initial markets
for the Modular One system have been in high speed data
acquisition and laboratory systems.   An increasing proportion
of systems are now being used for commercial applications,
and more than half the processors delivered in 1970 will be
in multi-processor systems.

24. In order to be competitive in its line, Computer
Technology must have the latest and best equipment.   It
buys most of its electronic components and almost all its
peripheral equipment from US companies.   About half of the
material content by value is currently imported, according
to Mr. Barron to Sub-Committee D.   Although the company
is now buying memories from Mullard and Plessey, it will
buy more of its memories from US companies in the future,
with the transition from ferrite memories to integrated
circuits memories.

25. The turnover in 1969 was about £2m.   Currently
200 people are employed.   Over a third are doing R&D, with
special emphasis on software.

IV. SAAB

26. The origins of Saab's computer activities can be traced
to its efforts in airborne electronics between 1955-60 and to
its purchase of the data processing activites of the FACIT
Company in the late 1950s.

     Saab was founded in 1937 as a military aircraft manu-
facturer.   Today, for example, the miniaturised computer,
the CK "37", is one of the main components in the Saab
37 Viggen, the new combat aircraft which is the main part
of the Swedish Air Force's new defence system 37.

27. In 1962 the Data Saab "D21" computer was put on the
market.   This was followed by the "D22" in 1966, a third
generation computer.   Other computers are the "D220",
which is modular, the mini-computers such as the "D5",
process control and numerical control computers, (Saab is
strong in NC for lathes and milling machines and in PC
for the textile, cellulose, leather and shipbuilding
industries) etc.   Saab also manufactures terminal display
systems and some electronic components for computers.

28. The "D21" and "D22", with average selling prices of
£100,000 are general purpose machines comparable in computing
power to the IBM "360 30" to "360 50".   Saab claimed that
the "D21" has made a profit, but the "D22" is not yet
profitable.

29. For the recent "D22", Saab has been heavily dependent
on the US for components, I-O devices and memories.   The
percentage of value added in the mini computers is much
higher.

30. The Computer and Electronics Group is one of the four groups in Saab.   The others are the aerospace, automotive, and Nordarmatur groups.

31. Saab told us confidentially that the turnover in data processing in 1969 was 100m Swedish crowns ($20m), or 3.3% of Saab's total.   Out of the total of 1,600 more than 1,000 people are involved for the computer and electronics group. SAAB has about 10% of the Scandinavian computer market.

Intergovernmental scientific organisations (1)

CERN

32. CERN's computer needs are expanding very rapidly.   By 1975 they will need ten times their existing capacity.   At present they have sixty machines on site, including a "CDC 6600".

CERN, after an unhappy experience with the Ferranti Mercury around 1958, has been using almost exclusively US computers, both for the small, dedicated machines and for the huge number crunchers.   European manufacturers have "no idea of the needs of the users", and show no sign of producing the large computers CERN would need by 1975.

The Eurodata bid and ESRO (2)

33. The main reasons for the rejection of the second bid were the costs of transferring to a new configuration and the lack of confidence in the operational reliability of the system offered and in the consortium's ability to meet the delays after the changes it now had to make.   It was calculated that over a four year period, the difference in costs between an IBM configuration and the Eurodata system, including the costs of leasing, of rewriting the software etc., would have been $2-3m, which represents 20% of the costs of the new computing installation.   The TD satellite operation planned for early 1971 had to succeed.

./.

(1) For special papers prepared by these organisations see separate documents.

(2) Background note: During 1968-69, ESRO sought to promote the integration of the European computer industry by encouraging a tender from a European consortium for its $10m of new computing needs.   The proposal by ICL, Telefunken, CII, Olivetti and Saab obtained a majority vote at ESRO's Council of Ministers early in 1970 but not the two thirds majority required.   The German delegation voted against the proposal on the ground that it was not compatible with IBM (Siemens is IBM compatible, Telefunken is not).   The consortium then asked for time to arrange the proposal to make it IBM compatible by using an English Electric System 4 instead of an ICL "1900" as the main central processor.   ESRO, who had encouraged the consortium to be formed, rejected the new proposal.   The ESRO representative was asked why.

General issues

34. It would seem that Siemens is making the most serious effort in the computer field from among the European owned firms in continental Europe. Its production figure and employment in data processing are only slightly higher than those of Philips, but the Philips figures include office machines. Siemens's production of computers of $136m in 1969 is about half ICL's turnover for the same year. Siemens's current programme of fixed capital expenditures for the data centre at Munich Perlach of $130m compares with the gross increase of fixed assets (excluding machines on lease) of $21m for ICL in 1969.

35. Co-operation is more difficult with the computer division of large electronic groups such as Siemens and Philips, than with say CII. The pressure to merge is weaker, and the data processing business is considered as an integral part of the company's total business.

36. All the companies questioned so far would favour some standardisation as a first step towards co-operation. This would mean a situation in which IBM can no longer dictate standards and would remove the threat that IBM can suddenly make obsolete its rivals' equipment simply by varying standards overnight.

37. All the companies also think that there is not much commercial potential for a huge European computer. The European market is not big enough, and the effort would divert scarce resources from the more profitable, bread and butter medium range.

38. It may be possible for a very small computer operation to be profitable by specialising in certain applications, and for a very large one, with some 10% of the world market, to be profitable. But a company in the intermediate range may be in troubled waters.

One hypothesis is that the main burden of costs are those associated with marketing, servicing and software development. A small operation sells to well-known customers or in well specified areas and does not maintain a large, comprehensive and international sales and maintenance force. When the small operation grows and starts selling to the open market, then costs start rising faster than sales. There is also the problem of finding finance for the leasing of machines. Eventually, after a certain threshold, profitability is achieved again.