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I. Introduction and Overview

Good Morning! 1976 is rapidly drawing to a close -- November 30th is that date for our International operations; December 31st for those in the U.S. In a word it has been a year of progress...

Another year of progress ... but only another step in our ongoing program. The progress is broad based; that is, it has occurred in each fundamental aspect of our business: in strategy, in management system, and in execution.

As I cover our systems and services businesses individually, I can give you more details in each of these areas -- particularly strategy. But first I'd like to make a few overall comments.

With the introduction in 1973 of the "levels of service" concept and the industry market area total services planning concept, we have been able to more clearly analyze and select standard products and services. In 1976 there was particular progress with regard to strategy in two broad areas: First, completing the future product line architecture and the requirements with regard to specific market areas as well as migration; second, better understanding of the role of data base management, of computer conferencing and of computer based education across all our product and service strategies.
Management system. Here we have made some real strides. In marketing we have re-examined the sales incentive plan in a fundamental way and laid out a phased two year program to bring it more in line with the mix of business and basic financial objectives of the company. And a six months study of the marketing organization structure yielded a plan to put 10% more quota carrying salesmen in the field for the same marketing dollars. Asset management measurement and reporting systems were improved. For example, in systems improved management and control systems for inventories, finished goods and idle equipment have been developed. Other asset programs, as well as an aggressive asset management incentive program, has yielded a reduction of $71 million in total assets employed from year end 1975 though revenues have grown by more than 5%. We continue to work at improved short range forecasting systems -- for both systems and data services. By short range I mean next month, current and next quarter, and year-end. This has greatly helped short-term resource deployment, cost control and so on.

We began a revamping of our management training and development program. Though this was begun in 1976, the major improvements will come in 1977 and 1978. CBE will play a major role in this new program. By the end of 1977 every manager in our operation will have received 96 course hours of training, 60% of which will be via CBE terminals. Since the summer of 1974 we have put some 700 managers from our technical organizations through an
intensive Programming Project Management Course. The results are impressive; in the past 24 months we have missed only 4 software product release dates. Technical Effort expenses in our Systems business has been below plan by 6% while this was being achieved.

Finally, the execution and thus the productivity of our people has been steadily improving. Revenue per employee has grown from $34,000 to $42,000 since 1974. Gross profit margin for combined Systems and Services has increased 5%. Productivity per salesman has increased for both Systems and Services in each of the last two years.

The result is progress reflected in the operating statements -- Profit before tax up some 20% year-to-year. But reduced assets and positive cash flow and a major contribution to the reduction of corporate debt are even more significant signs of progress.

I could go on in that vein, but instead let me turn now to look at the business in the context of its major product families. First, Systems...

II. Systems

Our Systems business comprises three major sub-families -- Aerospace & Military Products, Instruments & Controls, and Computer Systems.
Aerospace has been consistently profitable for the past several years. This year was a critical one. Some of the major programs of the past were coming to a close and we needed new major programs to replace them.

It has been nip and tuck, but last month a major award was won with the U.S. Navy for providing a standard airborne computer destined to be used on future naval aircraft through the 1980s and beyond. Initial deployment will be dual computer systems on each of 800 F-18 aircraft and single systems on 200 navy anti-submarine warfare helicopters. The initial contract award is $6.4 million, and the total program potential is well over $200 million and provides us with a much needed long term production base.

Other recent and important contracts have been received from the U.S. Army to provide militarized processors and plasma display equipment that will lead to significant production potential in the future.

So, even though revenues will be down some 12% this year compared to last, we have been able to hold profits close to a year ago. Next year profits will be slightly less than this year, but we have an excellent outlook beyond that for the next several years.
For the systems business (ex-Aerospace) the past few years have been unhappy ones. But this year will see this segment of the business in the black -- a year ahead of the schedule we laid out two years ago. I have already spoken of some of the improvements in fundamentals in management and in execution with regard to systems. But let me spend a few minutes here on market area and product strategy.

Our areas of concentration are Education, Atomic/Nuclear, Intelligence, Weather, Petroleum -- more precisely the exploration and production segments of Petroleum, and the Power Network Control segment of the utilities market. In addition, there are two cross industry market segments which are general scientific engineering (though this is mostly concentrated in the manufacturing industries and government beyond Atomic/ Nuclear and Intelligence) and data communication networks (though this is mostly concentrated in the banking industry). These industries will account for more than 90% of our shipments over the next five years.

I will try quickly to give you a flavor of these major segments:

Atomic Nuclear: Approximately one-half installed market value is for systems installed whose price is below $2 million and one-half above. Below $2 million there is no dominant vendor. Above $2 million CDC and IBM each have
about 1/3 of the total. Above $5 million CDC has over half. We expect to at least retain our position in this market and can probably improve it over the next five years. The market has historically been 80% purchase and 20% lease; we see no change in this.

**Intelligence:** Data on this market segment is mostly classified. We do estimate expenditures growing at about 5% per year. CDC is a major supplier though not a dominant one. We expect to maintain our position in this market segment.

**Weather:** There are 46 world weather centers of various sizes containing a variety of computers in each center. This will grow over five years to 70 centers. Control Data has over half of the currently installed systems. We should retain this position of about 50% over the coming five years.

**Power Network Control:** The PNC business encompasses three levels of systems complexity; the smallest are called Supervisory Control and Data Acquisition systems. The next level adds Automatic Generation Control to the basic SCADA. The highest level is the Energy Control System. Contracts in the latter category run 8 to 10 million dollars each and involve multiple Cyber class machines as well as multiple minicomputers such as the CYBER 18. This is a market segment which has only begun to develop in the last two years. Current plans should yield Control Data a 33% market share over the next five years.
Education: The applications within education are instruction, research, and administration. 90% of all installed systems are in instruction and research. Control Data competes primarily in the above $750,000 purchase price segment and has about 20% of that business. We expect -- primarily because of CBE systems -- to increase that share. I'll return to that subject later.

Petroleum: Within the exploration, production, and construction/engineering segments of this market, Control Data has a significant position. These segments are growing at 12% per year and we expect to maintain our position. Significant new geographic markets are in the USSR and the Middle East. Related markets of mining and solar energy also offer above average growth prospects for Control Data Systems.

With that brief look at some major market segments, let me now turn to a product line perspective of our Systems business. Four years ago we began to hammer out a new product strategy for systems. By mid-1973 this was pretty well in place. Two years later, deliveries of the new CYBER 170 series began. In the fall of 1973 we began the joint development with NCR of the architectural design of products beyond the CYBER 170. Now, three years later that design is in place and detailed implementation is underway. We expect, however, not to have a new product line introduction of the classical style but rather to evolve hardware and software products. From time to time new hardware models...
will be introduced. Similarly, new software models will be introduced. But new software will not be required with each new hardware introduction so that evolution and improvement can continue smoothly and independently of hardware. I would expect that each year between now and 1981 we will have some significant announcement in our systems product line.

Our major strengths lie in our broad product line offering which today contain excellent hardware technology and equally important field proven software. For the future we will strengthen this base. Technology investments in computer systems are currently between 60 and 70 million dollars per year and expected to continue at that level.

Finally, with regard to systems product strategy I want to cover STAR. Control Data has been known as the builder of the world's most powerful computers for almost all of its nineteen year history. During those years, our computers have been in the forefront of scientific endeavors ranging from research to engineering design. We are proud of the role they have played in helping to advance nuclear power, aerospace and military applications. Today's major scientific applications on the other hand are not military, but are vital to man's social and economic problems: weather forecasting, petroleum exploration and production, solar and other new forms of energy, earth resource applications, econometric modeling and, as always, improved education.
Past, present and future, however, scientific applications have made what we call the "computational facility" an integral part of our systems strategy. This is a resource designed for maximum computing efficiency. The computational facility has a special hardware design, and the associated software is tailored to take advantage of that hardware.

Why is this necessary? Simply because in many areas there are problems which tax the capability of conventional computers or can not even be solved at all. They include problems in oil exploration, reservoir simulation, regional and world energy models, nuclear power plant design simulation for safety tests, aerodynamic research -- replacing wind tunnels by simulation, airplane structural simulation, weather forecasting, earth resource data analysis, and earthquake prediction.

Examples of Control Data's computational facility concept are the 7600, first delivered in 1969, the CYBER 76, introduced in 1971, and their attendant software. The CYBER 76 is coupled with the CYBER 170 system to provide a complete problem-solving capability.

The STAR-100 system is another computational facility. It is designed to maximize processing performance by "vector processing", a dramatically different processing architecture which can increase computational throughput several fold for advanced scientific applications.
But more important is the fact that through CYBERNET this vastly expanded capability can be delivered right into the laboratory of an individual researcher or a multimillion dollar project. There is virtually no project too small or too large for STAR, or too far away geographically.

In fact, we are seeking individual scientists to cooperate with us on research projects to expand the frontiers of STAR computing. To help find those persons, wherever they are in the world, we are drawing on our TECHNOTEC, a worldwide computer-based technology exchange service to facilitate seeking out and communicating with those persons.

STAR is also important to Control Data stockholders. By itself it won't add much to the bottom line for a while -- it will down the road. Control Data has made a big investment in STAR -- a major part of the development effort and experience occurred during some of our most difficult years in building Control Data and there were difficult decisions required to keep on with the program. But in the final analysis, the rationale for the decision to continue was always our dedication to providing the most powerful scientific computing tools to help advance scientific problem solving. Scientific computer users value this dedication -- as evidenced by the increasing number who are turning to Control Data for large scale computers or computer service.
For each of the last two years, we have improved the profitability of our systems business. We have increased gross profit rates and decreased expense rates. We are now poised for a reasonable and steady growth -- year-by-year. We will increase marketing expense as a percent of revenue over the next five years while decreasing all other expenses -- as a percent of revenue. Systems will produce at least $10 million in cash contribution to the business each year for the next five years. In fact, over the five year period the total positive cash flow from systems will exceed 60 million dollars.

I am pleased with the accomplishments of the past three years. We expect to continue our progress. We know to whom we want to sell. We know what it is we want to sell them. We make a little progress every day in measuring ourselves better and managing our business better. Put it all together and we have a plan for measured and steady improvement.

III. Education

The mission of Education Systems and Services is to develop and implement high quality and cost justifiable computer based education and information services in the global marketplace.

We have two major strategies outlined for Education Systems and Services:
One: Establish the Control Data CBE service network with broad geographic distribution -- the U.S. market will emphasize first industry, and then selected government agencies and leading universities. We believe this is where courseware and information services will be most readily developed.

The plan for the services network itself calls for decreasing plant costs, i.e., in terminals, processors, large memories and communications costs while at the same time enhancing performance for the total system.

While education expenditures in the U.S. are over $100 billion a year and increasing 8% annually, the rate of increase in international markets will be even higher.

Two: Accordingly, the second basic strategy is to enter selected international markets where large national contracts can be negotiated.

By the way, when I speak of education now I refer only to service related revenue but I would like to point out again that considerable computer systems (revenue) can also be attributed to the CBE effort over the next five years.

Revenue for education services is forecasted to grow at an average annual rate of 70% over the next five years -- of course, starting from a small base point this year. We plan
break-even by 1979 -- possibly a year earlier -- and a rapid increase in profitability after that. Long term current analysis indicates that education services will have a higher return on sales than either data services or our hardware business.

The asset intensity of education services is greater than that of data services as we now see it -- about 90¢ per revenue dollar compared to 60¢ for data services currently. But this is predicated on a 70/30 lease/purchase mix for terminals and that is problematical.

In any event, our plan anticipates significant asset additions for lease terminals and CBE service center systems. Although the rate of investment can be managed to rate of market development and may vary from current expectations it is most realistic to expect a large negative cash flow for the next five years.

Those, then, are the essential features of our plan. But I would also like to provide a few words of additional perspective. A key question is the rate of market development. No one knows precisely, of course, what this will be. The situation with regard to computer based education is in many ways analogous to that of the computer industry itself 20 years ago. There is a new tool available, the need for it is enormous, potential applications rise up at every moment, there is a dedicated
band of enthusiasts, and there is no genuine body of applications software -- in this case we call it courseware. Certainly the lack of that courseware is a basic inhibitor to growth. Still, one must remember the enormous growth of computer usage in the fifties in the face of no applications and not even any generally available expertise. There is available in the world a massive set of conventional courseware. This corresponds roughly to the massive set of manual procedures present in government and industry prior to computers. One can pick up some old themes of enchantment followed by disillusionment, of cynacism and fear and disbelief, the same overambitious dreams and schemes. But all-in-all, I would say we are proceeding from a considerably higher level of technological sophistication both in vendor and user than was the case with early computing. Beyond all that, Control Data's CBE system has within it very powerful tools to assist the new user in producing effective courseware quickly. And that certainly is different! In the six months since our announcement in New York last April, I have been encouraged by the feedback of the marketplace. Also, there appears to be a more determined and less helter-skelter, a more considered and less wild-eyed, a more understanding and less naive approach to CBE by users than I would have thought. Not to say there isn't plenty of all those elements. Since April we have installed another system - at the University of Quebec, we have orders for terminals from several special government remedial projects dealing with learning disabilities and prison inmates. We recently received an order for four terminal subscriptions from
the Houston Integrated School District as a precursor to their own dedicated system (now who would ever have conceived of such a rational approach to a computer installation in the gold rush days of the fifties and sixties?). We are actively proposing to half-a-dozen major universities all of whom envision terminal subscriptions prior to systems procurements (Universities buying services?). We have study and pilot projects underway with several major corporations -- most of them initiated by the chief executive officer (how many chief executive officers initiated computer projects 20 years ago?).

We will have 30 learning centers by the end of this year. By the end of 1977 that number will be 50. There can be no question about marketplace presence.

Certainly there are pitfalls ahead -- and disappointments. But the basics are with us and progress is more a matter of determination and execution than anything else.

IV. Data Services

Let me move on now to Data Services.

CYBERNET

First, a few words about Cybernet -- the original of our network services. Cybernet offers a common set of scientific
engineering and management analysis applications to users worldwide. The major strategies here are to invest in new applications products, expand the marketing resource capability, and increase and improve our network delivery system. I'll cover the network delivery system in more detail in a moment, since it serves all our data services. Price increases are also an integral part of our strategy to enhance profitability in the face of inflationary costs.

Applications uniqueness will be pursued for its potential for strong profitable revenue growth -- the Utilities Service Center and other industry specialized service centers are part of this strategy. These centers will be set up in the same industry areas that are priority markets for our systems as well. Also, the multi-national company market offers us an excellent opportunity.

Applications Services

Another broad category of data services is applications services. As the name implies, they are dedicated to specific industry applications. The strategy in this area is to invest in those entities where the potential return is reasonably assured and predictable from past performance -- a $4 million investment will be made in Arbitron to ensure a solid position in the TV rating market -- additional investments will be made in Brokerage - BTSI and in SRI for a major Health Insurance application service.
Some of these services will be expanded with new offerings which are within complimentary markets or are logical extensions of the existing products. More specifically, Ticketron will leverage their ticketing distribution capabilities by developing an arena ticketing system and automated wagering will expand where the risk is reasonable.

SBC

SBC has doubled in revenue since Control Data acquired it. At the same time, profit levels have increased every year. We expect to continue this performance and this will be achieved through continued emphasis on the traditional product lines, namely general business applications for small and mid-size businesses and timesharing services. The strategy here is also industry/application oriented. Unique industry application packages allow businesses and management to solve problems without recourse to professional data processing equipment and personnel.

You, perhaps, have seen our advertisements in FORTUNE Magazine which indicates that we have more than 800 of the top 100 banks as customers. In addition, we have a very significant portion of the top brokerage houses and government agencies as well as many of the top Fortune 1000 companies as SBC customers. We intend to continue to provide applications to solve problems for business and management.
In addition, SBC has embarked on new application offerings for the distribution, retail, banking and manufacturing industries. These will allow SBC to continue to grow rapidly over the next five years.

**Data Base Management**

Through all these elements of our Data Services and their future growth strategies runs a common thread. And that is the importance of data bases and data base management. Sometimes it is the facility to deal with integrated data bases from several related applications programs. Examples are the Unistruc/graphics system of Cybernet for engineering design and the Minimis/Bispac system of SBC for financial modeling and planning.

Sometimes it is variety of informational and analytical reports provided from a proprietary data base such as the services of ARBITRON.

Sometimes the data bases are "self-generating" as with TECHNOTEC.

Sometimes the data bases are accessed in a transaction mode as with Ticketron, Action, FOCUS, and Cyberloan. Sometimes in a batch or timesharing mode.
But data bases and data base management are a key element of data services. The possibilities for new services are almost limitless -- because the needs for cogent information oriented towards communities of users and problems is steadily growing.

As I mentioned earlier, there is a common network "plant" which serves all our data service units. Our strategy is for the continued creation of a superior data services network.

1. Geographically dispersed remote intelligent concentrators provide the access interface to a shared network facility for a wide range of terminal types and speeds.

2. Customer data from the terminals flows through these remote concentrators and then over a variety of communications facilities to a Communication Network Processor (CNP) which in turn routes the users' data to the appropriate service processor. In all, this CNP routes data to 38 different computers located in various parts of the world.

3. Host processors are added as the increased demand for old services grows or as new services are added to our offerings.

4. Communications facilities throughout the network will be gradually upgraded as domestic satellite facilities become available as they are now available to Europe and Japan.
5. And of course the ability to handle terminal types is added almost continuously.

A Look Ahead for Data Services

For Data Services in total, the revenue plan is easy to remember. It doubles over the next five years. CYBERNET and SBC contribute equally to this growth and together account for three quarters of the total data services growth. The remainder comes from applications and developmental services.

Pre-Tax profit will increase to over 10% of revenues within a five year period. It already exceeds that for our more mature data services. With the exception of 1977, the investment in assets is more than offset by profits generated so that as opposed to the last five years the next five years will see a positive cash flow.

Once again, growth in data services is an area of strategic emphasis -- not as dramatic as that for education, but as I have indicated in excess of 15% per year. The mix of services and systems has switched and services now exceeds systems.

1975 and 1976 have been years of consolidation for services; absorbing and making viable previous start-ups; our posture now is one of more rapid and profitable growth in 1977 and the years beyond.