

COMPUTER DEPARTMENT CONFIDENTIAL

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PRESENTATION TO EXECUTIVE OFFICE
JUNE 23, 1964

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I. OPENING COMMENTS BY H. VAN AKEN

Let's first take a few minutes to look at the history and background of the Information Processing Business.

This (Chart 1) shows growth of the domestic equipment market from 1958 through 1964, and, as you know, this industry really took off in 1960 with the advent of transistorized equipment and the effective use of the computer as a tool in reducing labor costs; and as a result of its control and scientific capabilities. Although the industry growth slowed to a walk this year due to certain industry factors -- principally, announcement of a new product line by IBM for delivery late in 1965; it is expected the growth will continue at a rather rapid pace in the next five years.

Industry Characteristics

To refresh your memories again, broad industry characteristics could be summarized as shown on this (Chart 2). First, we must supply highly technical products that work together as a complete system. As you know, we don't just deliver pieces of hardware. We must also provide applications assistance, programming aids, and also program assistance; and, of course, our contracts also include maintenance work.

Another characteristic of the industry is that at least 90 per cent of shipments have been on a lease basis, and this results in deferred income over a four to five year period.

The industry is also characterized as a high risk business, inasmuch as it takes money -- a lot of it -- and technical ability to develop systems; which are then leased and are subject to obsolescence because of rapidly advancing technology.

As you know, this industry is dominated by one competitor -- IBM, which has about 74% of the business; and systems are sold on a world-wide basis.

General Electric Participation

(Chart 3) You will recall that the General Electric Company entered the Information Processing Business somewhat on an opportunistic basis. We took a contract with Bank of America in 1956, and undertook contract work for National Cash Register Company in 1957. Knowledge gained from our work with Bank of America and National Cash Register Company was applied in providing special equipment to the banking industry, with the first shipment being made in 1960.

Then we designed a general purpose computer for other industries, the 225; and first shipments were made in May, 1961, just three years ago. Also it has been our history up to the present time that we have had to purchase quite a substantial share of our systems from outside suppliers because we did not have the background in electro-mechanical input/output equipment.

As a result in our late start and limited product coverage, General Electric did not participate to any great extent in the expansion period of 1960-1964. This year we will ship \$60 million of equipment, about three per cent of the total industry.

Future

(Chart 4) Looking at the next ten years, we believe the industry will continue its rapid growth. The total equipment market is expected to be two billion dollars this year, and forecasted at 4.5 billion dollars by 1974. The offshore market will be about 75 per cent of the total U. S. market, or about \$3.3 billion by 1974, making a total world-wide market of \$7.8 billion by 1974.

These figures do not cover the Service Bureau business or equipment designed specifically for the military markets. If you should add computing services and military equipment to this picture, we would have about four billion dollars this year, 1964; and possibly a ten billion dollar total overall industry by the year 1974.

Now some will ask why we expect the industry will have substantial growth such as this, and I think that most people who are associated with the information handling industry state that revolution is really taking place in processing of information, and "we haven't seen anything yet."

Areas of Growth

Areas of growth can be summarized as shown on this (Chart 5). There is much work, both business and scientific, that can yet be applied to the computer. In addition, many concerns have lagged and still have to install their first computer. Our brief history tells us that once you apply work to a computer, soon you need a second and third in the house to do all the work that can be applied at a saving.

Of course, there are many new concepts of use of computers, primarily in the area of real time, which we call direct access computers; and which we will discuss in more detail later. This new concept means that there will be more communications ability between man and the computer, resulting in additional business in remote terminal devices. And then, too, as our technology progresses, we are getting more performance from systems per dollar investment, which means that additional work can be applied to this useful tool.

Dimensions of the Business

So much about the history and forecast for the future. Let me review briefly some dimensions of the business which we can use as background in further discussions this afternoon.

This (Chart 6) portrays the life span of a typical and theoretical computer program. As you can see, the development of a computer system is shown here as about three years, sales life about four years; production, a little over four years; and then revenue, about eight years. So that to get a good profit figure back, a typical computer program covers a period of eleven years, and it is a vital necessity that these systems stay out on lease the last three years if the manufacturer is to obtain profitable operations.

This (Chart 7) shows design costs incurred in developing computer systems. These figures represent average cost of designing the central processor for our 200, 400, and 600 lines of equipment. You will note that the costs of doing the basic programming for these processors is a substantial portion of the overall design cost. The total average

design cost of a total system, including peripherals, is \$20 million; 11% of estimated billing value.

This (Chart 8) shows information as to the time required to develop new products. Three or four years is required to develop a whole new product line covering a number of processors; it takes two years to develop a low cost processor, and perhaps four or five years to design mass storage devices.

Here (Chart 9) is some information as to the cost of doing business on an "If Sold" basis. Our shop cost this year, in 1964, is estimated to be 44 per cent. We expect it to be 39 per cent in 1969. This is still a relatively high figure because we have new products scheduled for introduction in 1969. The basic index for control of our cost is that we should be shooting for shop cost of about 33 per cent of the If Sold value. In other words, one-third for product, two-thirds for other services and profit.

Our engineering cost to sales on an If Sold basis, which will total 19 per cent this year, should come down to 8 per cent in 1969. Marketing, from 16 per cent to 11 per cent, and Product Service from 7 per cent to 4 per cent. We have a tremendous job to do in this area of Product Service.

This next (Chart 10) shows information concerning served industries and markets, and you will note that we have already invested considerable time in the industries of transportation, banking, and federal government. The next figures show the time it will take to gain acceptance in certain markets that we have not been active in in the

past. Of course, the point here is that you just don't decide that you want to enter a new market and attain orders immediately. It takes time to develop a market and be accepted.

Another characteristic of this business which is very important is the cost or investment that we have in people. Here (Chart 11) I have shown the average cost of recruiting, hiring, transferring, and training our Sales, Applications, Product Service and Manufacturing personnel. Here is the average cost of training per man, and this column shows total increase in personnel that we have budgeted for 1964. Our budgeted cost for just recruiting, hiring, transferring and training exempt people this year in Marketing is \$2,940,000.

It is also significant to note the lead time required to hire and train these people before they become effective. For Sales and Product Service people it is nine months; in Manufacturing, 6 months.

To carry this a step further, this year, because of acceptance of our 400 equipment and the late delivery of the IBM 360 equipment, we decided that we would have to double our requirements for production of 400 equipment for 1965. In order to handle these shipments, install them, maintain them and apply them, we will have to hire additional people as shown (Chart 12):

30 people in Marketing

67 people in Product Service

200 people in Manufacturing

The training costs this year -- the additional expense this year -- is shown as one million 290 thousand dollars over budget requirements.

Now, Mr. Cross has told me that this is fine. He likes to see increased business, but we still must live within our budget for 1964 in spite of this additional expenditure of increased production in 1965.

This we are going to do by continued control of all our functional expenses, through increased productivity, and delay of perhaps some other programs.

II. TRENDS OF THE BUSINESS - JOHN W. WEIL

(Chart 13) The single most important trend in the information processing market today is that we are moving away from batch processing, where information is collected from a far-flung organization by fundamentally manual methods and then processed in a batch through a computer system. The information is physically transported to the computer and physically returned to the consumer of the processed data. This is the classic use of information systems and is the only practical way to process data with the limitations of storage devices, communications and machine complexity which have existed to date.

The information processing business of tomorrow, (Chart 14) however, will have transaction data entered into the system through communication lines, processed against massive central files on a random non-scheduled basis and returned via communication lines to the user, frequently all in a matter of seconds. Prototypes of this kind can be found in the airline reservation systems, in military command and control systems and in process computer installations.

The direct access system equipment (Chart 15) is more complex than that used in batch processing. It requires a more agile central processor, which can service on a time-shared, interleaved basis its many users, providing virtually simultaneous access to the storage and processing capabilities of the system. In addition, the direct access system requires massive random access storage with billions of characters of information on line. Communications will become an integral part of the central system and a vast variety of remote terminals will be required. There is, also, increased sophistication on the part of equipment designers and users, and a continuing trend in the market place towards providing more efficient equipment to service-oriented business such as airlines, banks, insurance firms and even engineering firms.

Growth of Direct Access

The direct access system (Chart 16) will play a large part in the growth of the computer business in the next few years. We predict by 1974 80% of the domestic shipment volume of information processing systems will be serving the direct access market and almost one-half of this will be remote terminals. The classic batch system, which dominates today's market, will continue to exist but will play a diminishing role in the equipment market.

With its existing installations at Chrysler and Dartmouth and upcoming installations at Western Pacific and Clark Equipment, General Electric is well started towards serving this market. Our opportunity for the future (Chart 17) lies in working closely with

major customers of special significance in further developing the practical application of the direct access computer system as a true information utility of the future. Project MAC at MIT is today exploring experimentally the techniques for a future information system. They have about completed their first generation system and will re-equip themselves in early 1965. We are very hopeful that they will decide to use a GE-600 system. The Bank of America will be putting in place a complete new system in approximately 1970. This system will provide state-wide direct access financial service through two large centralized computer installations in San Francisco and Los Angeles. The World Trade Center proposed by the New York Port Authority is to be completed also by 1970, and will have, as a built-in part of the building, a public information utility system.

Other Trends

There are a few other trends in technology which should be noted. (Chart 18) Information systems manufacturers are today supplying a great deal more than just hardware. We must supply an ever large amount of software in the form of general purpose programming packages for aiding use of the computer and we must supply ever more application knowledge to go with our equipment. The cost of developing these software and application packages is now almost half the cost of developing a new line of computers.

(Chart 19) We are about to see the introduction of a variety of new technologies into the various new competitive offerings on the market. The IBM cermet circuit is but a first example and is of

importance primarily because of its susceptibility to automatic production, rather than because of circuit speed or size.

We, and other manufacturers, will be introducing magnetic thin film devices, integrated microcircuits and specialized forms of packaging and interconnection into our electronic equipment in the very near future. In addition we in the Computer Department, with the strong support of the Research Laboratory and other Company departments, are making rapid progress in the even more advanced area of cryogenic circuitry. We believe we are leading the field in this area, and may derive significant competitive advantage beginning perhaps in 1968, with the introduction of major system components built out of cryotrons.

There will be continuing major emphasis on mass storage devices. Today these are basically electro-mechanical in nature, but we see opportunities for very large, all electronic systems in the future. The Advanced Technology Laboratory is at work in this area.

Chuck Heiden is leading an activity working at the development of retail trade devices which will serve, together with direct access systems, as a wedge for entering the retail trade market.

III. COMPETITION - JOHN W. WEIL

The entire competitive picture in the information processing business at this time in 1964 is characterized by the impact of the IBM System /360 (Chart 20) announcement and by the reaction to this announcement of our competitors.

The System/360, as presently announced, (Chart 21) provides a range of compatible computers renting from \$8,000 to \$80,000 per month with six different basic models. We can expect this product line to be broadened in the near future to add four more models, (noted by astericks) giving a single family of equipment renting for from \$1,000 to \$150,000 per month.

For the direct access market of the future (Chart 22) the System/360 provides a variety of features. Program compatibility is provided, at least nominally, from one end of the line to the other. Of major interest is the fact that the System/360 integrates into a single set of equipment the capability for business data processing, scientific calculation, data communications, and process control. It seems clear that all of these are now but facets of the basic information handling and processing system. The System/360 also has major strength in a variety of new mass storage devices and a whole new array of remote terminal equipment.

System/360 Appraisal

(Chart 23) The System/360 is an excellent product line with outstanding peripheral offerings. It has many of the features which will make possible its application in direct access systems. Its only major drawback is its clear use as a delaying action. IBM's long-rumored announcement resulted on April 7 in equipment which would not be delivered for 18 to 24 months. This has irritated potential customers and provides opportunity for those competitors who can delivery truly competitive equipment during that period of time.

General Electric is one of these. In addition, so far as we know, there are no radical technical features in the System/360 when compared to our new own offerings. It is, however, no longer possible to compete against this broad offering of equipment by finding specialized weaknesses in IBM's armor. This is the role which CDC has exploited. They will not be able to continue to do so.

(Chart 24) But the most important aspect of the System/360 is that IBM has lowered the price umbrella which has for years sheltered the entire industry.

It is no longer possible to offer equipment with a significant advantage over IBM. Those competitors who will survive will be those who, in the short run, can sell against IBM without the traditional price-performance advantage and who, in the long run, can approach IBM's cost levels in manufacturing and product service.

Price/Performance Comparison

(Chart 25) Here is a relatively complex, but important basic comparison of the performance and price characteristics of the important scientific computer systems on the market today. Monthly rental for the equipment is displayed along the horizontal axis, while central processor performance increases along the vertical axis. At any point in time there is a diagonal line representing what you can buy. For more money you can get more performance; the inexpensive machines have less performance. As time goes on, improvements in technology will mean that this diagonal line of available equipment will move upward and to the left, so that

each generation of new equipment provides more performance at less money. The lower left-hand portion of the chart is expanded for clarity.

There are several important points to make. First of all, it is easy to see the nature of CDC's success of the last few years. CDC has had their 3600 on the market for about two years as competition for the 7090 and 7094 of IBM. You will note that the 3600 provided, at less cost, performance characteristics of about twice that of its nearest IBM competitor. IBM's reaction of the spring of 1963 was to announce a model II-7094 which still, however, could not meet either the performance level or the price of a comparable CDC 3600. CDC, over the past fall and winter, has announced a 3400 and a 3200 system in the lower price range. CDC has had its success by concentrating on an area of IBM price weakness, and by showing a major price performance advantage to potential customers.

General Electric has had no offering of equipment in the high priced, high performance portion of the market. Our 200-Line has been competitive with existing equipment on the market at the lower ends of the scale.

All this changed with the announcement of the IBM 360 series. IBM laid a line of products clear across the entire market; there are no gaps in IBM's product offering any longer. IBM has also grossly obsoleted its own equipment and is, therefore, well motivated to protect its present rental revenue by delaying delivery of the System/360 as long as possible consistent with maintaining market impact.

Response to the System/360 has included price reductions by both Control Data and RCA.

GE-600 Line

Our new GE-600 line is shown on this chart, and you will note, depending on exactly which model and details of usage and configuration, the 600 is either just a little more favorable or just a little less favorable than comparable members of the 360 series. We are, however, able to deliver our equipment a year earlier than IBM.

Note that in this new world the older GE-225 and related 205's and 215's are currently obsolete and will be phased out of our marketing effort. Our newer 235 is, however, a very competitive offering.

(Chart 26) Here is a similar chart for business applications. The picture is fundamentally the same except that we show here the new GE-400 line, which is our offering in the business data processing market. In the near future we will be announcing a new series of magnetic tape units which will permit adjustment of our 400 line system prices to increase our competitiveness. The 400 line is a competitive offering today, but will require some revision if it is to remain competitive in the direct access market, and in the mixed business and scientific environment of two years from now. Incidentally, note the very tough competition around the 360 model 30 which involves both our 235 and 415 and the Honeywell 200.

The rest of this picture is generally the same as the previous one with our 600 line showing off well and the older members of our 200 line showing their obsolescence.

Against this detailed product background, what then do we expect each of our competitors to do?

Sperry Rand

(Chart 27) Sperry Rand must bring out new equipment, probably as extensions to two of their present lines. We expect them to continue to build on their recent success in the military market but we feel that their future depends primarily on their ability to resolve their internal problems, and to rebuild a strong marketing organization.

Control Data Corporation

(Chart 28) Control Data is in a good competitive hardware position. Although they will continue to emphasize their traditional scientific market, they will broaden their market approach to include business data processing, and will have to add field applications personnel and sales personnel. CDC's future depends on their ability to meet product competition by IBM for the first time, and on their ability to make the difficult transition from a small company to a major corporation.

Honeywell

(Chart 29) Honeywell has made a spectacular, but curious, new offering of equipment. Their success will be determined, first by their wisdom in announcing an improved version of IBM's 1401 three months before IBM obsoleted the 1401 and, second, by their wisdom in introducing two isolated, non-compatible, new computers which are not members (so far) of any product family.

Radio Corporation of America

(Chart 30) RCA presently has no competitive equipment, and will have to scramble in order to hold their present market share. We expect that they will announce a broad new system of computers this year, reflecting their improved corporate financial position and their readiness to try again to penetrate the information processing market in a serious way.

Burroughs and National Cash Register

(Chart 31) Both Burroughs and NCR will withdraw from the large systems market and will concentrate on their traditional small business systems. As you know, there are rumors that Burroughs or NCR will merge with CDC, Bunker-Ramo or, perhaps, each other.

General Electric

(Chart 32) General Electric, when viewed in the same context is, for the first time, beginning to bring its corporate strength behind its entry into the information business. It has competitive equipment which can be delivered earlier than IBM's. If General Electric can capitalize on its advantageous position, it can make a serious move to become number two in the industry.

IV. GENERAL ELECTRIC'S PRESENT STATUS - H. VAN AKEN

Let's take just a few minutes to review General Electric's present status in the Information Processing Business.

In July, 1963, nearly a year ago, when I first reported to the Executive Office concerning the Computer Department, I pointed out that there were a number of problems that had to be solved before we would be in a position to make further penetration of the market place. Basically, (Chart 33) I covered these two broad subjects: first, that we needed to improve performance of products already in the field; and secondly, that we needed improved product coverage.

We have come quite a long way since our presentation of a year ago. We have improved the performance of our equipment in the field (Chart 34). Our document handlers today are superior to those of any other manufacturer. Our printers, card readers, and disc storage units have been considerably improved, although we still have some work on printer mechanisms that we buy from Anelex. But we believe now that we will have a good piece of equipment by January of 1965.

We still have some basic improvements in our card readers, but here, again, we believe that we will have a competitive piece of equipment in place the latter part of this year.

Of course, the proof of the pudding is whether or not we are really gaining in the area of product service costs, and I am pleased to say the product service costs have been reduced from 44 per cent

of rental revenue during 1963, to 36 per cent during the first part of this year, 1964, and we have put a definite plan in place to further reduce our overall product service costs. Just overall volume, of course, placing more units in particular geographical sections, will reduce our service costs, but we are currently making various studies to determine how to reduce maintenance costs to a competitive basis.

We have made a substantial headway in improving our product coverage. (Chart 35) You will recall that last year our product plan provided that we extend our 225 to the more powerful 235 and first shipment was to be made in August, 1964. We actually shipped our first unit far ahead of schedule, to NASA, in April, 1964; and it was put into test eleven hours after arrival. It has completed a four-week acceptance test without down time, and this is a real credit to our engineering organization.

The 400 series was scheduled to be shipped in May, 1964, and we shipped our first unit, again to NASA, on May 28 this year. Our 455 series is scheduled to be shipped in August, 1965, and this series is on schedule.

This is also true of the 600 series, which is scheduled to be shipped in December, 1964. You will recall we decided to add this processor to our line the latter part of April, 1963, and we will make our first shipment in December, 1964, just 19 months after the go-ahead was given. This is a real accomplishment.

We also stated that we would improve product coverage by coming out with an in-house high performance Tape Handler for the 600 series.

We promised that this would be delivered in December, 1964, and this is on schedule. We also indicated a low cost Tape Handler would be shipped in September, 1965. We have put additional effort on this unit, and will beat our prediction of a year ago considerably, making our first shipment in February, 1965.

I might add that a year ago we pointed out that we were hurting badly in competence of design in electro-mechanical peripheral equipment. I am pleased to say that, during the past year, we have made great progress in our mechanical section.

Other Accomplishments

(Chart 36) Another area of concern last year was the ability of our people to perform the tasks assigned, and I stated that we had a program under way for upgrading all of our personnel. We have made progress during the last year, I think. As you can see here, we have a lot of new faces in our Section level. I personally believe we have some powerful people now running our Department. In addition, many of these section managers have already upgraded a number of the subsection personnel working in the various functional components, and we are continuing our work in analyzing the abilities of all of our people in order that we can make progress in this never-ending job.

I also mentioned last year that we have a big job to perform in increasing productivity in all of our workers, not only those in the factory, but also exempt and non-exempt personnel in Engineering, Marketing, Finance and other functional operations. We have made

some progress in the factory -- we still have quite a way to go. I am quite pleased with the progress we have made in our salaried areas. Here, again, we have much work ahead of us, but we put into being a better management procedure which requires all of our people to put down specific work projects with completion dates for that work which it is necessary to attain in order to fulfill our objectives and work plans.

Last year, I mentioned the need to improve our morale and communications among our people so that we could do a better job. I am pleased to report that I believe we have made progress in this area.

1963 Performance

Here is (Chart 37) which shows what we forecast last July compared with what we actually did in 1963, and our 1964 budget. As you can see, in July, 1963, we forecast orders received to be \$76 million; this year we forecast \$108 million. Sales Billed in July 1963 were forecast to be \$40 million, actual was \$41 million, and forecast for 1964 is \$50 million. Loss was \$11.9 million, whereas actual was \$12.2 million. This was caused by write-off of a lot of obsolete equipment and cancelled projects.

1964 Performance

Our performance for the first five months of this year is shown on (Chart 38). As you can see, we bettered sales. So far, orders are on budget, \$42.8 million for the first five months. Loss is considerably less than that budgeted for this period.

Summary of Present Status

Now to summarize where we stand in the market place today, there is no doubt that we have gained considerable experience, and we have gained a reputation in the market place for our 200 series of products.

We have good competitive products on hand today which really improve our product coverage and give us an opportunity to penetrate the total market to a greater extent than we have in the past.

For example, this (Chart 39) forecasting industry growth for the next ten years also indicates that portion which General Electric intends to serve. You will note that our served market this year is less than 50 per cent, but that new products to be announced will allow us to increase our served market on a shipments basis to over 80 per cent of total market two years hence, and 90 per cent by 1974.

Although we are in a pretty fair position to compete in the market place, we still are not in a position to match IBM with all the products we need. We still have many specific product needs which we must satisfy. (Chart 40) First and foremost, we must greatly improve our mass storage products so that we are able to offer a full line of sizes and throughput capacities.

Secondly, we must have a whole new array of remote terminal devices for the various applications. Many of these will be vendor-supplied, but we hope to develop an in-house set of offerings capitalizing on General Electric proprietary developments.

Our 400 line, which competes well in the batch business data processing market, must be improved for application in the direct access market. Also, we must reduce its cost considerably. Our 600 line must be broadened to provide a wider range of appeal, and to provide certain specific devices which will make it even more attractive to the sophisticated customer.

We see very clearly that we must supply a whole new line of processing equipment which will compete effectively with IBM's successor to the 360 series. We expect this new equipment must be ready for delivery in late 1968, as outlined in our five-year plan.

Finally, we have a need for constructive laboratory support in a variety of areas similar to the excellent thin film support which we are now receiving from the Research Laboratory. We need work in such sophisticated areas as linguistics, Semantics, computability, distributed logic, machine organization and the like. We look forward to an ever broadening corporate base to provide the technical support for our expansion in the information processing business.

In summary, then, we have improved product coverage, competitive products, and a pretty fair organization in place today. Therefore, the question arises, "Where do we go from here? How much of the total industry can we attain in the next five to ten years?"

V. WHERE DO WE GO FROM HERE? - C. A. GILLESPIE

For the past four months, a substantial part of the time of the Department Staff has been devoted to the development of a comprehensive Business Plan covering all aspects of the Department's operations. In our deliberations, it soon became apparent that it would be necessary to seriously examine several possible courses of action that the Department might logically follow in the five-year term ahead. I will present today the financial implications of three of the alternate plans we developed, and then discuss why we have selected one of these three as the most logical plan for the Department to pursue.

In all our plans, Offshore Operations are included to only a very modest extent, representing a penetration of less than 1% of the total Offshore market. As soon as the Bull and Olivetti negotiations are completed, we will be able to firm up an aggressive Offshore plan.

Alternates

In the charts that follow, I will refer to Alternates A, B, and C. Alternate A can be characterized as a maximum, all-out effort to increase market position and volume; Alternate B represents a more moderate, yet extremely challenging, rate of growth; and Alternate C represents the minimum growth rate that we could strive for and still hope to be a factor in the Information Processing Industry.

Value of Shipments

(Chart 41) Shows the value of shipments at selling price for each of the years 1960-1969 in order to give you an idea of the physical

volume of business involved in each Alternate Plan. The top line represents our maximum, all-out effort. As you can see, this plan reflects 1969 shipments having a value of \$468 million, or almost a six-fold increase over our estimated 1964 volume of \$82 million. Alternate B calls for increasing to a 1969 volume level of \$285 million, or about a three-fold increase over 1964. The shaded area shows the probable range in which we could well be operating under Alternate B with the anticipated success of our 400 and 600 lines. Alternate C would bring us to a volume level of \$205 million in 1969.

Market Position

(Chart 42) In terms of market position, Alternate A would bring us from our present 3% of the total domestic Information Processing Industry to 12.5% in 1969; Alternate B would bring us to 7.2%; and Alternate C would bring us to 4.9%.

As Booked Sales

The industry is still characterized by rental of computer systems rather than outright sales. This ratio has averaged about 90% of total systems being shipped on a rental basis. As you know, however, there are several factors at work which may very well lead to an increased trend toward outright sales, and a little later I'll show you the substantial leverage on profit that a shift in this direction would produce. In our projections, we have conservatively assumed a continuation of this 90% ratio.

This (Chart 43) shows our "As Booked" sales trend. Under Alternate A we would expect to go from \$50 million in 1964 to \$343

million by 1969; from \$50 million to \$240 million under Alternate B; and from \$50 million to \$184 million if we follow Alternate C.

For calibration, the X's in the year 1969 represent the value of shipments at selling price that I showed on a previous chart. Note the significant spread between our As Booked sales and the equivalent value of shipments for the year 1969 - a difference of \$125 million for Alternate A, a difference of \$45 million for Alternate B, and a difference of \$21 million for Alternate C. The key to the difference, of course, is the amount of unrealized rental revenue to be received in future years from our equipment on rent at the end of 1969.

"As Booked" Net Income

This (Chart 44) covers the "As Booked" net income/loss trends that each of our plans would produce.

You will note that the "As Booked" net income from Alternate A - our all-out, maximum effort plan - is a substantial loss in each of the years through 1968, then a profit is generated in 1969. Alternate B - the middle of the road plan - generates less loss and turns the corner a year earlier than Alternate A. Alternate C follows a somewhat different trend. While the losses in 1965 and 1966 are somewhat less, the profitability trend in 1967 and 1968 is worse than Alternate B. This results from insufficient revenue being generated under Alternate C in those years to carry the engineering development and start-up costs that will be incurred in connection with the next generation of new equipment that will be required beginning in 1968.

Effect of Trend Toward Outright Sale

The effect on profit that would result from an increased trend toward outright sale is shown on this (Chart 45). The lower line is

the projected "As Booked" net income for Alternate B. For calibration, the upper line is the net income profile that would have prevailed if all our business were conducted on an outright sales basis.

The middle line plotted for the years 1965-1969 reflects the effect of one possible trend toward increased outright sales. In this projection, outright sales were assumed to increase from 10% of total shipments in 1964 to 35% in 1969, in increments of five percentage points per year. Note that by 1969 our net income would be \$27 million, compared with the \$15 million if our 10% outright sales ratio continues.

Cash Requirements

(Chart 46) Now let's examine the funds required to support the growth represented in our three Alternate Plans.

By the end of 1963, the aggregate investment by the Company in the Computer Department - representing the cumulative net operating loss plus the net investment carried on the books of the Department - totaled \$90 million.

If we pursue Alternate A, an additional \$400 million of capital, or an average of \$68 million per year, will be required by the end of 1969; Alternate B would require an additional \$220 million, or an average of \$37 million; and Alternate C, an additional \$150 million, or \$25 million per year.

At the end of 1969, (Chart 47) the \$496 million capital needed to support Alternate A would consist of \$126 million cumulative operating loss, \$204 million in unamortized equipment on rent to customers and \$166 million in all other assets. The \$310 million

required under Alternate B would represent a cumulative operating loss of \$69 million, \$132 million in equipment on rent, and \$109 million in other assets. The \$237 million needed for Alternate C would be comprised of \$77 million in operating losses, \$86 million in equipment on rent, and \$74 million in other assets.

In passing, it should be noted that investment turnover in the computer business is quite low as a result of the significant amount of investment tied up in equipment on rent. Investment turnover averages out to about one turn per year.

Employees

(Chart 48) Now let's turn to the projections of the number of people that would be required to achieve each of our Alternate Plans.

At the present time, the Department has a total complement of about 5,000 people. To do the job reflected by Alternate Plan A would require that we more than triple our organization during the next five years. Alternate B would take a little more than double the work force we have today. Alternate C would require an increase of about 80%.

Salesmen and Application Engineers

(Chart 49) The most critical skills, and those in shortest supply, are field Marketing personnel specialized in systems sales, systems application engineering, and site product service.

This chart shows the numbers of these people that will be required to man up for the sales growth rates reflected in each of our Alternate Plans. Alternate A plan would require a total of almost 4,800 such people by 1969; Alternate B, 2,600; and Alternate C,

about 1,900.

The Plan Selected

Of the three plans examined, we believe that Alternate A and C are less attractive than Alternate B.

Looking first at Alternate C (Chart 50) - the low plan - we believe that it has the following drawbacks:

1. Because of the limited Marketing organization that we could afford with the sales volume on which this plan is predicted, it would be necessary to forego potential penetration in several key markets that will be available to us.
2. High fixed costs in the areas of product development, software development, and product service would have to be liquidated over a relatively small volume base.
3. Somewhat offsetting these disadvantages could be the potentially higher productivity that might be achieved in the Marketing organization as the result of being able to concentrate on developing a relatively small field Marketing organization at a lower total cost.
4. Outweighing these other considerations, however, is the key question of whether General Electric could ever maintain sustained effective participation in the Information Processing Industry if our goal is to increase market position from our current 3% to only 4.9% five years hence. We don't believe that we could.

At the other end of the scale, we believe that Alternate A - (Chart 51) the maximum, all-out effort - also poses several serious doubts. I think we would all agree that, in the light of the tremendous costs required to enter this business, the best route to gaining profitability is by increasing volume and greater position in the market place as rapidly as we can, but we doubt that we could grow the business as rapidly as Alternate A calls for. The key factors taken into account are the following:

1. People - We doubt that we could hire and train the people required to do the job.
2. Experience and Image in the Market Place - We are gaining ground rapidly here, but time is still an important factor against us.
3. Products - While our products are now competitive in most respects with IBM, we do not have product superiority. In addition, we would have to rapidly develop a number of specialized remote terminal devices to tap some of the new markets that we would have to enter to achieve Alternate A.
4. Competition - All our competitors are going to put up an heroic struggle to survive in the next four to five years and, because of this, it's going to be real tough to improve market position.
5. Cash Requirements - Is it really attractive for the Company to invest the funds that would be required in this very

high-risk venture represented in Alternate Plan A in view of other demands for cash in other areas of the Company?

Because of these considerations, we are hesitant to adopt this plan as our course of action.

So we come to Alternate B,(Chart 52) which we have concluded to be, in our best business judgment, the most realistically challenging course for the Department to pursue.

VI. MARKETING OPERATION - V. S. COOPER

A continuation of the progress achieved by the Computer Department and reported to you this morning requires an effective, aggressive marketing operation which is increasingly confronted and tested by the IBM sales organization. It is against this competitive excellence that we must achieve our substantial future successes.

To give you an abbreviated review of our marketing work, these subjects deserve comment: (Chart 53)

Customer needs - both for the General Information Processing Market and the requirements of specific industries.

Manpower requirements.

Segmentation of the market.

Customer selection .

Our sales approaches and forecasted results.

Requirements

To compete successfully in the broad non-specialized Information Processing Market, (Chart 54) a manufacturer needs a substantially complete product line coverage including processors, peripherals and machine-oriented software. Product line compatibility is required which will permit a customer, for example, programming his system on a General Electric 415 and moving to the 425 or 435 as his need expands without incurring the high expense of reprogramming. An advertising theme for General Electric has become mandatory with the IBM 360 announcement. With computer users measuring their downtime in minutes, the manufacturer also needs high product reliability and efficient and prompt product service. And to satisfy these broad requirements, there is the need for manpower, experts in the product.

(Chart 55) Selling to specific industries requires additional capabilities. We need personalized terminals. For example, Security 1st National Bank requires a voice answer-back unit for each of their 300 branches. This device permits the branch to access directly the central processor and to receive back a voice answer regarding the status of a customer's account. And, also, there is the requirement for efficient applications-oriented software. The manufacturer must also demonstrate advance systems competence to accommodate the industry transition from batch to system processing. And, lastly, manpower expert in the customer's specific business and in the customer's information processing needs. The common denominator

to serving either the broad market or specific industries is professional salesmen, application engineers and product service personnel.

Personnel Requirements

(Chart 56) To achieve a professional status, the Department considers that a salesman requires 8 years experience, applications engineers 5, and a product service man 2 years.

(Chart 57) Our manpower requirements are shown here. You will note that although we have 6 fewer salesmen than in 1963 we are producing 40% more business. We have more productive salesmen, but we are still 29 below budget. In application engineers 27 men below budget. In product service we are likewise in an underbudget position. We have a very major problem in expanding and upgrading the quality of our sales and service organization. It is a major, but not insurmountable job. Plans are developing to obtain the required manpower from the open market, educational institutions and within General Electric, and where an excess of technical men from such organizations as EUSO may exist. These men could be trained to sell computers within a relatively short time period.

(Chart 58) Recruiting is but a portion of the job. Manpower development deserves emphasis. The Department has 135 courses in place today, 33 courses for salesmen, 55 for application engineers, and 47 for product service personnel covering these subjects. We will train thirteen hundred people in 1964 and 5,000 in 1969. IBM is spending 60 million dollars on education in 1964 - we 3 million dollars.

Total Domestic Market

(Chart 59) Turning now to the total Domestic Market, we have established four major industry classifications. The largest is the Industrial, and it is with customers in this group we expect to achieve our greatest volume growth. We intend to grow in the Financial Industry by expanding within the Banking Industry and invading the Insurance Market now that we have the necessary product lines to serve their needs. Government should be a much larger customer and to grow this business a Manager of Government Sales was appointed early this year. We expect a substantial growth of six-fold in the Services classification as you can see. We forecast a total domestic industry growth of nearly 60 percent over the next 5 years and we are planning to increase the Department's business by approximately 450 percent. A growth rate over 7 times faster than that projected for the Industry. (Chart 60) To achieve these growth objectives we are segmenting the market identifying those industries where our resources can be the most productively applied. Shown here are the segments chosen for penetration. Of the segments within the Industrial classification, we have chosen Manufacturing, Aero Space and Railroads for penetration, and in the first two we are in an active selling phase, and in the development stage with Railroads.

In the Financial classification with two segments, we have selected Banking and Insurance. In Government, we are selling to NASA now and are planning an entry into the Department of Defense and State and Local Governments.

In the Services classifications with two segments, Communications is planned for development. Universities and colleges provide an exciting opportunity. MIT has under development their project MAC which is in effect an information processing utility. Dr. Fano, of MIT, visited us just this past week in Phoenix and was considerably impressed with the capability of our 600 central processor. To define further our penetration plans and to deploy productivity our sales organizations, we are selecting specific accounts based on these criteria: (Chart 61)

The size of the customer

Its financial strength

Its growth

Whether it is expanding or contracting

Its technology and is our equipment adequate to supply
the customers requirements

Geography - Is the customer remote or is it located in an
area where there are either present or potential
General Electric computers to serve as backup
and also which would result in a lowering of our
product service costs

The degree to which competition is entrenched and the proba-
bility of successful entry by General Electric, and
General Electric's strengths. Those unique capabilities which
we have as a Company and can be focused on a specific
customer.

Specific Customers

From this selection process, we have chosen a number of customers, some of which I would like to review with you now.

(Charts 62, 63, 64, 65, 66, 67, and 68)

Order Picture

(Chart 69) The actual 1963 Orders Received was \$64 million and the budget for 1964, 1965, and 1969 is as shown here. The results through May, 1964 show a ratio to budget of 102%.

VII. CONCLUDING REMARKS BY H. VAN AKEN

Summarizing our discussion today, I would like to emphasize these points:

1. For the first time, we have competitive products available to serve a fairly substantial portion of the total industry.
2. However, with change in technology and concepts of use, we must design new processors for the market, and make available either through design or vendor purchase, many needed terminal and storage devices.
3. It is evident that my colleagues are optimistic and full of confidence about the future. Well I'm optimistic also, but all of us in the Computer Department realize we have a tough job ahead of us and we realize the risks are great. The next three or four years will be tough competitive years with about 5 major manufacturers, in my opinion, falling by the wayside, leaving only three or possibly four in the field.

4. To gain growth with profit, we shall need to tap all the resources of the Company, particularly manpower; we have asked for considerable help in the past year, and we shall be asking for more in the future; and I would like to say it is gratifying to see the response we get when we ask for Services and Operations help.
5. Last in my opinion, it is time for the Computer Department to move. For the first time we are in a position to move. We have the products and because of new industry product designs and new concepts of use, the user must in the next 2 - 4 years change out his equipment with all new computer programs. This is an opportunity for us.
6. Therefore, what we do in the market place in the next 2 years is all important. I'm convinced that our success is now dependent on the abilities of our Marketing organization; and therefore, we are taking definite action to expand and upgrade our whole Marketing and Sales organizations.

This completes our prepared presentation. Are there any additional questions?

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- #2 Industry Characteristics
- #3 G-E Participation In The Information Processing Business
- #4 Domestic and Offshore Computer Business 1958-1974
- #5 Summary of Areas Of Growth
- #6 Life Span Of Typical Computer Program - Net Income
- #7 Design Costs To Develop A Computer System
- #8 Time To Develop New Computer Products
- #9 Cost Of Doing Business - Present - "If Sold"
- #10 Time Already Invested / To Get Acceptance In Served Industries
- #11 Investment In Marketing People
- #12 Effect On 1964 Of Accelerating 400 Line
- #13 Trend Away From Batch Processing
- #14 Direct Access Systems
- #15 Reasons For The Change
- #16 1965-1974 Projects For Batch Systems, Direct Access Systems
And Remote Terminals
- #17 Direct Access Projects
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- #20 IBM Announcement System/360
- #21 System/360 Organization
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- #25 Price Performance Comparison Of Central Processors
For Scientific Applications
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- #36 Other 1963 Accomplishments
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- #39 Projected Industry Growth and Served Market 1964-1974
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- #46 Alternate Plans A, B & C - Capital Requirements
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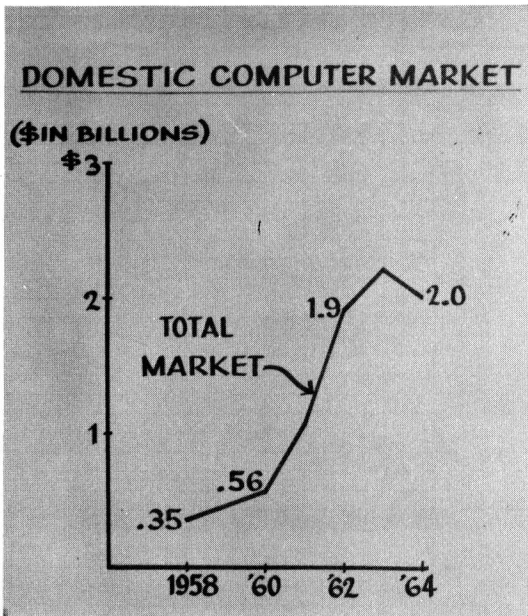


Chart 1

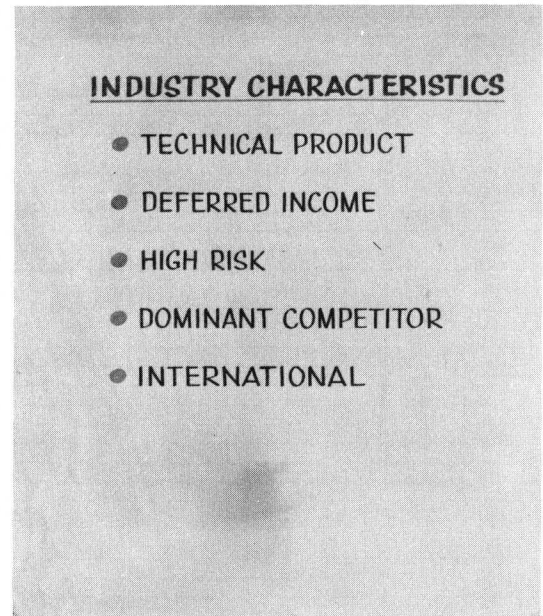


Chart 2

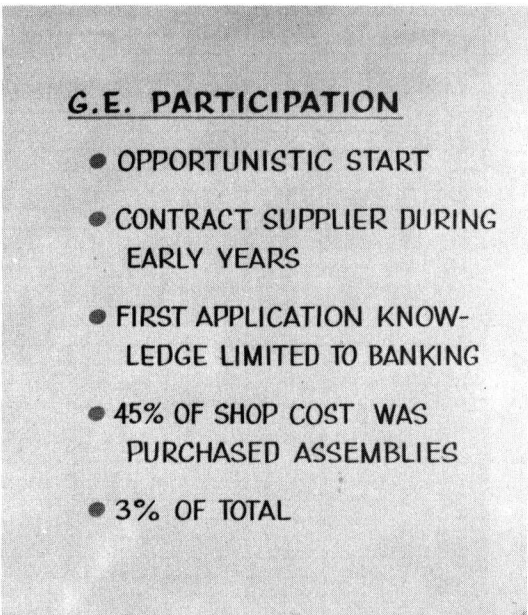


Chart 3

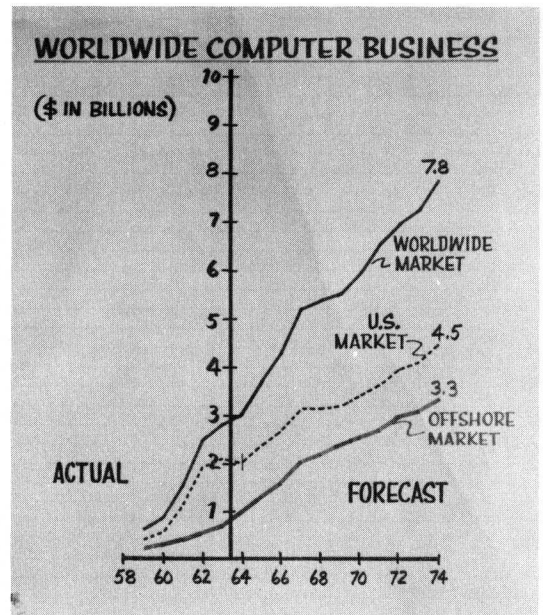


Chart 4

AREAS OF GROWTH

- **ADDITIONAL APPLICATIONS**
- **NEW "CONCEPTS OF USE"**
 - MORE COMMUNICATING ABILITY
 - REMOTE TERMINAL DEVICES
- **MORE PERFORMANCE PER DOLLAR**

Chart 5

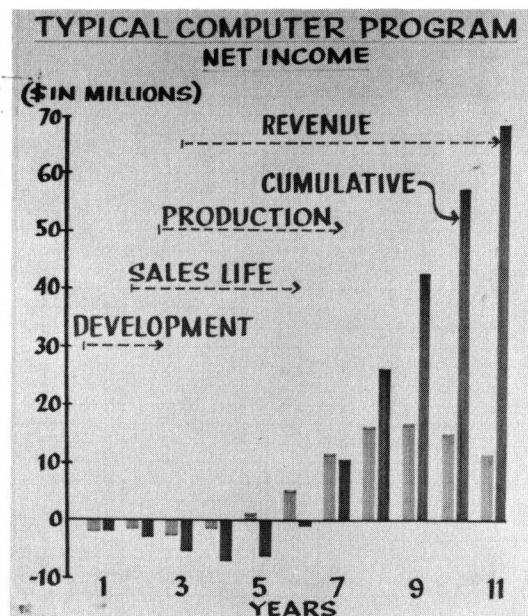


Chart 6

COST TO DEVELOP A SYSTEM

COST TO DEVELOP CENTRAL PROCESSOR

| | | |
|-------------|------|---------|
| DESIGN | \$6 | MILLION |
| PROGRAMMING | 3 | |
| OTHER | 1 | |
| | \$10 | MILLION |

COST OF TOTAL SYSTEM \$20 MILLION

PERCENT OF EXPECTED NET SALES BILLED (IF SOLD) 11%

Chart 7

TIME TO DEVELOP NEW PRODUCTS

| | YEARS |
|--|-------|
| ● NEW PRODUCT LINE | 3-4 |
| ● LOW COST CENTRAL PROCESSOR (WITHOUT PERIPHERALS) | 2 |
| ● LARGE MASS STORAGE DEVICE | 4-5 |
| ● OTHER PERIPHERAL EQUIPMENT | 2-3 |

Chart 8

COST OF DOING BUSINESS

| | <u>1964</u> | <u>1969</u> |
|-------------------------|-------------|-------------|
| SHOP | | |
| % TO "HARDWARE" OUTPUT | 44% | 39% |
| ENGINEERING | | |
| % TO IF SOLD VALUE | 19% | 8% |
| MARKETING | | |
| % TO O.R. | 16% | 11% |
| PRODUCT SERVICE | | |
| % TO SYSTEMS MAINTAINED | 35% | 20% |

Chart 9

SERVED INDUSTRIES AND MARKETS

| | <u>TIME ALREADY INVESTED</u> |
|----------------------------------|--------------------------------|
| INDUSTRIAL | 3 YEARS |
| TRANSPORTATION | 2 " |
| BANKING | 5 " |
| FEDERAL GOV'T. | 2 " |
| | <u>TIME TO GAIN ACCEPTANCE</u> |
| MEDICAL SERVICES AND RESEARCH | 2 YEARS |
| INSURANCE | 2 " |
| EDUCATION | 2 " |
| RETAIL | 3 " |

Chart 10

INVESTMENT IN PEOPLE
MARKETING ONLY

| | |
|-------------------------|----------------|
| RECRUIT, HIRE, TRANSFER | \$2100 PER MAN |
| TRAINING | \$7700 PER MAN |
| ADDITIONS IN 1964 | 300 |
| TOTAL COST | \$2,940,000 |
| LEAD TIME | 9 MONTHS |

Chart 11

400 LINE
ACCELERATED PROGRAM
EFFECT ON 1964

- INCREASED OUTPUT
 - LAST QUARTER 1964-13 UNITS
 - FIRST QUARTER 1965-27 UNITS
- ADDITIONAL PERSONNEL-MARKETING 30
 PRODUCT SERVICE 67
 MANUFACTURING 200
- ADDITIONAL EXPENSE \$1,290 K

Chart 12

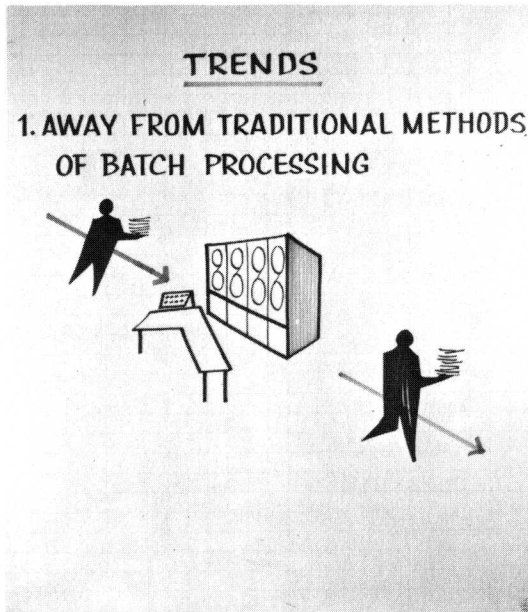


Chart 13

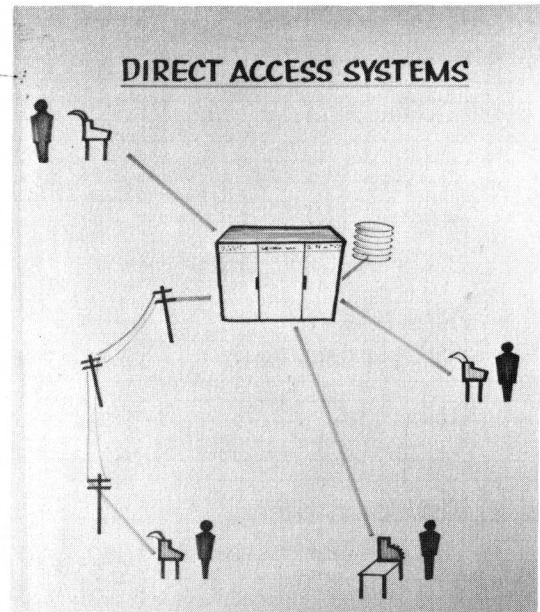


Chart 14

- REASONS FOR THE CHANGE**
- BETTER PROCESSORS
 - MASS RANDOM ACCESS STORAGE
 - DATA COMMUNICATIONS
 - REMOTE TERMINALS
 - GROWING SOPHISTICATION
 - NEEDS OF SERVICE BUSINESSES

Chart 15

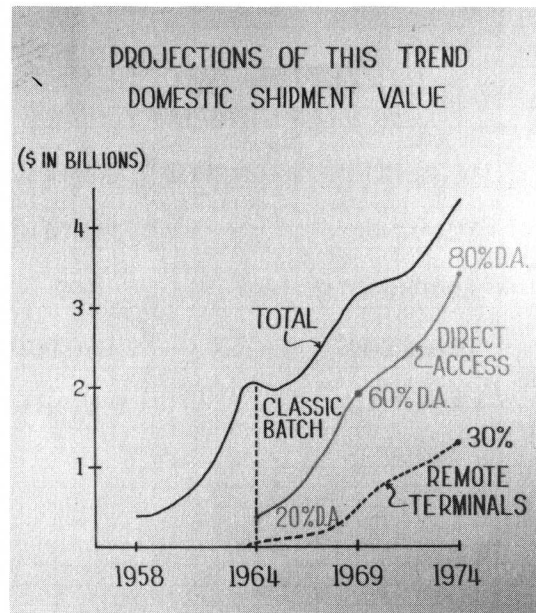


Chart 16

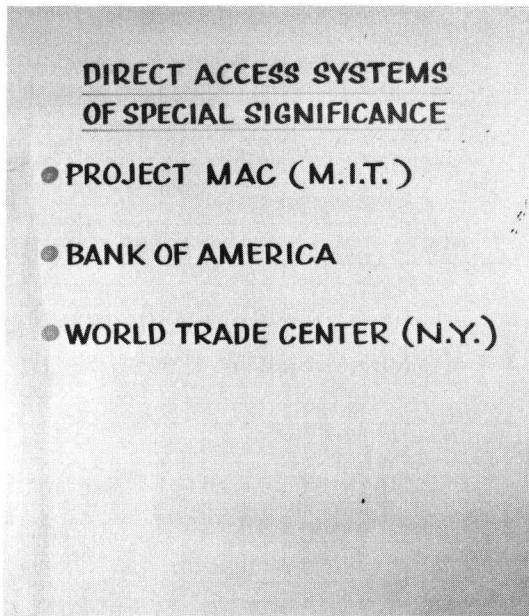


Chart 17

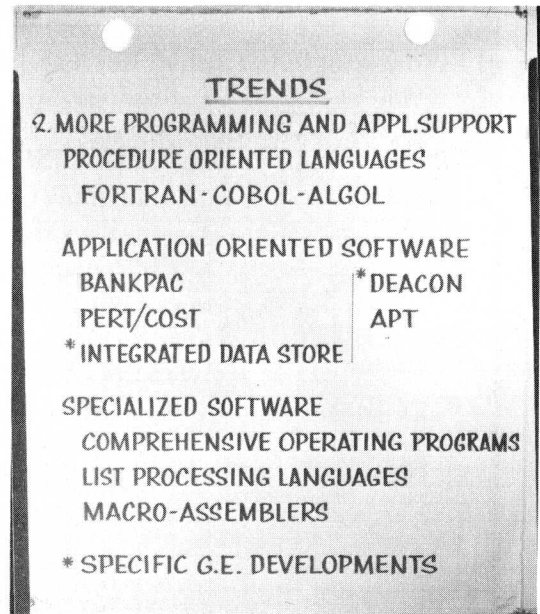


Chart 18



Chart 19

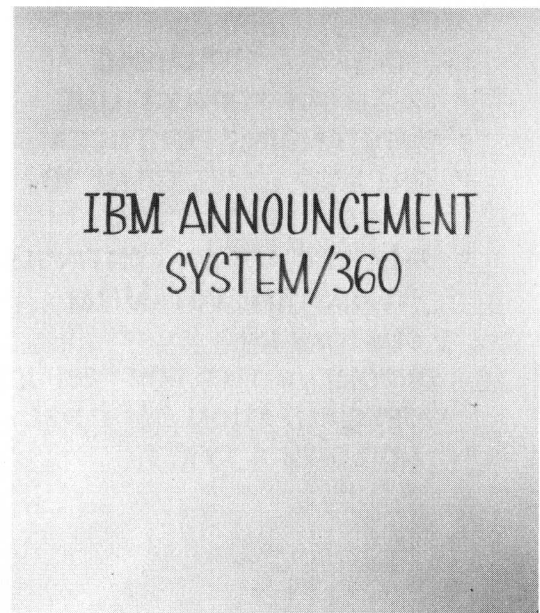


Chart 20

SYSTEM/360 ORGANIZATION

| MEMORY SIZE | MODEL NUMBER | | | | | | | | | |
|---|--------------|------|------|-------|-------|-------|-------|-------|--------|--------|
| | 10* | 20* | 30 | 40 | 50 | 60 | 62 | 70 | 80* | 90* |
| 1K | X | | | | | | | | | |
| 2K | X | X | | | | | | | | |
| 4K | X | X | | | | | | | | |
| 8K | | X | X | | | | | | | |
| 16K | | X | X | X | | | | | | |
| 32K | | | X | X | X | | | | | |
| 64K | | | X | X | X | X | | | | |
| 128K | | | | X | X | X | X | | | |
| 256K | | | | X | X | X | X | X | | |
| 512K | | | | | | | | | X | |
| 1024K | | | | | | | | | X | X |
| MEMORY CYCLE PER CHARACTER (micro sec.) | 2000 | | | 1250 | 500 | 250 | 125 | 125 | 60 | 30 |
| TYPICAL MONTHLY LEASE PRICE (\$K) | \$1K | \$4K | \$8K | \$12K | \$20K | \$40K | \$60K | \$80K | \$100K | \$150K |

* UNANNOUNCED BUT ANTICIPATED

Chart 21

360 FEATURES - DIRECT ACCESS

- PROGRAM COMPATIBILITY
- DATA PROCESSING AND SCIENTIFIC CAPABILITIES
- DATA COMMUNICATIONS CAPABILITIES
- PROCESS CONTROL CAPABILITIES
- OUTSTANDING M.R.A. STORAGE

| | |
|-------------------------------|-------------------------|
| LARGE CORE DRUM DISCPAK | LARGE DISC DATA CELL |
|-------------------------------|-------------------------|
- VARIETY OF REMOTE TERMINALS

| | |
|---|--|
| DISPLAYS FACTORY DATA COLLECTION BANKING AIRLINE RESERVATION | |
|---|--|

Chart 22

360-OVERALL APPRAISAL

- EXCELLENT PRODUCT LINE
- OUTSTANDING PERIPHERALS
- WILL ACCELERATE TREND TOWARD DIRECT ACCESS
- DELAYING ACTION CONTINUES TO IRRITATE POTENTIAL CUSTOMERS
- OPPORTUNITIES FOR PRODUCT SPECIALIZATION (*ala CDC*) NO LONGER EXIST

Chart 23

A KEY FACT :

IBM HAS LOWERED THE PRICE UMBRELLA UNDER WHICH COMPETITION HAS FOUND SHELTER IN THE PAST

SURVIVORS IN THE BUSINESS WILL BE THOSE WHO CAN MEET THE CHALLENGE—

- SHORT TERM CHALLENGE—
SELL AGAINST IBM WITHOUT THE TRADITIONAL PRICE/PERFORMANCE ADVANTAGE
- LONG TERM CHALLENGE—
APPROACH IBM'S COST LEVELS IN MANUFACTURING AND PRODUCT SERVICE

Chart 24

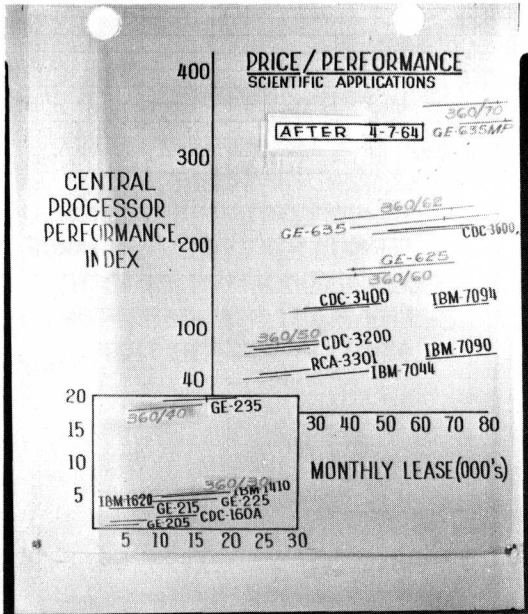


Chart 25

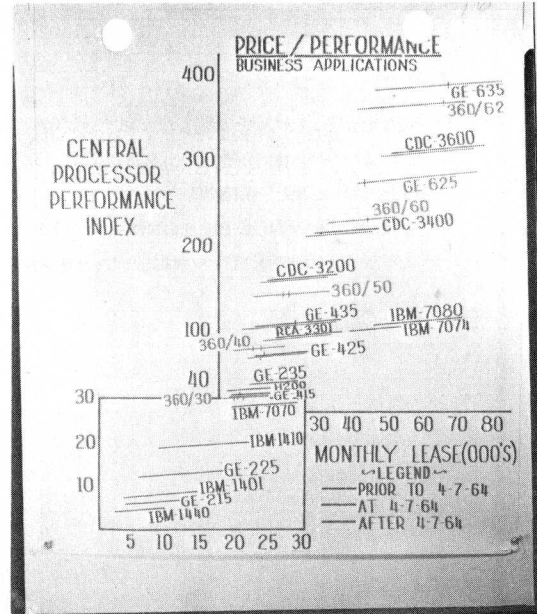


Chart 26

COMPETITIVE FUTURES

SPERRY RAND(8% OF MKT., 18,000 EMPLOYEES)

- MUST INTRODUCE NEW EQUIPT.
- CONTINUE EMPHASIS ON MILITARY
- FUTURE DEPENDS ON RESOLVING INTERNAL PROBLEMS AND STRENGTHENING MARKETING

Chart 27

CONTROL DATA(3.5% OF MKT., 5000 EMPL.)

- STRENGTHEN EXISTING EQUIPMENT
- CONTINUE TO EMPHASIZE SCIENTIFIC
- ENTER DATA PROCESSING MKT.
- FUTURE DEPENDS ON ABILITY TO SELL IN FACE OF FIRST REAL IBM COMPETITION AND ON ABILITY TO BECOME A SUCCESSFUL LARGE CORPORATION

Chart 28

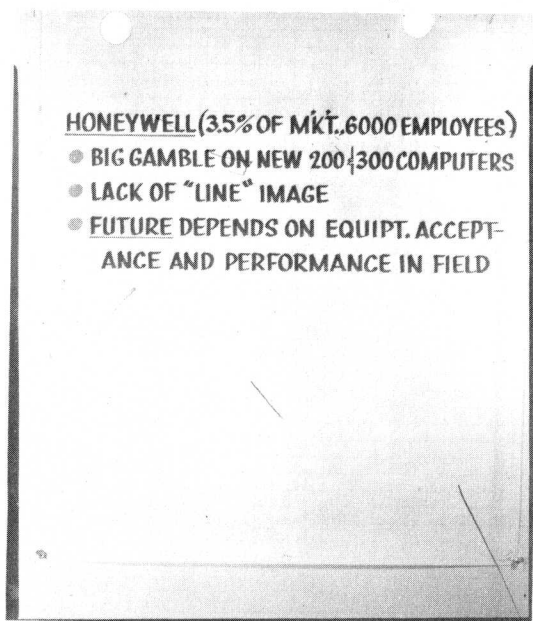


Chart 29

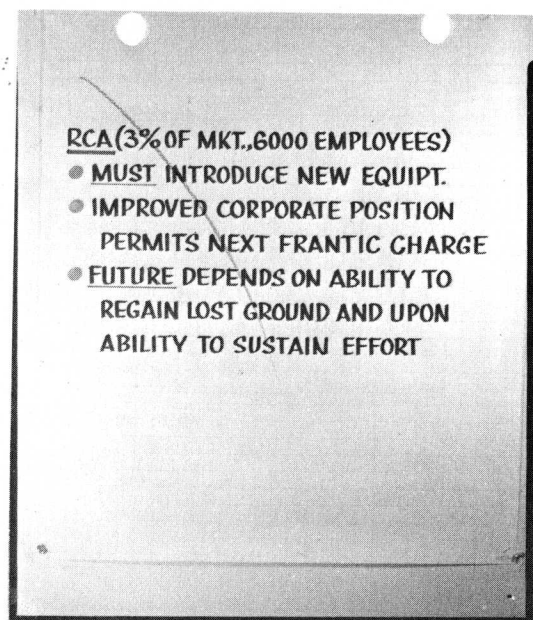


Chart 30

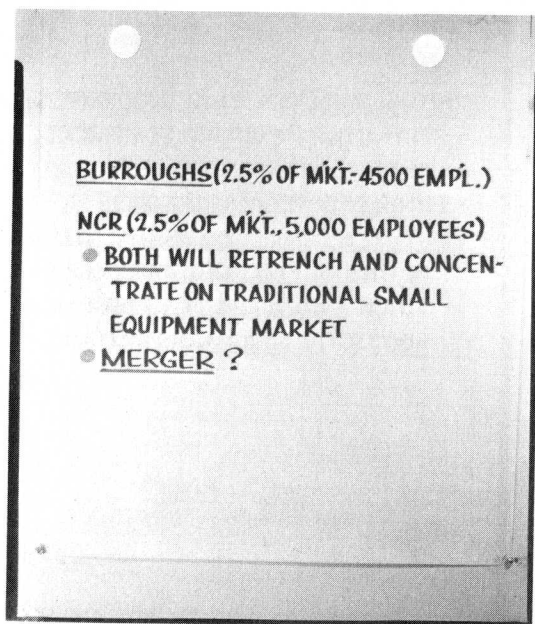


Chart 31

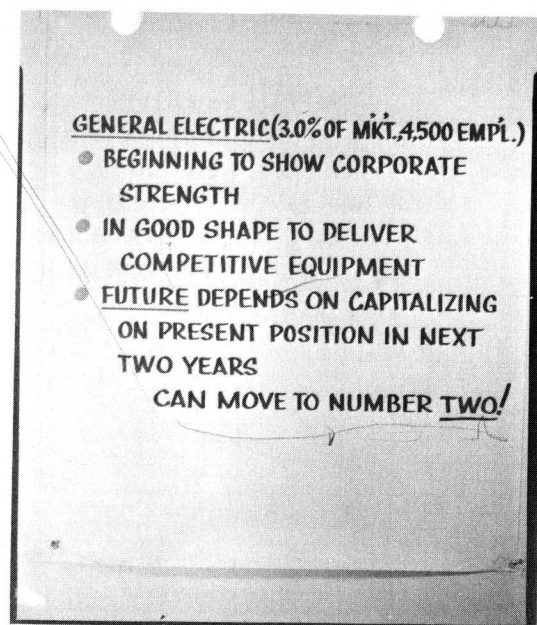


Chart 32

| <u>1963 PROBLEMS</u> |
|-----------------------------|
| ● IMPROVED PERFORMANCE |
| ● IMPROVED PRODUCT COVERAGE |

Chart 33

| <u>IMPROVED PERFORMANCE OF EQUIPMENT ALREADY IN THE FIELD</u> |
|---|
| ● DOCUMENT HANDLERS - CHARACTER READER ENDORSER |
| ● PRINTERS |
| ● CARD READERS |
| ● DISC STORAGE UNITS |
| ● PRODUCT SERVICE |

Chart 34

| <u>IMPROVED PRODUCT COVERAGE</u> | | |
|-------------------------------------|------------------|--------------------|
| | 1963 SCHEDULE | ACTUAL DELIVERY |
| GE-235 (UPGRADE OF 225) - | 8/64 | 4/64 |
| G1 (400 SERIES) - | 5/64 | 5/64 |
| G2 (455 SERIES) - | 8/65 | O.K. |
| Q2 (600 SERIES) - | 12/64 | O.K. |
| HIGH PERFORMANCE - TAPE HANDLERS | 12/64 | O.K. |
| LOW COST TAPE - HANDLERS | 8/65 | 2/65 |

Chart 35

| <u>OTHER ACCOMPLISHMENTS</u> |
|----------------------------------|
| ● UPGRADING OF PERSONNEL |
| ● INCREASED PRODUCTIVITY |
| ● IMPROVED MORALE/COMMUNICATIONS |

Chart 36

| <u>1963 PERFORMANCE</u> | | | |
|-------------------------|------------|--------|--------|
| (\$ IN MILLIONS) | JULY, 1963 | 1963 | 1964 |
| | FORECAST | ACTUAL | BUDGET |
| ORDERS RECEIVED | \$ 76 | \$ 74 | \$ 108 |
| SALES BILLED | 40 | 41 | 50 |
| NET LOSS | (11.9) | (12.2) | (14.7) |

Chart 37

| <u>1964 PERFORMANCE</u> (FIRST 5 MONTHS) | | |
|---|---------|---------|
| (\$ IN MILLIONS) | 1964 | 1964 |
| | ACTUAL | BUDGET |
| ORDERS RECEIVED | \$ 42.8 | \$ 42.0 |
| SALES BILLED | 19.8 | 18.6 |
| NET LOSS | (\$5.2) | (\$6.3) |

Chart 38

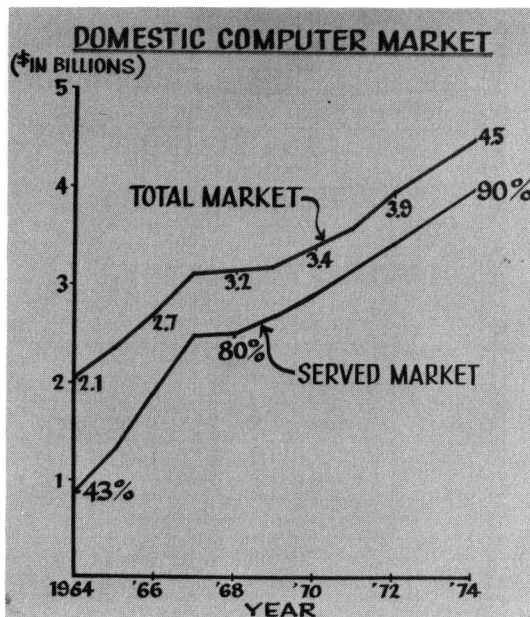


Chart 39

- PRODUCT NEEDS
- WIDE LINE OF MASS STORAGE DEVICES
 - REMOTE TERMINALS FOR VARIOUS APPLICATIONS
 - MORE DIRECT ACCESS APPEAL FOR 400 LINE
 - WIDEN THE 600 LINE APPEAL
 - NEXT GENERATION COMPUTER LINE BY 1968
 - COMPANY LABORATORY SUPPORT

Chart 40

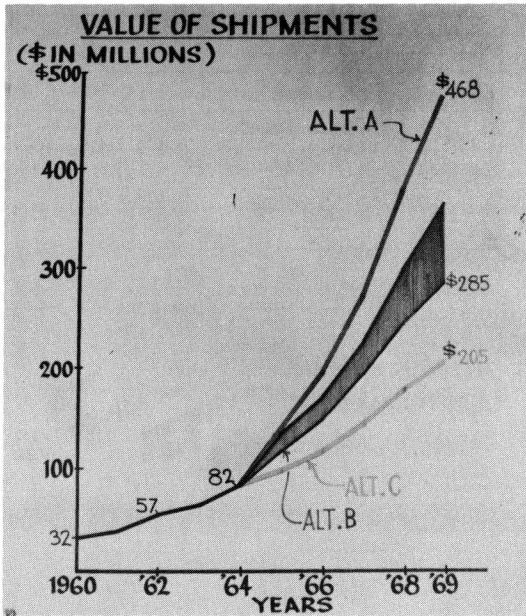


Chart 41

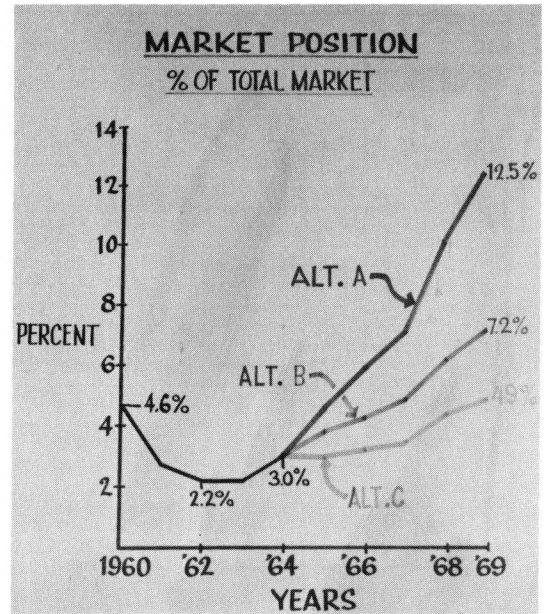


Chart 42

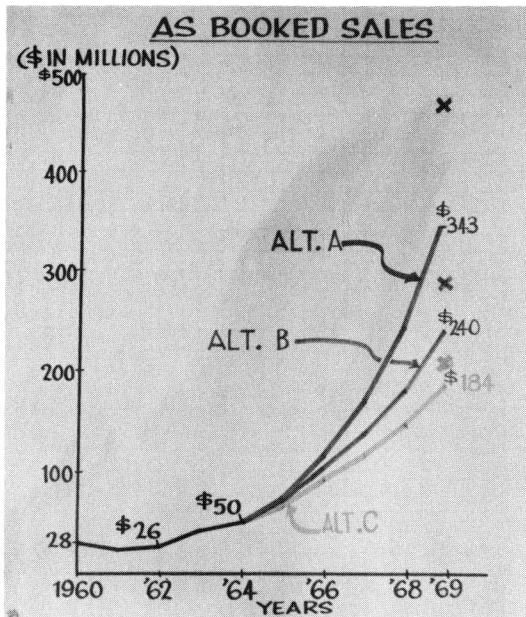


Chart 43

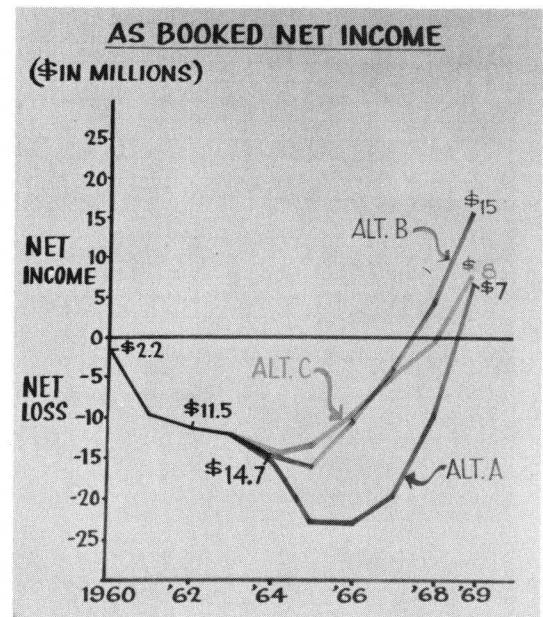


Chart 44

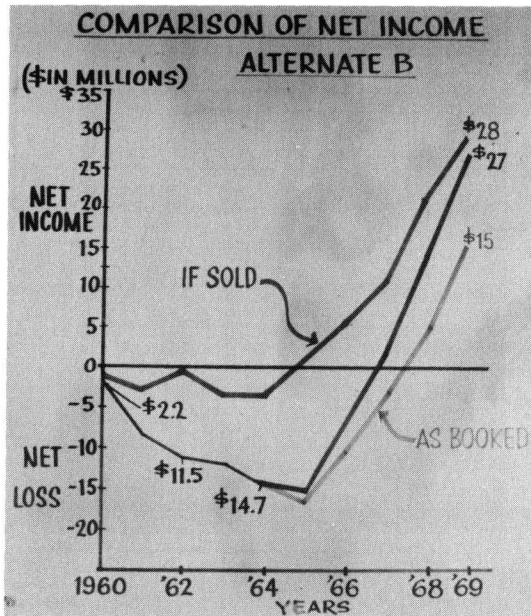


Chart 45

CAPITAL REQUIREMENTS

(\$ IN MILLIONS)

| PERIOD | ALTERNATE A | ALTERNATE B | ALTERNATE C |
|--|--------------|---------------|---------------|
| CUMULATIVE THROUGH 1963 | 90 | 90 | 90 |
| 1964 — 1969 | 406 | 220 | 147 |
| TOTAL AT 12/31/69 | <u>496</u> | <u>\$ 310</u> | <u>\$ 237</u> |
| AVERAGE ANNUAL ADDITIONAL INVESTMENT 1964-1969 | <u>\$ 68</u> | <u>\$ 37</u> | <u>\$ 25</u> |

Chart 46

INVESTMENT AT 12/31/69

(\$ IN MILLIONS)

| | ALTERNATE A | ALTERNATE B | ALTERNATE C |
|-------------------------------|---------------|---------------|---------------|
| CUMULATIVE LOSS | \$ 126 | \$ 69 | \$ 77 |
| EQUIPMENT LEASED TO CUSTOMERS | 204 | 132 | 86 |
| ALL OTHER | <u>166</u> | <u>109</u> | <u>74</u> |
| | <u>\$ 496</u> | <u>\$ 310</u> | <u>\$ 237</u> |

Chart 47

TOTAL AVERAGE NUMBER OF EMPLOYEES

| PERIOD | ALTERNATE A | ALTERNATE B | ALTERNATE C |
|--------|-------------|-------------|-------------|
| 1964 | 5261 | 5138 | 5131 |
| 1965 | 7471 | 6389 | 5739 |
| 1966 | 9,395 | 7,150 | 6384 |
| 1969 | 16,994 | 11,201 | 9,132 |

Chart 48

| FIELD PERSONNEL | | | | | | |
|--|--------------------|-----------|--------------------|-----------|--------------------|-----------|
| SALESMEN-APPLICATION ENG. PRODUCT SERV. | | | | | | |
| PERIOD | ALTERNATE A | | ALTERNATE B | | ALTERNATE C | |
| | NUMBER | V% | NUMBER | V% | NUMBER | V% |
| 1964 | 802 | 37% | 802 | 37% | 802 | 37% |
| 1965 | 1425 | 78 | 1151 | 44 | 942 | 17 |
| 1966 | 2214 | 55 | 1381 | 20 | 1150 | 22 |
| 1969 | 4751 | - | 2565 | - | 1890 | - |

Chart 49

| ALTERNATE C | | |
|--------------------------------------|-------------|-------------|
| (\$ IN MILLIONS) | | |
| | 1964 | 1969 |
| VALUE OF SHIPMENTS | \$ 82 | \$ 205 |
| MARKET POSITION | 3.0% | 4.9% |
| CAPITAL REQ'D. AT END OF PER. | \$ 129 | \$ 237 |

KEY FACTORS

1. NEW MARKET PENETRATION
2. HIGHER FIXED COSTS
3. HIGHER PRODUCTIVITY-LOWER TRG. COST
4. MARKET POSITION

Chart 50

| ALTERNATE A | | |
|--------------------------------------|-------------|-------------|
| (\$ IN MILLIONS) | | |
| | 1964 | 1969 |
| VALUE OF SHIPMENTS | \$ 82 | \$ 468 |
| MARKET POSITION | 3.0% | 12.5% |
| CAPITAL REQ'D. AT END OF PER. | \$ 133 | \$ 496 |

KEY FACTORS

1. PEOPLE
2. EXPERIENCE AND IMAGE IN THE MKT. PLACE
3. PRODUCTS
4. COMPETITION
5. CASH REQUIREMENTS

Chart 51

| ALTERNATE B | | |
|--|-------------|-------------|
| (\$ IN MILLIONS) | | |
| | 1964 | 1969 |
| VALUE OF SHIPMENTS - | \$ 82 | \$ 285 |
| MARKET POSITION - | 3.0% | 7.2% |
| CAPITAL REQUIRED AT END OF PERIOD - | \$ 129 | \$ 310 |

Chart 52

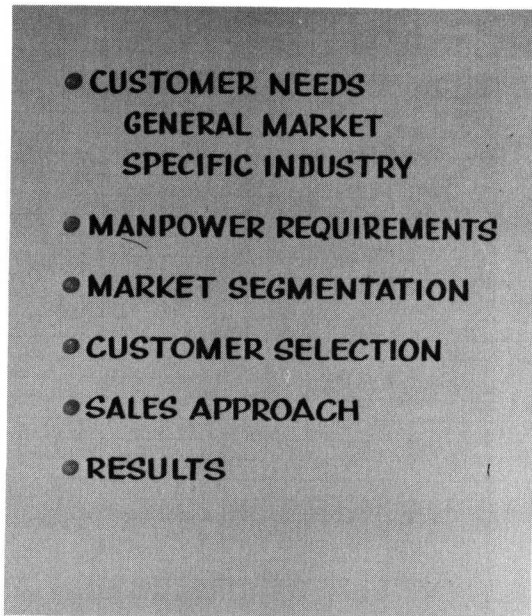


Chart 53

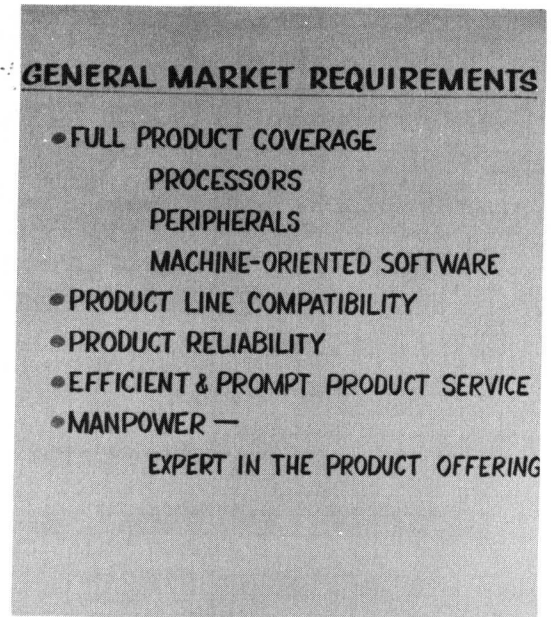


Chart 54

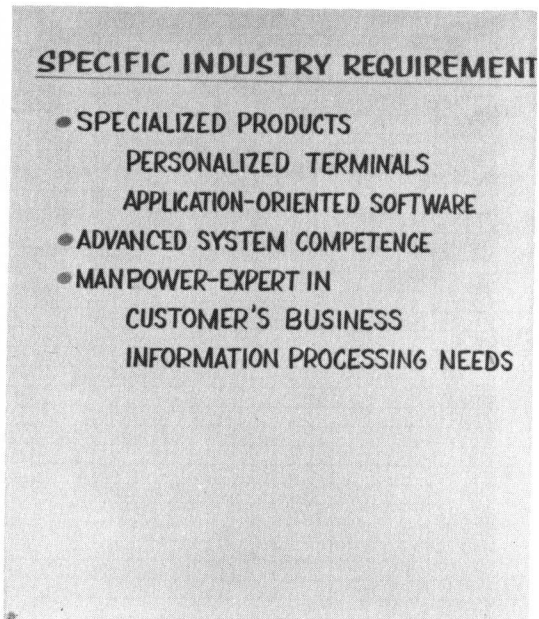


Chart 55

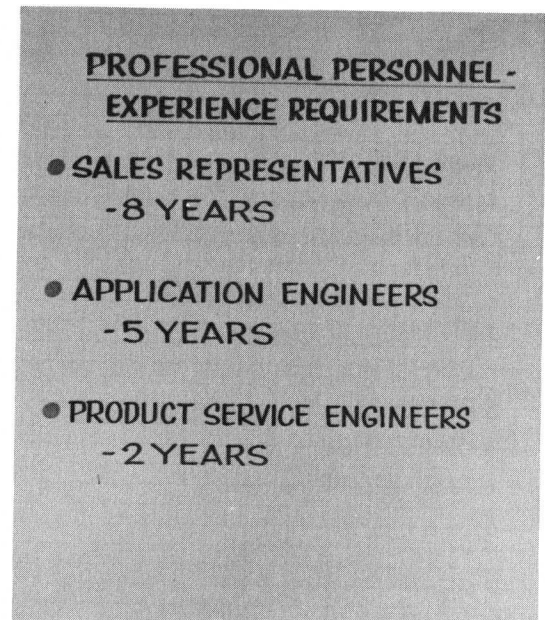


Chart 56

| PROFESSIONAL PERSONNEL | | | | | |
|-------------------------------|------|----------|--------|------|------|
| QUANTITY REQUIREMENTS | | | | | |
| | 1963 | 1964 | 1964 | 1965 | 1969 |
| | | BUDGETED | ACTUAL | | |
| SALES | 80 | 103 | 74 | 156 | 396 |
| APPL. ENGRS. | 168 | 191 | 166 | 333 | 713 |
| PROD. SERV. | 664 | 772 | 690 | 972 | 2110 |

SOURCE

- OPEN MARKET
- EDUCATIONAL INSTITUTIONS
- GENERAL ELECTRIC

Chart 57

| MANPOWER DEVELOPMENT | | TOTAL |
|---------------------------------------|--|------------|
| SALES REP. DEVELOPMENT PROGRAM | | 33 COURSES |
| GE-200 LINE HARDWARE | | |
| GE-400 LINE SOFTWARE | | |
| BASIC FINANCE AND COST ACCOUNTING | | |
| MFG. INDUSTRIES SYSTEMS | | |
| CONTRACTS AND LEASES | | |
| TABSOI | | |
| ASSEMBLY LINE BALANCING | | |
| APPLICATION ENG. DEV. PROGRAM | | 55 COURSES |
| GENERAL ASSEMBLY PROGRAM | | |
| GEGOM | | |
| OPERATOR'S COURSE | | |
| COBOL | | |
| FORTRAN | | |
| TRIM | | |
| CARD PROGRAM GENERATOR | | |
| PRODUCT SERVICE TRG. PROGRAMS | | 47 COURSES |
| CENTRAL PROCESSOR THEORY | | |
| CENTRAL PROCESSOR LABORATORY | | |
| CIRCUIT SETS | | |
| SYSTEMS COURSE | | |
| CUSTOMER SITUATION MANAGEMENT | | |
| DIAGNOSTICS | | |
| DOCUMENT HANDLER | | |

Chart 58

| TOTAL MARKET | | | | |
|-------------------------|-----------------|---------------|--------------|--------------|
| \$ IN MILLIONS | | | | |
| INDUSTRY CLASSIFICATION | TOTAL SHIPMENTS | | GE SHIPMENTS | |
| | 1964 | 1969 | 1964 | 1969 |
| INDUSTRIAL | \$1075 | \$1751 | \$31 | \$148 |
| FINANCIAL | 256 | 299 | 12 | 36 |
| GOVERNMENT | 397 | 596 | 11 | 47 |
| SERVICES | 301 | 554 | 6 | 36 |
| TOTAL | \$2029 | \$3200 | \$60 | \$267 |

Chart 59

| INDUSTRY SEGMENTATION | | |
|------------------------------|---------------|-------------------|
| | SELLING PHASE | DEVELOPMENT PHASE |
| • INDUSTRIAL | | |
| MANUFACTURING | X | |
| AEROSPACE | X | |
| RAILROAD | | X |
| • FINANCIAL | | |
| BANKING | X | |
| INSURANCE | | X |
| • GOVERNMENT | | |
| NASA | X | |
| D.O.D. | | X |
| STATE & LOCAL | | X |
| • SERVICES | | |
| COMMUNICATIONS | X | |
| EDUCATION | | X |

Chart 60

CUSTOMER SELECTION CRITERIA

- SIZE
- FINANCIAL
- GROWTH
- TECHNOLOGY
- GEOGRAPHY
- COMPETITION
- G.E. STRENGTH

Chart 61

U.S. STEEL

- POTENTIAL
 - REPLACEMENT - \$20 M
 - NEW APPLICATIONS - \$30 M
- SITUATION
 - G.E. SALES - \$1.6M
- SALES APPROACH
 - CAPITALIZE ON ELLWOOD SUCCESS
 - OBTAIN ORDER FOR 28 REMAINING
 - PLANT INSTALLATIONS
 - TOP-DOWN SELLING

Chart 62

WEYERHAEUSER

- POTENTIAL
 - REPLACEMENT \$ 4 M
 - NEW APPLICATIONS - \$ 3 M
- SITUATION
 - G.E. SALES - \$ 2.1M
- SALES APPROACH
 - DEMONSTRATE COMPETENCE
 - SELL REMAINING DIVISIONS
 - PROMOTE AS "SHOWPLACE"
 - DIRECT ACCESS INSTALLATION

Chart 63

WESTERN PACIFIC

- POTENTIAL
 - REPLACEMENT - \$.2M
 - NEW APPLICATIONS - \$ 2.0M
- SITUATION
 - G.E. SALES - \$ 1.5M
- SALES APPROACH
 - SUCCESSFUL INSTALLATION OF
 - A RAILROAD - INDUSTRY FIRST
 - UTILIZE SUCCESS STORY TO
 - SELL OTHER RAILROADS

Chart 64

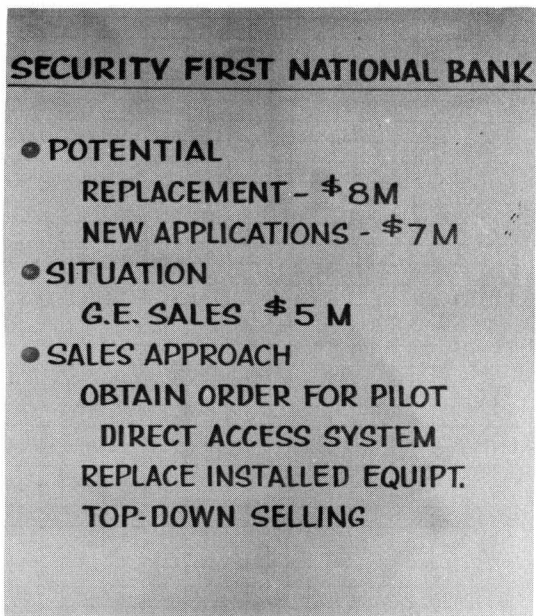


Chart 65



Chart 66

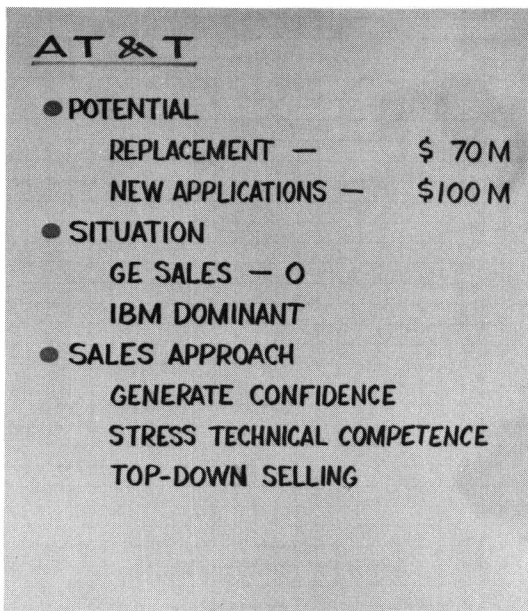


Chart 67

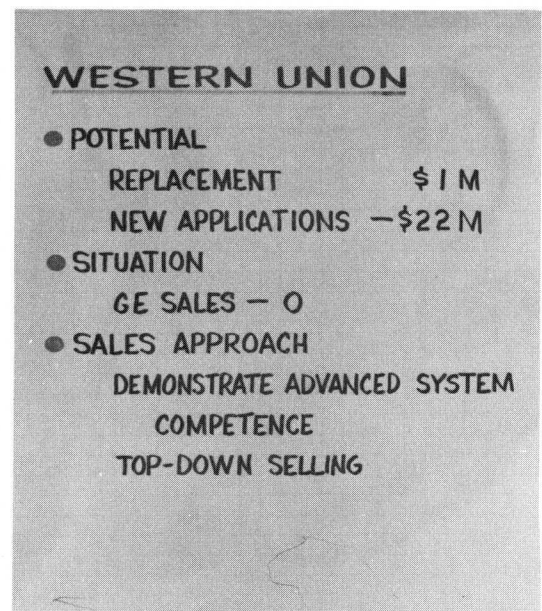


Chart 68

| ORDER PICTURE | |
|---------------------------------|------------------------|
| (\$ IN MILLIONS) | ORDERS RECEIVED |
| 1963 ACTUAL | \$ 64.0 |
| 1964 BUDGET* | 89.0 |
| 1965 BUDGET | 145.0 |
| 1969 BUDGET | 317.0 |
| RESULTS THROUGH MAY 1964 | |
| ACTUAL | \$ 43.0 |
| BUDGET | 42.0 |
| R% | 102% |

Chart 69