A Panel Discussion

The overseas computer market

Chairman:
MILTON C. MAPES, JR., Deputy National Export Expansion Coordinator
U.S. Department of Commerce

Panelists:
DONALD F. ORR, Vice President of International Operations
UNIVAC Division of Sperry Rand Corporation
JAMES G. MILES, Vice President for Marketing Development
Control Data Corporation
NORMAN J. REAM, Director, Center for Computer Sciences and Technology
Bureau of Standards, U.S. Department of Commerce
THEODORE L. THAU, Executive Secretary, Advisory Committee on Export Policy
U.S. Department of Commerce

MR. MILTON C. MAPES, JR.

Our procedure will be to devote the first half of the discussion to presentations by the panelists on various aspects of the overseas marketing problem, and the second half to questions and participation from the floor.

I know many of you are deeply involved in export marketing and the international business aspects of computer sales; in 1965 U.S. computer exports are going to run approximately 400 million dollars. Our imports at the same time are running approximately 60 million dollars. It might be significant to mention that computer exports are up almost 300% from the 1958 figures, only seven years ago. At that time our computer exports totaled only $103 million, as shown in Table 1.

The United States' share of the world computer market is a little difficult to determine. I do have a figure which includes both computing and accounting machines. On this basis the United States has 39% of the total world market in international commerce, followed by West Germany with 14%, the United Kingdom and Italy each with 11%, and France and Sweden with about 9% each. That includes accounting machines, which still comprise a very large part of the market. I suspect that if it were limited to computers alone the U.S. share of the world market would be substantially greater. As to where our computer exports go, I also have some pertinent figures. In 1964 our major cus-

### Table 1. Computers—Exports and Imports (values in millions of dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>Exports</th>
<th>Increase in Exports (percent)</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1958</td>
<td>$103</td>
<td>183</td>
<td>$15</td>
</tr>
<tr>
<td>1963</td>
<td>302</td>
<td>193</td>
<td>57</td>
</tr>
<tr>
<td>1964</td>
<td>369</td>
<td>22.2</td>
<td>57</td>
</tr>
<tr>
<td>1965 (est.)</td>
<td>400</td>
<td>8.4</td>
<td>60</td>
</tr>
<tr>
<td>1966 (est.)</td>
<td>445</td>
<td>11.3</td>
<td>65</td>
</tr>
</tbody>
</table>

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### Table 2. U.S. Exports of Computing and Related Machines (values in millions of dollars)

<table>
<thead>
<tr>
<th>Country</th>
<th>1963</th>
<th>1964</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>63</td>
<td>71</td>
<td>13%</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>35</td>
<td>62</td>
<td>77</td>
</tr>
<tr>
<td>Canada</td>
<td>39</td>
<td>55</td>
<td>41</td>
</tr>
<tr>
<td>France</td>
<td>41</td>
<td>38</td>
<td>-7</td>
</tr>
<tr>
<td>West Germany</td>
<td>38</td>
<td>28</td>
<td>-26</td>
</tr>
<tr>
<td>Australia</td>
<td>5</td>
<td>20</td>
<td>300</td>
</tr>
<tr>
<td>Italy</td>
<td>8</td>
<td>11</td>
<td>38</td>
</tr>
<tr>
<td>Switzerland</td>
<td>8</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Sweden</td>
<td>6</td>
<td>7</td>
<td>17</td>
</tr>
<tr>
<td>Other countries</td>
<td>59</td>
<td>68</td>
<td>15</td>
</tr>
</tbody>
</table>

**Source:** Bureau of the Census.
second major customer was the United Kingdom with 17%, and the third was Canada with 15%. The worldwide distribution of these exports for 1963 and 1964 is shown in Table 2.

I'd like to emphasize that the potential for growth of this market in the future is tremendous. For example, the total market for computers in Europe in 1965 is estimated to be about $450 million; by 1970 it is expected to be in excess of $1.5 billion. Our problem is how to penetrate that market most effectively. The United States, if it intends to maintain anything like its present share of the export market, is going to have to get out into the world market more than ever before. The tendency in the U.S. is to concentrate on developing the domestic market. There is very little tendency by most businessmen to export. When you talk to businessmen who have 12 to 18 months backlog tied up with orders merely from the United States, you can't interest them in getting into the intricacies and what may appear to them to be strange procedures of export marketing. I think though, that in the gradually growing one-market world which we find coming upon us with increasing speed, the United States businessman is going to have to get out and sell on the main streets of the rest of the world if he is going to compete on the main streets of the United States itself.

I want to discuss briefly the Export Expansion Program in general terms, and then Mr. Orr will present an introduction to the export of computers. We have had serious balance of payments problems, as you have probably read, consisting of a deficit in our balance of payments. Every year since 1950, except one, we've had a deficit in our international financial account. Since 1958 our gold reserve has dropped off from more than $22 billion to less than $14 billion at the present time. This is particularly significant because the dollar is the primary monetary unit in international exchange, and since that is backed up by the Fort Knox gold hoard, if that becomes substantially lower, or if there should be a lack of confidence in the dollar and willingness by foreign nations to hold the dollar as backing for their currency as we hold gold, it could result in an international monetary crisis and a serious collapse of the entire international financial structure. So we have inaugurated a voluntary program limiting overseas investments by U.S. corporations, which has been a subject of considerable discussion. We have also had a voluntary program administered by the Federal Reserve Board to limit all foreign lending this year to 105% of the total of all loans outstanding at the end of last year.

Then we have the National Export Expansion Program, in all its aspects. First, we have the services of the Bureau of International Commerce in the Commerce Department. I am running through these because I think many of you may not know what services are available to you in the international market directly from the Commerce Department. The Bureau of International Commerce has programs carried out by its offices of International Trade Promotion, International Region Economics, International Investment, and Commercial and Financial Policy. We have permanent trade centers in six major cities around the world. These are permanent exhibits of U.S. products and are always available for foreign buyers and businessmen who want to learn what is available from the U.S. Those trade centers are in London, Tokyo, Milan, Frankfurt, Bangkok, and, for the first time this year, in Stockholm. We also have business information centers all over the world and U.S. foreign service commercial officers. There are presently 156 commercial officers with the U.S. Foreign Service, and their work is coordinated by the Commerce Department. Their function is to service American business overseas. We have increased the budget during the last three or four years for trade fairs and trade shows and the Commerce Department has promoted U.S. commercial exhibits. We have trade missions, consisting of United States businessmen, which go over with Commerce assistance. They represent the entire United States business community for their own specialty and arrange for agency relationships, overseas branches, licensing agreements and even initiate negotiations for joint ventures. These businessmen do not represent only themselves. They represent a broad sweep of the firms involved in their line of business. These trade missions have been extremely successful in establishing relationships and doing business for U.S. firms overseas.

We have in the United States 42 field offices of the Department of Commerce. I would urge any of you who are interested in getting into the international trading community and have not done so, that your first point of contact should be the field office nearest your home base. It can supply you with information, printed material and very genuine technical know-how on how to trade overseas.

We also have 42 Regional Export Expansion Councils, which are composed of local businessmen in each of the regions served by the Field Office. They have an operation whose purpose is to increase the participation of businessmen in foreign trade. The name of it is Operation 10,000—the object being to get 10,000 additional businesses into the overseas market. In addition
we have the National Export Expansion Council which is composed of top level businessmen from all over the country. It recently appointed three action groups. In the last two months these groups have been studying specific problems—one doing export financing, one studying ocean freight rates, and the third working on tax incentives for export.

The Export Expansion Program is largely not subject to being programmed in the electronic sense. One major exception to this was recently acknowledged, when the Business and Defense Services Administration in the Commerce Department established a computer program to bring together overseas trade opportunities and the export capacity of United States firms. Approximately 50,000 U.S. manufacturers are now registered for this program. The idea is that as trade opportunities come in from overseas they will be mailed to those equipped to handle international trade. Perhaps much more will be and can be done in the line of automating and programming the export effort. At this time not very much has been done.

I ran across an interesting quotation the other day by Dr. Herbert Simon in his book on automation discussing the problem of the general problem solver. He stated: “Problem solving proceeds by erecting goals, detecting differences between present situation and goal, finding in memory or by search tools or processes that are relevant to reducing differences of these particular kinds, and applying these tools or processes. Each problem generates sub-problems until we find a sub-problem we can solve—for which we already have a program stored in memory. We proceed until, by successive solution of such sub-problems, we eventually achieve our overall goal—or give up.”

Our overall goal here is to increase our overseas sales of computer materials. Fortunately we can break this up into sub-problems by areas and types. This panel has been designed primarily to do this.

With that introduction, I want to introduce Mr. Donald F. Orr, Vice President for International Operations of Univac Division of Sperry Rand Corporation. Mr. Orr is in charge of all the Division’s international operations (engineering, marketing, and manufacturing) overseas. He has been in New York for the past five years. His previous 13 years were spent overseas with Sperry Rand and its predecessors. He is a graduate of the George Washington University School of Foreign Service. His subject is going to be “A General Introduction to Computer Marketing Overseas” with emphasis on Europe, both East and West, and the developing countries. Mr. Orr will also discuss some specific problems relating to the import of computers.

MR. DONALD F. ORR

During the past 13 years, the number of computers in the world has grown from a few to over 35,000 systems. In Japan and Europe alone some 7,800 computers are in use today, representing a value of $1.3 billion. This market is growing at the rate of about 20% a year, and it is expected that more than 22,500 computers will be in use in this area by 1971, representing a purchase value of over $4 billion.

The steady growth of the European market should bring it to about the same level as the United States within another decade. This is on top of the fact that because of the traditionally lower labor costs in these markets, the economic savings that a computer installation offers a businessman are not quite as easily justified as in the United States. Therefore, as a general rule I have found among European and Japanese users a relatively high degree of sophistication in the use and application of their computers.

If anything inhibits the growth of the computer market in Europe, it will be the shortage of qualified programmers and operators. At this time there is a need for 120,000 people with computer knowledge, and by 1971 this demand is expected to rise to 300,000. The U.S. computer manufacturer will face increasing competition from the local manufacturers in a growing number of the foreign countries where we are now selling our products. These competitors have indeed mastered the art of building computers and in some cases their technological designs are in advance of our own. To be competitive we must be fully knowledgeable of the hardware and software needs of these markets and understand the specific requirements of our overseas customers. We should be prepared to build these needs into the products to be shipped to these areas.

While export shipments of computers from the United States to other countries are higher than ever before, the ability to import computer systems into many of these countries at the same time becomes more challenging as time goes by. The changing tariff picture in Europe, the emergence of the European Economic Community, restrictions on importations of certain sizes of computers into Japan, are but a few of the factors which obligate the U.S. manufacturer to seek new means of maintaining his share in these markets and to be able to continue to support present customers.

Such steps have brought about a variety of arrangements such as joint ventures and licensing for manufacturers, prevalent in Japan, mergers and partnerships with foreign computer manufacturers, and the establishment and expansion of wholly owned U.S. plants overseas. In many cases such actions appear contrary to the government’s program to improve our own balance of trade as well as correct the present balance of payments deficit through voluntary restraints on new
investments abroad. No one country, or no one company, for that matter, can feel secure that it has a permanent lead in this fast-growing computer industry that is continually being pushed forward by major technological breakthroughs and the demands for its products. Therefore, the U.S. computer manufacturer is obliged to take such action as is necessary to maintain his present position in these markets.

To meet the challenges the overseas markets offer, our industry is continually seeking new ways of financing our export business. In this regard, for example, some provision for financing the leasing overseas of U.S.-manufactured computers would be helpful.

Turning to Eastern Europe for a moment, the lure of large potential markets within the Soviet bloc has been getting increased attention from western manufacturers. While it can be assured the need for computers in these countries may be as great as in Western Europe, in proportion a relatively small number of computers are in use behind the Iron Curtain today. Most of these have either been supplied from Russia or from firms in Western Europe.

Up until now, our own Export Control Act, which classifies computers as strategic goods, has restricted U.S. firms from doing business in Eastern Europe while Western European manufacturers freely export equipment of comparable technological design into these same countries. Perhaps we may hear a little more on this subject from my co-panel member, Ted Thau, later this morning.

Building a computer market for the less developed areas in the world should present us the greatest challenge of all. This area encompasses parts of Central and South America, the Middle East and Africa, and the Far East outside of Japan and Australia, excluding, of course, the Chinese mainland. These markets are indeed far flung on the map. They represent more than 40% of the total world land area with a population of 1.2 billion people. This area has probably the greatest need for computers, but at the same time is the least prepared to use them effectively.

Mr. U. Thant, Secretary-General of the United Nations, has said, and I quote: "The computer is the means by which the developing countries can bootstrap themselves to reach the technological level of the industrialized countries." Almost without exception, each of these areas is caught up in a fast-growing internal economy coupled with the entry into world trade on a competitive basis that is calling for the need for better controls, lower costs, and more efficient ways of conducting business. Electronic information processing techniques, through the use of computers, will play an important role to bridge the gap between their century-old business practices and the modern methods of business administration, control and decision making.

Before this can become a reality however, there must be faced up to and resolved the problem of a severe scarcity, and in some areas an almost complete lack, of qualified people who can be trained to make use of computers in business. In commenting on this, E. Dinah Gibson of the San Diego State College, who has studied the problem, stated that many of these countries are still not even teaching business administration in their universities or other institutions of higher education. This is a "must," he feels, as this is the base on which business data processing must be built. The development of the computer market, therefore, will be limited to quite an extent by the business education background of business executives at all levels until a way can be found to provide this background and ability for them.

The manufacturers are still the original trainers in many of these less developed areas. Several companies have set up training facilities such as in North Africa where customers and prospect personnel may come to be indoctrinated. This is not enough as it does not go far enough. It is my suggestion, therefore, that through our own government and/or U.N. sponsored programs, together with educational bodies of the more developed nations, we join together with the governments and centers of learning in these lesser developed countries to provide a solution to this educational program for training people not only in electronic information processing techniques, but in the basic concepts of business itself. This program would be a big step forward in enabling these countries to make the technological and economic progress that is essential to their citizens' well-being. I am sure that the various computer manufacturers throughout the free world could make a worthwhile contribution in one form or the other through such a program and would be ready to collaborate if called upon.

At the present time it is estimated that there are less than 350 computers in use in the less developed areas about which we have been speaking. These are mostly being used by government agencies and in some universities and by the larger, internationally oriented, foreign-owned companies. This total could well increase by tenfold in the next 10 years, provided skilled personnel are available.

The establishment of adequate sales, support, and service facilities on the part of the manufacturer in the less developed countries is vital if he expects to successfully compete in these markets. This will call for in-
vestments of both money and talent. The volume that could be anticipated from such a market and whether this can be profitably obtained will be an important factor in making any decisions to set up these facilities in the first place. Since we are dealing in areas which may be plagued with unstable currencies, higher rates of borrowing and other requirements such as prior deposits, restrictions on remittances and so forth, a means of sound financing of our computer export sales to these countries is a very important factor.

As a means of sharing part of the risks of doing business in these areas, local distributors may be the answer. They would be fully acquainted with the local market, understand their laws and business customs, and, hopefully, provide the necessary local investment and the financing of resulting sales. Joint ventures, made up of the manufacturers and the local interest, thus assuring the manufacturer of a share in the development of the business as well as overseeing sales and service standards, is still another approach. At Univac we have been successfully operating overseas using a combination of these methods in addition to a substantial number of wholly owned subsidiaries and branches.

Day to day operations are another thing. Underdeveloped and overloaded communications will restrict the applications of real-time techniques and other features that American manufacturers can offer in their computers today. Software, as we provide it, will not necessarily meet the requirements of these areas and, if anything, should be made more easy to use than it is today. Electrical power requirements are different and vary even between locations in the same country. Such concepts as operations research, CPM, and other management aids are not being applied and even less widely known. We can expect to have the computer operating in environments far below what we would consider ideal, or possibly even acceptable, in the United States. Unstable power supplies, problems of heat, dust, and humidity, are a few of the situations that the computer exporter may be faced with, depending on the country.

Spare parts backup and logistics involved in supplying and maintaining these inventories in the respective countries where computers are installed is an effort which gets special attention at Univac. Many of these parts are carried on the strategic commodity classification list and require export licensing to ship from the United States. So that we may better serve our overseas customers we are hopeful that the Department of Commerce will see fit to liberalize some of these regulations, particularly for shipments within the western world.

The challenges and opportunities that lie ahead for the American businessman in the less developed countries can be shared with others besides the computer manufacturers. I envision an important role that can be played by professional groups such as the independent consulting firms and the EDP service organizations. There is a real need for "turnkey" type of services to be made available and offered in these areas, which would provide a potential user with a complete EDP systems service encompassing all aspects of problem definition, development of procedures, system installation and operation of the system until local capability has been trained to take over. With the resources and experience behind these professional groups, this should be a natural as well as profitable expansion of their business.

I also envision and encourage the leaders of the emerging nations that already possess EDP know-how to pool their financial and human resources and establish national government computing centers in their respective countries, thus providing electronic information processing techniques on a "utility" basis to all segments of local government and commerce. In this way, all may reap the benefits that computers offer.

There is no doubt in my mind that the overseas market offers a real potential for American computer products in the course of the next few years. Our courage to face up to the challenges these markets present to us, and our ability to meet the competition from foreign computer firms can represent an important contribution to the President's program for export expansion, which Mr. Mapes has mentioned earlier, as well as provide new profits for the American exporter.

MR. MAPES

One of the founders of Control Data Corporation eight years ago, James G. Miles has a Bachelor of Science in Electrical Engineering from the University of Nebraska. He worked on radar development during World War II and somewhere along the line picked up an LLB from St. Paul College of Law. Jim's first subject today is going to be marketing to the countries of Eastern Europe. As Don Orr mentioned, there are a number of governmental problems involved here. We will hear more about them later from the government's side. Secondly, Mr. Miles will discuss problems of marketing in the developing countries, and third, the potential for computer sales as devices for impact on the less developed countries, promoting their development and promoting the interest of the free world in these areas.

MR. JAMES G. MILES

The people sitting in this room this morning are privileged to be associated with probably the most dynamic business in the world today—the making, selling, and using of computers.
 Probably never before in history has a single set of tools been developed which inherently contains so much potential for constructive use for all people in the world. We are making extremely good progress in the use of these tools in this country, a fact which is well publicized. And the rest of the world observes, and all desire the same for their countries.

You are all aware of the literally thousands of facets of our economy and lives in which computers are playing major roles today—from education to forest management, from heart analysis to steel mill controls, from banking to advanced communications systems, and on to space systems. And soon, the use of computers in total management systems to permit the optimization of our business enterprises will be achieved. And the rest of the world observes and desires the same for their countries.

There are several ways to look at this: Consider such a large capability and such a large technological lead and such a monopoly in the computer power of the world (in this regard I refer to the fact that 95% of the world computer market is vested in U.S. manufacturers) as carrying with it a proportionate responsibility. We are, in effect, the inheritors of a wonderful set of talents in this country—a combination of creative energy, financial capability, and a free enterprise system which has permitted this. By virtue of this extreme good fortune, we are, or should be, in the position of beneficial trustees. As a corollary, with this goes an extraordinary set of responsibilities which virtually place, or should place, their owners in the position of “trustees” in the legal philosophy. These talents, under this context, are not entirely the property of the presumed owners to hoard and dispense at their sole pleasure without consideration for others.

When we discuss the export of computers, and the export of computer technology, we are discussing a combined set of problems which probably offer more opportunities, and which are at the same time complicated by more problems than almost any other export subject that could be discussed today. These problems are not all internal to the United States.

- They cut across the technological capabilities of many countries to make and use computers, as Mr. Orr indicated.
- They involve complicated problems of international finance.
- They involve the need (in the less developed countries the desperate need) for computers to help them organize, build, and operate their economies.
- They involve the laws of the United States, and the laws, policies, and objectives of many countries who want to import our computers, technologies, and our data processing techniques.
- These problems heavily involve the foreign policy objectives of the United States, and heavily interact, on the other hand, with the aspirations and foreign policy objectives of many other countries. And, when the U.S. attempts to put undue restrictions on the exports of these commodities, we often obtain very serious reactions from the other countries.
- These problems involve also multinational trade agreements such as the COCOM (Coordinating Committee) Agreement, which in many respects are more realistic and liberal than the laws and policies of the United States.
- And these problems involve a “balance of power” in technology which can simultaneously work both for and against the United States, depending on how we handle it.
- Above all, these exports, or their denial, offer the greatest of opportunities for orienting many countries toward the United States, or otherwise.

Mr. Orr discussed the need for computers in less developed countries and the widening technological gap which is occurring between us and the less developed countries. This is a very real thing. These countries aren’t even keeping up, in most cases, with their growing populations and in their ability to feed them, house them, and provide them with the other amenities of life which, by way of worldwide communication and publications, they are easily able to discern is not their lot to have, vis-a-vis the United States. We sit around worrying about whether these same countries may become oriented with the Communist countries. We wonder how and what to do about it. The consequences, in my opinion, of this widening economic gap between the less developed countries and the United States should be of the utmost concern because the continuation of this problem, uncorrected, I believe, carries with it the seeds of increasing dissension and may give these people reasons to believe they should orient themselves with the Communist countries instead of with the United States. So we really have a responsibility in this country to dig in and help these countries to establish their ability to acquire a few computers and get them trained along the lines Mr. Orr discussed. As quickly as possible, also, we must help them develop in-country capabilities to make these systems, so they don’t need to rely entirely upon us for exporting or for importing.
I am now going to discuss a subject which is highly controversial—trade with the Communist and Communist-controlled countries. Various people of equally good will hold decidedly diverse opinions on this subject. Passions are keen. Some people think of the subject in terms of black and white; they may be right. Personally, I and my company, Control Data Corporation, take a different view.

President Johnson said in his State of the Union address in January 1965, and restated in a speech on May 8, 1965, significantly marking the 20th anniversary of the end of World War II, the following:

Here is some of our unfinished and urgent business.

First we must hasten the slow erosion of the Iron Curtain. By building bridges between the nations of Eastern Europe and the West, we bring closer the day when Europe can be reconstituted within its wide historic boundaries.

For our part, after taking counsel with our European allies, I intend to recommend measures to the United States Congress to increase the flow of peaceful trade between Eastern Europe and the United States.

And again on May 23 at Lexington, Virginia, President Johnson said:

There is no longer a single Iron Curtain. There are many. Each differs in strength and thickness, in the light that can pass through it, and the hopes that can prosper behind it. . . . We will continue to build bridges across the gulf that has divided us from Eastern Europe. They will be bridges of increased trade, of ideas, of visitors, and of humanitarian aid.

I think we should take the clue from this enlightened attitude of President Johnson. Whenever I go abroad, my main objective is to make friends for the United States. I believe, among other things, that if I can achieve this, the relatively simple process of taking orders will essentially take care of itself.

Then comes the frustrating part.

I am told by people in Washington on one hand, before I go on these expeditions, that I can pursue these objectives without limits in all countries including Soviet Russia, but excepting of course, Red China and Cuba and one or two others. Then when we go out and obtain some of these orders we come back and find that there is no feasible way to obtain export licenses. This is frustrating to the people in the Eastern countries because, I guess, they presume by the very fact that I showed up in their countries there is the opportunity to do business. This does not too often turn out to be the case when the export license is denied by the United States.

Computers are, because of their inherent usefulness, among the most valued, valuable, and useful items for foreign trade. Consider the people they reach. First of all, they reach the top people in each country. They reach the top educators, the top scientists, and the top businessmen; the top industrialists, and the top government people. There have been several countries in which we have obtained large computer orders where the head of state, the top man, has signed off on the order before it has come to us. If you are building bridges, or if it is your intent to build bridges, and it is the intent to try to wean some of these countries away from their past orientations (which, incidentally, many incurred because of enslavement, and not because of desire on their part), I believe that computers are the most important commodities to be traded. I don't think there is any particular point in going over and offering to trade tables and chairs, because they can probably manufacture such items as well or better than we can. Besides, the trading of tables and chairs does not reach influential people; such items are not matters of top national concern. It's the people these reach that is the important thing, and not just on Control Data's behalf, either. As we would bring computer users into the fold of our customers, they automatically join an international fraternity of computer users which exchange information and techniques. Fortunately most of this international fraternity is oriented toward the West politically and philosophically. These new users will become associated with a myriad of users in the United States and in West Germany, and in Scandinavia, England, Australia, France, etc. I believe that if you want to build bridges, this is the way. If you want to bore big holes in the foundations of Communism, this is the best way to do it, because of the influential nature of these tools, and the people that they reach.

How do we proceed to obtain the conditions by which this can happen, assuming that it is desirable. Well, of course, as Mr. Thau is going to tell you in a few minutes, there are many, many influences at work in the U.S. in this regard. First of all, there are laws of the United States which were established by the Congress; these laws include the Export Control Act, the Battle Act, and several others; these laws establish the basic framework of ground rules. On the other hand if you read those laws, it is very interesting to see that there appear to be many interpretations of those laws which don't necessarily have to be read into them. Oftentimes the Administrative Rules and Regulations which derive under these laws are much more restrictive than at least I read into the four corners of the words of those statutes. I'm not the only one that holds this opinion.

Then there are international agreements, such as the
COCOM Agreement which has rather set up some terms and items which involve supposedly enforceable multinational embargoes regarding certain so-called "strategic materials" shipped to the Eastern countries. Different countries put different interpretations on these multinational agreements, but our country puts "strategic materials" shipped to the Eastern countries. poses different sets of regulations which are more restrictive—and, I believe, too severely restrictive.

Beyond that, of course, there are the executive functions of the U.S. government. The major departments reporting to the President—Commerce, State, Defense, Treasury and Justice—all get involved in these matters and all insert their opinions. And I'm not saying that's entirely wrong, because the Export Control Act provides that this should and must be the case. But all of these opinions and decisions pile up on top of each other with compounding-restrictiveness, I believe. It's possible, of course, that the only way to get this really clarified is for Congress to study the matter again and come up with a revised or a new set of laws. And I certainly don't blame the very competent administrators in the administrative branches of the government who are charged with the responsibility of enforcing these laws for their overall-conscientious approach to the problem. But the laws, I must say, might be interpreted in any of several ways, and may be somewhat unclear.

About the most difficult problem that appears here is, apparently, one that centers around a word that is thrown around, called "strategic." I suppose there are many interpretations you can put on this word. I don't recall if it actually appears in the Export Control Act, or some of the other Acts, but the interpretation is always one of "strategic-for-military-purposes." This appears to be of very great concern, particularly among Defense Department people, and I'm sure that no one in this room would deny the "possibility"; I certainly won't.

It is mainly a matter of who is the prospective customer, and what he wants to use the computer for. Most prospective customers are quite frank and open regarding what they desire to use their computers for—for management information systems, industrial process control, product engineering, etc. In this regard we should rely on their representations with a reasonable amount of faith, meanwhile observing through the customer liaisons open to the computer manufacturers, that the computer is in fact being used as represented.

An item which appeared in Business Week, October 30, 1965, reported that COCOM regulations were recently modified to allow the shipment of nuclear reactors into the Eastern countries, provided that sufficient controls are imposed to allow inspection which would assure that those reactors were being used for peaceful purposes. I presume that this inspection includes that by-products of these reactors (which can, incidentally, be fuels for nuclear weapons) can also be monitored. Now, if nuclear reactors can be shipped, with their potential for strategic weapons usage, I cannot see why computers cannot be shipped, because at most, computers are only indirectly possibly useful or "strategic" for military purposes. Computers are not "weapons" per se. I know even this point could be debated, so I will get off it.

But, I say, there is a greater alternative possibility here than we have tapped, and that it is the possible "strategic" use of these computers for peace, to help politically orient these people toward our point of view. I believe there is a very interesting problem here, the answers to which hold tremendous opportunities for the United States, and which can, and should, be resolved in favor of the United States, vis-a-vis our competitors.

MR. MAPES

Mr. Mapes is one of the best-known figures in the field of systems research in this country today. He received his Bachelor of Science degree at the University of Illinois and is a licensed Certified Public Accountant in Illinois and California. Starting out in the petroleum business with Pure Oil, he moved on to become Director of Accounting Research for IBM. After a subsequent tour of duty with Lever Brothers, he moved on in 1953 to Lockheed Aircraft Company, where he served as Director of Systems Planning until, only a few weeks ago he was appointed to his present position as Director of the Center for Computer Science and Technology in the Bureau of Standards. Mr. Mapes is going to discuss problems of marketing computers in Asia, especially in Japan, as well as in some of the less developed countries. He also has a few ideas on the educational aspect of overseas computer sales, which I think he may share with us.

MR. NORMAN J. REAM

I think most of us are in favor of increased freedom of trade with the rest of the world, and there are usually two sides to every question, but Mr. Miles' suggestions on trading with the Communist countries move me to express the personal opinion that we have to be very careful about trading computer dollars for loss of security. But that isn't what I came here to talk about today.

Mr. Orr touched on the computer market in Japan. My knowledge of that market has developed from a series of lecture trips I have taken to Japan over the last three or four years. I have visited Japan about eight different times to lecture to the Japanese in-
dustrial communities concerning the use of computers in the United States and to discuss with them the potential of their use in their country.

The Japanese computer industry is very interesting in that today there are six major computer manufacturers active in the Japanese market. We have American computer manufacturers who are also active there—IBM, operating a large plant through their Japanese company which is 96% owned, and Univac being active in a joint venture company. Also there is NCR, Burroughs, and CDC. Japanese companies that are most active are Fuji Communication Apparatus Company, Miksabichi Electric Manufacturing Company, which is part of the Miksabichi family, the Oki Electric Industry Company, the Tokyo Shaboro Electric Company and Hitachi Ltd. Hitachi is the largest company in Japan and has a very active computer manufacturing group.

The latest available figures I was able to secure date back to September 1963, at which time there were actively used in Japan 440 Japanese-manufactured computers and 285 American computers (of which 163 were IBM). Of course when you think that the first computer was introduced in Japan in 1959, this figure has now probably about doubled. But in increasing at this rate the Japanese companies have gained a greater percentage of the market than the American companies. In other words the balance is swinging to the Japanese manufacturer.

It is also interesting of course that Japan ranks second to the U.S. in the use of computers and I think we will see a diminishing number of American computers in use in Japan in future years. I will try to tell you why I feel this way by talking about some of the problems in the development of the use of computers in Japan. Their problems are not too dissimilar from many of those we have here in the U.S. There is a great shortage of skilled personnel. This they are attacking through their universities, probably on a more formalized basis than we are. There is a direct emphasis on this. Also recently there was a program introduced in Japan by NOMA—the Nippon Office Management Association; however, we shouldn’t compare it to the NOMA in the United States. It’s quite a different type of organization. They are embarking on quite a computer programming training course and they will probably have 20,000-30,000 students in this course within the next 18 months. There also exists in some areas in Japan the problem of management attitude that is a sort of reluctance. However, I think that this reluctance on the part of management in Japan is not nearly so pronounced as it is here in the United States. They are also faced with the problem of program language development. Most of the programming languages in use in Japan are imported from the U.S., although there are activities under way to develop their own languages.

Additionally, they also have some rather distinct problems which are not as familiar to us. One is the economic evaluation of the use of computers. Mr. Orr touched upon this. They cannot justify computers solely on the basis of replacing people. Currently their labor costs are quite some bit below ours. But this problem is changing in a very fast rising economy; however, it will be quite some time before their rates will be comparable to ours. Consequently they are looking toward the more sophisticated areas which Mr. Orr mentioned.

A second problem that they have is that they have only nominal government support in the defense area and admittedly in our country our government has contributed very heavily to our defense efforts and all our research and development efforts in the computer industry. Japan also has minimal use of computers in the scientific areas because most of their industries are not heavily engaged in R&D activities, not as perhaps many of us would like to think of it. We like to think of Japan as being very active in R&D, and they are in the electronic areas, but in many other areas they look to licensing arrangements and the import of technical know-how from outside of Japan. This is understandable, considering financial conditions.

They have another peculiar problem. The labor market is not nearly as fluid in Japan as it is here in the United States. This is due to the paternal instincts which are deeply imbedded in the Japanese industry, which is sometimes referred to as “lifelong employment.” When a man or woman joins a Japanese company, normally they stay with that company for the rest of their business life. This means that in the introduction of computers into a Japanese company they must start at the very bottom and train their people to become accomplished and acute. They cannot proselyte, as is done here in Las Vegas, where there is sort of a trading mart for personnel. I believe, however, that in spite of all the problems they are faced with, they are going to make a very extensive use and a very sophisticated use of computers, especially in the management areas. I believe that their management will react faster to change, once the requirements for that change have been determined.

Looking at the Japanese government support of the computer industry, we find they are extremely active and feel that the development of a very strong computer industry is basic in developing the well-rounded electronics industry, for which they are very famous.

From the collection of the Computer History Museum (www.computerhistory.org)
In 1961 they established the Japan Electronic Computer Company, which is a leasing company to Japanese industry. A special committee has also been set up under the direction of the government. They are doing extensive work in peripherals, and they are developing equipment which will handle the common language, which will ease the use of computers. One of the recent developments on the part of Hitachi has been the electrostatic high-speed printer, which prints at 6,000 lines a minute. Two of these are currently in use in Japan and of course they are developing printers which will print the common language, this being one of these developments. Their manufacturing techniques are extremely advanced and their quality assurance programs are equally as good as any of those that are in existence in the U.S.

While talking about some of the problems of the American computer manufacturer, the Japanese government has for all practical purposes banned the import of small and medium sized computers into Japan and those that are imported from foreign sources have a 25% duty on the import. Of course this places the foreign manufacturer at a considerable disadvantage unless he is working directly with a Japanese company. IBM has been manufacturing the 1401 and has been granted permission by the Japanese government to manufacture the 360-20 and 360-40. This means that most American manufacturers in order to get into the Japanese market are probably going to have to go through licensing arrangements or joint venture companies with Japanese nationals.

There are several types of companies that can be formed in Japan. One type is 100% American owned. This is an extremely difficult task to accomplish and one that is not used very extensively at this point. The joint venture method is easier and one that is normally used. In this situation we would find a Japanese control being exercised. In other words, they would own more than 50%. There are many problems associated with American companies working in Japan, i.e., the problems of transport of technical know-how into Japan and the usually associated slow start-ups associated with a company until good working arrangements can be made.

In Japan we are going to find that the Japanese government, while it is a democracy, is much more influential than we may suspect. We are going to find that they will be very influential in supporting the use of Japanese-developed computers in Japanese industry. This does not mean that American computers will not be used in certain areas, but I do think that the percentage of use of the American computers in Japan will decrease in time.

As we look to the Orient in the lesser developed areas, we have an entirely different situation. The Japanese, American, and Western European manufacturers will be competing in a more or less open market. Also there are many problems associated with the use of computers in these less developed countries and we are going to find, as Mr. Orr says, that these are initially going to be used in the areas of government, or they are going to be used by the larger foreign companies operating in these areas. I cannot foresee a situation where local companies in Formosa, Thailand, and Malaysia are going to have a need for large computers at this time. This perhaps will develop over a period of time, but I think the market here is much more limited than we would like to realize.

I do believe, however, that in these areas there is a great possibility for the American computer industry to make a great contribution and to considerably improve the image of the United States. This is in the area of education. Those of you who have visited these countries recognize that there is a great void of middle class people and that the industries are not going to grow in these countries until the void is filled. It can only be filled through better education. I believe that there can be an extensive market developed in these countries through an educational field. However, this is an area in which we have not done too well in the United States. Perhaps by real emphasis in this area on the part of computer manufacturers, the computer industries, and the educational institutions, a great contribution can be made.

**MR. MAPES**

Mr. Theodore L. Thau is the Executive Secretary for the Advisory Committee on Export Policy. He went to the University of Chicago, receiving a Bachelor of Philosophy and a JD from the law school there and engaged in private practice in Chicago and New York. Then he was Assistant Solicitor for the Securities and Exchange Commission in Washington. He spent a good many years as Assistant General Counsel for the Department of Commerce in the field of export control until 1961, when he was appointed to his present position. Ted has suggested that perhaps we could forgo his initial presentation in the interest of opening a longer period of time for questions. I don't think I can let him off the hook that easily, but I can open the question by asking him to give us a brief presentation concerning the parameters of the term "strategic," which was discussed a few minutes ago, and also by covering the special problem of the export of computers to France.

**MR. THEODORE L. THAU**

A few years ago, for someone like myself associated with controls over exports from the United States to
be a member of a panel concerned with overseas markets for anything would seem kind of phenomenal. That's no longer the case and there is good reason why I am here today—because the Export Control Act which I'm concerned with is no longer regarded as a complete bar to exports to the East European Communist countries, including the USSR, as it once may have been considered.

As a preliminary matter, however, I want to tell you—and this may seem a bit unfair, but I assure you it had to be worked out this way in the interest of brevity, among other things—Mr. Miles and I made an agreement last night that if I didn't answer specifically everything he said today this would not necessarily mean I agreed with him.

First: Computers are licensed for export from the United States to all free world countries, excepting Canada, and to the East European Communist countries, including the USSR. I except Canada because since World War II days we have had an arrangement with that country whereby we do not require export licenses for goods intended for use and consumption there.

Our reasons for requiring licenses to export computers to the free world countries are not that we are concerned with preventing them from getting computers (with certain limited exceptions which I am going to refer to a little later), but rather in order to prevent unauthorized transshipments, re-exports, and diversions from the free countries to the Communist world, including the East European Communist countries, the Asiatic Communist countries, and Cuba.

We also require validated licenses for the Communist countries that I have described. Those countries really no longer comprise one world, you know, but several groups, toward which we have different levels of controls, reflecting the requirements of the law and policy of the United States to safeguard our security and welfare from those who might have hostile intentions toward our country. This means that we do not deny all applications for all licenses to all these different groups of countries. We use the licensing technique, instead, as the device to screen, from the strategic point of view, orders from Communist countries for computers. We do not grant any licenses for computers to the Asiatic Communist countries, for strategic and foreign policy reasons. I will not go into that any further here today. The same applies to Cuba.

With respect to the East European Communist countries, our restrictions are more selective. You will notice that I have been careful not to refer to the Soviet bloc. The reason is that we no longer regard all of the East European countries and the USSR as constituting a bloc. Just a couple of years ago we came to the conclusion that it no longer made sense to refer to anything called the Sino-Soviet bloc. So, now we consider that the East European Communist countries and the USSR are all to be treated individually under our export policies. For some of those countries, this will mean more favorable treatment than others. For example, since 1958 we have treated Poland more favorably. We will even allow her to receive strategic goods, if they are found to be reasonable and necessary to the Polish civilian economy. In the summer of 1964 we entered into negotiations with Rumania, as a result of which we gave Rumania a preferred status, much as we have for Poland. In accord with that preferred status, we allow Rumania to receive certain strategic items, if they can be found necessary and reasonable to the Rumanian civilian economy. Each of the other East European countries must be looked at on its own footing, in the light of our foreign policy and strategic interests relating to the particular country.

What do we mean when we say that we use export controls to screen the strategic from the nonstrategic? If we merely were to limit ourselves to direct military items, and be concerned only with tanks, guns, planes, bombs, etc., that would be one thing. There are controls over items of those kinds maintained by the Department of State Office of Munitions Control. Some of you may have had experiences with that office in connection with applications to export to free world countries items which you know or have reason to believe are going to be used there for military purposes. However, the U.S. Export Control Act, which is administered by the Commerce Department, goes beyond the narrow concept of direct military use. It embraces a concept that might roughly be called a “military-industrial mobilization base.” Some phrase of that sort would be aptly descriptive of the area of concern that is involved when the Commerce Department uses the term “strategic.”

From that point of view, then—using that concept as our yardstick—we have in the past approved licenses to export some kinds of computers to Communist countries. We approve them now to the East European Communist countries. We also approve components for computers which you may send to your West European affiliates or other free world firms to be used in the making of computers to go to East European Communist countries. We also approve peripheral equipment to go into computers to be made abroad and sold to the East European Communist countries. There is no U.S. embargo on all computers, components, and peripherals for the East European Communist countries.

There has been some misunderstanding about this. It
may have been because, in addition to concern about building up the military potential of the East European Communist countries, the Congress required us in 1962 to be also concerned about contributing to the buildup of the economic potential of the East European Communist countries. However, this does not mean, has never been interpreted to mean, that every computer, because it contributes inherently to the economic potential of an East European Communist country, is also necessarily detrimental to our security and welfare. We have publicly interpreted this amendment as not requiring us to conclude that an item is detrimental to our security and welfare, from the economic potential standpoint, if a comparable item is readily available to Eastern Europe from other free world countries. We have, therefore, a basis on which, even applying the economic potential criterion, we can and do approve the economic potential of an East European Communist country, is also necessarily detrimental to our security and welfare. We have publicly interpreted this amendment as not requiring us to conclude that an item is detrimental to our security and welfare, from the economic potential criterion, we can and do approve licenses to export computers, computer components, and peripheral equipment to East European Communist countries.

I turn now to the kinds of computers, components, and peripheral equipment, that we deny, that we are concerned about, that we ask you many questions about, when you come in to us with your license applications. When you tell us that you are interested in trying to sell these, we ask you, "How advanced is this computer over what is available from the free world without the use of U.S. components, without U.S. technology?" "How advanced is this over any that would be available to the East European Communist countries from their own resources?" We are here concerned with the more advanced types of computers. We are concerned with these because we have been told by the technical experts from Defense and other government agencies, that it is in this advanced area that the United States has a significant lead over the East European Communist countries and that there is more likelihood that such computers will be used in part and substantially for military-industrial, mobilization-base activities than the less advanced types of computers.

You may argue that this isn't necessarily so, and that is quite true. One could use the most advanced computer in the world for peaceful purposes. If we could be certain about that, it would be fine. I believe, however, that one would have a good deal of difficulty in finding a basis for even a reasonable degree of probability of such limited usage. For example, if company X gets an order for one of the most advanced types of computers presently known from a department store chain in one of the East European Communist countries, we may find ourselves having to ask the question: How many hours a week will this computer be needed to do the work of the chain? It may turn out to be that only a few hours a week are needed. What will be done then with that very expensive monster the rest of the week? We know, and it was a thrill for me to see this kind of operation yesterday, how peripheral equipment hundreds of miles away from a giant computer can be so connected to it as to work out very advanced problems, and how many pieces of peripheral equipment can be connected up and operating at the same time and still using only a small fraction of the capabilities of this computer.

Now it doesn't follow, even from what I have said, that there is anything that requires denial on the basis of this or some other single factor. We need full information from you in those cases. We need specific knowledge to be able to meet the requirements of the law and the national policy. We need to be more sure with respect to those types of computers than with respect to the others.

Next, it isn't enough just to tell us that "comparable" technology is available from computers that are obtainable from West European countries. The technology in a wide range of computers may be comparable, as technology goes. But the computers themselves may vary quite widely, and some may be far more advanced than others, even though all use comparable technology.

Of course, we are concerned to prevent our advanced technology from going without authorization to the East European Communist countries. We are also concerned not to have our most advanced computers go. As one of the people here at this conference told me yesterday, the East European Communist countries recognize that by getting our most advanced computers they have the best chance of overcoming most swiftly our technological lead. We have been queried whether this technological lead they want to overcome is only in the economic area, not related to a military-industrial mobilization base. Well, we're not sure. We're therefore concerned. So we will ask you many questions when you come in with such cases.

I would now like to talk a bit about one problem area, outside the East European Communist area, with which some of you have had experience. I refer to the problem that has arisen as a result of the Nuclear Test Ban Treaty, and especially as a result of certain activities of a friendly country that is not a signatory of the Nuclear Test Ban Treaty. We have obligations under the Test Ban Treaty not to aid any country in the development of nuclear weapons or in conducting nuclear explosions and nuclear weapons tests. As a result, the Commerce Department and the State Department's Office of Munitions Control have adopted regulations of a complementary nature, designed to regulate by special licensing procedures, items that
may be used for such purposes, even if going to free
world countries, and whether or not specifically de-
signed or modified for use in nuclear weapons test-
ing. As some of you may know, we have expressed
considerable concern here about very advanced com-
puters, components, and peripheral equipment.

There is much more I could tell you about this new
area of export controls, but time is running out and
perhaps in some of your questions you may ask some-
thing about it.