

CIA/DIR/ADM/10-10-77

Secret

[Empty rectangular box]

25X1

Doc/ser



**DIRECTORATE OF
INTELLIGENCE**

Intelligence Memorandum

*COCOM Countries' Sales Of Technology
To The USSR And Eastern Europe*

Secret

ER IM 70-121
September 1970

Copy No. 69

WARNING

This document contains information affecting the national defense of the United States, within the meaning of Title 18, sections 793 and 794, of the US Code, as amended. Its transmission or revelation of its contents to or receipt by an unauthorized person is prohibited by law.

GROUP 1
Excluded from automatic
downgrading and
declassification

SECRET

25X1

CENTRAL INTELLIGENCE AGENCY
Directorate of Intelligence
September 1970

INTELLIGENCE MEMORANDUM

COCOM Countries' Sales of Technology
To The USSR And Eastern Europe

Introduction

The USSR and other East European countries have shown increasing interest in purchasing manufacturing licenses and technology from the Industrial West. The USSR and Eastern Europe suffer from a wide technological lag *vis-a-vis* the Developed West, particularly in such areas as electronic computers, microelectronics, and telecommunications. These and other sophisticated technologies are high on the list of those the Communists wish to purchase, and these technologies are also embargoed by COCOM. This memorandum examines COCOM's handling of the technology problem, the proliferation of COCOM approvals of requests to export embargoed technology, and the impact of these actions on trade controls and East-West trade.

*Note: This memorandum was produced solely by CIA.
It was prepared by the Office of Economic Research.*

SECRET

25X1

SECRET

Background

1. The COCOM organization, an informal international group consisting of most NATO countries and Japan,* has been operating since 1949 to control strategic trade with Communist countries. The multilateral controls are embodied in the international embargo lists** which all COCOM countries have accepted as their minimum level of control. In addition to controlling the export of the items on the various lists, COCOM has used Administrative Principle 5 (AP 5) to control exports of the technology to produce embargoed goods. This note to International List I states:

"So far as practicable, the object of the controls should be maintained by restrictions on the export of technical data, technical assistance, and any other technology applicable to the design, production and use of the embargoed items."

In addition, to accommodate countries that wished to export an item without losing control over the technology, an Administrative Exceptions Procedure was adopted whereby a note to the embargo definition

* *The Consultative Group, the parent organization of the Coordinating Committee (COCOM) which coordinates the strategic trade controls of the member nations, was organized in November 1949. The COCOM countries are Belgium, Canada, Denmark, France, Greece, Italy, Japan, Luxembourg, the Netherlands, Norway, Portugal, Turkey, the United Kingdom, the United States, and West Germany.*

** *These are International List I, International List IV, the International Munitions List, and the International Atomic Energy List. The Munitions List and the Atomic Energy List contain items directly related to weapons and atomic power. International List IV, the so-called Watch List, contains items not embargoed but reportable for possible future embargo. International List I items generally have both military and civil applications (dual use items), and many are avidly sought by technology-poor Communist countries.*

SECRET

permitted the item to be exported without reference to the formal COCOM exceptions procedure.*

2. During the last few years the USSR and Eastern Europe have shown increasing interest in purchasing embargoed items. In addition, they have been seeking the technology for some of the most sophisticated items, particularly in the field of electronics, such as computers, microelectronics, and telecommunications. These areas are the ones in which the Communist countries show the greatest technological lag *vis-a-vis* the Industrial West. In an attempt to narrow or even close this gap, the USSR and Eastern Europe have given high priority to the acquisition of modern manufacturing technologies.

3. By 1968, sales of technology had become one of the major areas of disagreement between the United States and other COCOM countries. Leading COCOM members had made it quite clear to the United States that a comprehensive review of the COCOM embargo regulations was necessary. France had already agreed to sell embargoed computer technology to Czechoslovakia without COCOM approval and was continuing to negotiate computer related technology sales with Communist countries. Sweden -- a non-COCOM member which formerly had cooperated with the aims of the embargo -- sold Hungary the technology for a COCOM embargoed 960-channel frequency division multiplex (FDM) telecommunications system. Hungary had previously sought this technology from various COCOM countries, but all requests for an exception were vetoed by the United States in COCOM. A formal List Review was convened in 1968 and concluded in 1969.

4. The 1968-69 List Review continued the practice of previous List Reviews by reducing the number of items controlled by COCOM as well as relaxing controls over those items remaining on the List. Controls for Eastern Europe and the USSR were reduced on many items, and Romania was singled out for special treatment on computer technology in

* *COCOM countries may seek an exception to the rules to enable them to export an embargoed item to a Communist country. In practice, most exceptions requests are granted unless there is clear evidence that the item will be used for military/strategic purposes.*

SECRET

response to French pressure which was brought to legitimize a deal already made. COCOM, however, agreed to study the problem of computer production technology in an attempt to define and embargo computer production equipment. Controls on telecommunications technology also were maintained, despite the wide differences between the United States and its COCOM partners concerning the strategic importance of this item.

Communist Exceptions Requests
for Technology, 1967-68

5. Before 1967, COCOM had never approved the export of the technology to produce International List I* embargoed items. Two technology exceptions requests were submitted to COCOM in the late 1950s, but these requests were for items under now-defunct quantitative controls. The United States objected in these cases, but later withdrew the objections. Prior to 1967 the question of technology sales remained generally dormant, and there were no known exports to Communist countries of technology to produce International List I embargoed items.

6. In the period before the 1968-69 List Review, COCOM denied most exceptions requests to export embargoed technology. In 1967 the United Kingdom and France submitted competing exceptions requests to export to TESLA, a major Czechoslovak electronic producer, the technology to produce small embargoed computers and associated peripheral equipment. The computers were exportable under an Administrative Exceptions Note, but both France and the United Kingdom, by taking the cases through the regular COCOM exceptions procedure, apparently accepted the premise that the technology for the manufacture of these computers was embargoed. These cases were the first in the

* *These are the following: 1000-Metalworking Machinery; 1100-Chemical and Petroleum Equipment; 1200-Electrical and Power-Generating Equipment; 1300-General Industrial Equipment; 1400-Transportation Equipment; 1500-Electronics and Precision Instruments; 1600-Metals, Minerals, and their Manufactures; 1700-Chemicals, Metalloids, and Petroleum Products; 1800-Rubber and Rubber Products; and 1900-Miscellaneous.*

SECRET

recent upsurge of requests for and exports to Communist countries of the technology to produce embargoed commodities.

7. During 1967, five more cases for computer and telecommunications technology were submitted to COCOM from Eastern Europe. Hungary figured in all of the proposed telecommunications cases, and Czechoslovakia was involved in three of the four computer cases. The only case approved by COCOM was a West German proposal to export to Hungary coaxial cable-making equipment and technology.

8. France persisted in keeping its exceptions request for the sale of computer technology to Czechoslovakia under consideration in 1968, offering to alter various details of the licensing arrangements. In addition, France threatened to grant the appropriate licenses without COCOM approval and/or to leave COCOM. Finally, in March of 1968, France announced to COCOM that it had authorized GE-Bull, the proposed seller of the computer technology, to consummate a deal with Czechoslovakia. Most of the delegations expressed deep regret at the unilateral action by the French, but no other action was taken by COCOM.

9. Following the unilateral French action, COCOM approved three of the six technology exceptions cases considered in 1968 (see Table 1). All three of these cases involved telecommunications technology, as did two of the other three cases. As in 1967, the approvals were all for technology to produce small-diameter coaxial cable, while the telecommunications denials were for major carrier equipment.

Communist Exceptions Requests
for Technology, 1969-70

10. The List Review of 1968-69 brought substantial reductions in the level of controls for exports to the USSR and Eastern Europe. COCOM then began to approve exports of the technology for some items still on the embargo list. Following COCOM's approval in 1969 of a French proposal to license silicon transistor technology to Poland, other COCOM countries have sought and generally received approval to export the technology for advanced microelectronics items such as FM transmitting tubes, plastic film capacitors, transistors, and

Table 1
COCOM Technology Exceptions Requests

	1967		1968		1969		1970 ^{a/}	
	Requested	Approved	Requested	Approved	Requested	Approved	Requested	Approved
Total	7	1	6	3	5	5	14	4
Computers and/or peripheral equipment	4	0	-	-	2	2 ^{b/}	2	1
Microelectronics	-	-	1	0	3	3	6	2
Telecommunications	3	1	5	3	-	-	4	0
Other	-	-	-	-	-	-	2	1

a. As of 31 July, ten of the 14 exceptions requests in 1970 were still pending.

b. These two cases are being held up pending receipt of assurances of peaceful end use, but they have received tentative approval.

SECRET

SECRET

quartz crystal filters. Telecommunications technology also has continued in great demand; COCOM, however, has never approved the sale of technology for any Frequency Division Multiplex (FDM) or Pulse Code Modulation (PCM) carrier equipment.

11. COCOM had five exceptions requests for technology exports in 1969, and all five were approved, although two are awaiting assurances of nonmilitary end use from the potential recipients. The two cases awaiting assurances are for computer peripheral equipment and the three cases already approved were for microelectronic equipment. Through 31 July 1970, 14 exceptions requests for technology were submitted to COCOM, and none have as yet been denied. Four cases have been approved, and the other ten are still pending. Of the approved cases, one was for computer peripheral equipment, two for microelectronic equipment, and one for radiotelephone equipment.

12. Through 31 July 1970, COCOM had received 32 formal exceptions requests for technology exports. Czechoslovakia and Hungary led in seeking these imports of technology, each being involved in nine cases, and Poland was close behind with seven cases. The USSR, however, was involved in only one case, and that 1970 case for printed circuit boards is still pending. The COCOM members leading in the submission of exceptions requests were the United Kingdom, France, and West Germany with 13, 9, and 6, respectively. Only Japan and the United States among the major COCOM members have not entered requests to export technology. The United States has more stringent unilateral controls affecting its actions, and the Japanese COCOM delegate and Japanese businessmen have indicated their belief that commodity sales will benefit them more in the long run than technology sales.

13. During the period 1967-69, the number of exceptions requests submitted to COCOM in a year rose by approximately 120%, from 228 to 506 cases, but the value increased by more than 500%, from \$6.5 million to \$39.9 million. Much of the rise in value resulted from exceptions requests for technology, which are few in number but high in value. The cases in 1970 seemingly continue the trend toward higher per case values, with technology

SECRET

exceptions requests providing the major share of the value increase. Through 31 July 1970, almost as many technology cases have been submitted -- 14 -- as in the entire 1967-69 period -- 18. Furthermore, the total value of the 1970 technology submissions -- \$20.3 million -- is approximately the same as the total value of all technology cases previously submitted -- \$20.4 million. For the period 1967-70, technology cases were only slightly more than 2% of all exceptions cases submitted to COCOM, but the value of these technology cases was about one-third of all cases (see Table 2).

Table 2

Number and Value
of Total COCOM Exceptions Requests
and of Technology Requests

<u>Year</u>	<u>Total Cases Submitted</u>	<u>Total Value of Cases Submitted (Million US \$)</u>	<u>Total Technology Cases Submitted</u>	<u>Value of Technology Cases a/ (Million US \$)</u>
<i>Total</i>	1,403	137.2	32	40.7
1967	299	13.5	7	6.3
1968	312	37.9	6	4.1
1969	506	39.9	5	10.0
1970 <u>b/</u>	286	45.9	14	20.3

a. Approximately 20% of all technology cases had no value given.

b. Through 31 July 1970.

14. Some cases involving proposed sales of embargoed technology have not been brought to COCOM. The largest of these cases involved a UK proposal to upgrade the entire Soviet computer industry by licensing the technology to produce the third generation ICL 4-70 series of computers and associated peripherals and components. The United Kingdom valued the deal at some \$500 million over a period

SECRET

of four years. In bilateral talks with the United Kingdom, the United States noted its opposition to the proposal. The deal was never brought to COCOM's attention, and apparently has not been consummated. France, however, did conclude computer technology licensing agreements with Romania and Hungary without reference to COCOM. Subsequently, both cases were tacitly approved by COCOM without formal action. Also some pro-Chinese Japanese trading companies sold Communist China the technology to produce COCOM-embargoed silicon. This deal, however, apparently was made without the knowledge of the Japanese government.

Level of Technology Involved

15. A distinct change occurred in the level of technology sought by the Communist countries after 1968. The 1967-68 requests were for the export of technologies which were below the state of the art in the West. The French and British computer technology requests were for small, second generation models. GE-Bull of France had abandoned plans to produce the Gamma 140 computer commercially because it was already obsolete by Western standards, and ICT of the United Kingdom had plans to introduce an integrated circuit version of its 1900 series of computers. In the telecommunications field, the 960-channel FDM technology offered to Eastern Europe had only about one-third the capability of the 2700-channel systems already installed in the West.

16. Most of the requests in 1969-70, however, were for "state of the art" technologies. In addition, most of these requests were for technologies to produce multiapplication electronic components rather than for entire systems as in 1967-68. All of the requests have been for technologies to produce dual use items -- those which can be used for civilian as well as military applications.

17. The typical technology sales contract provides for the transfer of blueprints, designs, manufacturing equipment, and other basic data. Technology sales agreements also contain provisions for training technicians at the seller's facilities, providing continuing assistance, having Western technicians work on the new production lines, and passing on to the purchaser any subsequent improvements. Many of the agreements also

SECRET

SECRET

provide for training Communist managers in sophisticated Western managerial techniques, not necessarily connected with the technology involved, such as PERT and quality control techniques.

18. These supplementary benefits which accrue to the purchasers of technology may be transferred even more quickly by the introduction of a new form of technology sales: East-West joint ventures in the production of COCOM embargoed items. West Germany recently received COCOM approval for a request to provide Hungary with the technology to assemble computer memory cores. In this case, the West German firm will have a direct interest in the quality and cost of the product because all of the output will be returned to Seimens, the West German firm.

Impact on Trade Controls

19. Trade controls have never stopped Communist countries from developing advanced weapons systems as far as we know; however, controls have increased costs, delayed deployment, and reduced the efficiency of the weapons systems finally deployed. The increased acquisition of advanced manufacturing technologies from COCOM countries will assist Communist countries in reducing, in certain important areas, the pronounced technology gap which existed throughout the 1960s. Also, by securing the advanced technologies for the most basic items in the microelectronics field, such as integrated circuits and printed circuit boards, the Communist countries would be able to produce a wide variety of dual use items as well as more sophisticated military products.

20. The increasing export of technology is further limiting the effectiveness of trade controls by eliminating two of the major tests used to decide whether or not to permit an exception to the embargo. COCOM will no longer be able to determine whether or not the consignee for the product of the technology produces military end items, since once a production line is functioning, its products can go anywhere. In addition, COCOM will not be able to secure assurances from the end user that the products will be used solely for peaceful purposes.

SECRET

21. Another limiting effect on trade controls was pointed up during the discussions in COCOM on various technology cases. The Japanese COCOM delegate suggested that once technology to produce a particular commodity has been exported, there was no justification for continued COCOM embargo of the commodity itself. Even if the item remained on the embargo list, it would be difficult to justify denying an exceptions request for the item or the technology since lack of Communist capability to produce the item is a major criterion for keeping dual use items on the embargo list.

Impact on East-West Trade

22. The COCOM countries' trade with the USSR and Eastern Europe during the past decade has grown at a rate of 11.7% annually -- from \$3.2 billion in 1959 to \$9.7 billion in 1969 (see Table 3). Imports of manufactured products from the West emphasize capital goods and end items which are difficult to produce domestically or for which Communist technical and productive capability lags significantly behind that of the West. The basic restraint to volume of East-West trade is the limited export capability of the USSR and Eastern Europe. As Communist purchases in the West have grown, the problem of finding sufficient quantities of marketable exports to pay for imports has become increasingly acute.

23. Increases in trade over the past decade with the West were aided by Khrushchev's decision to run down the USSR's limited gold reserves and by the willingness of Western financial institutions and suppliers to extend several billion dollars worth of credits to the USSR and Eastern Europe. These measures, however, have offered no long-term solution to the Communist problem of expanding trade with the West. Indeed, the USSR had to hold the line on imports from the West between 1964 and 1967 to stem the drain on its gold reserves, and several East European countries found themselves in financial difficulties as a result of too liberal use of Western credit facilities.

24. Current Western export controls play at most only a very limited role in controlling the volume of East-West trade. Not only have the Communist countries been buying all that they can

SECRET

Table 3

COCOM and US Trade with the USSR
and Eastern Europe a/

Million US \$

<u>Year</u>	<u>USSR and Eastern Europe</u>		<u>USSR and Eastern Europe</u>	
	<u>COCOM Exports to</u>	<u>COCOM Imports from</u>	<u>US Exports to <u>b/</u></u>	<u>US Imports from <u>b/</u></u>
1960	1,969	2,051	194	81
1961	2,164	2,241	133	81
1962	2,287	2,358	125	79
1963	2,424	2,642	171	81
1964	3,030	2,808	351	98
1965	2,964	3,307	139	137
1966	3,643	3,780	198	179
1967	3,865	4,226	195	177
1968	4,155	4,463	217	198
1969	4,769	4,899	249	195

a. Based on Free World data; with minor exceptions, imports are c.i.f.

b. Included in the data for COCOM trade.

afford, but they have been mortgaging substantial amounts of future earnings through the use of Western credits. The relaxation of controls *vis-a-vis* the USSR and Eastern Europe in the 1968-69 List Review did little to increase the volume of this East-West trade, but it almost certainly did affect the commodity composition of Communist imports. Increasing orders for formerly embargoed Western equipment and technology can be expected to continue, but the increase in sales of technology and technical data may foreshadow a lessening of total trade.

SECRETConclusions

25. The increasing interest of the USSR and Eastern Europe in purchasing embargoed items and technology has brought a significant growth in requests for exceptions to multilateral trade controls in COCOM, particularly after the relaxation of controls effected by the 1968-69 COCOM List Review. The Communist countries have been seeking the technology for some of the most sophisticated items, particularly in the field of electronics, and have been probing extensively to find the limits of Western accommodation. Before 1967, COCOM never was called upon to approve exceptions requests to export the technology to produce International List I embargoed items. In 1967, approval was given to a West German proposal to export coaxial cable-making equipment and technology to Hungary, and in 1968 three more cases for the same technology were approved. France, however, took unilateral action in granting an export license to GE-Bull to sell Czechoslovakia the technology to produce a small computer.

26. After the 1968-69 List Review, which brought substantial reductions in controls for the USSR and Eastern Europe, COCOM began to approve exports of technology for some items still on the embargo list, particularly microelectronics and computers. Most of the requests in 1969-70 were for "state of the art" technologies to produce multi-application electronic components. Earlier requests were for the export of technologies below the state of the art in the West.

27. Through 31 July 1970, COCOM had received 32 formal requests for technology exports. Approximately one-half of the value and about two-fifths of the number of all requests were submitted in the first seven months of 1970. Czechoslovakia, Hungary, and Poland were the leaders among the Communist countries seeking these imports, and the United Kingdom, France, and West Germany led COCOM countries in the submission of exceptions requests. The United States and Japan, however, have not entered any requests to export technology. Japanese business and government officials believe that commodity sales will benefit them more in the long run than technology sales.

SECRET

28. Trade controls have not kept the Communist countries from developing advanced weapons systems, but they have increased costs, delayed deployment, and reduced the efficiency of systems finally deployed. Increasing exports of technology reduce the effectiveness of trade controls by helping to reduce the Communist technology lag in important areas and by eliminating Western control over end uses of the product.

29. The volume of East-West trade is not significantly limited by trade controls. Imports sought from the West are those difficult to produce domestically or for which Communist technology and production lag far behind the West. Limited export capability of the Communist countries places ceilings on imports from hard currency countries. Their difficulty in finding sufficient marketable exports to the West has become more acute with the inability to continue the expansion of petroleum exports.

SECRET

APPENDIX

Technology Exceptions Requests Submitted to COCOM

<u>Date</u>	<u>Countries Involved</u>	<u>Description</u>	<u>Value (Million US \$)</u>	<u>COCOM Status</u>
1967	France-Czechoslovakia	Equipment and technology to produce the GE-Bull Gamma 140 computer. GE-Bull agreed to take electronic components manufactured by TESLA, the licensee, in partial payment for the license.	2.7	Denied <u>a/</u>
1967	United Kingdom-Czechoslovakia	Equipment and technology to produce the IC 1901 computer.	N.A.	Denied
1967	United Kingdom-Czechoslovakia	Equipment and technology to produce magnetic tape handling equipment for computers.	N.A.	Denied
1967	Belgium-Poland	Equipment and technology to produce magnetic tape handling equipment for computers.	2.6	Denied
1967	Italy-Hungary	Technology to produce 24-channel multiplex pulse code modulation telecommunications equipment.	N.A.	Denied
1967	West Germany-Hungary	Equipment and technology to produce small-diameter coaxial cable.	0.1	Approved
1967	West Germany-Hungary	Equipment and technology to produce 960-channel FDM telecommunications equipment and small-diameter coaxial cable.	0.9	Denied
1968	France-Romania	Equipment and technology to produce silicon transistors	1.8	Denied
1968	United Kingdom-Czechoslovakia	Equipment and technology to produce 960-channel FDM telecommunications equipment and small-diameter coaxial cable.	0.9	Withdrawn
1968	France-Czechoslovakia	Equipment and technology to produce 960-channel FDM telecommunications equipment and small-diameter coaxial cable.	0.6	Denied
1968	France-Bulgaria	Equipment and technology to produce small-diameter coaxial cable.	0.3	Approved
1968	United Kingdom-Bulgaria	Equipment and technology to produce small-diameter coaxial cable.	0.4	Approved
1968	United Kingdom-Hungary	Equipment and technology to produce small-diameter coaxial cable.	0.1	Approved
1969	France-Hungary	Equipment and technology to produce disc drives and magnetic heads for computer peripherals.	2.4	Pending <u>b/</u>
1969	United Kingdom-Hungary	Equipment and technology to produce disc drives and magnetic heads for computer peripherals.	2.8	Pending <u>b/</u>
1969	France-Poland	Equipment and technology to produce silicon transistors.	2.0	Approved

SECRET

- 15 -

SECRET

Date	Countries Involved	Description	Value (Million US \$)	COCCM Status
1969	United Kingdom- Bulgaria	Equipment and technology to produce quartz crystal filters. The United Kingdom will provide the raw materials for the duration of the three-year agreement.	0.3	Approved
1969	United Kingdom- Romania	Complete production plant and technology to produce plastic film capacitors.	2.5	Approved
1970	Canada-Czechoslovakia	Equipment and technology to manufacture 960-channel FDM radio relay equipment.	2.1	Pending
1970	West Germany-Poland	Equipment and technology to produce ceramic television and FM-broadcast transmitting tubes.	0.4	Approved
1970	France-Poland	Equipment and technology to produce ceramic television and FM-broadcast transmitting tubes.	0.4	Approved
1970	West Germany-Poland	Equipment and technology to assemble radiotelephones. Subassemblies to be supplied by West Germany.	3.2	Approved
1970	United Kingdom- Romania	Equipment and technology to produce Hawker-Siddeley 748 and Rolls Royce Dart aircraft engines.	0.8	Pending
1970	United Kingdom-USSR	Equipment and technology to produce glass cloth-epoxy resin printed circuit boards.	5.9	Pending
1970	West Germany- Czechoslovakia	Technology to produce 960-channel FDM radio relay equipment.	N.A.	Pending
1970	France-Czechoslovakia	Technology to produce 960-channel FDM radio relay equipment.	N.A.	Pending
1970	Italy-Czechoslovakia	Technology to produce 960-channel FDM radio relay equipment.	N.A.	Pending
1970	West Germany-Hungary	Joint venture in production of wire memory cores. West Germany will supply equipment and technology; production to take place in Hungary. The cores will be returned to West Germany.	0.3	Approved
1970	France-Poland	Technology and equipment to produce integrated circuits.	7.0	Pending
1970	United Kingdom- Hungary	Technology and equipment to produce integrated circuits.	0.1	Pending
1970	United Kingdom- Poland	Technology and equipment to produce line printers for computers.	N.A.	Pending

a. France concluded the contract without COCCM approval.
b. These cases will be approved upon receipt of certain assurances.