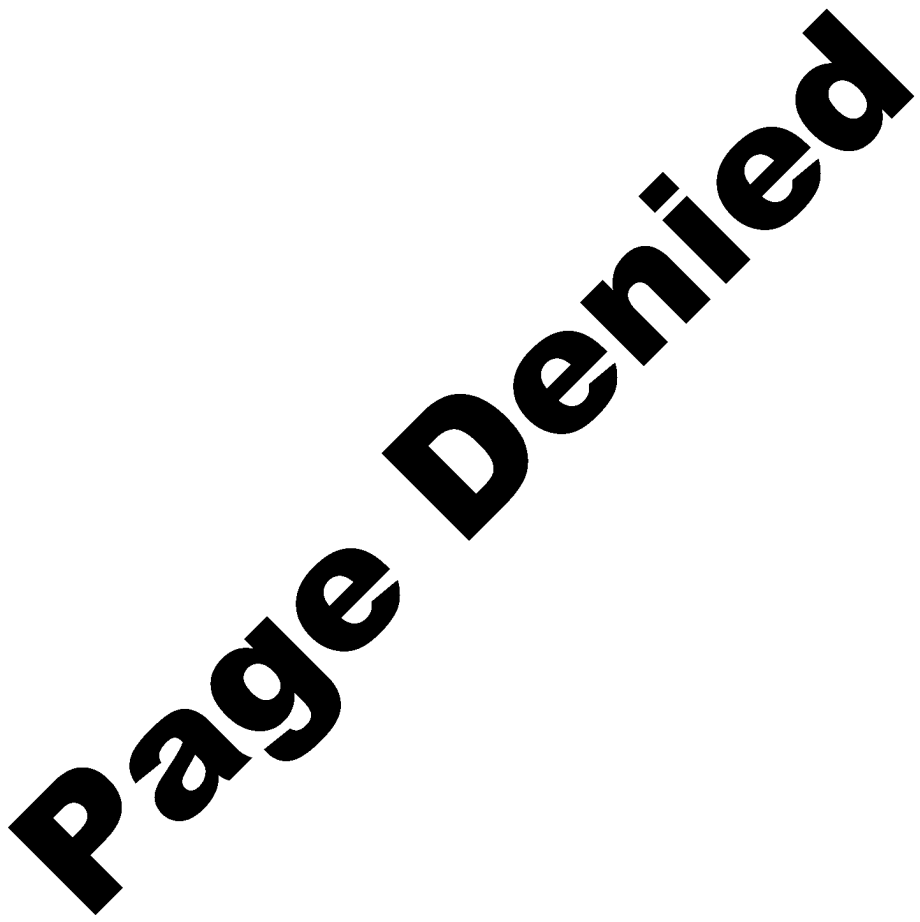

Dimensions of China's Technology Acquisition Program

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April 1983

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This report was prepared by of the Office of East Asian Analysis. It was coordinated with the Technology Transfer Intelligence Committee. Comments and queries are welcome and may be addressed to the Chief, Development Issues Branch, China Division,

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Dimensions of China's Technology Acquisition Program

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Overview

Information available as of 21 March 1983 was used in this report.

Since 1978 China has substantially expanded its efforts to acquire Western technology, establishing an increasingly sophisticated bureaucratic apparatus at home and abroad. Most technology is acquired through trade and commercial dealings, which now are more diverse and numerous than at any time since the founding of the PRC in 1949. The decentralization of foreign trade has permitted China's localities to build on Beijing's national-level programs to acquire technologies appropriate to their individual needs. China has also entered into nearly 150 joint ventures, almost half of which are based outside of China in Hong Kong and the West.

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In recent years, China has also signed science and tehnology agreements with a dozen Western nations and has sent some 15,000 students, researchers, and scholars abroad for study. Eventually these agreements will pay considerable dividends in specific scientific and research fields, such as nuclear energy and management.

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China's technology acquisition efforts are heavily oriented toward the United States. The science and technology agreement with the United States is the broadest of those signed with Western countries since 1978. Three-fourths of all the students sent abroad in the last four years have come to the United States. China also maintains a major technology acquisition effort in the United States involving its Embassy, three consulates, and some 35 commercial operations, including 17 Sino-American joint ventures.

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The Chinese are expanding their covert efforts to acquire restricted technology from the United States. Beijing has established six joint Sino-American enterprises in the United States to provide cover for covert collection of technology and is attempting industrial espionage. Hong Kong, however, as China's major trade entrepot, continues to be the most important conduit for illegal acquisition of US technologies. The Chinese use a broad network of official and quasi-official firms for such collection in the colony. In addition, Japan is becoming increasingly important as a source of technology that cannot legally be acquired from the United States.

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This Research Aid identifies the various Chinese organizations involved in technology acquisition and is based on reporting from a variety of open and clandestine sources. The American Embassy and consulates in the PRC and Hong Kong have contributed considerable information on Chinese organizations.

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Dimensions of China's Technology Acquisition Program

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China's Domestic Bureaucracy

Since 1978, China's trade apparatus, much of which is involved in the transfer of advanced technology from Japan and the West, has proliferated. The primary acquisition effort has moved from the Ministry of Foreign Economic Relations and Trade (MFERT) to a variety of other government bodies (see table 1). The establishment of new national-level organizations engaged in foreign trade and technology transfer such as the China Metallurgical Import and Export Corporation or the China Electronic Technology Import and Export Corporation has been replicated at provincial levels and below.

A growing number of corporations specialize in the acquisition of military and industrial technology (see tables 2 and 3). The operations of these organizations are coordinated directly by the National Defense Science, Technology, and Industrial Commission, which can task a wide range of Chinese commercial and technology organizations to collect special technology.

Professional and Technical Societies

Prior to 1978, professional and technical societies were the main conduits for technical data, literature, and exchanges with foreigners. Over the past four years, the number of such societies has grown from 75 to 106.

To streamline the technology acquisition process, the Chinese Association of Science and Technology has become the primary coordinator for China's professional and technical societies, especially in their dealings with foreign contacts. Since 1978, the Chinese have joined or reactivated their membership in 60 international and technological organizations.

Overseas Channels for Acquiring Technology

Embassies and Consulates. In most embassies and consulates, commercial and scientific officers are assigned to collect technical information. In the United States the number of diplomats involved in such activity has grown substantially over the past three years as consulates have opened in New York, Houston, and San Francisco. There are now some 132 Chinese diplomats and 228 support staff in the Embassy and consulates. We estimate that as many as 20 percent of them could be involved in technical acquisition. A few Chinese officials posted at the United Nations mission and the New China News Agency, as well as those serving as military attaches, are also active collectors of technical and scientific information.

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Chinese Commercial Operations in the United States. Since 1979, Beijing has set up 18 commercial organizations, subordinated to MFERT and other Chinese governmental organizations, for operations in the United States (see table 4). We believe at least six of them are heavily engaged in technology acquisition. A smaller number also are substantially involved in illicit collection. For example, in September 1981, Chinese embassy officers representing Techimport arranged to purchase a residence in a Maryland suburb of Washington from which they are attempting to acquire restricted technologies.

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China also has established 17 commercial operations with sponsorship or assistance from US companies

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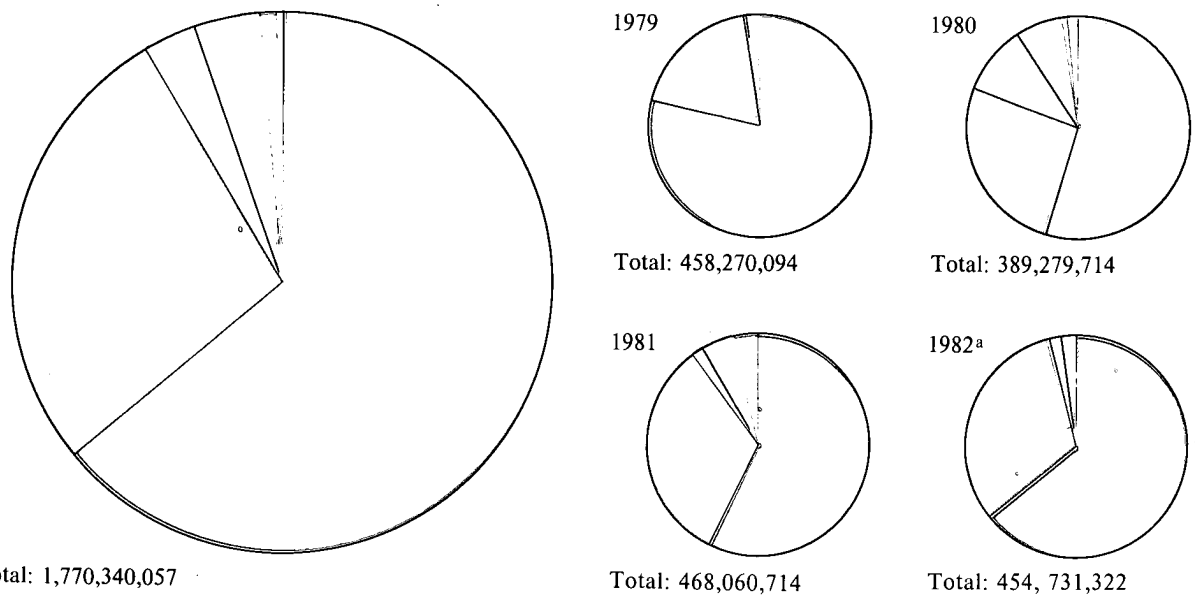
Figure 1.
China: Distribution of Export Cases by Commodity Value, 1979-82



[a] Includes data through 17 December 1982.

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US-Origin Technology. China's commercial operations in the United States clearly show the scope of the US role as a source of advanced technology. Much of China's $23 billion worth of machinery and equipment imported between 1972 and 1980 embodies relatively advanced industrial technology. Since 1980, a growing proportion of China's machinery and equipment acquisitions has had military as well as civilian applications and has been obtained through relaxation of US export licensing restrictions (see figures 1 and 2).

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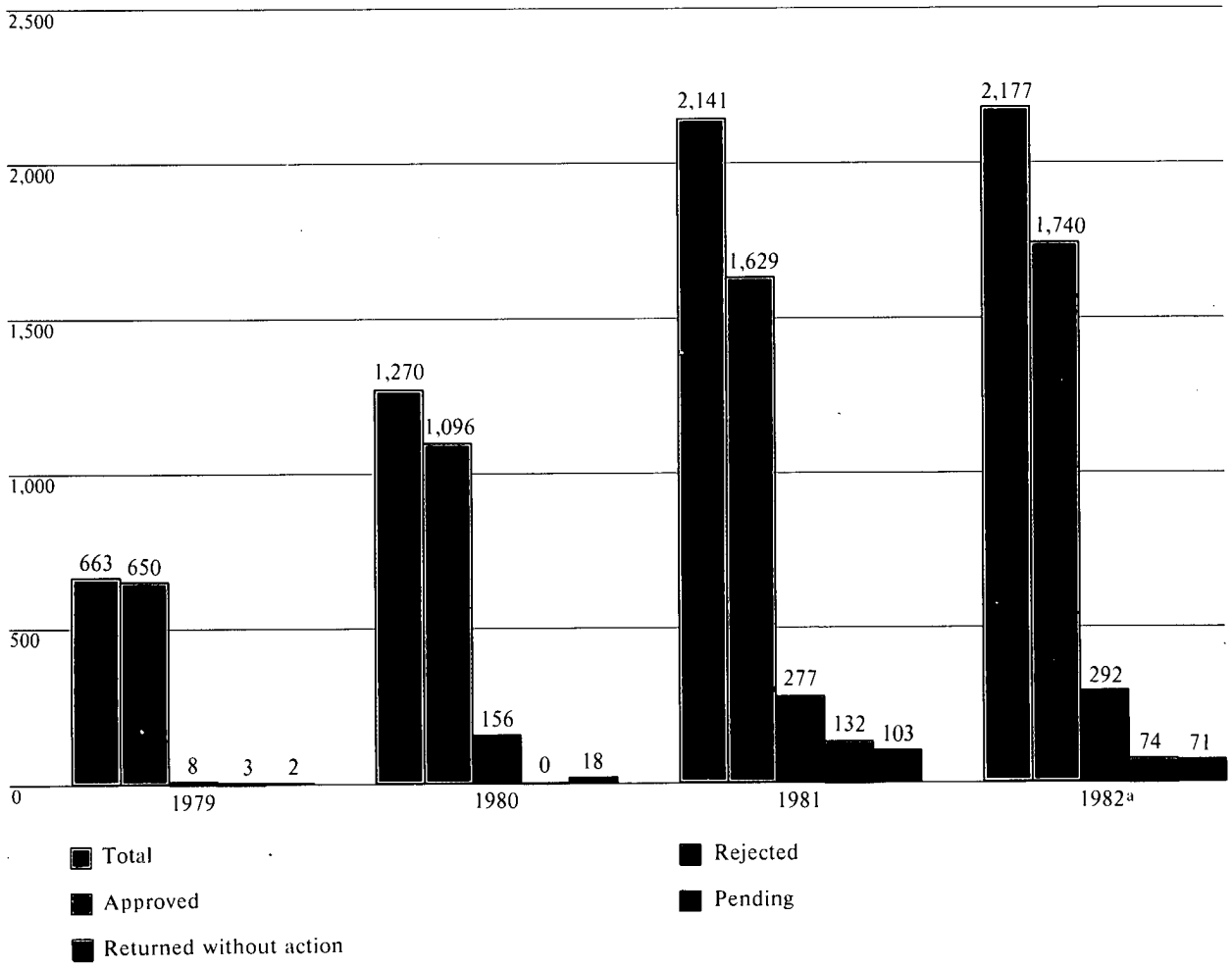
Figure 2.
China: Disposition of US Export Cases, 1982



[a] Includes data through 17 December 1982.

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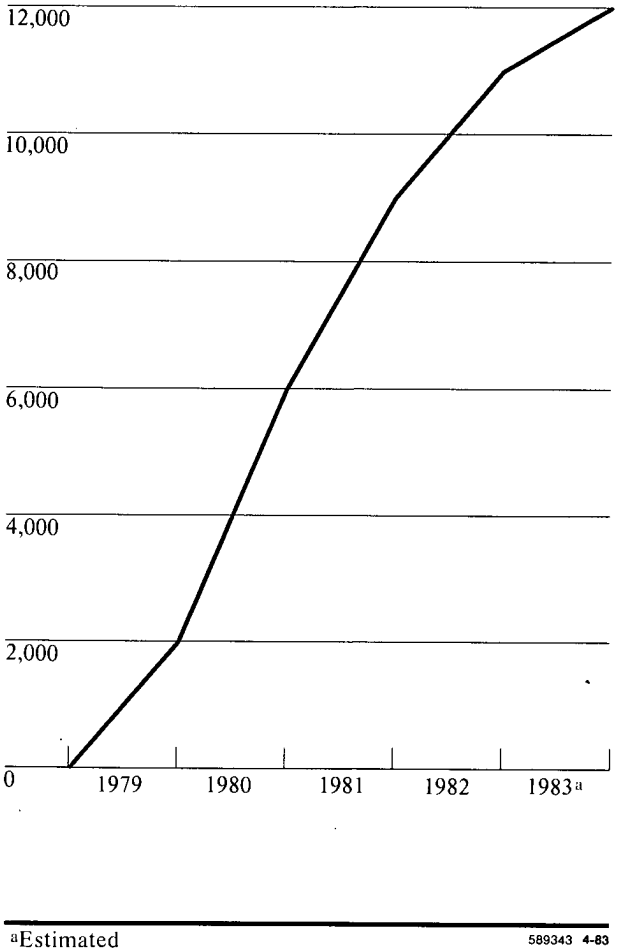
Student and Scholar Exchanges. The Chinese have sent more than 15,000 students and scholars abroad to 54 countries since 1978. The Chinese Ministry of Education reports that some 4,000 already have returned to China. Chinese officials have stated that the number of students going abroad will continue at about 3,000 per year through 1985. Most of these will undoubtedly be sent to the United States for advanced study (see table 6).

About 5,000, or less than half, of the Chinese students coming to the United States are officially sponsored, and most of those who are are in graduate programs in the physical sciences. Chinese students coming to the United States generally stay two years. The number of Chinese students in the United States grew from about 25 in 1979 when relations were normalized to nearly 11,000 in 1982 (see figure 3). In addition to receiving specialized academic training, Chinese students are also sending or taking components, technical manuals, and professional journals back to China. The number of students and scholars going abroad will decline after 1984 because Beijing has initiated measures to restrict the number of privately sponsored students.

The Chinese Academy of Sciences (CAS) also has established cooperation agreements with 45 countries. This involved some 2,311 exchanges in 1981, and CAS alone sponsored 749 graduate students and visiting scholars abroad in 1981. A total of 2,079 individuals in 235 disciplines have gone abroad during the last four years. According to CAS officials, about 350 of these have returned to China.

Figure 3.
Chinese Students in the US



[a]Estimated

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Bilateral Government Science and Technology Agreements

China has signed major science and technology agreements with a dozen Western nations since 1978 (table 7). Prior to that time China was party to only a handful of such agreements, almost exclusively with "socialist" countries. From the Chinese standpoint, one of the most active and productive pacts is the Scientific and Technical Agreement signed with the United States in January 1979 containing 17 protocols and annexes and providing for 31 working exchange programs. The most active programs are in hydropower, health, metrology, basic physics, and management. (The United States and China jointly sponsor an executive training center at Dalian.)

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Commercial and Trade Ventures in China

Licensing and technical agreements—basically contracts for industrial know-how—provide China with sharply focused applied proprietary technology. Beijing has signed at least 50 such agreements. These normally span five to 10 years and include considerable amounts of modern technology.

Joint Ventures.[1] An increasingly important, but as yet minor, conduit for Western technology is through joint ventures and contractual businesses (figure 4). These bind the foreigner and Chinese partner together technologically as well as commercially. Beijing is establishing these at an increasing rate, particularly in the United States, where 14 began to operate in 1982 (see table 8).

Of China's 70 joint equity ventures in manufacturing, 15 (10 in China and five abroad) are in highly technical industries such as instruments, electronic components, telecommunications, and computers (see table 9).

Service Centers. Foreign firms have contracted to establish 35 service and maintenance centers in China, primarily to facilitate commercial entry into the China market (see table 10). Electronic instrument makers are almost certainly transferring some proprietary technology through their centers. Most of the maintenance and service centers provide Chinese with advanced technical training.

Special Economic Zones (SEZs). China is using the SEZs as investment magnets, but the zones have not yet become major conduits for high technology. The Chinese have contracted for 17 joint ventures in the zones and claim that some 550 foreign investment and coproduction projects worth $1.2 billion were signed in 1982. However, of the seven joint-venture manufacturing operations located in the zones, there is only one electronic components assembly plant. The others are for metal forming and for industrial products such as cans and aluminum frames.

[1]The Joint Venture category includes both joint equity ventures and contractual joint ventures. These differ from other contractual arrangements because they share either investment (equity) or profits.

Figure 4.
China: Technical and Licensing Agreements by Country, 1982

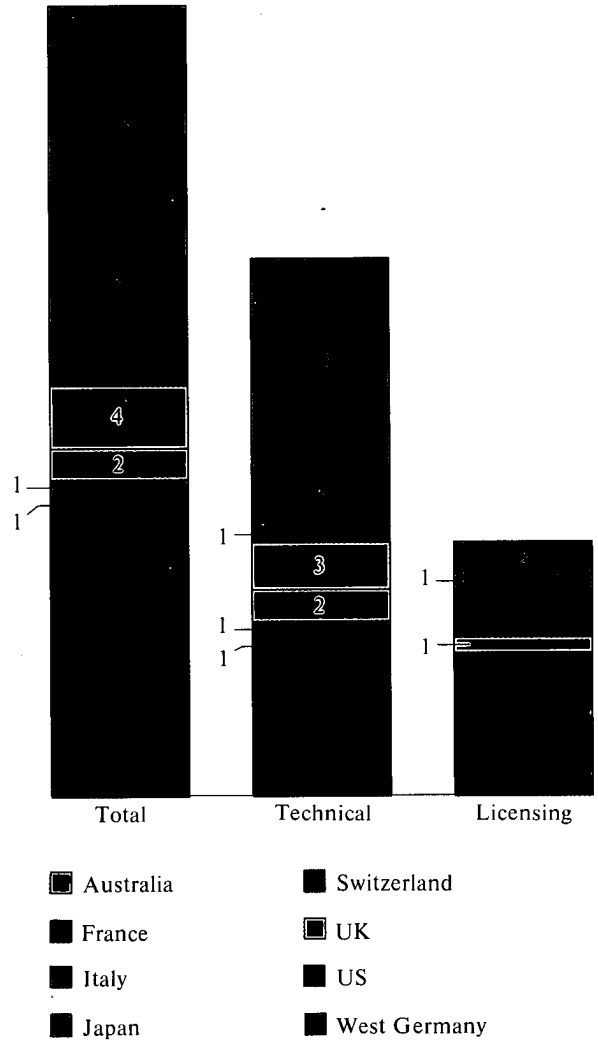

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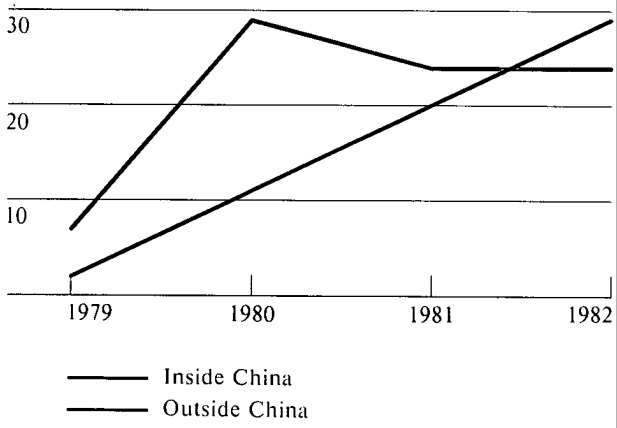
Figure 5.
China: Locations of Joint Ventures and Contracted Businesses



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Major Covert Channels

Most of China's foreign trade and technology corporations also facilitate covert collection in the course of their legal acquisition activities.

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Some Chinese trading corporations, moreover, are more actively engaged in covert collection than others because of the unique interests of their client agencies.

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China is making increasing use of visitors to Western countries to procure sensitive equipment and technology. Chinese corporations also are growing more adept at misrepresenting end users and at preparing false documentation to finesse Western controls.

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Table 1
China: Expansion of the National Foreign Trade Bureaucracy

	1978	1982
MFERT corporations involved in trade	14	16
Other corporations under ministries and state commissions	8	89
Total	**22**	**105**
MFERT corporations engaged primarily in tech transfer	2	2
Other corporations engaged primarily in tech transfer	2	24
Total	**4**	**26**

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Table 4
Official Chinese Organizations in the United States

Organization	Location
Bank of China	New York
China International Travel Service	New York
China Interocean Company, Inc.	New York
Sino-Am Marine Company, Inc.	New York
China Ocean Shipping Company	San Francisco
Chinatex America, Inc.[a]	New York
Chinatex Cotton Commodity Watchers [a]	Dallas
Ceroilfood New York, Inc.[a]	New York
Sunry Import and Export Corporations (Chinatuxu)[a]	Paramus, New Jersey
China National Equipment and Machinery Import and Export Corporation[a]	New York
China Arts and Crafts USA, Inc.[a]	New York
China National Chemicals Import and Exports[a]	New York
China National Technical Import Corporation[a]	Techimport
Chinatuxu Lumber and Timber Office[a]	Seattle, Washington
China United Trading Corporation[a]	New York
Beijing Book Company	New York
China Aero-Technology Import and Export Corporation	Arlington, Virginia Long Beach, California
Minmetals, Inc.	Fort Lee, New Jersey

[a] Subordinate to MFERT.

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Table 6
China: Number of Students Sent Abroad Since 1978 [a]

United States	11,000
Japan	1,000
United Kingdom	615
Canada	500
West Germany	500
France	200
Australia	100
Sweden	80
Italy	20

[a] The Netherlands, Switzerland, Norway, and New Zealand have 10 to 40 students in the country at any one time. Very few students and scholars are in Eastern Europe or the Soviet Union.

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Table 7
China: Science and Technology Agreements With Western Nations

Country	Date	Activity
France	Jan 1978	Nuclear, geological sciences
United States	Jan 1979	17 scientific areas
Italy	Oct 1978	Nuclear sciences
	Nov 1981	Science
	July 1982	Technical assistance, satellites
Federal Republic of Germany	Oct 1978	Minerals, oil and gas, computers
	Oct 1982	Coal development, agricultural management, quality control
Sweden	Oct 1978	Industrial technology
	Oct 1981	Industrial technology
United Kingdom	Nov 1978	Informational sciences
	Dec 1981	Science and technology
Japan	May 1980	Nuclear fusion, computer sciences, oil and gas, social sciences
Australia	Oct 1981	Science, agriculture, forestry, animal husbandry medicine
EEC	Nov 1981	Energy management
Pakistan	Oct 1982	Arms and weapon technology, nuclear cooperation
Portugal	Oct 1982	Science and technology

Table 8
China: Joint Venture Partners

	Total	Inside China	Outside China
Hong Kong	**51**	27	24
United States	**44**	24	20
Japan	**18**	9	9
Asian countries	**14**	11	3
European countries	**17**	13	4
Other	**2**	0	2
Total	**146**	**84**	**62**

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Table 9
Joint Ventures, 1982

Category	Inside China	Outside China
Machine building	18	6
Consumer industries, textiles, foodstuffs	15	3
Electronics and computers	10	5
Agriculture and fishery	5	4
Pharmaceuticals	5	0
Banking and financial services	0	3
Service and transport	1	9
Sales and trading	0	31
Offshore oil and oil rigs	14	1
Hotels, offices, recreation centers	16	0
Total	**84**	**62**

Table 10
China: Service and Maintenance Centers by Sponsoring Country

Country	Centers	Products/Technology
Japan	11	Automobiles, watches, motorcycles, construction equipment
United States	9	Electronic instruments, construction equipment
West Germany	3	Automobiles, marine equipment
Switzerland	2	Watches
United Kingdom	2	
Hong Kong	4	
Others	4	

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