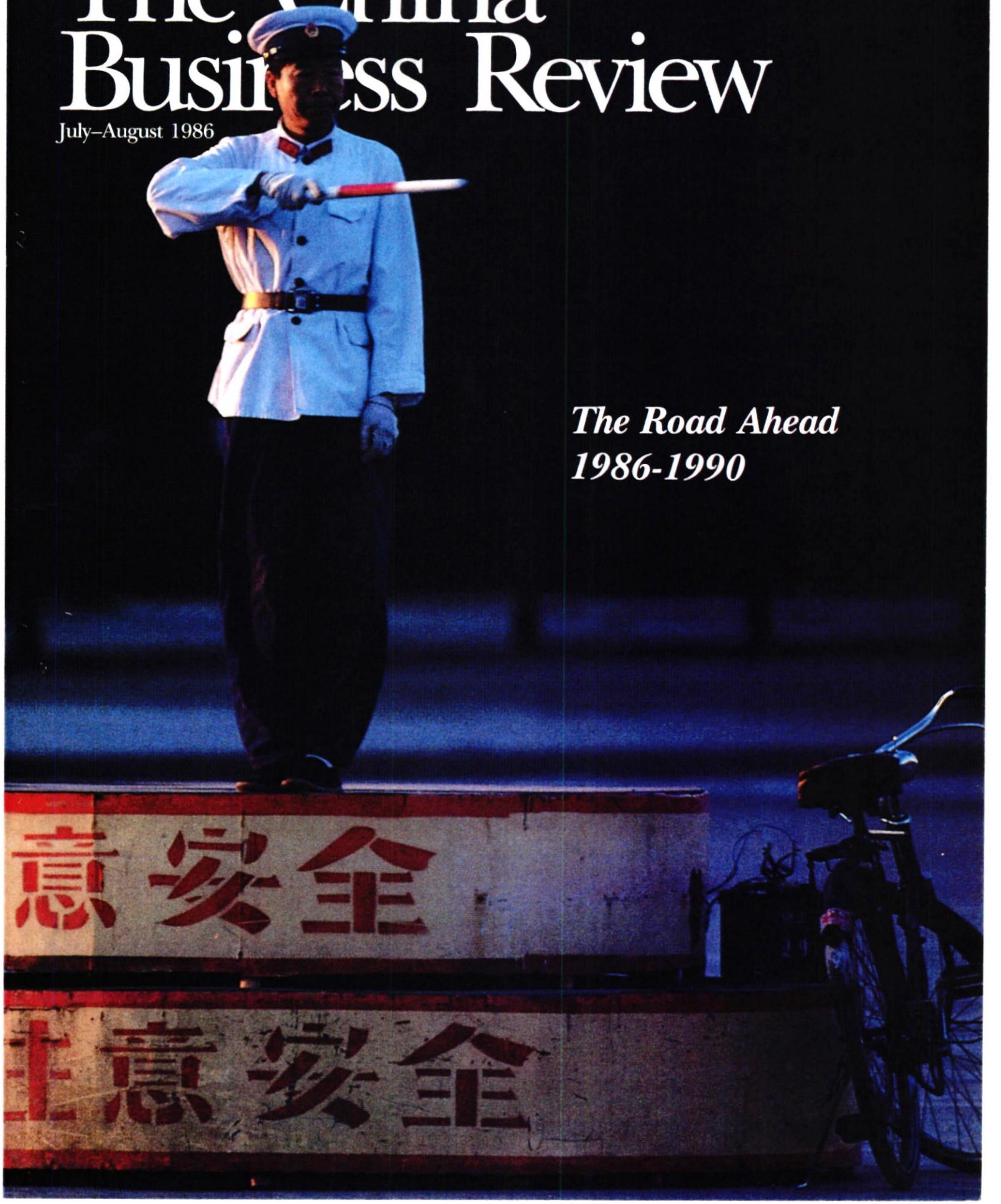
The China Business Review

July–August 1986



The Road Ahead 1986-1990

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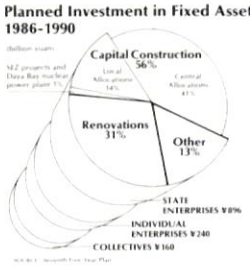
The China Business Review

The magazine of the National Council for US–China Trade

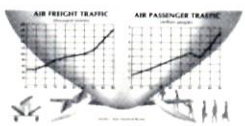
July–August 1986 Volume 13, Number 4

Cover: The Seventh Five-Year Plan reflects a new pragmatism in China's long-term economic planning. *Photo by Jim Brandenburg.*

Sectoral Investment: Channeling resources into such key sectors as energy and transport, and controlling local investment levels are major tasks for the next five years. **Page 12.**



Airports: Of all China's modes of transport, aviation has perhaps the farthest to go. **Page 36.**



Departments

摘要

NO MORE FREE RIDES

Do China's unprofitable State-run enterprises have the right to exist? Previously the answer was yes, and the State shelled out ¥2 billion in 1984 alone to subsidize them. But a draft of China's first bankruptcy law, submitted to the NPC Standing Committee for comment in mid-June, may eventually change all that.

A bankruptcy law would push the industrial reforms forward. It would confirm the power of factory managers by holding them accountable for factory performance. And it would help to readjust China's economic structure: only efficient enterprises would survive in the more competitive marketplace.

Increased autonomy would also be tempered by the fear of failure—perhaps preventing excesses like those that took place during the 1985 industrial boom when enterprises faced little to no risk in investing: if they failed, the government would bail them out. The result was wasted resources and energy used to produce many low-quality products or those not in demand.

Under the law, enterprises losing money would be threatened with closure, then given time to improve their performance. But actually deciding which enterprises to shut down may prove difficult, requiring judgments based on political as well as economic criteria. In China profitability is not always directly tied to efficiency—prices, though now somewhat more flexible, are still irrational, unfairly favoring some sectors over others. The auditing system, still in its infancy, uses the book value rather than real market value of products. And expenses are not always equal—some enterprises are saddled with more redundant labor, and older enterprises must support larger retiree rolls.

In closing factories, two hallowed traditions will be broken. State-owned means of production (appropriations of machinery and buildings) will not revert back to the State, but will be auctioned off to pay debts—salaries, State taxes, and other creditors, in that order. And the "iron rice bowl" of job security will be smashed as workers in the bankrupt enterprise lose their jobs. Insurance companies are now considering creating a "workers job-waiting insurance" to provide compensation until they find new jobs.

Whether workers accustomed to State-assigned jobs will be forced to find their own new positions is unclear. But a recent survey in the Shanghai-based *World Economic Herald* may ease the fear of some central planners who see the potential for more joblessness here. If their enterprise went bankrupt, 51.8 percent of those surveyed said they would look for work in another enterprise on their own and 35 percent indicated they would go into private business. —JSS

HOLDING ON TO MARKET SHARE

Most executives would find a drop in market share from a record 22.7 percent in 1982 to only 11.9 percent in 1985 rather disconcerting. But in losing 10.8 percent of China's import market during this period, the United States really didn't do as badly as one might think.

In the past four years the structure of China's imports has shifted away from agriculture—where the US held an abnormally high 40 percent share in 1982—toward machinery and manufactures, where international competition is keen. But according to Chinese customs statistics, outside of steep declines for a few agricultural products, US market penetration rates for most categories have hardly changed. In fully 55 percent of the cases, the US stayed within five percentage points of its 1982 share of China's market, and 22 percent saw market share rise more than 5 percent. Considering the overvaluation of the dollar against other currencies during this period and Chinese price consciousness, the US did quite well to hold its market share.

The worst may now be over. A moderate growth in market share is likely during 1986–87. With imports of luxury consumer goods—an area in which the US is less competitive—strictly prohibited, a higher percentage of China's foreign exchange will go toward purchasing capital goods and raw materials. And agricultural imports may pick up as China moves toward a more commercial agricultural system.

Most significant, the value of the dollar has dropped 30–40 percent against the currencies of competitors. Based on the first four months of the year, the US already seems to be picking up market share in 1986. While China's total imports in these four months grew by only 3.49 percent over the same period in 1985, imports from the US rose 18 percent. —David Denny

WANTED: A BETTER PUBLIC IMAGE FOR CHINA'S POLICE

The sight of 1,000 jeering students blocking the path of police may be unusual in most parts of the world, but in China such incidents are even more unexpected. Especially in the context of reforms that are quietly revolutionizing Chinese society, any sign of social unrest, however minor, can feed skepticism of where the reforms will lead. In this incident in June, the Beijing students threatened to overturn a police car after a dispute between a motorcyclist and police. The increasing brazenness and frequency of student disturbances are worrying the authorities.

Corruption, poor discipline, and sagging morale in the police force are partly to blame for the growth of "troublesome incidents" and strained relations with the public. Better discipline among the police, officials argue, will make it possible for them to control disturbances before they get worse. In June's con-

frontation with students, it took more than one hour for reinforcements to arrive.

Public security officials are now taking concrete steps to improve the quality and numbers of police. Since cadres with higher education now form only a small percentage of all police nationwide, the Ministry of Public Security has established many police academies and colleges over the past two years to train students, many recently released by the army. But recruiting new force members may prove difficult. With opportunities opening up in the service industries, young people are no longer inclined to regard public security as an attractive line of work. Salaries are low, and public security is not, and never has been, a highly regarded occupation in Chinese society.

So far, officials have said nothing about raising police salaries. But salaries will have to be raised, first, to help police resist the temptation to abuse their authority for private gain, and second, to attract more young recruits.

As Chinese officials grapple with the problems of improving public security, it is important to keep the problem in perspective: public disorder may be growing, but there appear to as many homicides in some busy New York police precincts as there are in all of Beijing. —DCD

THE JOB NOBODY WANTS

Ever since September 1985, China's top leaders had been seeking a replacement for aging Minister of Culture Zhu Muzhi. A succession of literary and artistic luminaries were called in for interviews. Each in turn politely but emphatically declined the post. Finally, in March the well-known author Wang Meng was reportedly persuaded by no less a duo than Deng Xiaoping and Hu Yaobang to change his mind and accept the job.

Why was everyone so reluctant to take this prestigious position? One reason, of course, is that for a serious artist, the post of Minister of Culture—with responsibilities for art, music, book and magazine publishing, staging plays and, until recently, producing films—leaves little time for creative pursuits. But more important, assuming the post of culture minister is like walking into a political minefield.

"Culture" is a highly political affair in China; literature especially has been a vehicle for political debate, and even a powerful political weapon. In recent times, literary works have frequently presaged campaigns against political opponents. But the Minister of Culture has little control over these campaigns or even lesser "cultural debates." He reports to the Propaganda Department, from which he receives Party instructions. When cultural policies go awry, he is more likely to be blamed than high-level officials in the Party Secretariat or Central Advisory Commission who are actually calling the shots.

However limited the influence of the culture ministry, the appointment of its minister is viewed as a bellwether of political trends in China. Wang Meng's appointment is another victory for relatively tolerant reformists over those favoring a more didactic approach to cultural work. His appointment also signifies the preeminent position that literature is expected to play in promoting reforms, since Wang claims to have little interest or expertise in cultural matters apart from literature.

Although his appointment coincides with the rebirth of the "double hundred policy" ("letting a hundred flowers blossom and a hundred schools of thought contend"), Wang is likely to face his share of troubles. He must implement Party policies even when they run counter to the interests of his fellow writers, and perhaps those of the general public. Already attempting to strike a compromise between conservative and liberal views, Wang is courting the mistrust of both orthodox theoreticians and his colleagues in the Chinese Writer's Association. Despite recent high-level rejection of the view that a Party leader's artistic opinions should be taken as 'the last word,' Wang can still expect the Party to play the role in cultural affairs.

During his term of office, Wang will have to confront all the "contradictions" that still create tension in literary circles. Should stories emphasize the positive, or the true-to-life? Is the worth of a book proven by the response of the readers, or how well the writer "educates" them?

As long as there are Party leaders who believe these questions require definitive answers, the Minister of Culture will remain the man-in-the-middle with the job nobody wants. —DCD

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American publishers begin to take notice of the world's fifth-largest market for English-language books

Selling Books to China

Priscilla Totten

American book publishers will occupy 94 out of 320 booths—more than any other country—when the first Beijing International Book Fair (BIBF) opens on September 5. Offering everything from technical, reference, and college textbooks to art history, classics, and contemporary literature, the publishers will be looking to increase their name recognition in China and obtain a share of the money Chinese buyers plan to spend on imported books and periodicals this year.

John Wiley & Sons began staging individual exhibits in China in the late 1970s, and many more publishers have followed suit. Last year McGraw-Hill exhibited its books in Beijing, Shanghai, Guangzhou, Chongqing, and Harbin, and then held a reciprocal display of English-language books from China in the lobby of its New York headquarters.

But international book fairs in China made their debut only last year with the Shanghai International Book Fair (SIBF), which displayed 11,000 books from 100 publishing houses in 16 countries and regions. The Beijing book fair, scheduled to become a regular event held every other year, sold out booth space early and still has a waiting list. In addition to the large US presence, there will be sizable representations of British, Japanese, and West German publishers. Some 40,000 books published overseas during the last two years will be exhibited.

Sales to China defy international trends

According to a 1986 study called *American Books Abroad*, the United States leads the world in book exports. In 1984 more than 80 percent of these, or $540 million in sales, went to 17 markets, mainly in Western countries. The remainder went to 131 other countries, including China.

The majority of US book exports consist of professional books and scientific, technical, and medical texts. During the last 10 years, while the percentage of US sales to developed countries has grown, the percentage to developing countries has dropped. In particular, sales of scientific and technical books to developing countries are stagnating.

But China defies these trends: both overall US book purchases and sales of scientific and technical books reached their highest levels ever in 1985 (*see* p. 7). Because China's government subsidizes the vast majority of foreign book sales as part of its commitment to expand intellectual resources, China is not in the same situation as many other Third World countries where demand for imported books is tied to individual ability to pay for them.

China began lifting restrictions on book imports in 1979 after 30 years in which almost no Western books were purchased. The government's current list of priorities for imported subject matter is headed by science and technology—in keeping with the spirit of the four modernizations. But a renewed interest in the West has China's book buyers snapping up everything from classics to books on advertising.

The audience for imported books is large and growing. An estimated 60 million Chinese now study or already speak English, the most popular foreign language taught in the schools. Thousands of Chinese also learn English by listening to Voice of America and BBC radio broadcasts and by watching English-language television. All these English speakers make China the world's fifth-largest potential market for English-language books, after the United States, Great Britain, Canada, and Australia.

Foreigners and Chinese alike can buy English-language books in many locations. At the foreign-language bookstore outlets in many Chinese cities, customers buy foreign books for RMB. Current best sellers at the Wangfujing Foreign Language Bookstore in Beijing include *75 Short Story Masterpieces* (which costs ¥7), *Mark Twain's Complete Short Stories* (¥7), and the *Scribner/Bantam English Dictionary* (¥5.50). English-language books are also available to customers paying in foreign exchange at friendship stores in the major cities, some of the large hotels, and all of the joint venture hotels.

Volume discounts used to enter market

As with many international book sales, selling books to China generates relatively low profits compared with the expense of cultivating the market. Most companies start by sending catalogs to the China National Publications Import–Export Corporation (CNPIEC) headquarters in Beijing, and discussing terms of sale and discount schedules. A sales rep may then be assigned to provide firsthand knowledge of the market (often through extensive travel).

Sales representatives bring samples and the latest book lists to the foreign language bookstores, universities, and libraries. Although no US publisher has opened an office in China yet, many cover China from regional offices for Asian sales (usually in Hong Kong, Singapore, or Manila).

In the United States a technical book is priced for retail with the

markup built in. Unlike books designed for the general audience, the price is not printed on a technical book and can be raised or lowered as needed. Books distributed domestically can be returned by bookstores to the publisher for money back if they are not sold. But in international sales, the price is often discounted because the buyer cannot return unsold texts. While some publishers report selling to China at standard international discounts, which vary from country to country based on currency rates, others will negotiate price based on volume. Discounts for China reportedly range from 25 percent to 40 percent or more.

Publishers are paid in dollars for their books, although like many foreign traders they report intermittent slowdowns in payment due to the current squeeze on foreign exchange. Yet China's leaders have earmarked more and more precious foreign exchange for book imports—a sign of the importance they place on keeping up with Western science and technology.

The price of a foreign paperback is expensive for the average Chinese. Chinese novels typically cost only about ¥1–¥2 ($.31–$.62), while overseas editions often cost 10 times as much.

These foreign books could be sold more cheaply if China bought the copyright and published the novels themselves, but translating is slow, paper is in short supply, and China has yet to join the international copyright convention. This convention, founded in 1952, binds its 72 member nations to international copyright rules. Many publishers claim their books have been pirated by the Chinese—indeed, this is a major concern in all international publication sales—and several claim to be holding back from the market until China's copyright law, currently being drafted, is published. To assuage these concerns, an official from the China State Copyright Bureau will be on hand to answer copyright questions during the BIBF.

Science and technical books lead commercial sales

The Chinese divide American book publishing into three basic categories: commercial publishers, led by John Wiley & Sons, McGraw-Hill, Academic Press, and Prentice Hall; association publishers, led by the Institute for Electrical and Electronic Engineers (IEEE), the American Institute for Aeronautics and Astronautics (AIAA), the American Society of Testing Materials (ASTM), and the American Society of Mechanical Engineers (ASME); and government publishers, led by the Government Printing Office and the National Technical Information Service.

John Wiley & Sons, publishers of academic and professional books, is among the most successful US publisher in China. The company sold books in Shanghai in the 1930s, and set the groundwork for current sales in the late 1970s. Chairman W. Bradford Wiley first visited the PRC in 1979, and his long-term interest in China is often credited with the firm's success today. At the SIBF Wiley & Sons displayed more than 500 titles, and the Chinese have already purchased about half the books on Wiley's list—more than 700 titles.

McGraw-Hill, a publishing conglomerate whose products include books, periodicals, and computer software, is also a leader in US book sales to China, with a focus on educational, business, and professional books. Like Wiley, McGraw-Hill targets China's universities and professionals from their Hong Kong office.

Baker & Taylor, a distributor representing 14,000 small publishers, entered the China market in 1984 and will display 2,000 books at the BIBF. It is represented in China by a consulting firm (rather than by a regional sales rep), who keeps libraries and CNPIEC supplied with spring and fall lists. To date, orders have come predominantly from universities, booksellers, and libraries, but the company hopes to expand its list of clientele after the September fair. According to Fred Philipp, senior vice president for marketing, China is among the top five international markets for Baker & Taylor.

Feffer & Simons, another distributor representing 150 American pub-

US Book Exports to China

Value and Unit Sales
(thousands of $)

	TOTAL 1982	TOTAL 1983	TOTAL 1984	TOTAL 1985
	$2,354	$3,699	$1,480	$5,694
	448,144	563,758	280,854	611,687

Partial breakdown:	1982	1983	1984	1985
Textbooks	$1,448 213,752	$540 54,732	$53 3,122	$351 19,706
Technical, Scientific & Professional	$181 58,283	$257 46,939	$340 76,874	$1,485 165,530
Paperbacks	NA	$58 43,323	$25 16,263	$126 62,647

SOURCE: Department of Commerce trade statistics

lishers, displayed 1,000 titles at the SIBF, and plans a similar booth at the BIBF. Marta Schooler, Asian sales director, says the Chinese are interested in their humanities selections, including books on photography, illustration, and advertising.

Classics and westerns sell well

In the area of trade sales—that is, books for the general audience—no publisher has been more aggressive than Bantam Books, a major publisher of best-selling trade paperbacks. Bantam sells to libraries and 42 State-run bookstores through an Asian sales representative based in the Philippines. So far their reference books and classics series, which features such works as *Huckleberry Finn* and *Moby Dick*, have drawn the biggest response. Their westerns are also popular—anything inherently American seems to pique the interest of the Chinese. Bantam's contemporary fiction is mostly purchased by Westerners living in or visiting China. At last year's Shanghai fair, Bantam sold several thousand paperbacks in five days at a special discount counter they set up.

Because of their racy covers, Bantam's very profitable line of romance novels has not yet found a Chinese audience. China's strict censorship standard prohibits the sale or display of books considered unfriendly or obscene. Bantam's classics compete in China, as everywhere else, with other paperback publishers who sell many of the same titles.

Who's buying?

CNPIEC, which coordinates about 90 percent of China's book imports, operates "under the guidance of" the State Science and Technology Commission. The other 10 percent of China's book imports are handled by the China International Book Trading Corporation (CIBTC) (which purchases books on the humanities and social sciences only), Shanghai Book Traders, and the Beijing Book Import–Export Corporation.

CNPIEC and CIBTC both have New Jersey subsidiaries (*see* chart) that process orders from US publishers and collect spring and fall catalogs to send back to China. CNPIEC opened a representative office in London in April, and one in Heidelberg, West Germany, in May.

CNPIEC's budget of $55 million in 1985 was six times the outlay in 1977, and $17 million more than budgeted

CNPIEC AND OTHER BOOK IMPORTERS

BEIJING BOOK IMPORT–EXPORT CORPORATION (BBIEC)
(est. 11/85)
78 Hou Shi Dao
Chaoyangmennei Dajie
Beijing
Tel: 444653
Manager: Wang Enmin

SHANGHAI BOOK TRADERS
(est. 4/85)
390 Fuzhou Road
P.O. Box 234
Shanghai
Tel: 223200
Telex: 33355 SBT CN
Cable: Shanbot
President: Wang Yichen

CHINA NATIONAL PUBLICATIONS IMPORT–EXPORT CORPORATION (CNPIEC)
137 Chaoyangmennei Dajie
P.O. Box 88
Beijing
Tel: 440731
Telex: 22313 CPC CN
Cable: Publimex Beijing
President: Chen Weijiang

Branches and Subsidiaries:

CNPIEC, Shanghai branch
P.O. Box 4111
Shanghai

CNPIEC, Guangzhou branch
P.O. Box 525
Guangzhou

Beijing Book Company
701 E. Linden Avenue
Linden, NJ 07036
Tel: 201-862-0909
President: Wang Yulong

CHINA INTERNATIONAL BOOK TRADING CORPORATION (CIBTC)
21 Chegongzhuang Xilu
P.O. Box 399
Beijing
Tel: 891607
Telex: 22496 CIBTC
Cable: CIBTC Beijing
President: Wang Qinyun

Subsidiary:
Cypress Book Co.
205 Robin Road
Suite 225
Paramus, NJ 07652
Tel: 201-967-7820
President: Chen Tingsun

Book Department I
Ma Juemin, director
Imports books published in socialist countries

Book Department II
He Jiarui, director
Imports books published in the West, in the Third World, and in Hong Kong and Taiwan

International Periodicals Department
Yu Xuechang, director
Imports newspapers and periodicals published worldwide

Export Department
Yang Jixian, director
Exports Chinese books and periodicals, also handles consignments of certain foreign books and journals

Promotion and Development Department
Zhao Huiyuan (f), director
Organizes exhibitions in China for foreign books, educational films, records, and tapes. Imports AV materials and equipment

BIBF Management Office
Ling Huaying (f), director
Manages BIBF every two years

in 1984. CNPIEC, which imported 100,000 books in 1984, has a staff of 800. According to Wang Yulong, president of CNPIEC's subsidiary, the Beijing Book Co. in Linden, New Jersey, "About 70 percent of CNPIEC's foreign exchange goes to purchasing science and technology books, and 30 percent to books in the social sciences, but the share alloted the social sciences is increasing."

The Beijing Book Import–Export Corporation (BBIEC) and Shanghai Book Traders (SBT), each started by their respective foreign-language bookstores, receive some foreign exchange (albeit a fraction of that received by CNPIEC) from the Ministry of Finance. Their establishment last year has signaled a move toward decentralization and competition for CNPIEC. According to *Publishers Weekly*, for instance, Shanghai Book Traders hopes to expand its sphere of business beyond the immediate Shanghai region—into regions where it will compete directly with CNPIEC. But while universities and libraries are free to order books from any of China's four main importers, CNPIEC has the most foreign exchange and experience. Moreover, CNPIEC is still China's sole distributor of periodicals, videotapes, and software, which involve more complicated transactions than books.

CNPIEC produces a monthly catalog of foreign books divided into sections on science and technology, the humanities and social sciences, and "scientific literature," (technical association and government publications). Ten thousand copies of this catalog are distributed to libraries and foreign-language bookstores in China. Libraries then place orders (and pay in RMB) with the foreign-language bookstores, who forward them to CNPIEC, who in turn forward the orders to the Beijing Book Co. in New Jersey.

CNPIEC also publishes a monthly magazine, *World Books*, to keep China's libraries and bookstores abreast of activities in the international book scene.

If libraries or bookstores have their own foreign exchange, they may order directly from a foreign sales rep, but otherwise they must go through one of the four State-run book trading companies. China's more than 3,000 official libraries contain some 2 billion books, and include public libraries, educational libraries (mainly in universities funded by the State Economic Commission); research libraries of the Chinese Academy of Sciences; trade union and factory libraries (which make extensive use of public, educational, and research libraries through group borrowing); and administrative enterprise and army unit libraries.

From management training to cooperative publishing

Several US publishers are intensifying their marketing efforts by going beyond sales into training exchanges and co-publishing arrangements.

Management training exchanges offer a way for US publishers to help China modernize its book buying, publishing, and distributing systems, as well as gain influence with important Chinese book buyers. Wiley has hosted several such exchanges, one of which involved an editor from the Shanghai Scientific and Technical Bureau, who spent three months in New York and three months in Wiley's UK office learning marketing and sales. She is now helping Wiley market its books in China before returning to her old job. Two other Wiley trainees later became bookstore managers in Beijing and Shanghai. McGraw-Hill currently has three Chinese trainees spending several weeks in each of its departments to gain an overview of publishing. Shanghai Book Traders Vice President Chang Ruizhi worked for a year as an intern at Bantam Books in New York, and then in 1985 put his new skills to the test by organizing the Shanghai International Book Fair. Americans have also gone to China to observe Chinese publishing practices.

Translation deals and co-publishing ventures are other offshoots of the growing relationship between Chinese and US publishers. Co-publishing—the simultaneous publication of a book by publishers in two or more countries, each holding the rights for their traditional market areas—costs less than traditional forms of publishing, and is gaining popularity in China. Such arrangements can help Chinese scholarly works find an international audience. In a co-publishing deal, the Chinese can translate research into English, then turn it over to an American publisher who will edit it for an English-speaking audience and pay to have it produced in China, Hong Kong, or the US. Likewise, when a Chinese publisher wants to translate an American book to produce in China, they might ask for a basic translation and pay the subsequent costs. With a joint venture, the costs are split.

McGraw-Hill plans to translate some professional and scientific books into English for distribution in the United States, and print some McGraw-Hill English-language books in China. In the latter case, some of the books would be distributed worldwide. Bantam Books is also discussing a joint venture with the Chinese, but is awaiting the results of the BIBF before deciding its future level of involvement in China.

Of course China's bibliophiles are not interested only in foreign books. This is a period of dynamism and change for domestic publishers as well. More than 6.6 billion books rolled off China's presses in 1984, up 10 percent over 1983. Political and literary works dominate the list of 45,000 domestic titles. China now claims more than 300 publishing houses, and ranks fifth in the world in variety of titles (the USSR is first) but first in the number of

copies printed.

But US and other foreign books have an important role to play in China's modernization drive. While US book sales to China have had their fits and starts (*see* p. 7), there is ample evidence to suggest that the market for English-language books in China has finally arrived. The growing number of Chinese learning English; the steadily increasing demand for the latest science and technical books; the advent of American publishers discussing co-publishing, joint ventures, and management training deals with the Chinese; and the optimism that China will soon join the copyright convention all point to a solid future for American book sales in China. 完

China Books and Periodicals: A story of patience that paid off

Books from China

Patricia Kalman

While they constitute only a tiny percentage of US imports from China today, books made up a substantial share of US purchases from 1960–71. The tale of China Books and Periodicals, Inc., pioneers of business relations with the PRC, is one of frustration, patience and, ultimately, reward.

Begun in 1960 as a family-run business grossing just $2,000 in its first year, China Books is now a multimillion-dollar importing and publishing company that expects an additional 20 percent growth in sales this year. The company is headquartered in San Francisco, and has expanded to include regional offices in Chicago and New York. China Books distributes 95 percent of the English-language publications coming from China. (The other 5 percent are distributed by bookstores in Chinatowns throughout the country.) The company has 30,000 mail order customers, thousands of wholesale standing orders, and more than 50,000 subscribers to its periodicals. China Books offers about 1,200 periodicals in Chinese and 14 in English, including *China Daily* (the only daily newspaper from China in English), *China Reconstructs*, and *Beijing Review*.

Early hurdles

Henry Noyes, the founder of China Books, was born in China to missionary parents. Although his family returned to the United States in 1919, Noyes remained interested in China. When he learned in 1960 that it was legal under the first amendment to sell Chinese books and periodicals in the United States, he decided to give it a try in the hope of promoting better understanding between the two countries.

To begin importing from China, Noyes had to obtain a license from the US Treasury Department. After months of delay, the Treasury's Foreign Agents Registration Control Bureau granted him a license that included the stipulation that 50 percent of all money owed China from the sale of the books be deposited into a blocked account. This effectively froze payment to China, as China Books kept the other 50 percent to cover its costs. The Chinese agreed to keep shipping the books without payment because they saw it as a way to educate the American public about China at a time when there were no diplomatic relations between the two countries.

Two tons of books were sent from China in the first shipment, but then began a series of Catch-22s. Unloading was a problem because the US government did not recognize shipments from China. Noyes was told that he would need an invoice filled out in China. Two months later, China International Book Trading Corporation (CIBTC), China's distributing company for books and periodicals, wrote to Noyes that they were unable to fill out the official US documents due to the absence of diplomatic ties. Not long afterward, the US Customs Office fined Noyes $1,200 (later reduced to $12) for failing to conform to regulations.

The family struggled financially to keep importing Chinese art, history, and political books and novels, purchased mainly by universities and bookstores. But in the mid-60s China Books began importing *Quotations from Chairman Mao*, the "little red book," which sold over 1 million copies in the United States and Canada. Its success fueled demand for other political writing from China as well.

Breakthrough and diversification

A breakthrough came in 1971, when Chris Noyes was invited to China by CIBTC, becoming one of the first American businesspeople to attend the Guangzhou Trade Fair. The diplomatic relations that grew out of President Nixon's 1972 visit to China ended the need for a special license to import Chinese publications. China Books' account was unblocked, and the company was finally able to pay its bill. But the Justice Department still requires China Books to register two copies of all publications that have any political content, and all periodicals.

Interest in the travel guides that China Books offers grew rapidly after the establishment of diplomatic relations in 1978 and the surge in American travel to China. Today Chinese novels are again popular, but political books have never regained the popularity they had in the 1960s.

In July 1985 China Books signed an agreement with the Chinese government to act as their agent for the overseas edition of *Renmin Ribao* (*People's Daily*). In China the paper boasts a readership of 30 million,

Patricia Kalman is marketing manager at China Books and Periodicals.

while circulation in the United States is 20,000 and growing. The overseas edition is printed in traditional rather than simplified characters, making it accessible to most of the overseas Chinese who left China before 1949. *Renmin Ribao* is transmitted via satellite to the United States, where the paper is printed and distributed the next day. China Books has also been the agent for *China Reconstructs* since 1981.

In addition to distributing everything from art books to language texts and travel guides printed by Chinese and US publishers, China Books now publishes its own books on China. A recent best seller was *Two Years in the Melting Pot*, a view of American culture through the eyes of visiting Chinese scholar and journalist Liu Zongren. After publication, China Books brought Liu back to the United States for a nationwide promotion tour, the first for a PRC author. This fall new titles will include a contemporary Chinese literature series, an art book on Chinese furniture, and a paperfolding craft book for children.

China Books continues to try out new ideas. For instance, the company realized that aesthetics cannot always be successfully transferred across national boundaries. The Chinese are very fond of jade green, often used on book covers—but the color does not sell well in the US. Also, paper and photographic reproductions are often not of the quality Americans are accustomed to. In 1985, after four years of negotiations, the firm convinced China's publishing houses of the need to work with American book designers, arguing that improved design and quality would increase US book sales. "The fine line of this delicate balance is the understanding of the American audience, quality control, and aesthetics, which have to be on a par with what the American readership is used to—yet retain the essence of what is Chinese," explains China Books designer Kathy McKeown, who recently returned from three months of teaching book design in China.

Aesthetics cannot always be successfully transferred across national boundaries: The Chinese are very fond of jade green, often used on book covers, but the color does not sell well in the US.

More and more US book publishers are getting involved in two-way transactions that involve importing and translating Chinese books. While this may sound like competition for China Books, Chris Noyes doesn't see it that way. He feels the overall impact will be to promote a better understanding of the international publishing industry, and generate better manuscripts and books from China. China Books and Periodicals should gain from any growth in popularity of China's books, and stands ready, as it has since the 1960s, to experiment with new areas of US–China book trading. 完

A pragmatic approach makes this China's most credible plan to date

China's Seventh Five-Year Plan

David Denny

China's recently released blueprint for economic development—the Seventh Five-Year Plan—reveals much about the goals of China's reformist leadership from now until 1990. But foreign companies aren't likely to change their marketing strategies because of what's in the plan. When Chinese planners miss their annual production targets by as much as they did in 1985 (industry was slated to grow by 8 percent, but actually grew by 18 percent) it's not surprising that longer-term plans are not taken very seriously. Even Chinese officials admit that the five-year plans contain only very general goals.

Still, the current plan is a more credible document than all preceding plans—largely because of the way it was drafted. For the first time in the history of the People's Republic, China's leaders have produced a plan early enough in the five-year period to have an impact on the allocation of investment resources. Also unlike previous plans, it was debated and analyzed by a wide variety of officials, scholars, and technical experts both within and outside the normal planning mechanisms.

Macroeconomic goals are ambitious but feasible

One important reason for this departure from usual practice is the growing need to include a broader range of Chinese organizations in the planning process. In China's increasingly decentralized economy, lower-level governments and enterprises have greater control over investment decisions and resource allotments. As a result, central planners need to allow a greater flow of information—not only between central planners and enterprises but between the ministries and enterprises themselves.

Official statements appropriately describe the goals of the Seventh FYP as ambitious, yet realistic and feasible. Ambitious because they are based in part on fundamentally restructuring the economy while sustaining high growth rates. Realistic and feasible because the latest targets do not depart markedly from the growth rates and patterns established over the past three decades.

As in the past, industrial growth remains a priority, with both light and heavy industry (including rural industry) set to increase by about 7.5 percent each year, compared to an average of just over 9 percent between 1970 and 1984.

The graph on p. 13 shows that the planned rate of growth for the next five years is substantially lower than the actual results achieved during the Sixth FYP. But the Sixth FYP performance was something of an aberration, influenced by the overheated industrial growth in 1985 that Chinese planners now admit was largely unplanned and unhealthy. Except for the years 1984 and 1985, China's industrial growth rate has shown a long-term tendency to decline moderately. From this perspective, the targets for industrial growth in the Seventh FYP appear somewhat modest—but only by 1–2 percentage points. And Chinese planners have publicly expressed the hope that actual growth will be greater than planned.

Agriculture is projected to grow by 4 percent per year, down from the spectacular performance of recent years but consistent with and somewhat above the long-term average. If the rate of population increase is held to its low planned levels of 1.2 percent, a 3–4 percent growth rate in agriculture should generate a surplus that can be marketed and used to develop higher value-added agricultural products (such as animal husbandry). Over the long term, however, this relatively rosy short-term outlook could lead planners to underestimate the need for investment in major water conservancy, land reclamation, and agricultural research projects that will be needed to sustain China's agricultural growth through the 1990s and beyond.

Under the plan, China will remain a high saving, high capital formation economy. Planners will try to restrain the rate of investment to an average of 30 percent of national income during the plan period. As recent history has shown, this will not be easy, since depreciation funds, local government revenues, enterprise profits, and bank loans have grown at the expense of government revenues directly under the control of central planners. In any case, the chief danger in the immediate future remains excessive investment, rather than insufficient investment demand.

The only remarkable new feature of this plan's macroeconomic goals is the attention given to the "tertiary" or service sector of the Chinese economy. The tertiary sector is scheduled to grow by 11.4 percent per year—far above the average rate of growth for the rest of the economy. As a result, this sector will account for 25 percent of the planned 1990 GNP as compared to 21 percent in 1985.

The prominence of services in the Seventh FYP reflects, in part, China's current emphasis on satisfying consumer demand and providing employment. Even more important, planners are counting on services such as information processing, in-

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surance, and private transport, to raise the efficiency of the whole economy.

Emphasis placed on reforms

As important as the macroeconomic goals are, Chinese leaders place an even higher priority on initiating basic changes in the structure of the economy over the next five years. As a recent *People's Daily* commentary points out, "our experience has proven that expanding the investment scale beyond the limits of the State's financial and material resources will inevitably cause tension in our economic relations. In this situation it is hard to maintain a sustained and stable increase in our economy, let alone to promote our reforms."

Chinese leaders are considering new socioeconomic measures to ensure that growing inequalities do not threaten the overall reform program. Thus, a progressive income tax and land and natural resource taxes have been proposed to capture the excess profits of those benefiting from superior natural conditions. Equally landmark reforms under consideration include a social security system that would blunt the effects of possible widespread unemployment and a bankruptcy law to determine who bears the burdens caused by enterprises that go belly up.

Chinese officials candidly admit that the whole reform process is far too complicated to permit an accurate forecast of how the economy will look when it is "perfected." Even if formulating a comprehensive reform program were possible, the leadership would not dare to introduce it all at once. Consumers would balk at the loss of grain, housing, energy, and other subsidies, heavy industries would oppose immediate jumps in their energy costs, and bureaucrats would defy radical reductions in their control over economic matters. To win the support of skeptics—or at least to blunt their opposition—China's leaders must introduce the reforms step by step and demonstrate at each phase that the advantages outweigh the disadvantages. The Seventh FYP will thus be a period of carefully planned adjustments in the economy.

Growing local authority over investment

The emphasis on economic reform and a less centralized planning process affects both economic priorities and the way they are presented in the plan. Although this plan provides a great deal of quantitative information on 1990 output goals and investment allocations, it is somewhat less comprehensive and exact than the previous Sixth FYP. For example, grain output for 1990 is presented as a range rather than a single estimate, probably because the impact of decentralized decisionmaking by the more than 100 million rural households is difficult to predict.

Much of the ¥1,296 billion investment budget in fixed assets contains no sectoral breakdowns. The plan provides no breakdown at all for investments made by collectives and individual enterprises (*see* p. 14). For State enterprises, only a general breakdown is given, with the exception of the ¥375 billion to be allocated directly by the central government for capital construction. The lack of details for the majority of these funds stems from the fact that local governments and enterprises will determine how to spend their portion of the funds, making it difficult for central planners to predict the actual breakdown.

Apparently, State planners have also wisely avoided making firm commitments to important projects not scheduled to begin until late in the plan period. Major investments in oil, for example, will be made only after promising reserves are discovered and foreign companies willing to develop them have been found. Thus the Seventh FYP may well be a "rolling plan" that spells out the investment plan for the first half in some detail, but leaves the remainder purposefully vague.

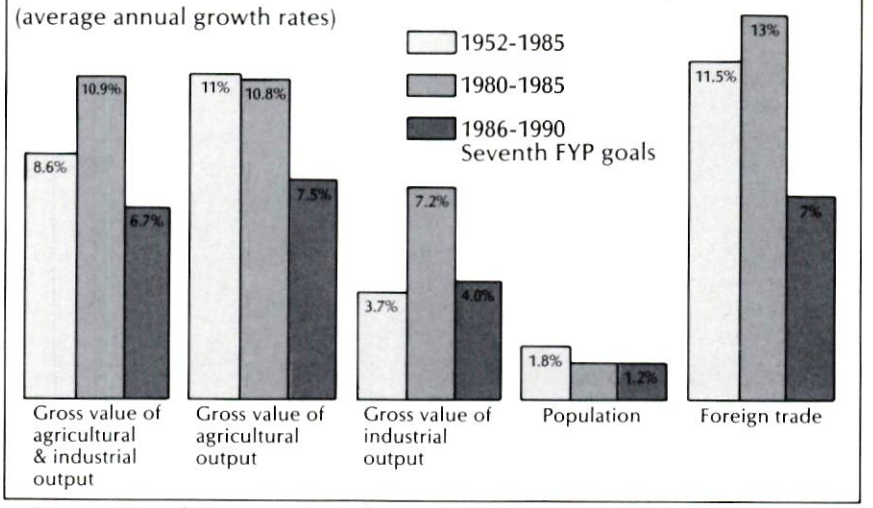
Winners and losers

In contrast to local investment in capital construction, the sectoral breakdown of centrally allocated funds clearly indicates the planners' priorities. State resources will support the growth of heavy industry—a continuation of China's policies of the last three decades. The energy sector will get nearly one-third of centrally allocated capital construction funds; raw and semi-finished materials 21 percent; and transport and communications 15 percent. These allocations are all up from the Sixth FYP and from the actual allocations made during the last five years. Some local funds will also go to these sectors, raising the proportion of all sources of capital construction going to the three priority sectors even higher.

The sectors that didn't fare well in centrally allocated capital construction funds include agriculture, textiles and light industry, science and education, and commerce and foreign trade. In part, their declining share of central investment can be traced to greater dependence on local funds (particularly in the case of consumer-oriented light industries, education, and agriculture). But the main reason is China's present preoccupation with energy, transport, and developing the raw and semi-finished material inputs on which heavy and light industry depend.

Seventh FYP Goals in Historical Perspective

(average annual growth rates)



SOURCE: Seventh Five-Year Plan and National Council files

Foreign trade no longer a "fundamental task"

Foreign economic relations play an important role in this FYP. However, a careful comparison of this plan with the Sixth FYP indicates that foreign commerce is not expected to develop as rapidly as it did between 1979 and 1985. For example, the Sixth FYP labeled the "energetic development of economic relations and trade with foreign countries" one of the 10 "fundamental tasks" of the plan. The Seventh FYP has three "major tasks," none of which involve foreign countries directly.

Nevertheless, the Seventh FYP is based squarely on the assumption that China's door will remain open through 1990 and beyond. For example, the key regional emphasis is placed on the eastern coastal areas where foreign technology will be assimilated and passed on to the interior. And many of the investments in transport make sense only in the context of an abiding commitment to open door policies. The ports and railroad projects, for example, are designed in large part to facilitate foreign trade, such as coal exports to Japan.

The plan calls for foreign trade to grow at roughly the same pace as the rest of the economy (7 percent). To reduce the gaping foreign trade imbalance of 1985, planners are calling for exports to grow more rapidly (by 8.1 percent) than imports (6.1 percent). Reliance upon foreign funds and foreign technology will be greatest in power generation, port facilities, and the petroleum industry. The plan pledges continued support to the special economic zones (granted a separate investment line in the budget) and to the open coastal cities.

In commenting on the plan, officials admitted that foreign trade targets for the next five years imply that the foreign trade deficit will not be offset by earnings from shipping, remittances, and other invisibles; nor will the available concessionary loans make up the difference. Therefore, increased borrowing from commercial banks appears to be an important, if unstated, assumption of the Seventh FYP.

An improved planning process

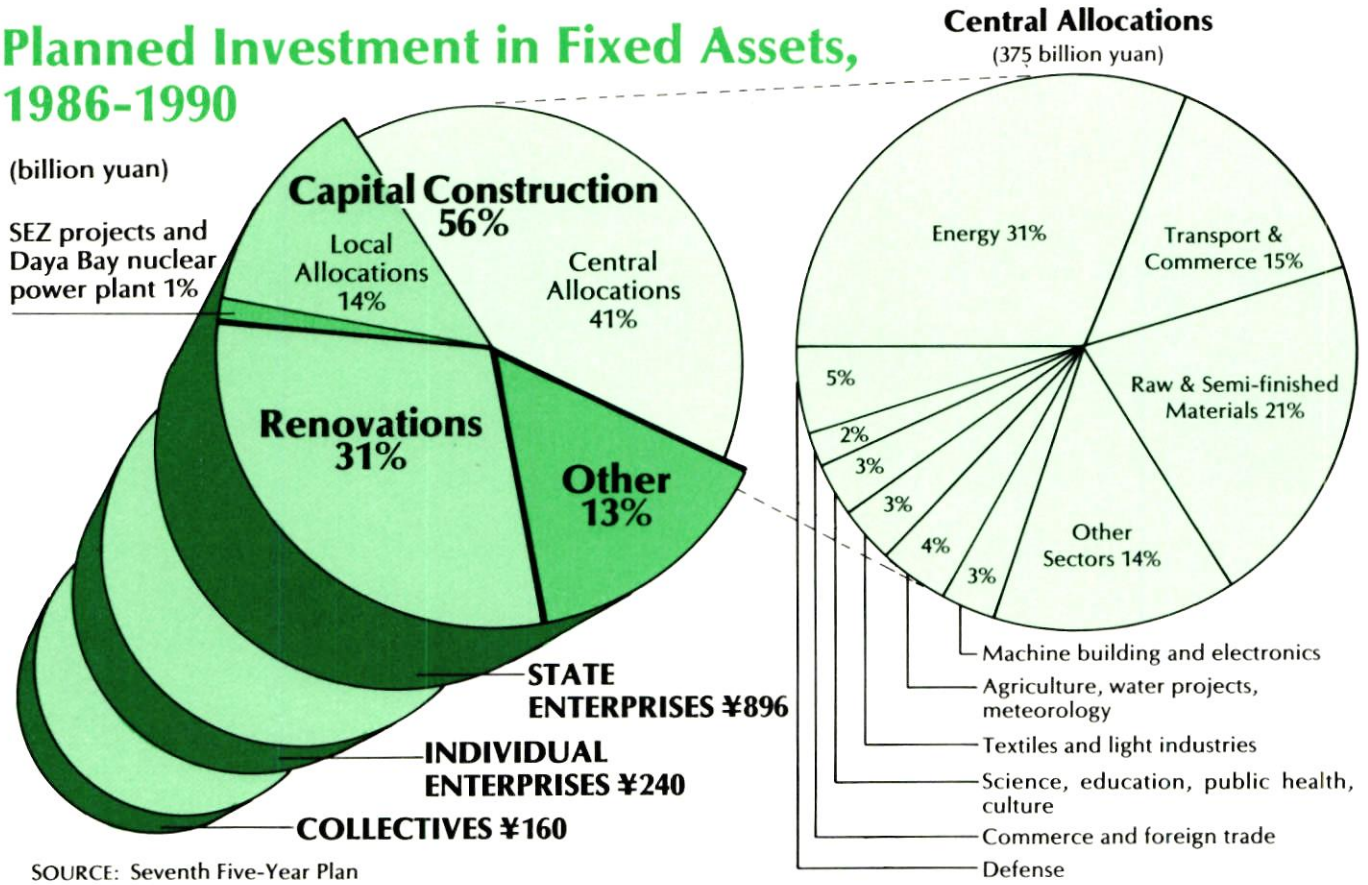
In the past, long-term planning had little impact on the actual course of the Chinese economy. Unlike the Seventh FYP, previous FYPs were drawn up largely in secret, with few participants involved in the process. Only the First and Sixth FYPs were ever published, and the operational impact of even these plans was negligible since they were finalized halfway through the plan periods.

Not surprisingly then, the actual results of China's past five-year plans bear little similarity to the goals established in the plan. For example, the Sixth FYP called for aggregate growth of 4–5 percent per year while the final result turned out to be 10.8 percent. The actual 1985 output of washing machines, tape recorders, plate glass, and automobiles all exceeded the plan by more than 100 percent. On the other hand, output of a few commodities such as sulphuric acid, tractors, and sewing machines fell short of their five-year targets by 18 percent, 26 percent, and 30 percent, respectively. However, in many categories where central controls were strongest and unpredictable events played a relatively small role, the Sixth FYP was actually rather accurate. Examples include electric power, steel, and cotton yarn.

To better anticipate changes in the economy and coordinate the needs of the various sectors, Chinese planners

Planned Investment in Fixed Assets, 1986-1990

(billion yuan)



SOURCE: Seventh Five-Year Plan

now stress the preparation of consumer demand studies. A leading example of this new approach is the State Planning Commission's decision to subject each major investment project to a feasibility study conducted by a new, independent, and presumably objective organization: the China International Engineering Consultants. The new rule is intended to eliminate costly and embarrassing white elephants like the Baoshan Steel Complex that were approved without careful appraisal.

Central and local authorities responsible for approving investments are also hoping to receive guidance from nationwide studies that identify areas in need of investment as well as sectors that are already saturated. Still other studies will help the authorities to assess input-output relationships—ironically one of the weakest aspects of China's system of central planning. To reach the 1990 production target for automobiles, for example, Chinese planners can now turn to studies to find out how many radiators need to be produced.

Problems and constraints

China's remarkable economic progress since the late 1970s has introduced a whole new set of problems. Three areas in particular may prevent China from achieving its Seventh FYP targets: expanding exports; determining the appropriate size and sectoral allocation of the investment program; and achieving the efficiency gains that are now projected.

Expanding Exports—The immediate cause of China's burgeoning trade deficit in 1985 was the startling growth in imports, fueled by the breakneck growth of the domestic economy. Equally important was the failure of exports to keep pace with imports during the Sixth FYP. In US dollars, China's exports grew at an average annual rate of only 4.4 percent between 1981 and 1985.

Many factors contributing to the lagging pace of exports were beyond the control of China's planners, such as falling oil prices, soft world markets, and increasing barriers to China's textile exports. But part of the problem relates to the difficulty of encouraging Chinese producers to export. This problem gained prominence in 1984 and 1985, when Chinese producers had more say in trade decisions and faced overwhelming demands for their products from less fussy domestic customers.

Planners are well aware of this problem, and the Seventh FYP attaches a high priority to expanding exports. On the one hand, planners intend to stimulate exports directly by giving exporters priority access to raw materials, fuel, and power. On the other hand, indirect levers of control (export credits and changes in exchange rates) will be used to stimulate producers' interest in exporting their goods. Substantial progress has been made since early 1984—particularly by devaluing the RMB by 39 percent in terms of the US dollar (and a great deal more in terms of the yen and deutschmark).

Nevertheless, meeting the Seventh FYP goal for increasing exports by 8.1 percent each year—or nearly double the Sixth FYP rate—will not be easy. More than half of China's export earnings come from petroleum and petroleum products and textiles. Earnings from the former are likely to decline by more than $2 billion per year in the first part of the plan period, while the growth of textile exports is unlikely to approach 8 percent annually. Exports of manufactured consumer and capital goods and raw and semi-finished materials are thus the best hope for rapid expansion. But expanding exports in these categories will also be difficult, despite concerted efforts to increase processed food and nonferrous metals (particularly aluminum) exports.

Controlling investment and sectoral allocations—According to Vice Premier Yao Yilin, the most difficult part of preparing the Seventh FYP was determining the appropriate level and allocation of investment. This is unsurprising because access to State investment is both the symbol of China's priorities and the means of achieving sectoral goals.

However, at present, the normal bureaucratic log rolling that obstructs access to resources is compounded by high demand for investment funds and low real costs (interest and principal payments). Hence Chinese organizations still have an incentive to overinvest, despite recent modifications in the Chinese investment allocation system. The problem is exacerbated by artifi-

SEVENTH FYP TARGETS vs. SIXTH FYP ACHIEVEMENTS
(average yearly growth rates for selected products)

Total output (GVAIO)	**7th FYP goal (A)**	**6th FYP actual (B)**	**7th vs. 6th FYP (A/B)**
	6.7%	11.0%	.6
Agriculture (GVAO)	4.0%	8.0%	.5
grain	4.0%	3.4%	1.2
cotton	0.4%	9.0%	0.1
oil-bearing crops	3.0%	15.5%	.2
sugar crops	2.6%	15.7%	.2
milk	16.0%	17.0%	.9
aquatic goods	5.2%	9.1%	.6
Industry (GVIO)	7.5%	11.8%	.6
Rural industry	11.6%	24.2%	.5
Heavy industry*	7.5%	9.6%	.8
steel	3.9%	6.2%	.6
rolled steel	4.2%	8.0%	.5
chemical fertilizers	4.2%	1.7%	2.5
soda ash	11.8%	4.6%	2.0
ethylene	14.9%	5.8%	2.6
Light industry*	7.5%	12.0%	.6
cigarettes	2.0%	9.1%	.2
beer	16.0%	35.0%	.5
cotton cloth	2.5%	1.2%	2.1
washing machines	6.3%	104.8%	.1
chemical fibers	8.8%	16.1%	.5
Energy	3.3%	5.7%	.6
electricity	6.2%	6.3%	1.0
coal	3.3%	6.5%	.5
oil	3.7%	3.3%	1.1
Transport			
freight	7.7%	4.6%	1.7
passenger	9.9%	9.8%	1.0

*For heavy and light industry breakdowns, the Seventh FYP numbers include rural industry while the Sixth FYP numbers exclude rural industry.
Prepared by David Denny

cially high domestic prices that keep some Chinese sectors (particularly consumer appliances) inordinately profitable. Thus planners must confront the dilemma of how to decentralize investment decisionmaking while preventing excessive investment from flowing into uneconomical local investment projects.

If central planners are unable to restrain demand by local governments for nonproductive projects (e.g., office buildings) and duplicative investment projects in profitable consumer goods, then controlling investment—a vital goal of the Seventh FYP—will have to be abandoned. Allowing total investment to rise would lead to a resurgence of inflation and/or a reduction in the supply of the consumer goods. Finally, allowing local investment to rise but keeping a lid on total investment would inevitably cut into higher priority energy and transport sectors.

Raising efficiency—The success or failure of the Seventh FYP depends not only on mobilizing labor, capital, natural resources, and energy, but also on raising the efficiency of their use. Goals for improved efficiency are explicitly included in the plan. Labor productivity is scheduled to grow by 3.8 percent per year; and the amount of energy required to produce each ¥10,000 of national income will be reduced from 12.9 tonnes (coal equivalent) in 1985 to 11.4 tonnes in 1990, for an annual improvement in energy efficiency of 2.5 percent.

These goals appear to be feasible since they fall short of annual improvements in labor productivity and energy efficiency already attained during the 1980s (4.9 percent and 3.25 percent per year, respectively). Since China remains an extremely inefficient user of all economic inputs, the potential for still greater improvements is apparent.

These advances in efficiency depend in large part on the success of China's economic reforms. Greater efficiency is possible if enterprises have control over their own profits and losses; markets are used to establish more accurate prices for outputs and inputs (including the interest rate assigned for use of capital); labor mobility increases; and factories are given more freedom to acquire inputs on the market in contrast to assignments made by central planners.

Although the problems confronting the Chinese economy over the next five years seem formidable, they are actually much more manageable than the constraints posed by stagnant energy and agricultural output in the late 1970s. Planners no longer worry that output of basic natural resources will slow economic growth; instead, their main challenge is to muster the political support and technical skills necessary to develop the economic potential that already exists.

To do this, China's leaders will have to find an institutional structure consistent with socialist goals that eliminates the worst features of China's bureaucratic, incentive-stifling system. The Seventh FYP is only part of a long-term effort in this direction. But its step-by-step approach to reform, combined with modest targets for economic growth, suggests that a pragmatic concern for efficiency has taken root in China. 完

Spending more—on smaller projects

Energy Plans Shift Focus

Martin Weil

The well-publicized recent postponements and cancellations of energy megaprojects involving large amounts of foreign exchange create the misleading impression that China is downgrading the energy sector's importance. So do relatively modest 1986–90 target growth rates of 3.3 percent per year for coal production, 3.7 percent for oil, 3.1 percent for natural gas, and 6.2 percent for electricity.

In fact, energy remains a high priority in the Seventh Five-Year Plan (FYP) as reflected in a projected capital construction budget of ¥117.66 billion ($36.77 billion)—almost double the total energy investment called for in the Sixth FYP. Despite modest target growth rates, the next five years will be a period of unprecedented investment to pave the way for higher energy output in the future.

Electric power in shortest supply

Electric power is the form of energy in shortest supply, accounting for only 20 percent of final energy consumption according to World Bank estimates—less than most other developing countries. The Chinese estimate that one-fifth of the nation's industrial capacity is already idled by power shortages. To make matters worse, household electricity consumption, which accounted for only about 7 percent of electricity consumption in 1984, is likely to expand rapidly with the popularization of household electrical appliances.

Overall power production is projected to rise from 407 billion kilowatt-hours (kwh) in 1985 to 550 billion kwh in 1990. The Chinese have committed to building 30,000–35,000 megawatts (MW) capacity during the Seventh FYP, 55–80 percent more than in any other five-year plan. This would bring total electric power capacity to 115,000 MW. Construction of an additional 30,000 to 35,000 MW of generating capacity will begin during the Seventh FYP, but conclude after 1990.

Thermal power takes center stage

Thermal power plants will be the greatest area of activity in the electric power sector. Of the power-generating capacity to be completed during the plan, 22,000–27,000, or 75 percent, are to be fossil fuel plants, almost all of them coal-fired. The thermal power capacity to be commissioned each year—about 5,000 MW—exceeds what the Chi-

nese have added in thermal and hydro capacity combined for any year except 1985.

Thermal power plants fit neatly into the State Planning Commission's drive to lower the fixed investment per unit of energy output. They are relatively cheap to build and require construction lead-times of only three to six years. This is the major reason why they are being favored over nuclear plants and huge hydropower projects like Three Gorges.

As many as half of the new thermal plants may be minemouth plants, to help alleviate coal transportation bottlenecks. The remainder will be built near load centers, primarily on the east coast.

Most new capacity will be in the form of 300 and 600 MW generators. China has its own 300 MW technology, and it has also licensed 300 and 600 MW technology from several US firms. Nevertheless, China will almost certainly be unable to assimilate the new technology quickly enough to make the generators necessary to keep up with the Seventh FYP's goals for electric power output.

In recognition of this fact, the power ministry has indicated that it plans to import as much as 10,000 MW of new thermal power capacity. Seven plants worth more than $1 billion have already been purchased from US, Italian, French, and Japanese companies through the first half of 1986. These constitute far and away the largest series of thermal power plant imports China has ever made, and one of the most concentrated capital equipment import sprees since 1978 (*see* box).

Substituting coal for oil

Since 1979 it has been accepted wisdom in China that coal—which now accounts for 75 percent of China's primary energy consumption—should be substituted for oil where technically feasible. The Seventh FYP continues this approach, calling for a reduction in fuel oil consumption of 10 million tonnes.

But the declining price of oil on the world market is causing many countries to reconsider plans for conversion from oil to coal. Even if China cancels some of the more marginal oil to coal conversion schemes as a result, and diverts some petroleum back to the domestic market, coal's position is not likely to be seriously threatened. Foreign exchange considerations will compel China to export petroleum despite the low prices. And despite the rise of domestic coal prices over the last few years, most coal is still cheaper on a heating value basis than petroleum. Finally, major investments in coal mines and related equipment are too far along to be stopped.

Coal output is set to increase from 850 million tonnes in 1985 to 1 billion tonnes in 1990. The increased production will come almost completely from underground mines, rather than open pits. Except for the Antaibao No. 1 mine at Pingshuo, Shanxi Province, being developed in cooperation with Occidental Petroleum, none of the big open pits previously under discussion will be moving ahead on the scale originally discussed (*see The CBR*, Mar–Apr 1986, p. 16). The scale-back of the open pits, with their very high up-front investment, exemplifies the Seventh FYP's trend toward less capital-intensive projects.

Hydroelectric power: Three Gorges' loss is others' gain

The Seventh FYP calls for 8,000 MW of hydroelectric capacity to come onstream and for construction to begin on an additional 10,000 MW. The controversial 13,000 MW Three Gorges project on the Yangtze River in Hubei Province, however, is not listed in the plan.

Deng Xiaoping said recently that the Three Gorges project has more pluses than minuses, but must be "studied further." In China, as in other countries, "study" can be a euphemism for permanent inaction. The difficulties presented by the Three Gorges project may well consign it to such a fate unless the sponsors, headed by the Ministry of Water Resources and Electric Power, can scale down plans and decrease lead time.

NEW POWER PLAYER: THE HUANENG INTERNATIONAL POWER DEVELOPMENT CORPORATION

China is embarking on a massive thermal power plant purchasing spree by decision of the highest level of the government. Most plants are being bought through a newly formed entity called the Huaneng International Power Development Corporation (HIPD). On paper, HIPD is a joint venture owned 60 percent by the Huaneng Fine Coal Corporation (which in turn is owned by the State Council Office for Conversion of Oil to Coal, and has no relation to the Coal Ministry); 10 percent by the Ministry of Water Resources and Electric Power; 10 percent by the People's Bank of China, which now oversees the Bank of China; 10 percent by China Resources Company, MOFERT's Hong Kong subsidiary; and 15 percent by China Construction and Investment Company, another PRC-linked Hong Kong firm.

HIPD, in essence, acts as a negotiating agent for the provinces, which put up most of the money for these plants. HIPD also helps coordinate central government purchasing efforts to maximize China's advantages in negotiations with foreign companies. Some of the money may come from HIPD itself, through the State Council Office for Conversion of Oil to Coal, which has built up a war chest by reselling oil freed up by power plants that have converted from oil to coal. Huaneng will formally own the plants, while the provinces or transprovincial grids purchase the power.

All of the plants bought so far by Huaneng have been financed by a combination of foreign government Eximbank and private bank loans. Plants with two 350 MW generators will be supplied by a Babcock & Wilcox/General Electric/GIE Ansaldo consortium for Nantong and Shijiazhuang with American, Canadian, and Italian financing, and by Mitsubishi Heavy Industries (Japan) for Fuzhou and Dalian on the basis of contracts signed in the first half of 1986. A smaller 100 MW oil–gas cogeneration plant was sold by Alsthom Atlantique (France) to Shantou.

Further purchases through Huaneng are planned for Shanghai, Shandong, and Hunan in the near future. Selected purchases are also being made outside the Huaneng format, including two 600 MW units for Beilungang in Zhejiang under a loan offered by the World Bank, two 350 MW units sold by France for Jiangyou, Sichuan Province, two units sold by GIE Ansaldo (Italy) to Tianjin, and two units supplied by Mitsui-IHI (Japan) to a plant in the Shenzhen SEZ run as a joint venture with Hong Kong's Hopewell Holdings. Many other firms are scrambling for a piece of thermal power plant business, including Everbright Industrial Corporation, which is reportedly negotiating an expansion of the Baoshan Steel Mill's power plant near Shanghai. —MW

The postponement of Three Gorges, however, does free funds for a number of other projects to be started during the Seventh FYP. Preliminary drafts of the Seventh FYP called for only three or four big new hydro projects to be initiated. But after strong appeals from hydropower interests, the list was expanded to include several more.

Highest priority is a series of dams on the Hongshui River in the southwest—by virtue of its steep drop, high water volume, and location in a relatively sparsely populated region that is within striking distance of the Guangzhou load center. The government is also continuing its efforts to systematically develop the upper Yellow River by committing to build the 1,600 MW Lijiaxia dam in Qinghai during the Seventh FYP, and enlarging the Qingtongxia dam in Ningxia by 600 MW.

The most appealing projects for US companies are those funded by low-interest loans from abroad, and particularly by the World Bank. By far the largest loan project will be the 1,400 MW Shuikou dam in Fujian, for which the World Bank will fund the entire civil construction. The foreign general contractor—who undoubtedly will enter into a joint venture with a Chinese dam construction company—will be selected later this year through international competitive bidding, in what will be the largest contract signed in this manner to date. In addition, Canada is believed to be discussing concessionary government financing for the 1,200 MW Geheyan dam on the Qing River in Hubei.

Nuclear industry returns to self-reliance

Nuclear power development, like the Three Gorges hydropower project, is an expensive program with vocal bureaucratic supporters and less visible bureaucratic opponents. In both cases, it is the opponents that are coming up the winners in the Seventh FYP.

A bureaucratic change in the first quarter of 1986 signaled the new nuclear policy: the substitution of the Ministry of Nuclear Industry (MNI) for the Ministry of Water Resources and Electric Power (MWREP) as the lead agency in nuclear power development. MNI, as befits the agency that has spearheaded China's nuclear weapons development, has long favored a self-reliant approach to nuclear power. Unlike MWREP, which favored importing large plants that could ease the power problem relatively quickly, MNI stresses domestic research and development. Giving MNI the leading position scales back the nuclear program, while ensuring that domestic research and development will continue.

The well-publicized Sunan nuclear project in Jiangsu Province, which involved negotiations for two 900 MW reactors with West Germany, has now been cancelled, as has the 1,800 MW project for the Dalian area. Instead, the Seventh FYP calls for the construction of two 600 MW reactors at the Qinshan site in Zhejiang Province, where MNI is already building a 300 MW demonstration project. Some foreign analysts believe that, given the underdeveloped nature of China's grids, 600 MW units may indeed make more sense than 900 MW units.

MNI hopes to develop 600 MW reactors using the same formula as the 300 MW reactor: domestic design, with some troubleshooting and design review by foreign engineering

firms; and mainly domestic equipment, but with a sizable number of key imported components. MNI may also opt to purchase a foreign company's 600 MW design.

Guangdong Province's Daya Bay nuclear power plant, with two 900 MW reactors, is still in the Seventh FYP. Its survival is probably due to the fact that negotiations were far along, and because it is a joint venture with Hong Kong that can theoretically earn enough hard currency from electricity exports to pay for itself. After long, hard negotiations, letters of intent were signed in early 1986 with EDF (France) for overall design, Framatome (France) for the nuclear island, and GEC (Britain) for the turbine generator. The foreign loans for the project—85 percent from the French and British government export–import banks and 15 percent from consortia headed by Banque National de Paris and Midland Bank, respectively—will be made to the Bank of China directly.

MNI, which has replaced MWREP as the lead agency for the project, indicates that the letters of intent are to become contracts, and the loans finalized by the end of 1986. Whether this happens or not depends on the resolution of a number of thorny issues, including whether China should be allowed to supply the nuclear fuel. The project's fate will ultimately rest on Hong Kong's continued willingness to buy 70 percent of the plant's output.

New financing schemes

Even before the onset of a more conservative fiscal climate in 1985, a number of Chinese officials privately portrayed many of the highly publicized energy megaprojects as ill-considered efforts by project sponsors eager to expand their jurisdiction. Extensive publicity for such projects in China often indicates strong opposition to them—the publicity being part of the effort to mobilize opinion in the debate.

But megaproject supporters have apparently failed to win over many critics. In fact, the emphasis on foreign help for these large projects may have been viewed by critics as an admission—always dangerous in the Chinese political context—of China's inability to run the projects on its own.

The fact that less grandiose projects (like thermal plants, select hydro dams, and underground coal mines) are proceeding apace, even in an era of partial economic retrenchment, stems in considerable degree from new flexibility in the financing system. The trend over the last four or five years, particularly in the power sector, has been to more systematically tap the growing amounts of excess cash held by local governments, industrial bureaus, and even enterprises, rather than finance large projects out of the State's budget.

More and more power plants are being built as joint ventures between the MWREP and provincial governments. In many cases, the provincial governments are soliciting money from individual endusers or enduser bureaucracies, who are more than willing to pay for such an essential commodity as electric power. In Hunan Province, money for a large, imported power plant is even being raised through an internal bond issue. The Daya Bay nuclear power project, one of the few megaprojects left intact in the plan, exemplifies the importance of financial feasibility as a key criterion for energy projects in the Seventh FYP. 完

Any way you look at it, a system under stress

Modernizing China's Transport System

Jacques Yenny

During the past three decades China has doubled its rail network to 50,000 km and increased its road length ninefold to 900,000 km. But despite great efforts, the coverage of China's transport network remains much lower than that of other large developing countries such as India and Brazil.

Part of this lag in development may be due to the fact that transport often accounts for a lesser share of total investment in centrally planned economies than in market economies. These lower investment levels, combined with typically high levels of freight transport, lead to heavy use of existing transport facilities and severe traffic congestion—both of which are problems in China.

The underdeveloped transport system constrains the pace of economic development throughout the country, particularly in the rural areas and smaller cities that are to receive greater emphasis under China's Seventh Five-Year Plan (FYP). And the demand for transport services shows no sign of letting up. By 1990 the country's total freight volume is expected to reach 9.4 billion tonnes, an increase of 45 percent over 1985, while passenger volume may reach 9 billion persons—up 60 percent over 1985.

To break out of this pattern, transport has been designated a top priority during the Seventh FYP. Approximately 15 percent of the State capital construction budget, or ¥57 billion, will be spent on transport and communications by 1990. China's planners are expected to give priority to transporting energy resources (coal and oil), upgrading ports, and developing transport corridors from the ports to the hinterlands.

High demand for freight transport

Freight intensity is determined by such factors as country size; the relative locations of natural resources, industry, and population; and economic structure. In China, almost three-quarters of the population and most industrial production are located east of an imaginary Beijing–Guangzhou line, while resources are generally found in the west and require lengthy transport.

By international standards, China's economy generates a very large amount of freight transport. Tonne-kilometer is the standard output measure for the transport sector, indicating the movement of one tonne of freight one kilometer. China generates more than 3 tonne-kilometers (tkm) per dollar of GNP, compared to well under 2 in India, Brazil, and the United States. Only the USSR has a higher freight intensity than China—over 4 tkm per dollar of GNP.

The problem is compounded by the results of poor planning and administrative rigidities. China's past policy of self-sufficiency often contributed to irrational transport patterns. Every province except Tibet, for instance, has a steel mill, although iron ore resources are found in only a few provinces. Since iron smelting is a highly weight-reductive process—4 to 5 tonnes of inputs for 1 tonne of output—it would be far more efficient to distribute finished steel than transport iron ore and coking coal to all provinces for smelting.

Some Chinese planners feel that ongoing economic reforms will help alleviate the freight transport situation. They predict that the projected quadrupling of national output between 1980 and 2000 will bring about only a doubling of demand for freight transport—based on the assumption that the faster the economy is restructured away from heavy industry and into light industry and services, the faster incremental transport demand will fall. This means that by the year 2000, every additional unit of output would require only one-third as much transport as one existing unit of output.

This scenario, however, is far from assured. In fact, growing industrial specialization and exchange may actually increase transport demand. Depending upon the progress of structural changes in the economy and improvements in distribution systems, transport demand in the year 2000 could range from 2.5 trillion to 3.0 trillion tkm versus 0.9 trillion tkm in 1980.

Passenger transport in flux

In contrast to freight, intercity passenger travel in China is extremely light. The average person travels only 150 miles per year. In India, with the same average per capita income, people travel three times as much as in China. In Brazil and the USSR the figure is 15 times greater, while US residents travel 50 times as much—or 7,500 miles per person per year.

But this situation is changing rapidly as China's economic reforms and rising incomes stimulate demand for travel. Passenger traffic has increased at double digit rates each year since 1980, culminating in an overall increase of 17 percent last year, including an 18 percent rise in

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rail passenger traffic and a 41 percent jump in air travel. Trains are overcrowded as a result, carrying up to one and a half times their seating capacity, while plane tickets are often unavailable to the general public.

Domestic tourism is booming and bus transport flourishing as a result of the new prosperity. Farmers have now joined the ranks of tourists. Rural communities in Jiangsu Province, for example, organize bus tours for farmers to visit famous scenic towns such as Suzhou and Hangzhou. The shortage of transportation and places to stay has prompted farmers to invest in bus companies, guest houses, and restaurants in cities and along major roads.

All indications point to continued growth in passenger travel. Rising incomes inevitably lead to higher demand for travel in most countries. Thus by the year 2000 passenger travel in China could be five to six times greater than what it was in 1980. But even with such a large increase, the number of travelers in China would still be 10 times less than in the United States today.

Railways continue to dominate

Although their share of total transport is lower than it was 30 years ago, railways still account for over two-thirds of the tkm and over half the passenger-kilometers registered in China.

China's railroads operate very efficiently under difficult conditions. Freight traffic densities average 15 million tonnes per route km—double those of the United States and three times those of India. Turnaround time between two subsequent freight car loadings averages less than four days—a world record. Since China mainly uses steam locomotives that can only pull small loads of 3,000 tonnes or less, these figures are all the more impressive.

Technical upgrading of the existing rail network should make it possible to improve performance even more. Between 1955 and 1975, the USSR tripled its freight density from 8 million to 24 million tonnes per route km merely by switching from steam to diesel and electric traction and double tracking some routes. The network itself expanded only 14 percent during the same period. China has embarked on a similar program. Steam traction will be reduced to 20 percent of the total rail traffic by the year 2000, compared to 80 percent in 1980. Electric and diesel traction will be substituted, with electric traction slightly more prevalent. (For a fuller discussion of Chinese rail technology *see The CBR*, Sept–Oct 1984, p. 24.)

Although other modes of transport are expected to expand at a faster pace, rail will still account for more than 50 percent of China's total tkm in the year 2000. Achieving even this goal will require large investments in railroad development through the end of the century. The Seventh Five-Year Plan allocates ¥30 billion to this sector, more than half of planned State investment in transport and communications. The money will be used mainly to increase the capacity of existing lines rather than expand the network. Electrification, double tracking, and station and yard lengthening to allow handling of longer trains will be emphasized, together with boosting annual production of freight and passenger cars as well as diesel and electric locomotives.

Priorities for other modes of transport

▶**Road Transport** demand is burgeoning as a result of current economic policies emphasizing light industrial development and agricultural decentralization. Roads moved twice as much freight in 1984 as they did in 1980 (in tkm), largely due to the growing use of trucks owned by enterprises, collectives, and individuals. At this pace, roads could easily raise their share of freight transport to 20 percent by the year 2000, up from only 11 percent in 1984, and will handle a growing share of short-distance passenger transport as well.

With few exceptions, China's provincial and local governments are responsible for road construction and transport. Only recently have some 110,000 km of the country's roads been designated part of a national network linking provincial capitals with each other, with Beijing, and with major sea ports.

Modernizing the road transport system poses complicated problems. Larger and more fuel-efficient trucks are needed, but existing roads and bridges cannot support their increased axle loads. Energy-efficient trucks need higher quality fuel, and diesel rather than gasoline, but this will require modifying Chinese refineries. Fuel distribution systems will also have to be adapted to create convenient refueling systems for interprovincial trucking and busing.

Some of the 4,000 km of missing links in the 110,000-km national network will be completed during the Seventh FYP, and the rural road network will be expanded and upgraded. Building four-lane roads between major city pairs such as Beijing–Tianjin, Shanghai–Nanjing, Dalian–Shenyang, Chengdu–Chongqing, and Guangzhou–Hong Kong is another priority, and several of these projects will be started during the next five years. Vehicle production will be diversified to include both large diesel trucks and small pickup trucks that can replace the highly inefficient two-wheel tractors currently used for short hauls. These small, slow tractors not only hold up traffic but consume about three-quarters as much fuel as a 4-tonne truck—while carrying a maximum load of 1 tonne.

▶**Waterways,** China's oldest form of transport, have been sadly ne-

Photo by Cary Wolinsky

Traffic tie-ups in rural China are becoming more common.

Domestic Freight Traffic

(billion tonne-kilometers)

	RAIL	ROAD[1]	WATER[2]	AVIATION	PIPELINES	TOTAL
1980	571.7	76.4	152.3	0.1	49.1	849.6
1981	571.2	78.0	150.7	0.2	49.9	850.0
1982	612.0	94.9	170.8	0.2	50.1	928.0
1983	664.6	108.4	181.1	0.2	52.4	1007.1
1984	724.8	153.6	196.1	0.3	57.2	1132.0
1985	812.5	NA	NA	0.3	61.2	NA
Average annual growth rate 1980-1985 (*1980-1984)	**7.3%**	**19.1%***	**6.5%***	**25.0%**	**4.5%**	**7.5%***

Domestic Passenger Traffic

(billion passenger-kilometers)

	RAIL	ROAD	WATER[2]	AVIATION		TOTAL
1980	138.3	72.9	12.9	4.0		228.1
1981	147.3	83.9	13.8	5.0		250.0
1982	157.5	96.4	14.5	6.0		274.4
1983	177.6	110.6	15.4	5.9		309.5
1984	204.6	133.7	15.4	8.3		362.0
1985	241.6	154.3	17.2	11.7		424.8
Average annual growth rate (1980-1985)	**11.8%**	**16.2%**	**5.9%**	**24.0%**		**13.2%**

[1]Includes freight carried by vehicles not managed by the highway transport departments, and for 1984 also includes freight carried by privately-owned vehicles.
[2]Inland and coastal shipping only; excludes ocean shipping.

SOURCE: State Statistical Bureau and The World Bank.

Artwork by John Yanson

glected until recently. Indeed, the navigable length of rivers and canals has shrunk by about one-third since the early 1960s due to the construction of dams and irrigation works. Since water resources fall under the jurisdiction of many different administrative agencies, including the ministries involved in electric power, agriculture, and fisheries, as well as provincial and local authorities, the great potential for water navigation has not always been recognized.

But with increasing congestion of the railway system, China's central planners have recently rediscovered the potential of water transport. As with railways, the emphasis is likely to be on increasing the capacity of existing waterways rather than on building major new works and canals. Existing rivers and canals provide ready-made routes that do not require scarce land to be diverted from agriculture—unlike road and rail, which typically require 2.0 to 2.5 hectares of land for each additional km. The development and regulation of waterways is also far less expensive than new road and railway construction.

Coastal shipping provides another economical alternative to the congested north–south railway lines. But to fully utilize coastal waters China needs a greater variety of shipping methods. Self-unloading ships for moving more coal from north to south would decrease port investment costs; floating terminals would relieve congestion, particularly in the port of Shanghai; and ocean-going barges would minimize transshipment between inland and coastal shipping.

Experiments with these new techniques are already underway. Two coal self-unloaders will be put into service between Qinhuangdao and Yingkou by the end of the year and a floating coal terminal is being tried at the port of Nantong. Meanwhile, the Shanghai Shipping Research Institute is working on shallow-draft vessels for use on both coastal and inland waterways.

▶**Ports** are extremely congested due to the foreign trade boom that followed China's reopening to the outside world in the 1970s. Port traffic, which increased threefold from 1952 to 1972, increased sixfold from 1972 to 1982. Limited port facilities have created such a bottleneck that by 1985 an average of 400 to 500 ships were waiting to enter major Chinese ports on any single day.

Construction is underway at every one of China's 15 major ports. Some 120 new berths will be added from 1986–90 to increase total handling capacity from 300 million to 500 million tonnes per year. Further capacity increases will be achieved by modernizing existing facilities and in particular by shifting more of the cargo to container and bulk handling. Hinterland distribution must also be upgraded to prevent ports from becoming huge warehouses.

In 1961 China's merchant marine had only 21 ships. Today it ranks ninth in the world with more than 1,000 ships. China is working particularly hard to increase the number of container vessels. Two years ago China had only 15, but seven went into service last year and 22 are on order. With these 44 vessels China will have the 13th largest container ship capacity in the world. While many ships were bought secondhand in the past, Chinese shipyards are now becoming serious international competitors.

▶**Aviation** is still in its infancy in China. The national airline, CAAC, carried only 7.5 million passengers in 1985, roughly equivalent to the level of US air traffic in the late 1940s.

Only 3–4 flights per day each way operate between Beijing and Shanghai, versus over 80 flights a day between Washington, DC, and New York. The potential demand for air travel in China is enormous: currently 110 million rail passengers every year travel over 500 miles per trip, spending 16 hours and more on the train. Many of these passengers might take a plane if flights were available.

The World Bank's transport loans

By the end of June 1986 the World Bank had lent just under $1 billion to six transportation projects in China including development of ports, railways, and roads.

The Bank's first transport loan, made in 1982, targeted port development, including equipment for container handling at three major gateways on the east coast: Tianjin, Shanghai, and Guangzhou. All three ports have already put container equipment into operation, and the project is almost complete. Coal-handling equipment, a special part of the Guangzhou project, will enable the port to receive coal from north China.

The Bank recently approved a second port project to further expand the port of Tianjin. A new east pier with 11 berths will be built by 1991. While designed for general cargo, these berths can be easily converted to container facilities if required. At Guangzhou's Huangpu Port a new area will be developed south of existing facilities with a final capacity of some 30 berths. The Bank recently appraised a project focusing on the first five of these berths—for coal, iron ore, fertilizer, and general cargo, to be completed by 1990. Future Bank projects may include expanding the ports of Dalian and Shanghai.

The Bank's first railway loan to China was made in 1984, rapidly followed by a second loan in 1985 and a third this year. The first project focused on improving coal transport from Shanxi Province, by electrifying and double tracking part of the Datong–Taiyuan line, and constructing a new line, including a 10-km-long bridge over the Yellow River that opened to traffic in 1985. The second and third railway projects include line electrification of mountainous sections of track in Henan and Hubei, and in Guizhou, Sichuan, and Fujian provinces.

The Bank is also helping to modernize and increase the capacity of several key railway factories—the electric locomotive factory in Zhuzhou, the passenger coach factory in Changchun, and a signaling factory in Xi'an. Under the third project, track maintenance will be mechanized on some heavily used lines as a way to increase capacity. In future rail projects the Bank hopes to assist with train operations and software aspects of management, maintenance and repair, and train control.

The first road project was approved in 1985, to finance construction of some missing links in the national road network, and rural roads in eight provinces. The largest subprojects, for major roads in Shaanxi and Shandong provinces, have already been submitted for international tender. The smaller contracts are being let under domestic bidding, and the rural roads will be constructed by local work forces. The Bank will shortly appraise the Beijing–Tianjin–Tanggu (port of Tianjin) expressway, a planned four-lane divided highway that would be the first major intercity expressway in China. Future projects may include pavement and bridge strengthening to allow the gradual introduction of larger, more efficient trucks.

Projects emphasize training, transport coordination

In addition to infrastructure and equipment, all World Bank projects have software components that include training and studies of critical issues. Studies cover such matters as railway and port costing, management information systems, and safety. Training programs enable Chinese personnel to operate the new equipment and facilities being built under the projects and to plan for the future needs of the sector.

China's transport specialists are currently educated only at universities under the Ministry of Railroads or the Ministry of Communications (which deals with road and water transport)—and thus are very specialized in their transport mode. No transport planning and economics are taught at other key universities, resulting in a lack of cadres who can plan for transport needs in a comprehensive and intermodal way.

The Bank's Economic Development Institute (EDI) has conducted seminars in China since 1981. Transport topics range from general planning to project preparation, economic analysis, and feasibility studies. The first intermodal transportation course will be offered in the fall of 1986, emphasizing policy aspects of transport coordination. EDI has trained more than 250 engineers, economists, and financial analysts who work in the transport ministries in Beijing as well as in provincial transport departments, railways bureaus, and ports all over the country. EDI also trains teachers to conduct the courses independently.

Better integration between the various forms of transport is vital to improving China's transport system, and may become another focus of World Bank lending. Intermodal transport is virtually nonexistent in China except for some coal shipments that leave Shanxi Province by rail for Qinghuangdao, where the coal is then loaded onto coastal ships for distribution in the south. Containerized shipments do not go door-to-door but are often stuffed and unstuffed in the ports or their immediate vicinity, adding to the congestion problem.

Multimodal equipment is needed, including special rail cars, trucks, and inland terminals as well as new management techniques, better customs procedures, freight forwarding with appropriate documentation, and better intermodal coordination. To help address these issues the World Bank has suggested undertaking corridor studies in the context of future port projects. The Bank is also involved in a comprehensive study of transport in Guangdong Province, which includes all transport modes.

Although much has been accomplished in the past, transport bottlenecks still threaten to hold back China's economic growth. Thus, the changes required in all transport sectors are a vital part of China's ongoing modernization program. More rational systems for freight transport must continue to be a priority, even though demand is likely to grow more slowly than in the past. Passenger traffic, on the other hand, will probably grow even faster than national income levels. While rail will continue to be the dominant mode of transportation in China, road, water, and air transport (and coordination between these systems) must also receive attention in order to gradually assume an increasing share of the tremendous tasks at hand. 完

New-found support not yet matched by funds

Uncertain Course for Inland Waterways

Rosemary Draper

Efforts to overhaul China's inefficient system of inland water transport began in earnest only in 1984, but are already laying the groundwork for potentially substantial growth of this sector under the Seventh Five-Year Plan (FYP). While developing inland water transport is finally being emphasized by central planners, the localities are expected to play a major role in managing and financing most projects. It is too early to judge how well localities will be able to fill this role, but the growing vitality of domestic commerce will undoubtedly be a driving force behind local efforts.

Rebirth of private shipping

During the Sixth FYP a series of administrative reforms were initiated by the Ministry of Communications (MOC), which oversees water and road transport, that stimulated the growth of local shipping. Primarily aimed at the Yangtze River system, which accounts for more than 80 percent of China's inland water transport volume, the reforms ended what had become an unwieldy chain of regional and political "fiefdoms" that exerted a near stranglehold on waterborne commerce. Whereas local ships plying the Yangtze's tributaries previously had to transship their goods whenever they entered a section controlled by a different region, enterprise, or department, by 1984 they could sail without interruption through these tributaries. They were also no longer barred from the MOC-administered main channel. At the same time, the 24 Yangtze ports that had been operated exclusively by and for State-run shipping corporations opened to collective and private shipping companies as well.

With fewer delays caused by frequent transshipping, local entities have more incentive to form collective and privately owned shipping companies. By September 1985 some 800 shipping companies had been established on the Yangtze alone, operating 230,000 boats of various sizes. A number of the new companies have also entered the ocean-going freight business, including the reestablished Minsheng Shipping Co., a collective enterprise headquartered in Chongqing that was a shipping powerhouse before the revolution.

The 1984 organizational reforms have thus spurred an increase in the volume of transport along the huge but greatly underutilized Yangtze. Freight volume carried by China's waterways (excluding private vessels) totaled more than 85 billion tonne-kilometers in 1985, a 12 percent increase over the previous year that matched the growth rate of rail transport, although it amounted to only about 10 percent of the freight volume carried by rail.

Waterways gain new supporters

The current emphasis on upgrading inland water transport reflects a more balanced transport strategy than in the past, when prestigious new railway projects were sometimes promoted at the expense of existing navigable water routes. Central planners now criticize the practice of wasting funds on rail projects when waterways would have provided similar transport capacity more cheaply. Rail lines were constructed parallel to the Yangtze in southern China, for example. And in the north a 750-km stretch of the Yellow River in Inner Mongolia was abandoned in the 1950s when the Baotou–Lanzhou Railway was completed. It is only now being dredged, at a cost of ¥37 million over the next five years, to help develop the region's huge coal resources.

The MOC now views the Yangtze river system as the primary transport mode for the 345 million Chinese who live on or near its banks in south-central China. Sound economic reasoning is behind this viewpoint. Chinese planners point out that inland water transport has four major advantages: 1) it has much greater carrying capacity than rail lines; 2) it requires much less investment in construction (and steel) than rail lines of comparable carrying capacity; 3) it consumes half the energy of rail transport; and 4) it occupies little if any farmland. A comparison of various 1978 shipping costs revealed that rail transport costs nearly 20 percent more to operate than water transport.

Even in north China, where inland waterways are less extensive and thus subordinate to land transport, waterways can play a greater role, not only in regional commerce, but also as a means of lessening the burden on railways to transport coal to the energy-poor south. In January 1986, for example, the Shaanxi provincial government announced plans to open up a nearly 600-km water route along the Yellow River to make it easier for large cargo ships to travel inland and gain access to coal deposits in that province. From Shaanxi, coal can also travel as far south as the Yangtze along the Grand Canal, which is now being upgraded primarily to increase its coal-carrying capacity.

Paying the price for neglect

Despite all the natural advantages of water, this mode of transport has been sorely neglected and mismanaged in the past. In fact, the navigable mileage of China's rivers actually fell by more than one-third from 170,000 km in 1960 to 109,000 km in 1982. One problem has been the lack of a coordinated approach to wa-

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terways development. Hydropower projects initiated by power authorities proceeded without consideration of the needs of transport. In the past 30 years, 742 dams were built along the Yangtze's tributaries which, according to Chinese statistics, cut transport by more than 15 percent.

Lack of attention to environmental planning also took its toll. Soil erosion brought on by overcutting forests added to the normally heavy accumulation of sediment in China's rivers; these factors, combined with the massive dumping of factory waste and sewage (over 12 billion tonnes annually in the Yangtze river system), severely clogged many navigation routes. Yet little attention was paid to dredging or other modifications to rivers in the two decades preceding the Sixth FYP. As a result, only about 4 percent of the nation's waterways are navigable for barges of 1,000 tonnes or more. Underscoring this past neglect is the fact that although the Yangtze is comparable to the Mississippi in annual runoff, its utilization rate is only one-seventh as high.

Some progress in cleaning up the rivers has been reported. But as long as irate passengers and navigators of the Yangtze complain as they do now of planted trees and "other contraptions" sitting out in the middle of the river, it appears that unified management and maintenance of the waterways is still more a concept than a reality.

National plans still murky

An integrated strategy for inland water transport has only recently been developed. A 400-member panel of experts from provincial and municipal water transport departments commissioned by the Ministry of Communications early in 1984 devised a 15-year program for upgrading the Yangtze. Approved only this year, the plan reportedly recommends a massive cleanup of the river and its tributaries. It also recommends the establishment of an "industrial corridor" along river routes, and improved intermodal transport links. Although the MOC has promised to begin implementing some of these proposals this year, provincial authorities are still lamenting the absence of an overall plan. This suggests that precise strategies have not yet been discussed with all the local authorities involved in the reform plans and, possibly, that MOC guidelines are not as concrete as some reports would suggest.

What is known is that MOC allocated more than ¥1 billion to modernizing navigation along the inland waterways during the Sixth FYP. Another ¥1 billion will be allocated "over the next few years" according to the Xinhua News Agency, to improve navigation and port facilities on the Yangtze, Pearl, Yellow, and Heilong rivers as well as the Grand Canal. Part of these plans include expanding docks and berths at 41 inland ports to increase cargo handling capacity by 60 million tonnes. And sometime this year the Ministry of Communications will install port radar stations and short-wave navigational systems along the Yangtze.

In cases where the Ministry of Communications is unable to provide funding for water transport projects, creative financing might involve linking up with the industrial departments that stand to gain from the project, such as the Ministry of Coal Industry if a coal harbor is planned.

Localities gear up for greater responsibilities

Although the Ministry of Communications recently announced a major drive to upgrade coastal ports, just how much attention inland waterways will receive is not clear. The major coastal ports are certainly the top priority, followed by the three largest MOC-controlled Yangtze River ports of Nanjing, Nantong, and Zhangjiagang. Other ports will probably have to depend more heavily on pooled local resources.

Fully aware of the role they are expected to play, local authorities are beginning to map out a strategy for local development of the waterways. Participants at a mayor's conference held earlier this year noted that breaking down barriers between regions and departments—including those responsible for waterways transport—would not be easy. Nevertheless, some interprovincial cooperation has already begun. To promote cargo shipping, for example, the cities of Suzhou, Shanghai, and Hangzhou are cooperating on several projects to jointly develop the Jiangnan Canal, Hangzhou–Suzhou–Shanghai river line, the harbors of Suzhou and Shanghai, and six tributaries.

Provincial leaders are also looking at ways to begin some water transport projects on their own. Many provinces have already earmarked tens of millions of yuan for inland waterways during the Seventh FYP period. To attract financial support, provincial authorities urge localities to conduct feasibility studies and other preparatory work. Where the MOC is unable to provide all the funding, creative financing might involve linking up with enterprises or industrial departments that stand to gain from the project, such as the Ministry of Coal Industry if a coal harbor is planned. Since particular stress is now being laid on developing special terminals to handle grain, cement, chemical fertilizer, lumber, steel, and other raw and semi-finished materials, more cooperation from ministries overseeing these goods is likely. According to the new principle, whoever builds the wharf will manage it and receive the profits from it. Many wharves in Anhui were reportedly built in this way, from funds contributed by enterprises and individuals. And Sichuan Province taxes the revenue earned from hydroelectric power to finance dredging projects.

One increasingly popular means of raising revenues is likely to be fines and levies at the ports. Provincial, regional, and municipal governments are introducing stiffer port regulations, including setting minimum distances for water transport (goods destined for nearby towns and cities should be transported by truck), and establishing warehouse fees for goods held up at ports for 10 days or more. This year the three major Yangtze River ports at Nanjing, Zhangjiagang, and Nantong introduced fees on all cargo passing through at the rate of ¥2 per tonne.

The pace at which ports can be modernized will depend, in part, on

the size of the profits they bring in each year. But information in this area is lacking. Only the MOC ports of Nantong and Nanjing reported profits for 1985, which increased 25 percent and 150 percent respectively over 1984; for the other ports there is no published data. This could suggest that the other ports are not doing so well. But as pressures mount from emerging rural industries and local shipping companies, port efficiency is likely to become a sensitive local issue.

There is certainly a great deal of room for improvement at the inland ports. The smaller ports rely almost exclusively on manual labor, loading equipment is antiquated overall, and containerization minimal—accounting for only 5 percent of exported goods.

Growing role in foreign trade

The boom in foreign trade as much as the increased volume of domestic commerce is responsible for the new emphasis on inland ports. Beginning in 1980, China designated 10 ports along the Yangtze to handle foreign cargo transported in Chinese ships. In 1985 these ports handled 5 million tonnes of foreign cargo, compared to 115 million tonnes of domestic freight. Three of these, Nantong, Zhangjiagang, and Nanjing, have also been opened to foreign ships. Although the proportion of foreign cargo handling is still small, it should rise substantially by the end of the Seventh FYP, when construction of new container docks and deep-water berths is completed.

Expansion and modernization of these open ports will further relieve the burden on coastal ports such as Shanghai, where foreign and domestic ships face delays of three weeks or longer. For instance, now that Japanese ships can bypass Shanghai's customs and take their goods directly to Chongqing for clearance, shipments arrive one month earlier and costs have been cut by 20 percent, according to Chongqing authorities.

The fourth and latest port to be opened to foreign ships lies not along the Yangtze but far to the north, where the Songhua, Ussuri, and Heilong rivers converge. Tongjiang Harbor in Heilongjiang Province reopened to Soviet ships in May 1986 after a 20-year lapse, and will handle some 100–200 tonnes of Soviet and Chinese trade in grain and timber.

Strapped for funds, China looks abroad

Perhaps the surest indication that the rapid modernization of inland water transport will not be easy is China's reluctance to purchase the foreign technology that could help attain this goal. Companies from Japan, West Germany, the Netherlands, and Great Britain report that China's strong interest in their technology is matched by a general reluctance to buy. Some companies that began negotiations five or six years ago have sold equipment such as push-barges, dredgers, cranes, and navigation equipment, but most are being asked to form joint ventures. So far only the Dutch have responded, entering into the first harbor construction joint venture undertaken by a foreign company in China. The project, which involves construction of five deep-water berths at Nantong that will reportedly double the ports' annual capacity to more than 20 million tonnes, is scheduled to begin late this year.

China's apparently limited purchasing ability and emphasis on foreign government loans for developing inland waterways suggest that funding will be the chief problem during the Seventh FYP. The importance of developing this mode of transport has finally been widely (though not universally) accepted by Chinese authorities. Plans for establishing industrial corridors along the major waterways and improving intermodal links with land transport reveal a growing sophistication in Chinese planning. But the main challenge will be raising enough money to ensure that inland water transport can outpace the growth of foreign and domestic trade—and to do this with as much provincial participation as possible. 完

事历

TRANSPORT '86/CHINA'S INTERNATIONAL MASS TRANSPORT (AIR, SEA & LAND) EXHIBITION & CONFERENCE. September 23–28, 1986. Guangzhou. *Contact:* Naomi Levy at International Trade Exhibitions Ltd. in London (Telex: 296023) or ITE in New York (Tel: 212/213-8848).

2ND RAILWAY, URBAN TRANSPORT & SUBWAY EXPO/CHINA '86. November 10–15, 1986. Beijing. Exhibits include railways section (locomotive and rolling stock) and urban transport/subway section (subway and light rail, bus and trolley bus, traffic control). *Contact:* Andrew Kay at China Promotion Ltd. in Hong Kong (Telex: 76270 CHOCH HX) or Linda Davidson at Glahe International Inc. in Washington, DC (Tel: 202/659-4557).

MARINE CHINA 86/INTERNATIONAL MARINE TECHNOLOGY EXHIBITION. November 12–18, 1986. Beijing. Includes shipbuilding and related machinery, port and offshore facilities, and fishery equipment. *Contact:* Stanley Chu at Adsale Exhibition Services in Hong Kong (Telex: 63109 ADSAP HX) or George Kallman at Kallman Associates in Ridgeway, NJ (Tel: 201/652-7070).

CHINA AVIATION 86/CHINA INTERNATIONAL AVIATION & AIRPORT EXHIBITION & CONFERENCE. December 8–14, 1986. Shanghai. Aircraft, aircraft production and systems, avionics, airport equipment, air traffic control, apron equipment, emergency services, environmental controls, airport construction and engineering, air cargo/cargo handling. *Contact:* International Trade Exhibitions Ltd. (*see* above).

CHINA AUTO PARTS '87/INTERNATIONAL AUTOMOTIVE SPARE PARTS & ACCESSORIES EXHIBITION FOR CHINA to run concurrently with **CHINA GARAGE '87/INTERNATIONAL AUTO MAINTENANCE TECHNOLOGY & GARAGE EQUIPMENT EXHIBITION FOR CHINA.** March 18–23, 1987. Guangzhou. CHINA AUTO PARTS to feature products and services applicable to a wide range of vehicles. CHINA GARAGE will focus on advanced components and technology. *Contact:* Elba Sung at B & I Group in Hong Kong (Telex: 64882 ASIEX HX) or James Teele at Business & Industrial Group USA, Inc. in St. Paul, MN (Tel: 1-800-626-2295).

WATER TRANSPORT 87. May 28–June 3, 1987. Beijing. Harbor management and facilities, shipping communication and navigation, dredging and port construction, river/offshore freight and passenger traffic vessels, dockside warehousing, and mechanical handling. *Contact:* Joann Turford at National Council member company SHK International Services Ltd. in Hong Kong (Telex: 89587 SHKIS HX).

TRANSPORT '87/INTERNATIONAL TRANSPORTATION EQUIPMENT EXHIBITION. June 16–22, 1987. Xiamen SEZ. Equipment and technology for the shipping, rail, passenger and cargo aircraft, and automotive industries. *Contact:* Lawrence Ming at Bixpo Xiamen International Trade Fair Company, Ltd. in Hong Kong (Telex: 86776 BIXPO HX) or Harry Lepinske at International Marketing Services Ltd. in La Grange, IL (Tel: 312/354-3900).

AUTOMOTIVE CHINA 87/THE THIRD INTERNATIONAL EXHIBITION ON THE AUTOMOBILE INDUSTRY. June 17–22, 1987. Shanghai. Scope includes all aspects of vehicle manufacturing, special purpose vehicles, testing and maintenance equipment; also agricultural machinery. *Contact:* Adsale Exhibition Services or Kallman Associates (*see* above).

INTERNATIONAL MATERIALS HANDLING CHINA '87. July 20–26, 1987. Shanghai. Exhibition addresses four major areas of the industry: bulk solids and power, hazardous materials, plants and factories, and warehousing and distribution systems. *Contact:* Rich Craig at National Council member company Cahners Exposition Group in Washington, DC (Tel: 301/657-3090).

Notice of upcoming exhibitions in China may be sent to Susan D. Baugh, The National Council for US–China Trade, 1818 N St, NW, Washington, DC 20036.

TRANSPORTATION CHINA '87. August 20–29, 1987. Beijing. Equipment and supplies to service transportation infrastructure—rail, ports, airports, and highways; also ground-related and materials-handling equipment. *Contact:* Cahners Exposition Group (*see* above).

3RD URBAN TRANSPORT, SUBWAY & RAILWAY EXPO/CHINA'87. September 4–9, 1987. Shanghai. Follow-on to 1986 show. *Contact:* China Promotion Ltd. or Glahe International Inc. (*see* above).

SEA & LAND TRANSPORT/CHINA '87. Mid-September 1987. Tianjin. Includes port development; navigation and maritime services; urban and rural transport distribution and storage; and signalling communication technology. *Contact:* Don Chow, China International Trade Fair in Hong Kong (Telex: 49446 PIWIN HX).

AVIATION EXPO/CHINA '87 (FOR CIVIL, MILITARY, SPACE & ELECTRONICS). October 14–20, 1987. Beijing. Airport equipment, apron equipment and vehicles, aircraft (flight demonstrations), avionics, air defense, missiles and space. *Contact:* China Promotion Ltd. or Glahe International (*see* above).

AUTO EXPO ASIA. November 1987. Shenzhen SEZ. Exhibits will include many types of automotive transport and will feature a design competition for prototype Third World vehicles. *Contact:* Chuck Matteson at National Council member firm Great Eastern Development Ltd., Greenwich, CT (Tel: 203/622-1717).

MARINTEC CHINA '87/3RD EXHIBITION & CONFERENCE ON PORTS, SHIPBUILDING & OFFSHORE TECHNOLOGY. December 7–11, 1987. Shanghai. Equipment, supplies, and services for China's shipyard modernization, port development programs, and offshore oil exploration; also naval technology and fisheries. *Contact:* Cahners Exposition Group (*see* above).

TRANSPO 88. April, 1988. Beijing. Includes various types of transport systems, traffic control systems, and car maintenance equipment. *Contact:* SHK International Services (*see* above).

Lots of action, but not high priority and not well coordinated

Overhauling the Automotive Industry

Martin Weil

The peasant woman whose picture appeared on the front page of *People's Daily* in 1984 symbolizes the growing importance of the Chinese automotive industry. As the first private citizen to purchase a car to transport her products to market, she signifies changing transport patterns—resulting from economic reforms—that should make the second half of the 1980s a major growth period for the automotive industry.

Government policy calls for shifting short-distance rail traffic, which accounted for 25 percent of all rail shipments in 1983, to highways. This transition will require many more trucks. The demand for light- and medium-duty trucks should rise with the rapid growth of both State and privately run light industry in city and countryside and the commercialization of agriculture—both characterized by short-distance transport to diverse consumers. Heavy-duty trucks are also needed for large-scale municipal and industrial construction projects. And although there is no 'private' market for passenger vehicles, burgeoning sales of vans and sedans in the last few years—officially to factories and offices, but actually often for the personal use of leading cadres in these units—testify to the demand for these types of vehicles as well.

Boom and bust cycle fails to slow demand

The potential demand for automotive vehicles was far from obvious in the early 1980s. Low production targets and a shortage of raw materials depressed production, which at 240,000 vehicles in 1983 was only 8 percent above 1980. Lulled by relatively flat demand (caused by the economic retrenchment of the early 1980s), and convinced that petroleum shortages ruled out rapid automotive growth, transport planners emphasized rail development instead in the Sixth FYP.

The seriousness of their misjudgment became clear in 1984 when, with the economy growing vigorously, an explosion of demand for motor vehicles forced a mid-year production target increase of 50,000 vehicles. To fill the gap between supply and demand, imports—primarily from Japan and often purchased by local governments—shot up sixfold to an officially reported 149,000 units.

The trend continued in 1985 as China produced 420,000 vehicles and imported 354,000, increasing the country's motor vehicle total by almost 30 percent. Domestic production in 1985 jumped 33 percent over 1984, of which more than half were trucks of all sizes. At the same time, imports rose by a staggering 137 percent, of which about 30 percent were passenger cars, 30 percent trucks, 20 percent passenger vans or small buses, and the remainder vehicles such as dump trucks, tool trucks, and jeeps. A large portion of the imported vehicles were purchased by Hainan Island, which abused its special status by using its foreign exchange allotment to buy cars and vans, reselling them at a huge markup for domestic currency to eager inland provinces.

This frenzied speculation ended abruptly in the second half of 1985. Strict administrative measures reduced imports to a trickle, and domestic production in the first three months of 1986 was 13 percent less than during the same period in 1985. But this turnaround does not signify diminished long-term demand for motor vehicles. Rather, the Chinese consider it a short-term slowdown resulting from a combination of factors:

- Large stocks left over from the two years of speculation. As many as 150,000 vehicles from stockpiles—thousands of them imported—are up for sale in 1986.
- With the domestic tight-money policy in effect since mid-1985, enterprises and farmers can no longer obtain credit to buy vehicles.
- Soaring prices charged by middlemen and speculators or by the factories selling their above-target production were beginning to deter would-be purchasers. Since the middle of last year, prices of some well-known vehicles have declined by 20–40 percent, a clear indication of how much they had risen earlier. The market price for the ubitquitous Liberation-brand truck, for example, has dropped from ¥38,000 to ¥29,000–¥32,000.
- Fuel shortages are keeping many newly purchased vehicles idle. SINOPEC officials estimate that gasoline production in 1985 fell short of demand by at least 2–3 million tonnes. Most gasoline, furthermore, is of low quality, with octane levels of 70–80 and high lead content.

Although Chinese automotive planners are certain that the recent downturn is only temporary, they do not appear to know when, or to what degree, automotive sales will resume their growth. The Seventh FYP calls for a surprisingly conservative 1990 output target of 560,000 vehicles, implying only a 5 percent yearly growth rate.

The reasoning behind these low targets is unclear. The leadership may be deliberately understating targets, since Chinese auto industry officials have been quoted as saying that the market for vehicles will reach 900,000 by 1990. Or officials may be attempting to prevent rapid growth before the necessary infrastructure, in the form of roads and gasoline supply, is developed.

However, if low production targets and patterns unfolding in the automotive industry's attempt to modernize are any indication, the leadership could once again be underestimating the latent demand for automotive products. If this is the case, as fiscal controls are loosened and the economy returns to more rapid growth,

another sudden shortage and perhaps a second round of speculation, are likely.

A fragmented and backward industry

The automotive industry will find it hard to cope if faced with another surge in demand. China has 130 automotive production plants, but only two come even close to being world-scale facilities: The No. 1 Automotive Plant in Changchun, which produced about 90,000 vehicles in 1985, mainly the 4.5-tonne Liberation truck with gasoline engine; and the No. 2 Automotive Plant, in Hubei Province, which finally reached its 100,000-unit capacity in 1985, producing primarily 5-tonne trucks.

Foreign observers find the No. 2 facility impressive and modern, all the more so because it is located in a remote mountainous area where construction was difficult, and because it was built in the 1960s and 1970s without foreign help. Aside from No. 1 and No. 2, only two other plants produce as much as 20,000–30,000 units, and many produce less than 5,000 units.

The component industry is similarly dispersed. Big plants such as No. 1 and No. 2 produce their own castings, engines, brakes, transmissions, and other parts in workshops on their premises. Many of the smaller plants also have their own component production facilities.

This self-reliance is deeply ingrained in the automotive industry, but it comes at a cost of gigantic diseconomies of scale. Small assembly plants set up by local governments eager to cash in on profitable vehicle assembly are in an even worse position than large ones: they cannot afford to make components and often find themselves unable to buy them. Perhaps not surprisingly, Americans visiting Chinese automotive assembly and component factories say that most operate at only about 20 percent of capacity, either because they produce only for their locality, lack some critical raw material input, or are simply unfamiliar with the potential economies of scale.

The Chinese automotive industry is backward as well as inefficient. Most vehicles are still based on Eastern European designs from the 1950s. The World Bank estimates that the fuel consumption of China's trucks is several times greater per tonne-kilometer than vehicles manufactured in developed countries—in part because of poor road conditions, but also because of obsolete design characterized by low compression ratios in gasoline engines, and the absence of turbo-chargers and fuel injection systems.

Only 11 percent of China's trucks use diesel engines which, while more difficult to manufacture, are more energy-efficient than gasoline engines. Deficiencies in gasoline quality will make it difficult to realize the full potential of upgraded gasoline engine design, although steps are being taken to improve gasoline quantity and quality. These include the installation of alkylation units using Phillips Petroleum Co. (US) technology in at least seven refineries with output of nearly 700,000 tonnes of high-octane gasoline, construction of at least one methyl tertiary butyl ether facility, and new fluid catalytic cracking units using Stone and Webster (US) technology at three refineries.

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CNAIC behind the wheel but not in control

The leadership of the China National Automotive Industry Corporation (CNAIC)—the ministry-level bureaucracy in charge of the automotive industry—is aware of these problems. Indeed, CNAIC was carved out of the Ministry of Machine-Building in 1982 and given corporate status precisely to help rationalize the industry. No one is a stronger spokesman for modernization and concentration of production than CNAIC General Manager Chen Zutao, former chief engineer of No. 2 Automotive Factory, who last year called for focusing resources on two new plants: one to produce 300,000 light trucks per year, and one to produce 300,000 passenger cars. But awareness of the problems has not yet translated into viable solutions.

In 1982, for example, a number of "associated companies" were established beneath CNAIC. One or two large complexes were to serve as the hub of each company, coordinating the specialized activities of smaller plants with the hub. These "associated companies" now include *Jiefang*, centered around the No. 1 Automotive Plant and including factories mainly in the northeast; *Dongfeng*, centered around the No. 2 Automotive Plant and including plants in central and south China; *Nanjing*, centered around the Nanjing light truck complex, and including plants in east and southeast China; *Beijing–Tianjin*, centered around a light truck and jeep plant in Beijing and a minivan plant in Tianjin; the *Shanghai Automotive and Tractor Company*, with no less than 99 subsidiary plants; and the *Heavy-Duty Truck Company*, centered around the Jinan complex, and including plants in Chongqing, Shaanxi, Qingdao, and Hangzhou among other places.

However, the only associated company that looks like it may work is *Nanjing*, which bought the technology to manufacture light diesel trucks from Fiat's Iveco (Italy). The main Nanjing complex will do assembly and engine manufacture only, with the other components manufactured in specialized factories in Nanchang, Hangzhou, Ningbo, Nanjing, and Xuzhou. In practice the voluntary associations within each company have generally proven unsuccessful since plants are often unwilling to specialize or cooperate with each other. One American firm, for example, reports discussing the same project with competing factories within the *Jiefang* company in 1985.

The Heavy-Duty Truck Company un-

AUTOMOTIVE EXPANSION PROJECTS

The Chinese automotive industry has traditionally focused on production of 3 to 5 tonne medium-duty trucks, but industry leaders now recognize that China needs both larger vehicles for more efficient long-distance freight haulage and construction, and smaller vehicles for passengers and short-distance, light-duty freight transport in the city and countryside. Most new projects, therefore, are for heavy-duty and light-duty vehicles.

CNAIC faces strong pressures from various factories, all lobbying for major expansion. In general, CNAIC seems to be trying to give each major factory a specialty, to minimize duplicate production. Time alone will tell whether this strategy will be successful, as there is intense competition among the factories to produce the products most in demand.

Some of the known or planned projects:

LIGHT VEHICLES AND PASSENGER SEDANS

Shanghai Automotive Factory: Sedans

This plant, which for many years was China's sole sedan manufacturer, has entered into a joint venture to produce Santana and Audi passenger sedans with Volkswagen. From 1983 to 1985, the plant assembled approximately 5,000 Santanas; in 1986, it plans to assemble 8,000 Santanas on production lines supplied by VW, as well as begin assembling a small number of Audis. A new engine plant (capacity of 100,000 units) is under construction. The factory aims to raise output to 30,000 Santanas, 10,000 Audis, and 100,000 engines by 1988, although this target may well prove overambitious if foreign exchange problems arise. Production of the old "Shanghai" sedan is to be phased out this year. The venture hopes to source over 80 percent of its parts in Shanghai by 1990.

Tianjin Automotive Industry Co.: Minivans and Sedans

The company currently reports the capability to manufacture 10,000 minibuses annually. Under a seven-year contract signed with Daihatsu (Japan) in 1984, the company can assemble 20,000 four-seat minivans with 850 cc engines per year, though only 5,500 vehicles were assembled in 1985. In early 1986, another seven-year contract was reached with Daihatsu for technology to assemble up to 10,000 Charade minisedans with 1,000 cc engines. Daihatsu's program is supported by a $1.15 million soft loan from Kuwait. The Daihatsu program probably does not involve much assistance in component manufacture, although reportedly 30 percent of the Daihatsu minivan components will be supplied locally. Tianjin also manufactures several thousand domestically designed minivans each year.

Ministry of Aviation Industry: Minivans and Minipickups

The Ministry of Aviation purchased Suzuki (Japan) Carry series 550 cc engine minivan and small pick-up truck technology in 1984. In 1985 the Harbin Aircraft Factory made 3,100 of the approximately .5-tonne pickups, while the Changhe Machinery Plant in Jiangxi made 1,500 minibuses, and the Dong'an Machinery Plant in Harbin made 7,000. Workshops are currently under construction to bring the annual capacity in the three plants to 40,000 vehicles and 50,000 engines by 1987–88. Hikuni (Japan) made the first known component technology transfer for the Suzuki program, providing carburetors to a Changchun factory belonging to the Aviation Ministry in early 1986.

Guangzhou Automotive Factory: 1-Tonne Pickup Trucks

The plant previously assembled buses, but entered a $25 million JV with Peugeot in 1985 to manufacture 15,000 1-tonne 504-model pickup trucks by 1988. The factory will include facilities for machining engine blocks, front and rear axles, and stampings, as well as assembly and painting lines. The program does not include any other component manufacture. The partners hope to expand capacity to 50,000 vehicles in the 1990s.

No. 1 Automotive Plant (Changchun), No. 2 Automotive Plant (Shiyan, Hubei), or Beijing No. 2 Automotive Plant: 1–2 Tonne Gasoline Engine Trucks

Industry representatives believe that CNAIC is committed to doing one large project to make 100,000 or more 1–2 tonne trucks with gasoline engines during the Seventh FYP. Chrysler, Ford, and GM are all discussing joint venture projects for such vehicles, with the No. 1 Automotive, No. 2 Automotive, and Beijing No. 2 Automotive plants respectively. Although it is not yet clear which of the projects CNAIC will ultimately support, Chen Zutao, general manager of CNAIC, has hinted that he leans toward Beijing. The Beijing No. 2 factory already specializes in light trucks, the popular 2-tonne 130 model. No. 1 Automotive makes about 15,000 light trucks per year from a design industry reps believe is copied from Nissan, but its specialty is medium-duty trucks, and it already has a major medium-duty truck expansion project underway. No. 2 Automotive makes 2.5-tonne trucks, but its main specialty is larger vehicles, for which it also has a major expansion project underway.

Ministry of Ordnance/Chongqing: 1.5–1.75 Tonne Pickup Trucks

Since late 1984 factories under the Ministry of Ordnance in Chongqing have had an arrangement with Isuzu (Japan) for joint venture manufacture of 1.5–1.75 tonne ELF-model pickup trucks. Since paid-up capital is less than a million dollars, and planned volume is only about 1,000 vehicles per year, the arrangement appears to be little more than a cover for assembly of Isuzu vehicles.

Nanjing Motor Vehicle Industry Co.: 1.5–3.5 Tonne Trucks

The Nanjing Motor Vehicle complex is physically one of China's largest, even though its output—primarily 2.5-tonne "Leap-Forward" trucks—was only a little over 20,000 vehicles in 1985. It has been selected as the focal point for production of Iveco (Fiat) (Italy) S-series 1.5–3.5 tonne diesel engine trucks, one of CNAIC's highest priority projects. A contract signed in 1985 and ratified in early 1986 calls for the Italians to transfer finished vehicle and component technologies, equip three new workshops, and renovate a number of old ones. This is supposed to enable the complex to produce 60,000 Iveco vehicles per year with 100 percent local content, but this target will probably not be realized until the early 1990s at the earliest. The initial year of the project, 1986, involves assembly of only 1,500 built-up units and 1,500 kits. Many US industry reps believe that generous financing offered by the Italian government—a $7 million to $8 million grant for training, $112 million at 2.5–4.5 percent over 15 years, in addition to $100 million in commercial loans—won Iveco the contract. Fiat has reportedly also granted China the right to export, a point on which earlier discussions with Isuzu for this project are believed to have bogged down. The Nanjing factory also continues to produce improved versions of its earlier models.

MEDIUM-DUTY TRUCKS

No. 1 Automotive Factory (Jilin): 5–6 Tonne Trucks

China's oldest automotive complex, built by the Soviets in the 1950s, No. 1 produced about 90,000 vehicles in 1985,

of which probably 75,000 were "Liberation" 4.5-tonne trucks used in a wide variety of applications, including as buses. The factory is in the final stages of upgrading its existing product's design, including a new 135 HP gasoline engine to replace the old 85 HP engine and a modern-looking cab-over configuration. The complex has also been tapped by CNAIC to produce 60,000 6.5-tonne diesel engine trucks in a new plant currently under construction. Cab and chassis technology has been licensed from Mitsubishi, transmission from Hino (Japan), and clutch from AP (UK); technology transfer discussions continue for some other components as well. The engine is being developed domestically and according to informed sources is already a problem.

No. 2 Automotive Factory (Hubei): 8–14 Tonne Trucks

In 1985 this factory produced just under 100,000 "East Wind" trucks, mainly 5-tonne payload vehicles with a 135 HP gasoline engine and 4 x 2 axle configuration. The factory is upgrading its models, but its main expansion project involves building a new complex in Xiangfan, some distance from Shiyan, to make 60,000 8–14 tonne trucks per year. Initial efforts are concentrated on 8-tonne trucks, whose annual output is to reach 20,000 units per year. Cab, chassis, and transmission technology have been licensed from Nissan, and power-steering technology from TRW-Ross (US). Further component licenses are likely; the most important item still outstanding is the engine for which discussions are ongoing with Cummins (US). The foundry for the project is already under construction in Xiangfan; used equipment has been purchased from Navistar (formerly International Harvester) (US). The delay in obtaining an engine license, however, makes it unlikely that the new complex will reach its intended capacity by 1990.

HEAVY-DUTY TRUCKS

Heavy-Duty Truck Corporation: 10–32 Tonne Trucks

Currently, heavy-duty truck production is spread out among a number of plants nominally controlled by the Heavy-Duty Truck Co. (HDTC) under CNAIC. The corporation's major ongoing project is the licensing of the Steyr (Austria) 91 series of 16–32 tonne trucks. The target is to produce about 10,000 Steyr model vehicles per year, but despite the fact that the license was signed in 1983, estimated 1986 production will only reach 500 units, virtually all assembled from foreign parts. Diesel engines are built at a large plant at Weifang in Shandong, but the finished vehicles are assembled in all of HDTC's major constituent plants, including:

Jinan: This plant is China's largest heavy- duty truck producer, accounting for about 15,000 units in 1985, most of them 8-tonne "Huanghe" 4 x 2 trucks. Most of China's larger buses are made from a related model. The plant will produce some of the larger models of the Steyr series, with 280 HP engine. It also recently commissioned a line to produce 10-tonne trucks made to Romanian design.

Shaanxi: This plant, built in the remote mountains of Qishan county in the late 1960s, produces mainly 6 x 6 5-tonne off-highway and 10-tonne on-highway trucks for military use. Output was probably less than 1,000 units in 1985. In recognizing how the plant's location adversely affects both the flow of materials and skilled people, CNAIC, the plant, Shaanxi Province, and Xi'an Municipality have agreed to jointly fund a ¥79 million project to build a new factory in Xi'an. The new plant is to produce 5,100 vehicles per year during the Seventh FYP—of which 2,000 are to be trucks on the lighter end of the Steyr 91 series, equipped with 200 HP engines. The gear factory associated with this plant is licensing Eaton (US) heavy-duty truck transmissions.

Qingdao: This plant is a small-scale producer of domestically designed heavy-duty trucks and dump trucks. It also produces some of the smaller trucks in the Steyr 91 series, with 200 HP engines.

Sichuan Motor Vehicle Plant, Chongqing: This plant was the licensee of the Berliet (France) heavy-duty truck, but has never produced at more than a fraction of its potential 10,000-unit capacity. Production in 1985 was probably around 1,000 units, primarily 6-tonne cross country trucks for military use. The plant has also begun to manufacture several hundred 17.5-tonne special trucks for oilfield use. The engine factory associated with this plant has licensed the Cummins NHK series diesels, primarily for use in construction machinery, and now makes over 1,000 units per year with substantial local content. Another factory associated with the plant has licensed Zahnrad Fabrik (ZF) (FRG) power steering for the Steyr project, and a third, the Qijiang Gear Plant, the ZF transmission.

Xingtai Motor Vehicle Plant, Hebei: This factory is a relatively minor player in heavy-duty truck manufacture. But although not involved in the Steyr licensing program, it has set up a line to assemble small numbers of 15-tonne trucks according to the Tatra (Czechoslovakia) design.

Ministry of Ordnance Industry: This ministry has expressed its intent to become a major manufacturer of heavy-duty on-highway trucks, but has not yet actually done so. A factory in Tianjin has been mentioned as the possible site for producing 7,000 trucks per year. A Harbin factory has reportedly assembled several hundred MAN (FRG) trucks on a one-time basis. Daimler Benz (FRG) has reportedly been discussing a license with a plant in Hohhot, Inner Mongolia.

OFF-HIGHWAY DUMP TRUCKS

Shanghai Heavy Duty Truck Plant: 32-Tonne Trucks

This plant has signed a license with WABCO (US) for 32-tonne trucks and has already assembled several. Anticipated volume is several hundred over the next five years. The plant also makes about 1,000 15-tonne trucks per year and claimed in 1985 to be seeking a licensing partner for this vehicle.

Beijing Dump Truck Factory: 27-Tonne Trucks:

This factory entered a license with Aveling Barford (UK) to make 24–35 tonne trucks in 1985 and just finished assembling its first unit. The plant also manufactures several hundred 20-tonne dump trucks using a domestic design.

Inner Mongolia No. 2 Heavy Machinery Factory, Baotou:

This factory, which reports to the Ministry of Ordnance Industry and is primarily a tank maker, has assembled several dozen 35-tonne trucks with components supplied by Terex (US) over the last three years. According to the ministry, a joint venture signed by the two sides is awaiting government approval. The JV would involve transferring some existing Terex manufacturing facilities to China.

Benxi Heavy Duty Truck Plant: 78-Tonne Trucks

This factory, which reports to the Ministry of Machine Building Industry, has signed a license with Komatsu (Japan) for 78-tonne trucks. Komatsu will supply 21 trucks, and 8 will be co-manufactured at the factory. Benxi also manufactures about 750 4- and 5-tonne dump trucks using a domestic design.

155-Tonne Trucks:

When it appeared in 1984–85 that China might build several world-scale open-pit coal mines, there was serious talk of licensing the largest off-highway truck of all. The Changzhou Metallurgical Machinery Factory, which has assembled several Unit Rig (US) 170-tonne trucks was considered for the license, so was the Hengyang factory belonging to the China Nonferrous Metals Corporation, and the Xiangtan Electrical Machinery Factory belonging to MMBI. With the cutback in open-pit mining development, interest in this project appears to have cooled.

Off-Highway Truck Transmissions:

In 1985, the Qijiang Gear Factory affiliated with Sichuan Motor Vehicle Plant licensed transmission technology from Detroit Diesel Allison (General Motors) for trucks ranging from 20 to 78 tonnes.

der CNAIC is a portrait of this continued fragmentation. Its major project, a licensing agreement with Steyr (Austria) to produce 16–32 tonne trucks, is distributed among at least four assembly plants in four cities—Jinan, Qingdao, Xi'an, and Dazu—although total production does not exceed several hundred units per year. Two transmission technologies have been purchased, and according to industry sources, the individual assembly plants (rather than the company) are deciding which transmission to use.

Light trucks present a similar picture. At the end of 1985, CNAIC reported outstanding proposals for no less than 10 light truck projects. If implemented, production would be twice as high as projected demand, according to CNAIC officials. Ford is talking with the No. 2 Automotive Plant, Chrysler with No. 1, and GM with Beijing Municipality—with no clearcut indication of which project will receive the central nod. And, outside the CNAIC system, the military is also getting involved in light truck production.

Bringing order to this chaos may prove difficult because CNAIC's financial control is severely limited. Although exact figures are not available, CNAIC's budget is small. The central government favors large infrastructure projects over machine building for the time being. And, under China's unwritten—but widely observed—fiscal rules, projects with high profitability (including most automotive projects) mainly fall to local authorities, who will receive most of their profits. Thus, despite Chen Zutao's appeals to concentrate resources on a few large projects, every major automotive plant has an expansion project underway at present.

CNAIC does, of course, have some control over foreign exchange expenditures and—as the bureaucracy in charge of automotive planning—can veto projects. But it is not powerful enough to push through its own preferred projects without the support of the local governments and plants themselves. To keep them happy, CNAIC almost has to give everybody a project. And indeed, there may have been times when CNAIC's own thinking has run along these lines—such as when it signed two component licensing agreements with competitors on the same day, hoping to get a better price from each company—regardless of the fact that it probably did not have the foreign exchange to support one license, let alone two.

But CNAIC is now trying to end such practices. No less than three groups within CNAIC (not to mention the State Council) must approve component technology imports: the Planning Department; the Import–Export Corporation; and the Accessories and Parts Corporation, a nationwide coordinating group. It remains to be seen whether these measures will be more effective than previous ones.

No one is a stronger spokesman for modernization and concentration of production than CNAIC General Manager Chen Zutao, former chief engineer of the No. 2 Automotive Factory, who last year called for focusing resources on two new plants: one to produce 300,000 light trucks per year, and one to produce 300,000 passenger cars. But awareness of the problems has not yet translated into viable solutions.

FX shortage hinders systematic technology purchases

CNAIC recognizes that the automotive industry needs foreign technology. However, since the industry holds relatively low national priority, mobilizing foreign exchange to systematically acquire foreign technology has proven difficult.

Purchases in the early 1980s tended to focus on isolated components, rather than integrated vehicle technology. While these purchases, including Mannesman (FRG) wheel technology and Perfex (US) radiators, have moved Chinese technology forward, many observers believe that their impact would be greater if they were part of a systematic vehicle redesign. In recent years, CNAIC has purchased technology more comprehensively for high-priority projects—from Steyr for 16–32 tonne trucks and most of their components, and from Iveco for light-duty trucks, engines, and components.

A few other factories are at least trying to obtain most of the key component technologies for their projects—albeit from a variety of suppliers. The No. 1 and No. 2 automotive plants have turned mainly to Japanese companies for the component technologies for their respective projects: Mitsubishi (No. 1 cab and chassis); Hino (No. 1 transmission); and Nissan (No. 2 cab, chassis, and transmission). However, both projects still lack engine technology, the most crucial component of all.

These licenses may not be any more successful than earlier ones. Informed sources say that in the case of Mitsubishi and Hino, and possibly Nissan as well, no pure technology license was signed; rather, these companies added the technology as an 'extra' to vehicle sales made to China in 1985, in response to Chinese pressure to "combine technology with trade." How strongly the Japanese firms will support these "licenses" with training and marketing assistance once the drawings are transferred is uncertain. Furthermore, the Japanese media reports that the Nissan license has an effective period of five years—a time period most US companies have found insufficient to fully impart know-how to Chinese factories wedded to the habits of decades.

The complete license purchases are encountering problems as well, mostly financial. The Steyr project limps along producing several hundred units per year, rather than the several thousand originally projected, and rumors fly that CNAIC is considering switching the whole program to Daimler Benz. CNAIC complains that Steyr has moved slowly in localizing content and has not adequately supported its license with training and other assistance.

While Steyr does have its own financial problems, its difficulties in China sound too familiar to other li-

censors, including US firms, to be attributed to the company alone. As informed sources have pieced together the picture, Steyr is moving slowly because the Chinese, due to a lack of foreign exchange, have not bought either the number of assembly kits promised or the machinery necessary to produce Steyr products of an acceptable quality. There may also be some end-user unwillingness to buy a licensed product, which is more expensive than a domestic product.

As a result, the venture is unable to import higher quality materials necessary to make an advanced product. Because of this quality problem, Steyr has so far been unable to fulfill promises to counterpurchase Chinese components—reportedly an important reason that Steyr was originally chosen over its competitor Daimler Benz.

At first glance, the Fiat venture in Nanjing seems likely to avoid these problems, since the Italian government has offered a low-interest loan amounting to over $100 million, with interest rates varying from 2.5 percent (if built-up vehicles or tooling is purchased) to 4.5 percent (if kits are purchased). This program, however, is also off to a slow start, with only 1,500 built-up units to be shipped and 1,500 kits assembled in 1986. End-user reluctance to pay a premium price may mean even these targets are not achieved.

Joint venture trials and tribulations

The Chinese recognize that foreign expertise can be most thoroughly assimilated through direct foreign investment. To date, four automotive joint ventures have been launched:

1) a $51 million venture between AMC (31 percent, half in technology and half in cash) and the Beijing Automotive Works;

2) a $165 million deal between Volkswagen (50 percent), the Shanghai Automotive and Tractor Corporation (25 percent), CNAIC (10 percent), and the Bank of China (15 percent) to produce passenger sedans;

3) a $25 million venture between Peugeot (22 percent), the Guangzhou Automotive Factory (46 percent), and CITIC (20 percent) to build pickup trucks with $29 million in loans from the International Finance Corporation (a World Bank affiliate) and Banque National de Paris (who also hold the remainder of the equity); and

4) a tie-up valued at less than $1 million between Isuzu and several Chongqing factories under the Ministry of Ordnance Industry. This appears to be little more than a short-term agreement to assemble Isuzu light trucks.

AMC's project, which got underway in 1984, has the longest track record. Its well-publicized problems (*see* p. 34) reveal a number of disturbing issues confronting any potential investor in China's automotive industry, including:

- The need to deal, both before and after contract signing, with people on the Chinese side either opposed to or threatened by cooperation with foreigners.
- The slow speed at which local content can be increased while maintaining international quality standards and competitive prices.
- The demand that a joint venture quickly begin exporting in order to balance foreign exchange, and the unreliable supply of foreign exchange for kit imports in the absence of product exports.
- The necessity of having complete cooperation from the local as well as the central government.

The Volkswagen joint venture may run into fewer problems. The Chinese government has reportedly agreed to allocate foreign exchange to Volkswagen over a multiyear period for producing an "import substitute" product. This suggests that the central government attaches high priority to the Volkswagen venture. In addition, Volkswagen's own up-front investment is larger. Official timetables still hold, calling for production to reach 30,000 Santanas and 10,000 Audis by 1987, and 100,000 engines by 1990 (60–70 percent of which are to be exported starting in 1990 to balance the venture's foreign exchange).

But the VW project is encountering some problems similar to those of the Beijing jeep venture (*see* p. 35)—notably a lack of cooperation from local government, delay in launching projects to make key components (negotiations with German suppliers for wheels, axles, and speedometers are underway, but no contracts are believed to have been signed yet), and difficulties making sales on the domestic market for foreign exchange. A number of American observers believe that VW will also have problems finding domestic components of suitable quality and, given the depressed market, fulfilling its pledge to export 60,000–70,000 engines per year to balance foreign exchange. Some industry sources indicate that, although VW is maintaining a lower public profile than AMC, it too may be running out of foreign exchange to buy kits—and that VW will not go any further with its commitment under the contract until the Chinese catch up on theirs.

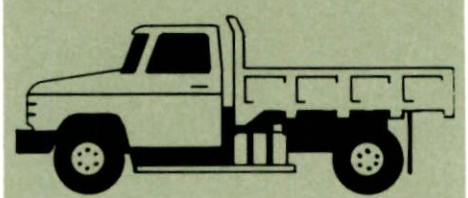
While the Guangzhou–Peugeot joint venture to manufacture pickup trucks is just beginning, potential trouble spots abound. The venture plans to balance the plant's foreign exchange expenditures by selling 5,000 units per year (one-third of its anticipated output) for foreign currency in the Chinese market over an eight-year period. The plans also assume that 50 percent local content can be achieved by an early date, while the venture is upgrading only a small number of the necessary components and production lines. However, its location in foreign exchange-rich Guangdong Province may give the project access to more hard currency than the joint ventures further north.

The tribulations of early investors in the Chinese automotive market may be natural until all parties involved adjust to the major differences between the Western automotive companies and China's automotive industry. But the problems are likely to make foreign automotive manufacturers wary of making large investments before China demonstrates concrete signs of change.

As one American automotive industry executive sums up the situation: "My prediction, unless China frees up a bundle of foreign exchange and is willing to put it in up front with no strings attached, is that the entire auto industry will stumble along in its fractionated, two-bit way. I cannot visualize any foreign auto manufacturer investing megabucks under CNAIC terms which in short say 'You, Mr. Foreign Partner, assume the entire burden of foreign exchange and solve the balance problems, and then some day China will reward you in return with world-class vehicles and components at dirt cheap prices.'" 完

PROBLEMS AT TWO JOINT VENTURES

Fundamental Problems Plague AMC Joint Venture



The widely publicized foreign exchange shortage suffered by the AMC–Beijing joint venture has fueled foreign companies' apprehensions about doing business with China. But the AMC venture may have been on unstable ground from the beginning. An article in the *Beijing Review* last November indicated that during the negotiations with AMC, "there were still people involved with the Beijing company who had misgivings about entering into a joint venture with foreigners—a result of the shackles imposed by years of 'leftist ideas'." These "misgivings" appear to have persisted during actual operation of the venture, making even the smallest operational decisions difficult.

The original contract called for the Chinese and American sides to jointly design a new jeep using only Chinese components. However, according to the *Beijing Review*, "after several months of work by Chinese and American engineers . . . it was found that the vehicle designed was defective in such areas as its exhaust system, noise, visibility, and speed, none of which could match international standards. . . . AMC suggested that the idea of joint design be postponed . . . .The Chinese, however, took AMC's suggestions as a symbol of the Americans' unwillingness to cooperate on a jointly designed vehicle and . . . of AMC's desire to control China's market." Ultimately, the Chinese agreed to build AMC's XJ model series, including the Cherokee jeep, using imported components—but clearly in a suspicion-marred environment that foreshadowed the more serious troubles that arose later.

The financial viability of the AMC venture was based on the assumption that the plant would be able to earn foreign exchange through exports after only a few years. This, of course, depends on how quickly the Chinese are able to produce vehicles of internationally acceptable quality at competitive prices. The venture's experience to date suggests that timetables calling for 80 percent local content by 1988 and 10,000 exported vehicles in 1990 are unrealistic. The venture is experiencing difficulty both in finding factories that can make high-quality components, and in gaining access at reasonable prices to the output of factories that can. Thus, until domestic sources can be developed, a major issue for the venture is how to maintain a foreign exchange flow to pay for the necessary kit imports.

In mid-1985 the Beijing International Trust and Investment Corporation—an arm of the Beijing city government—reportedly loaned the venture $8.5 million to buy equipment for a new Cherokee jeep assembly line and to import kits. At that time AMC chipped in an additional $6 million for the assembly line. But recent indications are that the loan was made under the assumption that the vehicles could be sold to endusers in China for foreign exchange. Since December 1985, these endusers have proven unwilling or unable to buy the vehicles with foreign exchange—chiefly because foreign exchange allocations to enterprises have been slashed across the board, but perhaps also because a 60 percent duty on imported parts makes the Beijing price considerably higher than the North American price. During the first part of 1986, local authorities were unwilling to renew foreign exchange allocations or loans to the venture, since the venture's expected foreign exchange earnings were not forthcoming.

This forced a major showdown in which AMC allowed its grievances to leak into American newspapers and, according to numerous reports, threatened to pull out of the venture. The gesture aroused enough high-level concern in China to guarantee the venture renewed foreign exchange for kit purchases, at least for the time being. According to Chinese press reports, the central government has offered $2 million for jeeps already assembled, in addition to an unspecified amount for further kit imports. But the venture's Cherokee jeep production will almost certainly fall well short of the earlier 4,000 unit target, although the company will make about 20,000 of the factory's old BJ212 model jeeps for sale in the Chinese market for renminbi.

The Chinese argue that AMC should also take some responsibility for maintaining the venture's foreign exchange flow. And a number of foreign observers point out that AMC's initial cash contribution—$8 million—was very small in relation to its goal of building an export-quality jeep in China. The corporation has apparently agreed to increase equipment supplies to the joint venture as part of the settlement of the foreign exchange dispute. —MW

If Things Go On Like This, There'll Never be a Chinese Detroit

He Ling

In October 1984, following seven years of negotiation, the relevant Shanghai authorities and Volkswagen Motor Corporation of West Germany signed a contract to set up the Shanghai–Volkswagen Automotive Company Ltd. For awhile, everyone was talking about it: China's motortown was on the rise. When Premier Zhao Ziyang inspected the Shanghai Automobile Factory in Anting, he was even clearer: "This place will become China's Detroit."

After the Spring Festival [Chinese New Year], a *World Economic Herald* reporter paid a visit to this joint venture, and to his surprise, found the situation far from encouraging. The managers from Volkswagen said, "There's little chance of establishing a Chinese Detroit in Anting." The Chinese personnel were even more straightforward: "If things go on like this, we might as well quit!" The reporter asked the personnel involved to explain the reasons:

- The "30,000-car" Shanghai Santana project was approved by the State Planning Commission with the stipulation that a portion of the funding was to be raised in Shanghai. Not only have these funds never materialized, but the funds and materials allocated to this project by the central government last year were in the end appropriated by related departments and put to other uses.
- In order to promote the start-up of this project, the State especially contributed some foreign exchange, which was used for spare parts imports during the initial phase. But the cars produced have all been taken by the higher authorities and sold domestically for foreign exchange, and the foreign exchange earned from these sales was not in turn used to support the development of the Shanghai Santana. Recently, the enterprise has had trouble making sales and thus the turnover of funds has been slow.
- The infrastructural facilities and coordination for which Shanghai is responsible were started very late. Some of this work will have to be included in the project's expenses. The investment budget has doubled. To this day, the municipal construction authorities haven't made plans or arrangements for basic infrastructural construction.
- When reporting their lending plans for this fiscal year, the relevant banks "forgot" about this important project. As of January, all of the credit lines and loan sources from which the project can borrow stood at "zero."
- The factory premises required by the project are being acquired principally by renovating old factory buildings. But it is very difficult to find construction workers, as construction units only measure their achievements in terms of new footage completed, and don't want renovation work.
- The key to Santana taking root in China is to raise the level of "local content" very rapidly. But only two of the more than 100 projects planned for integration with this project have been carried out, and no funds whatsoever are available for horizontal integration . . . .Scores more such instances could be cited.

The Party Central Committee and the State Council have repeatedly and unequivocally declared that the auto industry is a pillar of China's industry. The leadership of the State Council has indicated time and time again that sedans are to be produced in Shanghai. That's why the relevant leaders and departments of Shanghai Municipality have also stated repeatedly that this project has their fullest blessing. But who's going to solve the problems described above? So far, none of the leaders responsible for overall work matters has taken a detailed interest in this project.

The Germans have a long-term point of view. The president of Volkswagen, overriding all dissenting views, has indicated on several occasions that he hopes to co-invest with Shanghai in the sedan industry on an even greater scale and, furthermore, that he is willing to furnish half of the capital required to increase production to the level of 300,000 cars per year. So now the question is whether the Shanghainese can really make up their minds.

Meanwhile, some of our "brother and sister" provinces and cities are making no-holds-barred efforts to support the development of their auto industries. Someone has made this comparison: Shanghai has been producing cars for 30 years, and its annual production is 8,000 vehicles, whereas Shenyang has been in the industry for three years and has turned out 30,000. Beijing plans to invest ¥2 billion in its auto industry during the Seventh FYP. As for Shanghai? Still not a dime. If this disparity in the rate of change is not reversed promptly, Shanghai's fragile superiority in the industry will melt away.

It isn't a completely hopeless situation. Recently, a group of economic theorists, after investigating Shanghai's auto industry, proposed a tentative plan for relying on foreign funding to develop it, particularly the sedan sector. This plan has been endorsed by the industry's policymakers. However, under the present system, if a newly developing industry like this one, with its wide-ranging implications for other industries and its large volume of investment, fails to become a matter of urgency causing sleepless nights for Shanghai's leaders, all of our hopes will prove to be nothing but unrealizable fantasies.

This article originally appeared in the Shanghai World Economic Herald *on March 3, 1986. It has been translated by Ellen R. Eliasoph, resident attorney, and Bianca Ip, paralegal, of Paul, Weiss, Rifkind, Wharton & Garrison, in Shanghai.*

Challenges and Opportunities in Civil Aviation

Few transport sectors have seen such dramatic change as civil aviation in the past two years—and few have as far to go. China's present air system is simply inadequate: its approximately 600 scheduled flights daily are two-thirds those of Hong Kong's Kaitak Airport alone, and carry only a tiny percentage of the country's freight and passenger traffic.

A major bureaucratic reorganization is underway to help cope with the country's rapidly changing air transport needs. In late 1984, amidst mounting criticisms of unsafe service and poor management, the Civil Aviation Administration of China (CAAC) announced its intent to evolve into a regulatory body, allowing new airlines to assume its former function as the sole national airline.

The first rumors of new airlines being formed followed shortly, along with a challenge to CAAC's authority in many aspects of civil aviation management. Confusion reigned through most of 1985 amidst conflicting reports of the establishment of new airlines, routes, aircraft purchases, and joint ventures with foreign firms.

Finally, the outlines of the new system began to emerge late last year. In September the State Council issued regulations confirming CAAC's role as a regulatory agency with jurisdiction over civilian air operations in China. Thus CAAC will continue to supervise pilots, planes, routes, fares, and airports, and approve aircraft and equipment purchases.

Meanwhile, at least two types of airline companies will take CAAC's place in the airline business. First to be formed are regional airline companies evolving out of CAAC's six regional aviation bureaus. They will continue to operate most of CAAC's routes, using former CAAC aircraft, although CAAC will no longer include planes or other equipment bought by the regional bureaus in its assets. The regional airlines may form ventures with other organizations, and indeed several have already done so. The six, their regional headquarters, and emerging structure are as follows:

- Air China: (Beijing). Will operate most of China's international routes for the time being, and some major domestic routes.
- China Eastern: (Shanghai). A joint venture between CAAC and Shanghai Municipality.
- China Southern: (Guangzhou).
- China Southwestern: (Chengdu). A joint venture between CAAC, and Sichuan and Guizhou provinces.
- China Northern: (Shenyang).
- China Northwestern: (Lanzhou).

The Beijing Regional Administration, the largest and most powerful of CAAC's six, has been the most vocal about its impending separate identity. In March regional officials announced their projected expenses, staffing needs, and intent to purchase up to 20 jets over the next five years—to the consternation of some CAAC officials who apparently feel it is still their prerogative to make such information public.

In addition to these six regional carriers, "local" airlines are being formed with CAAC approval, to operate new passenger and cargo routes based on need. So far at least 10 local airlines have received a preliminary go-ahead, and many more have applied for approval. Several are to be run by municipal governments or the air force, and at least one has already asked CAAC to be a partner. Some intend to carry only passengers, while others will offer cargo and industrial services. Most are not expected to go into operation before next year.

Some of these new regional and local airlines have already begun to procure their own aircraft and equipment, albeit with CAAC approval (*see* table, p. 38). There may be some overlap in routes between the local and regional airline companies, allowing them, in theory, to compete on the basis of service, although CAAC will continue to oversee fares and route assignments.

The task of coordinating all of these developments will keep CAAC busy—even as it gives up a substantial portion of its former responsibilities. In May 1985 CAAC opened a new nationwide center in Tianjin for training a variety of airline personnel. At about the same time CAAC spent $9 million on a Sperry mainframe computer to be installed in Beijing for coordinating airline operations throughout the country.

The US Federal Aviation Administration (FAA) has been working closely with CAAC, advising on air systems management and discussing bilateral issues of mutual concern. Last March CAAC and the FAA signed a technical cooperation memorandum, and are discussing a bilateral airworthiness agreement, although this must wait until China completes its own airworthiness code.

The ongoing decentralization of airline operations has also spelled an increase in business opportunities. US firms maintained their position as China's major aviation suppliers in 1985. And few seem daunted by Chinese statements that the willingness to transfer technology will be a major factor in winning future sales contracts. Several US aerospace companies have already signed technology transfer agreements, and 73 US firms attended the first US National Aerospace Exhibition in Beijing this May.

As the pace of change in China's air transport system picks up, the stakes have never been higher nor the opportunities greater. The following articles describe China's needs in aircraft and ground facilities—and how US and other foreign firms are responding to them. —MCR

Aircraft Procurement and Production

Richard E. Gillespie

Airlines worldwide are expected to spend $250 billion on purchases of up to 5,500 new commercial aircraft by the year 2000, and China, with a far-reaching program underway to upgrade its long-neglected air transport sector, should be one of the leading buyers. During this period China may also begin to compete with aircraft manufacturers around the world, as it improves its own domestic aircraft industry.

Chinese officials say they will continue to buy or lease foreign aircraft for the next three decades—if foreign suppliers are willing to cooperate in the development of China's own aircraft industry. According to various foreign estimates, China may spend up to $5 billion for foreign commercial fixed-wing aircraft over the next 15 years, while a $2.1 billion market for commercial jet engines (to include $400 million spare parts purchases) is expected over the next nine years. Programs for purchasing, manufacturing, refitting, and leasing commercial aircraft in the Seventh Five-Year Plan (1986–90) should spell significant business opportunities for foreign suppliers.

Foreign exchange restrictions are likely to be less severe in aviation than in other sectors, since CAAC can draw on the profits it has generated regularly since 1979 for aircraft purchases. It is expected that the new regional and local airlines will retain up to 95 percent of their profits, and will account for an increasing share of purchases.

At present, CAAC's active commercial air fleet consists of a hodgepodge of at least 350 fixed-wing aircraft, including Soviet Ilyushin-18s and Antonov-24s, more than 30 British Tridents, some 40 Boeing aircraft, 5 McDonnell Douglas MD-82s, 3 Airbus A310s, and a few domestic models. Such a varied assortment of aircraft is difficult to maintain under any circumstances, but the problem is compounded by the fact that many of these planes need refitting or replacement.

Thirty years of aircraft purchases

Commercial air transportation was funded on a shoestring budget until the 1970s. CAAC's early flights relied on twin-engine piston aircraft (American DC3s, C46s, and C47s) left behind by the Chinese Nationalists. Additional piston and turboprop aircraft, IL-18s and British Viscounts, were purchased during the 1950s and 1960s. Purchases of the Soviet IL-62 airliners moved China into jet propulsion in the 1960s. Although a relatively small number of foreign aircraft were purchased during the first two decades of the People's Republic, they were adequate for the limited amount of civilian air travel in those years.

Even fewer resources went to domestic production of commercial aircraft, since the military took priority in production. Only 400 of the approximately 10,000 airplanes manufactured since the early 1950s were for civilian use. But by the early 1970s China began to take commercial air transport modernization seriously. CAAC began to buy substantial numbers of foreign aircraft while the Ministry of Aviation Industry stepped up the development of domestic aircraft. The aircraft procurement program looked primarily to the West, beginning with the purchase of some 39 new and used Tridents followed by several large orders from Boeing between 1972 and 1982 (*see* chart, p. 38).

The sharp increase in foreign travel in the late 1970s added to the importance of developing commercial aviation. Tourist traffic increased from 420,000 in 1979 to over 4 million in 1985. Boeing strengthened its position as China's largest foreign supplier in the early 1980s, but McDonnell Douglas also began to make sales by 1983.

China's economic retrenchment in 1980–81 temporarily halted this trend, and led to heavy cutbacks in foreign aircraft purchases for several years. Reportedly China even tried to sell off the aging Trident fleet for badly needed foreign exchange. US sales to China declined substantially, while British efforts to market its BAe 146s failed and China's overtures to other countries for cheaper or used aircraft proved to be only window shopping.

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PROCUREMENT OF FOREIGN PASSENGER AIRCRAFT, 1972–86*

Year	Model/Value	Specifications	Remarks
1986	Airbus (Europe) (2) A310-300/ $100 million	Engine: General Electric (GE) CF6-80C2	Destined for Shanghai.
5/86	Boeing (4) 747-200 (4) 767-200/ Total: $620 million	Engine: Pratt & Whitney (PW) JT9D-7R4G2 Engine: PW JT9D-7R4E	Dates of delivery: one 747 every March from 1987 to 1990; two 767s in 2/87, one in 1988 and one in 1989.
12/85	Canadair (3) Challenger 601	Engine: GE CF3E4 Seats: two 17-seaters, one 11-seater	Date of delivery: summer 1986. Purchased through Polytechnologies, Inc. For transporting government officials.
7/85	Boeing (4) 737-300/ $106 million	Engine: CFM56-3B1 Seats: 130	Dates of delivery: 11/85, 1/86, 2/86 and 6/86. For Southwest Airlines, based in Chengdu.
5/85	Boeing (5) 737-200 (2) 767-200ER (1) 747-200 Combi/ Total: approx. $350 million	Seats: 120 Seats: 250 Engine: PW JT9D-7R4G2 Seats: 250	Delivery in 1985. Destined for Guangzhou.
5/85	British Aerospace (10) BAe 146-100/ $150 million	Seats: 86	Date of delivery: 6/86. For linking Lanzhou, Chengdu, and Lhasa.
4/85	Airbus (3) A310-200/ $156 million	Engine: PW JT9D-7R4E Seats: 228	Dates of delivery: two in 6/85, one in 5/86.
4/85	McDonnell-Douglas (26) MD-82/ $800 million	Engine: PW JT8D-217A Seats: 142	Dates of delivery: one in 10/85; remaining 25 to be sent in kit form for assembly by 1991. Option to purchase 15 more.
2/85	Short Brothers (UK) (8) 360/ $39 million	Engine: PW twin turboprop Seats: 36	Date of delivery: 8/85. 4 for Wuhan, 4 for Shanghai. Feeders for major hubs.
1/85	Boeing (2) 737-300		Delivery in 1986. For Yunnan Airlines. First purchase by local airline.
1985	McDonnell-Douglas (2) MD-82		For Shenyang Regional Administration of CAAC.
1985	Boeing (2) 737		New; sold by Western Airlines.
1985	Boeing (5) 707-300C/ $9 million	Seats: 188	Delivery in 1985. Reconditioned. Provided by The Batchelor Group in Miami, FL, for Shanghai Airlines.
1985	Tupolev (USSR) (Approx.) TU-154M Countertrade deal	Seats: 160	Soviet Union Aviaexport sale. First two arrived at5/86, one at Heilongjiang Province; and one in Lhasa for moving PLA units to Beijing.
1985	de Havilland (Canada) (5) Twin Otter/ $12 million	Engine: 4×RR Dart Seats: 19	Delivery in 1985. 3 for transport; 2 for survey work.
12/83	McDonnell-Douglas (2) DC9-80	Engine: JT8D-217	For Shanghai Regional Administration of CAAC.
11/82	Boeing (10) 737-200/ $170 million		
1982	Boeing (1) 747SP/ $55 million	Engine: 4×JT-9D Seats: 291	
1982	Boeing (1) 747-200 Combi		Delivery in 1983.
12/78	Boeing (3) 747SP	Engine: 4×JT-9D Seats: 291	Delivery in 1980.
1972	Boeing (10) 707-320/ $125 million	Engine: PW JT3D-4 Seats: 149	First Boeing sale to PRC.

*Listed chronologically by date of sale.
SOURCES: National Council files and US industry estimates.
Compiled by Valerie J. Chang and Natasha M. Wei.

CAAC's sweeping reform of its own organization, beginning late in 1984, combined with an upturn in the economy, have generated a spate of new foreign aircraft purchases. Contracts for many new Boeing aircraft have been signed since 1985. But worried about developing an over-dependence on one producer, China also turned to other foreign suppliers. In 1985 three Airbus passenger planes were bought from the France-based European consortium, Airbus Industrie, as were 10 British Aerospace BAe-146 short-haul transports, and—reflecting the improvement in Sino–Soviet relations—a number of Soviet Tupolev-154M airliners. The same year, another American company, McDonnell Douglas Corp., not only sold several more aircraft but concluded a pathbreaking agreement for the assembly of 25 MD-82s in Shanghai—a sign of the growing importance assigned to domestic civil aircraft production.

From 1975 to 1985, China turned a portion of its military output to commercial production, and tested and produced several new aircraft models during the Sixth Five-Year Plan (FYP). But the failure to successfully reverse-engineer foreign models—especially the abortive $300 million attempt to build a Boeing 707 lookalike (the Yun-10)—reinforced the aircraft industry's shift away from self-reliance toward foreign technology.

Trends for the next five years

Both foreign aircraft purchases and domestic production will continue—on parallel tracks—during the Seventh FYP. More than 200 aircraft are to be added to the fleet, about half of them to be purchased or leased from abroad.

PRC authorities say China will buy approximately 30 aircraft this year alone. So far 1986 orders include eight new Boeings and two new Airbus 310s. Meanwhile, the new regional and local airlines began to place their first orders in 1985: Southwest Airlines (Chengdu) purchased four Boeing 737s and the Kunming-based Yunnan Airlines another two. The Shenyang regional administration bought two MD-82s and will buy the first MD-82 off the Shanghai production line in 1987.

Foreign aircraft appear to be distributed on a regional basis in China, with the MD-82s flying the northeast

routes from Shanghai; Soviet aircraft on the northern routes (Xi'an, Lanzhou, Urumqi, and Harbin); and Boeings on the Beijing, Guangzhou, Xiamen, and Kunming routes. This apparent supplier segmentation policy may help to decrease CAAC's regional maintenance problems.

The jurisdictions of several aircraft procurement agencies are in flux and may overlap. The China National Machinery Import–Export Corp. (MACHIMPEX), under the Ministry of Foreign Economic Relations and Trade, purchased foreign aircraft and sold Chinese-made airplanes abroad in the past, acting as an "order taker" for CAAC. But CAAC now requires the China Aviation Supply Corporation (CASC), its own procurement arm and formerly MACHIMPEX's competitor, to play the leading role in all aircraft procurement. CASC also oversees the import of aircraft engines, spare parts, and overhaul equipment. This recentralization of authority by CAAC/CASC also extends to the regional airlines, which must (and already have) come to CAAC for approval of aircraft purchases, and also for money when they run short of foreign exchange for these purchases.

Engine sales

These aircraft purchases have generated a demand for foreign aircraft engines. Accompanying Boeing aircraft purchases have been sales of Pratt and Whitney engines, which are standard on all Boeing aircraft except the 737-300s. But CAAC, like other foreign purchasers, can install whatever engine it wishes on its aircraft, and in an unusual departure from past policy recently procured two different engines for the same model of a foreign aircraft. In this deal valued at $40 million, CAAC bought General Electric engines for its two newest Airbus A310s. These airliners are to operate alongside three other A310s equipped with Pratt and Whitney (PW) engines.

This apparent attempt to foster competition among aircraft engine manufacturers may in part be an effort to negotiate lower prices. It is quite likely that CAAC will try both GE and PW engines for some of the eight Boeing aircraft ordered this year. PW engines will power the two 767s set for delivery in 1987, but CAAC can still purchase other engines for the remaining new Boeings.

The domestic aircraft industry

While China will continue to purchase foreign commercial aircraft, the domestic aircraft industry will gradually become more important. The Ministry of Aviation Industry (MAI) now manufactures several commercial aircraft (*see* box, p. 40), and 20 types of engines—both piston and turbojet.

MAI oversees approximately 100 factories, more than 200,000 employees, and some 16 aeronautical research institutes. Other ministries, notably the Ministry of Electronics Industry (MEI), are involved in avionics production. MEI, however, must coordinate its avionics production with MAI and the Ministry of Astronautics Industry (which fabricates space and rocket launch vehicles). The aircraft industry in both the civilian and the military sectors is overseen by a supraministry Civil Aviation Leading Group, headed by aviation Minister Mo Wenxiang and including senior cadres from MEI and other relevant agencies.

With military orders down, the aviation industry, like other defense-related sectors, is under pressure to produce more for civilian use. In 1985 alone MAI produced more than ¥1.5 billion worth of nonaviation goods, including trucks, motorcycles, and household appliances—much of it from relatively obsolete aircraft factories. It converted aircraft engines into industrial-use gas turbines for oilfield power generation, and made equipment for many other industrial uses. Approximately two-thirds of MAI's production is slated for the civilian sector by 1990, which would reverse its present production ratio of about two-thirds for the military sector.

Civilian aircraft and engine production take place in several large plants throughout the country, especially in Shanghai, Xi'an, Harbin, and Shenyang. Test equipment, avionics, components, and accessories, on the other hand, are produced in medium-sized plants, some of them MEI facilities. Materials are normally produced in the metallic, chemical, and engine material departments of the aircraft plants, as are the machine tools and measuring test equipment.

While strong in basic research and the manufacture of replicated items, China's aviation industry remains weak in applied research, design, development, and systems integration. Improvements in aircraft engines, electronics, and materials are badly needed.

The China Aerotechnology Import–Export Corporation (CATIC) oversees many of the MAI plants. CATIC supervises aviation exports and technology imports and is a key player in the upgrading of domestic production through transfer of technology. Offices for CATIC are located in Shanghai, Guangzhou, and Fuzhou as well as in the United States (New York and Los Angeles/Long Beach), Canada, the United Kingdom, France, and West Germany.

Sales strategies for the future

One option now being pursued by foreign firms is to help China upgrade older foreign aircraft. CAAC has considered an ambitious program to refit a number of used Boeing 727-200s, replacing the current two engines with three more powerful models, incorporating larger fuselages and more seats at a cost of $15 million per aircraft. Little progress has been made on this program, however.

Improving domestic aircraft with foreign help is another priority. The Yun-7-100, China's priority domestic aircraft during the current FYP, is to be upgraded to international standards. In the next five years, 40 Yun-7-100s will be made for CAAC. To upgrade the Yun-7, CATIC has formed a joint venture, called the Hua Nan Aerotechnology Corp., with the Hong Kong Aircraft Engineering Company (HAECO). Attempts to improve the Yun-7-100 have so far centered on changing the equipment from Soviet to American, and the plane now incorporates advanced US avionics.

But the improved Yun-7-100 is still too heavy, and Boeing, as part of a general industrial cooperation agreement with China, has contracted with CATIC to study how the plane's performance could be upgraded. The work, to include wind tunnel testing, will be done by Boeing in Seattle.

Upgrading the 17-passenger Yun-12 aircraft, also with HAECO help, is another priority. The improved Y-12 will be powered with two Pratt and Whitney Canada PT6A turboprop engines. In a licensing agreement reached with CATIC this May, Pratt and Whitney will test and assemble these engines at the Harbin Aircraft Plant where the Y-12 is made.

Equally important is foreign collaboration in the development of new commercial passenger aircraft. Since help with domestic production has become a prerequisite for doing business in China, foreign aircraft manufacturers are not likely to remain in a competitive position for long unless they explore this option.

Development of several types of aircraft is being examined with foreign companies. Japanese firms and de Havilland Aircraft Company of Canada (recently acquired by Boeing) are working on 40-seater models. McDonnell Douglas is working with MAI on developing an 80-seat advanced technology propfan aircraft, designed for domestic use, while West Germany's Messerschmitt-Boelkow-Blohm (MBB) signed a memorandum of understanding in mid-1986 to help China develop an aircraft of similar size.

In the short term, foreign aircraft manufacturers are being asked to consider manufacturing existing aircraft models in China through some form of technology transfer agreement. Boeing and Airbus are both negotiating with MAI on manufacturing airliners in China. More recently, Lockheed offered its 100-seat, 4-engine PRC 105 turboprop aircraft, unveiled at the recent US National Aerospace Exhibition in Beijing, for joint venture production in China. The PRC 105 is based on the P-3C Orion antisubmarine warfare plane, and Lockheed representatives feel that its large fuel capacity and short take-off and landing capability make it well suited to operating conditions in China.

McDonnell Douglas program underway

So far, however, China's most ambitious effort to develop its aircraft industry with foreign help is the agreement signed last year with McDonnell Douglas Corp. for co-production of the MD-80 series aircraft under a co-production arrangement. Under discussion for 10 years, the agreement signed in 1985 is the first of its kind between a US manufacturer and MAI.

Valued at between $750 million and $1.2 billion, the deal calls for purchasing and assembling 26 MD-82 airliners by 1991, with an option for 15 more. The first MD-82 was assembled at the Douglas Long Beach plant and delivered to China in late 1985. The remaining 25–40 airlines

DOMESTIC CIVIL AIRCRAFT PRODUCTION

Since the late 1950s China has been developing a series of indigenous civil aircraft, known as the Yun, or Y-series. This line of aircraft is used for passenger and cargo transport as well as for agricultural and scientific purposes. The earlier models in the series were based on Soviet aircraft, while more recent models have been either based on Western aircraft or Chinese design.

The Y-series is the foundation upon which China eventually hopes to develop a self-sufficient aircraft industry. Models targeted for further production and improvements are the Y-7, Y-8, Y-11, and Y-12.

YUN-5:
- First manufactured in Nanchang Aircraft Manufacturing Plant, later in Shijiazhuang Aircraft Factory.
- Test flight 12/57; batch production begun 1957; no longer produced.
- Based on Soviet AN2.
- Twin turboprop engine.
- Biplane powered by reciprocating engine.
- Freight capacity of 2 tonnes.
- Used in agriculture (seeding, spraying) and forestry (transport).
- Has been exported to such countries as North Korea and Pakistan.
- 200 produced; because of short lifespan, only 100 are still in use.

YUN-6:
- Built in 1950s.
- Copy of Soviet IL-14.
- Used for transportation.
- Only a small number produced.

YUN-7:
- Manufactured at Xi'an Aircraft Company.
- Research and development started in 1966.
—Maiden flight in 1970; batch production begun 1983.
—Flown on domestic routes since 1984.
—Reportedly manufactured at least 20 Y-7s by mid-1986.
- Based on Soviet AN24.
- Twin turboprop engine.
- Largest domestically built passenger plane in production, seating 48.
- Range: 1,900 km.
- CATIC hopes to replace IL-14s and DC3s with Y-7.

Yun-7-100:
- Manufactured at Xi'an Aircraft Company.
- Remodelled version of the Y-7 being done with help of Hong Kong Aircraft Engineering Company (HAECO) and Boeing Aircraft Co.
- Passenger capacity increased to 52, crew members cut from 5 to 3.
- Extensive upgrading being done, much of it involving replacement of Soviet with US equipment:
—Rockwell Corp. HF and VHR radios.
—Omega system direction finders and distance-measuring equipment.
—Litton Industries inertial guidance systems.
—Sperry Corporation radar and autopilots.
—Improving acoustic insulation; renovating interior; improving ventilation and lighting systems; adding winglets.
- 40 to be built over the next five years, including 10 in 1986.

will be assembled at the plants of the Shanghai Aviation Industrial Corporation (SAIC) using components shipped from Long Beach. Gradually more PRC-made components will be used in the aircraft. The first Chinese-assembled MD-82 is due off the Shanghai assembly line in July 1987. The SAIC facility has been producing landing and nose gear doors for the MD-80 since 1979, providing more than 115 ship sets to Long Beach.

McDonnell Douglas will provide master and assembly tooling as well as technical assistance in setting up the final assembly lines in the 10,000-worker Shanghai facility. The agreement paves the way for further cooperation between the partners. A joint task force has been formed by the McDonnell Douglas Aircraft Division and CATIC/SAIC to study cooperative development of new commercial transports. SAIC and McDonnell Douglas will work together in a three-year program to develop a new propfan propulsion system, with McDonnell Douglas providing an advanced flight simulator training system for a new flight training center that is to be completed by 1987–88.

The US Federal Aviation Administration (FAA) has agreed to allow McDonnell Douglas to extend its production certificate to the MD-82s manufactured in Shanghai if all goes well. The FAA completed an initial plant survey this spring. Assembly of the first MD-82 has begun, and the certificate could be obtained by the end of this year. This pathbreaking agreement may make it easier for other US aircraft manufacturers who hope to produce their aircraft in China.

The drive to export

In line with the country's current drive to expand exports, China's aviation industry is accelerating its export program. MAI is aggressively promoting the sale of aircraft components to foreign aircraft manufacturers. Its plants in Xi'an, Shanghai, Harbin, and Shenyang have to date manufactured more than $80 million worth of parts for nine principal foreign aircraft companies.

The industry manufactures cabin doors, engines, and other parts for 10 types of aircraft including foreign planes such as the Boeing 737, MD-82, and Airbus 320. Automation and specialization are minimal since most facilities operate as self-sufficient entities. However, the Xi'an Aircraft Factory makes parts for Boeing and the Canadian Aircraft Corp., and has recently won a contract for vertical stabilizers for the Boeing 737-200s. The Hongqi Aircraft Factory (also near Xi'an) sells components for Trident aircraft, while both Xi'an and Chengdu sell components to Pratt and Whitney.

Chinese officials frequently stress the mutual advantages of building aircraft parts in China. Buying components from China, they argue, will make foreign products more competitive due to China's low labor costs, and will help China generate the foreign exchange needed to purchase more aircraft.

Meanwhile, China hopes to market its own Yun-7s as commuter planes in Asia and Africa in the next few years. Both the Yun-7 and the Yun-12 have recently been upgraded for export, and export of the Yun-8 is also being considered.

Pressures and prospects

As China's aviation industry improves, foreign suppliers can expect growing pressure for countertrade and buyback agreements to form a part of most future deals with MAI and CATIC. According to MAI Minister Mo, China "needs" countertrade,

YUN-8:
- Manufactured at Shaanxi Transporter Manufacturing Plant (Hanzhong).
- Research and development started in 1968.
- Test flight 12/74; batch production begun 1980.
- 25 produced.
- Based on Soviet AN12.
- Specifications:

—Four-engine 250 HP turboprop.
—Cargo capacity 20 tonnes.
—Range: 5,615 km.

- Largest Chinese-made cargo and passenger plane.
- Used as patrol craft and military transport.
- MAI considering modification of Y-8.

YUN-9:
- First produced in early 1970s.
- Medium-range transport plane.
- Based on Soviet AN-12 with modified engine.
- Approximately 25 produced and all in use by CAAC, air force, and navy.

YUN-10:
- Manufactured at Shanghai Aircraft Factory.
- First model completed in 1980 after 10 years of R&D.
- Work on Y-10 stopped after three models built.
- Resembles Boeing 707.
- 124–178 seats, crew of 3.
- Uses Pratt & Whitney JT3D-7 engines.
- First large Chinese-manufactured long-haul jet airliner.
- Not in service.

YUN-11:
- Manufactured at Harbin Aircraft Factory.
- Test flight 12/75; batch production begun 1977.
- 8 passengers, 2 crew members.
- Used in agriculture, forestry, and geological prospecting.
- General purpose light transport plane.
- Also made Y-11T for light transport and Y-12 (*see* below).

YUN-12:
- Manufactured at Harbin Aircraft Factory.
- R&D started in 1980, successful test flight 7/82.
- At least 14 completed by mid-1986.
- Improved version of Y-11.
- Specifications:

—17 seats.
—Twin engine, Pratt & Whitney PT6A-27 from Canada.
—Range: 400 km.

- Multipurpose, originally intended for surveying and short-range passenger service, now used primarily for medium-range transport.
- First Chinese-manufactured plane to comply with international navigation and safety standards.
- Scheduled for upgrading (together with Y-7-100) by HAECO.
- Marketed as Turbo Panda for export by DK Aviation (UK).

Source: National Council files and Beijing Office

Photo courtesy of New China Pictures

A Yun-7 assembly line at the Xi'an Aircraft Company

as it provides "the only way for China to get hard currency to buy more aircraft." McDonnell Douglas plans to offset the cost of its co-production agreement in China with $300 million in purchases of Chinese products in perhaps the industry's most ambitious countertrade program yet.

Foreign firms are also keeping an eye on protectionist trends in China. Chinese officials have discussed various measures to shield the fledgling civilian aircraft industry from foreign competition. The decision last year to stop importing aircraft comparable to domestic models aroused little concern at the time, since MAI's capabilities lie primarily in the area of smaller, low-technology planes. But the government's commitment to such protectionist policies has become more pronounced recently with the call to stimulate Yun-8 production by imposing higher tariffs on imported aircraft. Since China needs foreign technology to bring its aircraft production to international standards, industry observers hope that this protectionist trend will be short-lived and that the government will not impose strong measures.

China has relied on the open door to modernize its aircraft production, and cannot afford to close the door now if it is to achieve the dual goals of modernizing its air system and eventually becoming a world-class aircraft manufacturer. Noisy, oil-guzzling Tridents and Boeing 707s must be phased out and replaced with new models shortly. Foreign aircraft are needed to meet immediate needs while domestic aircraft are developed for the future.

The competition is likely to heat up over the next five years, which promise to be a significant period in China's procurement cycle. Prospects for US aircraft and technology sales should remain strong. Boeing, which has trained large numbers of CAAC technicians and has an expanding service structure in China, should retain its dominance as a source of long-range wide-body aircraft. The willingness of McDonnell Douglas and other US aircraft manufacturers to co-produce aircraft and engines in China, source parts there, and develop new models in conjunction with the Chinese should also ensure them a continuing share of the market.

Attractive financing provided by other nations is beginning to stimulate their aircraft sales, however. China's Airbus A310 purchases have been helped significantly by generous loan terms. And part of a recent Canadian $252 million concessionary loan to China may be used for de Havilland aircraft purchases. The competition for sales of medium- and short-range feeder aircraft is likely to be particularly intense.

But in the long run, if all goes according to plan, China's own domestic industry will emerge as the principal source of China's aircraft. Currently CAAC and the regional airlines are under political pressure to buy domestic aircraft such as the Yun-7 instead of foreign planes, other factors being similar. This policy is reportedly sweetened by a 40 percent subsidy given to the airlines by the central government for these domestic purchases. Without these pressures and price incentives, the domestic industry could not compete effectively at this time. If MAI is to eventually achieve its goal of competing on more equal terms, it must keep the door open to foreign aircraft and technology until at least the end of this century. 完

Keeping the focus on the ground

Airport Development

Beverly LoPinto

Few who have taken flights within China would disagree that more money needs to be spent on airports and other ground-based facilities. With few exceptions, most of the 90 airports currently being used for civil aviation are in a sad state of disrepair, and many date back to World War II. Aircraft purchases have received far more attention and financial resources than have ground facilities in recent years: only a small portion of the $1 billion spent by CAAC on new equipment purchases in 1985 went toward development of airports and ground infrastructure.

The limited amount of airport development that has taken place has generally been in response to immediate needs. First priority has been on upgrading international and major domestic airports—such as Beijing's showcase international airport completed in 1980. In 1984 airport development in the four special economic zones and 14 coastal cities was added to the list of priorities. Six of the 14 cities and the Xiamen SEZ have completed airport projects since then, and the remainder have projects on the drawing board. The largest will be new international airports for Shenzhen and Shanghai to be built during the Seventh Five-Year Plan.

Ownership and management

Although in the midst of internal reorganization, CAAC continues to control most of China's civilian airports, with responsibility for landing rights and air rights in all cases except where military flight paths are concerned. Several nationwide divisions of CAAC guide airport development, each having its own counterpart at the local levels. CAAC's maintenance division controls all airport grounds and buildings and oversees repair and development.

Final approval for new airports and the upgrading of older facilities must still come from CAAC's planning department, which works closely with the central government and State Planning Commission to determine priorities. Once approved, the project is turned over to CAAC's construction department, which relies on local labor and equipment whenever possible.

Until recently, the money for airport projects came from CAAC. But as CAAC focuses on regulatory activities, responsibility for funding will increasingly fall to local authorities—as will the operation of regional airlines.

It is still uncertain to what extent local authorities will be involved with actual airport ownership and operation as decentralization occurs. Shanghai's recently expanded Hongqiao Airport will be the first to be completely owned by a municipality. The airport in Chongqing will soon follow, although CAAC will share responsibility for its operation with the Chongqing municipal government. One thing is certain: Once CAAC's handouts are less available, airports will be forced to find new sources of revenue, and municipal governments will be primary candidates to play a greater role in their development and operations.

Unlike American airports, which earn revenues mainly from space rentals, services, and concessions, China's airports are primarily subsidized through CAAC ticket sales. Landing fees, building rentals, maintenance, and refueling are additional ways that China's airports earn revenues, some of which they retain for operations and purchase of new equipment. CAAC also takes a percentage, which goes into priority investment projects and bailing out small unprofitable airports, in order to keep CAAC's networks well served.

Military assistance

Civil aviation could not have come as far as it has without the military's knowledge and experience. The PLA Air Force, in particular, has lent airports and aircraft to CAAC and assisted in airport construction. The prohibitive cost of building a new airport has been behind the decision to make more military airports available for civilian aviation. By the end of 1985, a total of 50 military airports had been borrowed for civilian use.

Several arrangements have been tried. The military airport in Yantai, Shandong, was converted to a civilian airport, repaired, expanded, and opened to commercial air traffic in 1984. In Xianyang, Shaanxi, the military airport was also simply turned over to civilian use. But these are exceptions; in most cases military airports needed for commercial flights will simply serve a dual purpose until more civilian airports are available, at which time they will revert back to the military.

The military has even offered the engineering capabilities of PLA Air Force units for airport construction, such as in the case of Changchun, Jilin, and the cities of Dalian and Dandong in Liaoning. Such assistance can be expected to continue as long as the shortage of civilian airport facilities and qualified personnel persists.

Ground-handling equipment

China's air freight during the 1950s and 1960s was extremely limited. The few inbound flights had little space for cargo, which consisted mainly of pharmaceuticals, diamonds, and some raw materials imports. During the 1970s China began to export aquatic products by air, and soon added raw silk, silk piece goods, and textiles.

Since the late 1970s the potential for moving China's growing volume of import–export goods by air, including agricultural products and animal stock, has grown considerably. According to an official at

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SINOTRANS (China's national freight forwarding agency), computers, instruments, and other electronics will also make up a large part of China's inbound air freight over the next 10 years.

Much of the air freight to China is now diverted through Hong Kong's Kaitak International Airport before heading into China by air, rail, barge, or truck. By following this route, freight forwarders avoid bottlenecks at China's airports and the higher costs of doing business with CAAC. Although Hong Kong's airport (with the world's largest integrated cargo-handling building) also faces bottlenecks because of this practice, it is likely to be used until China is better equipped to handle the cargo.

The air freight business is not only growing rapidly but, with the split-up of CAAC's functions, becoming more complex. In addition to the activities of SINOTRANS, a number of Western airlines and freight forwarders operate in China under agreements with SINOTRANS. Meanwhile, new Chinese companies such as Beijing Air Cargo Transport are being formed to compete with SINOTRANS, and some of the regional airlines intend to get involved in this area. China lacks the planes to meet most of the demand for air cargo transport, and according to one report CAAC operates just one 707 exclusively for cargo services. But CAAC continues to increase its cargo capacity, and announced plans this year to increase its air freight capacity to Great Britain, Switzerland, West Germany, and Japan.

China is the first to admit that sophisticated ground-handling equipment for this growing freight tonnage is in short supply. With the exception of Beijing, Guangzhou, and Shanghai, cargo-handling equipment at the country's civilian airports is virtually nonexistent. Problems range from a lack of transport containers and equipment for moving the goods to inadequate warehousing for goods in transit. There are almost no refrigerated warehousing facilities at airports, causing Chinese hotels that receive perishable items to send their own trucks to the airports for pick-ups. As passenger and cargo traffic increase it will be necessary to acquire various types of loaders, de-icers, carts, trailers, and ground power units for servicing aircraft.

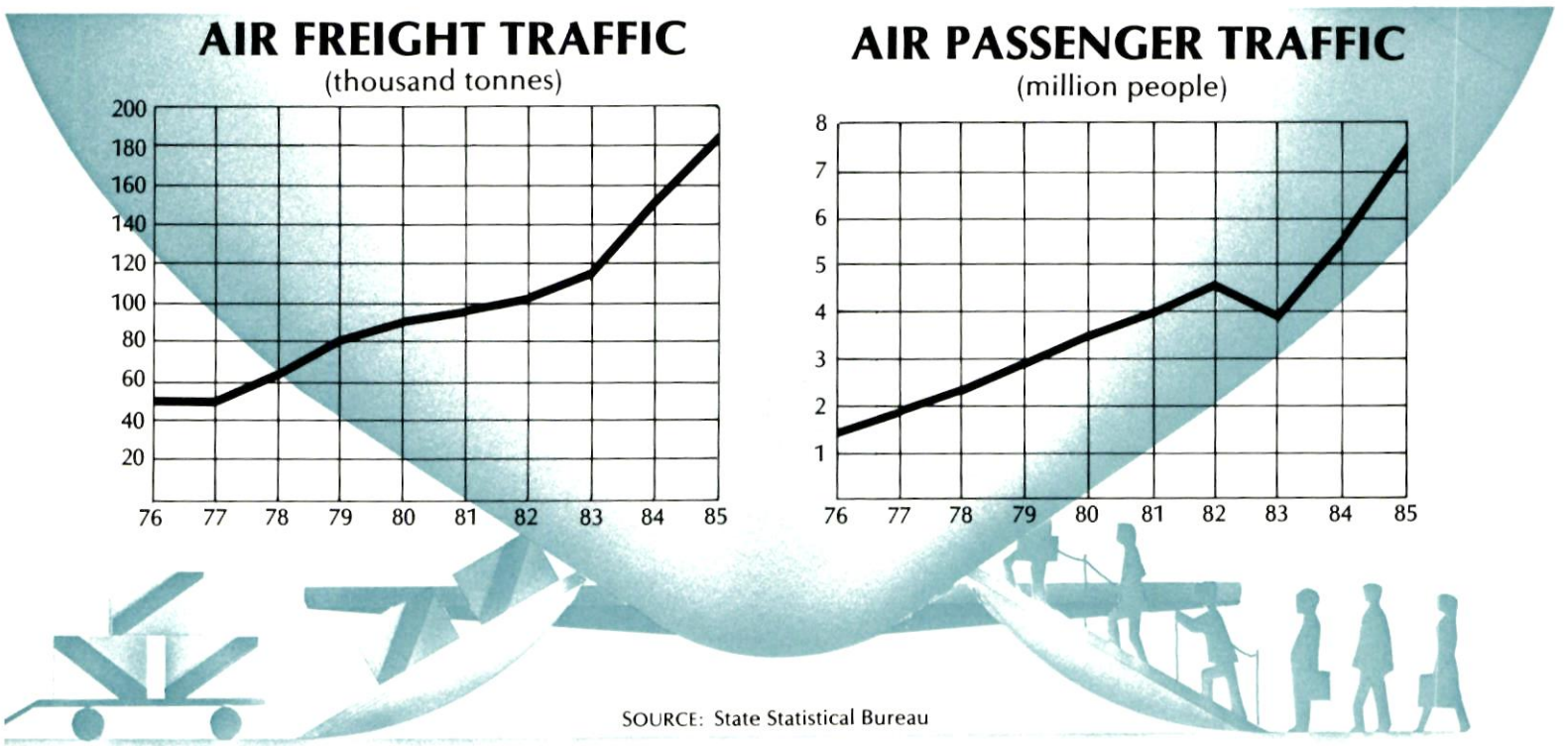
FMC Corporation (US) is one of the few foreign manufacturers to have sold some ground-support equipment to China. FMC has made limited sales of deck loaders and one de-icer to the China Aviation Supplies Corp. over the past six years. Currently, Shanghai Airlines is buying used FMC ground-handling equipment; this may indicate CAAC's unwillingness to assist the new start-up airlines with ground-handling equipment. Perhaps China will eventually adopt a fixed-base system of operation similar to that of US airliners, where independent airlines own or lease such equipment. In either case foreign firms hope for more sales of such equipment to new regional carriers.

The China Aviation Supplies Corporation, under CAAC, will handle the negotiating and purchasing of most airport equipment. CASC may face competition, however, from the slowly emerging China Aviation Development Corp. Reportedly to be headed by Shen Tu, former director of CAAC, the company hopes to get involved in purchasing a broad range of aviation products and perhaps act as an investment partner as well.

Foreign firms provide technical assistance

Businesses wishing to take part in the modernization of China's airports and ground facilities must work with CAAC's Civil Aviation Engineering Consulting Corp. (CAEC). CAEC offers management and technical assistance to domestic and foreign firms for airport development and equipment procurement on a contractual basis.

Several foreign firms have been involved in feasibility studies for airport projects in China. But China intends to seek outside assistance for airport expansion only when it cannot carry out the projects alone. US industry experts generally have high regard for China's engineering ca-



SOURCE: State Statistical Bureau

pabilities, but there are limits to what China can do. Technical assistance and financing are areas where foreign firms may be able to make the most significant contribution. There are indications that beyond the feasibility study stage, however, they may often be relegated to an advisory role.

Parsons-Lockheed International (PL Intl), a joint venture between Parsons Group and Lockheed Air Terminals Inc., completed a feasibility study for the proposed Shenzhen Airport last February. Assisted by CAEC, the six-month $800,000 study was financed by a grant from the US government's Trade and Development Program. The study calls for the airport to be built in three stages, with the State funding half of the total estimated ¥1.47 billion. The remainder is to be supplied by both RMB and foreign currency loans. Some in Hong Kong fear that the proximity of the Shenzhen Airport will take away valuable business from its Kaitak Airport, but the study estimates that Kaitak will reach its maximum capacity in another 10 years and the Shenzhen Airport will be needed as a second international gateway to south China.

Although the project has not been formally approved, the State Council has given Shenzhen the green light to begin preparatory work. The Shenzhen Airport Corporation will initially focus on land acquisition and airport design. If final approval is received, PL Intl and several other foreign firms will be prime candidates for further involvement.

A new international airport for Shanghai, to be built in the northern part of the city, is another focus of foreign attention. At least six foreign companies bid on a $600,000 contract for the initial feasibility study design work, won by a Dutch company, Netherlands Airport Consultants (NACO) in May 1986. NACO is now negotiating with Shanghai authorities for Phase II of the project, reportedly with an offer of attractive financing from the Dutch government.

Meanwhile, several other airport projects are slowing down due to financial problems. Bechtel's joint venture engineering and construction company in the PRC, China American International Engineering, Inc. (CAIEI), won a contract in Wenzhou for preliminary engineering and assistance with procurement and construction of a new airport. Their expertise was brought in due to engineering problems resulting from the poor soil in Wenzhou. CAIEI's project team and members of the national Aeronautical Project and Design Institute have begun work, but the project is currently on hold for a budget review. Other cities, including Guangzhou and Shenyang, have initiated discussions with foreign firms about airport expansion projects, but called them off due to a lack of foreign exchange.

Although Bechtel is pursuing other airport construction opportunities, the company does not expect "too much too soon" because of China's current financial crunch and the slow selection process. In mid-1985 Fluor Corp. (US) and McDonnell Douglas signed a cooperative agreement to build and renovate airports in China together. Fluor feels that many opportunities for foreign firms are available but cites the same problems of insufficient funds and a cumbersome decision-making process as initial obstacles.

Tradewinds International, a US consulting firm that has assisted China with aviation projects, signed a contract in May to help coordinate the building of a new airport in Yinchuan, Ningxia, to eventually accommodate international traffic. Yinchuan's old airport, built in 1958, has been closed since early this year after water table problems caused a cracked runway. A new airport is considered crucial to the development of land-locked Yinchuan, which lies 27 hours from Beijing by train. Most of the estimated ¥90 million ($28.1 million) required by the project is expected to come from local sources.

Other forms of cooperation have also emerged as part of China's airport development program. The Jetways Division of Abex (US) signed an agreement in 1984 to co-produce passenger boarding bridges with the Shanghai Crane and Conveyor Works (SCCW). In a model project at the Xiamen airport, Abex supplied components and technical assistance for manufacture of one unit, while China supplied materials and labor. In addition, Abex's Engineering Group did the preliminary planning for the airport's apron area. After some shipping delays the unit was installed at the airport in mid-May this year, only 20 months after the contract was signed. It is estimated that China can save 50 percent of the full

CHINA'S AIRPORTS

Airport Renovation and Expansion

During the Seventh FYP, China plans to build 16 new airports. China reports 90 civilian airports currently in use, although our map shows 125. This discrepancy results from our inclusion of some airports that are yet to be built and some that may have been retired for repairs or replacement, as well as from varying definitions for civilian, military, and cargo transport airports.

ANHUI

1. Anqing
2. Fuyang
*3. Hefei
4. Tunxi: Plans for expansion during Seventh FYP.

BEIJING MUNICIPALITY

5. Beijing: Capital International Airport. Biggest airport in China, equipped with two runways (3,000 m) and advanced ATC that can handle 1,000 aircraft/day. New facilities include lounge that can accommodate 1,500 passengers, 50 m high control tower that can handle 70 jumbo planes/hour, and new hangar with upgraded facilities.

FUJIAN

*6. Fuzhou (coastal city): Yixu Airport. Expanded (12/85).
7. Quanzhou
8. Xiamen (SEZ): Gaoqi Airport. Plans to extend runway to 2,900 m and equip parking apron with American landing facilities. Can handle Tridents and 737s. Signed $2 million contract with Plessey Radar (UK) for Watchman primary and Cossor monopulse secondary surveillance radars (2/86). Fujian Province received a low-interest $22 million loan from Kuwait to finance expansion.

GANSU

9. Dunhuang: Airport undergoing construction (1984).
10. Jiayuguan
11. Jiuquan
*12. Lanzhou
13. Qingyang

GUANGDONG

*14. Guangzhou (coastal city): Baiyun Airport. Expansion plans for Seventh FYP include new $10 million terminal for international flights to be completed in 1987. New maintenance center to be built that will meet US/FAA and CAB standards.
15. Haikou, Hainan: Expansion included widening and extending runway to 2,500 m, widening taxiways and parking apron, extending communication routes, and constructing control tower and housing. Funds for expansion allocated by the State Planning Commission. Airport can now handle 707s and 737s and serve 400 passengers/hour.
16. Meixian: New airport scheduled for completion 10/86. To have 1,800 m runway with modern facilities for piloting, communications, and lighting. Will accommodate 737s and medium-sized planes. Design undertaken by CAAC.
17. Sanya (Yulin): Contract signed with Japanese for expansion (5/85).
18. Shantou (SEZ): Plans for expansion during Seventh FYP.
19. Shenzhen (SEZ): Huangtian Airport. International airport scheduled to begin construction late 1986 during Seventh FYP. Awaiting approval by State Council. Three-phase plan, first phase scheduled for completion 1/89 at cost of ¥210 million. Phase I will include 2,800 m runway to accommodate 737s and Tridents and will handle 1.2 million passengers and 50,000 tonnes of cargo. Phase II will extend runway to 3,400 m, accommodate 747s, and handle 5 million passengers and 200,000 tonnes of cargo. Phase III will include another 3,400 m runway. Feasibility study done by Lockheed (US) and Parsons International (US).
20. Xingning
21. Zhanjiang (coastal city): Has been expanded to accommodate jumbo jets (5/86).
22. Zhaoqing
23. Zhongshan: Plans for construction of medium-sized airport to accommodate 737s; approval uncertain (10/85).
24. Zhuhai (SEZ): Proposed plans for Cuiwei airport to be built near Gongbei, which is the border checkpoint between Zhuhai and Macau. Airport would be medium-sized, accommodate 747s, and would not have customs and immigration processing facilities.

GUANGXI

25. Beihai (coastal city): Construction of Beihai Airport scheduled for completion within two years (5/86). Runway to be 1,800 m long, and will accommodate 737s and Tridents.
26. Guilin: Plans to expand airport during Seventh FYP.
*27. Nanning
28. Wuzhou

GUIZHOU

*29. Guiyang
30. Tongren

HEBEI

31. Qinhuangdao (coastal city): Expanded airport put into operation (12/84).
*32. Shijiazhuang
33. Zhangjiakou

HEILONGJIANG

*34. Harbin: Expansion completed in third quarter of 1985. Can now accommodate 747s.
35. Heihe: Repair work completed (11/85). Third-class airport for smaller aircraft.
36. Jiamusi

HENAN

37. Luoyang: New airport to be built during Seventh FYP in cooperation with overseas firms through compensation trade or loans.
38. Nanyang
39. Shangqiu
*40. Zhengzhou: Plans to build airport in cooperation with overseas firms through compensation trade or loans (8/85).

HUBEI

41. Enshi: Plans for expansion during Seventh FYP.
42. Shashi: Plans for construction during Seventh FYP.
43. Shiyan
*44. Wuhan: Plans to improve equipment including modern ATC during Seventh FYP.
45. Xiangfan: Plans for expansion during Seventh FYP.
46. Yichang

HUNAN

*47. Changsha: Renovation work on runway and expansion during Seventh FYP.

JIANGSU

48. Changzhou: Construction on new airport near completion (12/85).
49. Lianyungang (coastal city): New airport opened 4/85.
*50. Nanjing: Airport terminal expanded and in service (4/86). Plans for expansion during Seventh FYP.
51. Nantong (coastal city): Scheduled for expansion, to be completed within two years (5/86).
52. Qingjiang
53. Rugao
54. Yancheng: Expanded (12/84).

JIANGXI

55. Ganzhou: Plans for expansion during Seventh FYP.
56. Ji'an
57. Jingdezhen
58. Jiujiang: Expanded (12/84).
59. Lushan: Airport expanded in 1984.
*60. Nanchang

JILIN

*61. Changchun: Dafangshan Airport. Expansion project completed 10/85 by engineering corps of PLA Air Force. Amount of investment approximately ¥25 million. Renovations included runway expansion to 60 m wide and 2,600 m long and plane parking apron expanded. Can handle 707s, 737s, MD-82s, Lear 62s, Tridents and, if not fully loaded, 747s. Annual capacity for airport is 700,000 passengers.
62. Dafangshen
63. Tongliao
64. Ulanhot
65. Yanji: Airport under repair and to be expanded. Will be used for forest fire fighting, crop spraying and other civil air services.

LIAONING

66. Chaoyang: Airport under repair and to be expanded. To be used for forest fire fighting, crop spraying and other services.
67. Chifeng
68. Dalian (coastal city): Zhoushuizi Airport is gateway to NE China. Work completed 3/86 by engineering corps of Shenyang PLA Air Force. Additions include expansion of runway to 3,200 m; 2 aprons; 3 navigation towers, 5 communication roads, navigation lights and automatic control systems for all-weather capability. Announced opening for international flights 3/86 and plans to install modern ATC during Seventh FYP.
69. Dandong: Langtou Airport. Opened 3/86, built by an engineering corps of Shenyang PLA Air Force. To be used for forest fire fighting, crop spraying and other services.
*70. Shenyang: Taoxian Airport. International-class airport to go into operation in 1988. Will handle 747s and requires investment of $143 million.
71. Yingkou: Airport to be built during Seventh FYP.

NEI MENGGU (INNER MONGOLIA)

72. Baotou
73. Dongsheng
74. Hailar
*75. Hohhot: Under construction (4/86).
76. Xilin Hot

NINGXIA

*77. Yinchuan: Contract signed 5/86 with Tradewinds Corp. (US) for coordinating development of all-weather airport. Phase I: 45 m wide and 2,800 m long runway, ATC facilities, proper-lighting terminal. Will be able to handle 707s and 737s. Phase II: expansion of runway and adding cargo handling facilities to make into international facility, capable of handling 747s. Funding from local sources. Cost of Phase I is ¥90 million.

QINGHAI

78. Golmud
*79. Xining: Taojipu Airport. Contract with Aeroports de Paris (ADP) to study, plan, and build new airport. Will have 3,600 m runway, handle 300,000 passengers/year, and handle 707s and 737s. Feasibility studies have been carried out by CAAC, Lanzhou and Qinghai Civil Aviation Bureaus.

SHAANXI

80. Ankang
*81. Xi'an: Will add modern ATC, increase number of parking aprons to 11 and expand terminal during Seventh FYP.
82. Xianyang: New airport to handle 23 million passengers/year, scheduled to be completed in 1989. Will handle 747s and cost $80 million. Will supplement existing airport at nearby Xi'an.
83. Yan'an
84. Yulin

SHANDONG

85. Dongying (Shengli Oilfield): Airfield built by Jinan PLA Air Force engineers to accommodate medium-sized aircraft.
*86. Jinan
87. Linyi
88. Qingdao (coastal city): Has been expanded to accommodate jumbo jets.
89. Yantai (coastal city): Chaoshui Airport opened 1/85. Seeking foreign cooperation to be second-grade airport for Tridents and Boeings with 2,600 m runway and ATC facilities. Estimated total investment ¥75 million.

SHANGHAI MUNICIPALITY

90. Shanghai (coastal city): Hongqiao Airport. Expansion in 1984 with Obayashi-Gumi Ltd. (Japanese) included adding baggage system and enlarging old terminal to handle 900 passengers/hour. Plans for second runway, new terminal, warehouses, and control tower.

New international airport to be built in northern part of city, converting Hongqiao into domestic air services only. Contract for design and feasibility study awarded to Netherlands Airport Consultants 5/86, worth a reported $600,000.

SHANXI

91. Changzhi
92. Datong
93. Linfen
94. Taiyuan*

SICHUAN

*95. Chengdu: Shangliu Airport at hub of SW Region. Expanded in 1983. Expansion includes runway extended to 2800 m; apron, taxiways and runway now meet first-class airport standards; flood control and night lights installed. Plans to computerize navigation system (4/86).
96. Chongqing: Jiangbei Airport. Construction of top-grade, all-weather airport as key project of Seventh FYP, scheduled for completion in 1987. ¥300 million project. Airport will have 2,600 m runway, terminal building that can handle 700-800 passengers/hour, highway linking airport to Chongqing city, modern navigational system, ILS, and night lighting. Will handle 707s and 747s.
97. Daxian
98. Nanchong: Plans for expansion during Seventh FYP.
99. Xichang

TIANJIN MUNICIPALITY

100. Tianjin (coastal city): Zhangguizhang Airport. Agreement signed with Chartwell Pte Ltd. (Singapore) for modernization.

XINJIANG

101. Aksu
102. Altay
103. Fuyun
104. Hotan
105. Karamay
106. Kashi
107. Korla
108. Kuqa
109. Qiemo
*110. Urumqi: International airport expansion project (4/85).

111. Yining: Expansion in 1984 included extended runway and new terminal building.

XIZANG (TIBET)

112. Gonggar: Airport expansion to handle large jets (4/85).
***113.** Lhasa: Plans for new airport.
114. Ngari Region
115. Xigaze

YUNNAN

116. Baoshan
***117.** Kunming: Ordered installation of secondary radar 9/85. Plans for expansion during Seventh FYP including computerized navigation system.
118. Lijiang
119. Simao
120. Xiaguan: Plans to build modern, medium-sized airport (5/85).
121. Yunjinghong (Xishuangbanna Prefecture): Feasibility studies and design of airport now underway, scheduled for completion 1987. Will accommodate small and medium-sized planes. Funds being raised by local government.

ZHEJIANG

***122.** Hangzhou: To be enlarged with more flights and airlines (5/86).
123. Ningbo (coastal city): Construction during Seventh FYP of large, second-class airport for civil use approved by State Council and Central Military Commission. To be built on old site of Lishe Airport.
124. Wenzhou (coastal city): Construction during Seventh FYP. Contract signed to build one-terminal airport with Bechtel's China American International Engineering Inc. and Wenzhou General Economic & Technical Development Corp. Project completion scheduled for late 1987.
125. Zhuangqiao: New airport to be constructed south of Ningbo (4/85).

* provincial capital

Project completion dates are noted where known. In other cases the date of the most recent press report has been noted in parentheses. Information has not been independently verified in most cases, and it is possible that some of the projects reported have not proceeded as planned.

Source: National Council files

Prepared by Beverly LoPinto and Natasha M. Wei.

Artwork by John Yanson

cost, typically $200,000–$250,000 per unit, by assembling it themselves.

Navigation aids

A poor safety record and increased air traffic have put pressure on China to make the air traffic control (ATC) system safer and more efficient. Stories persist of travelers whose flights have been delayed or cancelled because of insufficient ATC facilities or navigation equipment at the point of departure or destination.

Although China considers investment in ATC systems a high priority, acquisition is likely to be gradual with new equipment assigned to the busiest routes first. Only the Beijing, Shanghai, and Guangzhou airports—three of the seven regional air traffic control centers that form the basis of China's air traffic network—currently have advanced navigation systems. A Thompson CSF system provides a 700-mile corridor of primary and secondary (beacon) radar coverage between Beijing and Shanghai. The next stage of development will probably be the Shanghai to Guangzhou air corridor.

Communication and navigation equipment purchases that began in 1983 are continuing at a modest pace (*see The CBR*, May–June 1984, p. 54). Recent purchases include a $7.6 million sale in April 1985 of 10 surveillance systems, made by Japan's Toshiba Corp. and Nissho Iwai Corp., to be installed in five airports including Beijing and Shanghai. China intends to install similar radar systems and related facilities at about 100 airports nationwide. And Plessey Company PLC (UK) received an order worth more than $2 million in January 1986 for an advanced watchman radar system to be installed at Xiamen's airport.

China has only slightly more than a dozen Instrument Landing Systems (ILS) in operation at its civil airports. Wilcox Electric Corp. (US) has sold a number of these systems, most recently to airports in Qingdao, Meixian, and Beihai. Wilcox has also sold VOR stations and distance-measuring equipment, but China's needs in these areas are still huge according to company officials.

Although ILS is now the primary instrument landing system in use at airports worldwide, by 1998 an ICAO (International Civil Aviation Organization) mandate will phase out ILS and make microwave landing systems (MLS) the primary system at the world's international airports. Many characteristics of the MLS make it an appealing replacement for ILS. Of particular note is the fact that MLS is cheaper to install and operate. Therefore, instead of buying more ILS systems, China may begin buying MLS systems. Hazeltine Corp. (US), currently one of the few companies making FAA-approved MLS systems, held discussions with the Xi'an Research Institute of Navigation (under MAI) this May. No contracts were signed, but the institute has requested funds for one MLS system and also indicated their interest in a technology transfer arrangement.

Although most ATC equipment purchases have been straight acquisition so far, licensing and co-production deals are getting started—often still accompanied by significant purchases. Racal Avionics (UK) signed three contracts with CAAC in mid-1986 for sale of an omni-range station (to be installed in south China), 15 nondirectional beacons (for Guangzhou and Beijing), and another 25 nondirectional beacon stations to be assembled under license in Beijing. The total value of these deals is $618,000.

Denro, Inc. (US) has made several sales of ATC communications equipment and is one of several US manufacturers exploring ATC equipment co-production deals. Denro signed a memorandum of understanding with CAAC in 1985 for manufacture of Denro's model 400 ATC communications equipment, and negotiations are continuing. In May Denro sold equipment valued at $30,000 to upgrade the ATC communications system previously sold to the Guangzhou airport.

Improving national coordination

ATC equipment has thus far been procured on a somewhat decentralized basis, and sourced from a number of manufacturers worldwide. But as China's air traffic control network develops, this piecemeal acquisition method could become a logistical problem, costing more money and time in the long run for maintenance and training. Chinese authorities respond that their purchases to date are only a beginning, and that they are formulating a long-range plan for modernizing China's ATC system.

One sign of this may be the creation of a new Air Traffic Control Bureau this year under the State Council to oversee the sector with input from CAAC, the air force, and the Ministry of Electronics. Regional offices of this organization are expected to be set up throughout the country as soon as possible.

Martin Marietta Corp., which is acting as a systems engineer and integrator to implement the FAA's $12 billion US National Airspace System Plan (NASP), raised the issue of coordination during two seminars at the May US National Aerospace Exhibition in Beijing. Martin Marietta made a series of presentations explaining the benefits of a long-term air space system plan for China's ATC network. Currently only the United States, Canada, Australia, and Colombia have an air space system plan or are in the process of formulating one. It may make sense for China to move in this direction at this early stage of development.

The US FAA is also encouraging CAAC to consider a comprehensive approach. At the Beijing exhibition, discussions between the FAA and Chinese aviation officials included the development of a Chinese national airspace system plan and the full range of technical training programs the FAA offers, particularly air traffic control training of CAAC personnel in the United States.

Airport development is a key aspect of China's civil aviation. The importance of developing airports throughout the country is emphasized in the Seventh FYP. Of particular importance will be improving air and communication links between the special economic zones and open coastal cities. China has also said that radar will be upgraded on all major air routes over the next five years.

While lack of financial resources may keep the pace slow, airport development must take place to meet the demands of passengers and cargo. Ground support equipment for handling cargo, servicing aircraft, and air traffic control will be required as more planes are added to the fleets of CAAC and the new regional airlines. For the civil aviation sector, the focus is likely to shift toward ground facilities for the near future, in order to keep up with activity in the air. 完

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Wholly Foreign-Owned Enterprises Come of Age

New law protects nascent form of investment

Preston M. Torbert

The door to investment in China swung open wider on April 12, 1986, with the promulgation of the Law of the PRC on Wholly Foreign-Owned Enterprises (hereafter the "Law"), making China the first socialist country to pass a law governing the establishment of domestic enterprises wholly owned by foreign interests. Although China now lists 120 such enterprises, no law has provided a secure legal basis for them—until now.

The Law does not introduce many surprises for foreign investors, but instead mainly codifies practices that have been evolving for wholly foreign-owned enterprises (WFOEs) since their first appearance in 1980. These enterprises, most of which are small establishments set up by Hong Kong Chinese in the SEZs, should find little in the Law to challenge the way they now operate, although some provisions still need to be clarified.

Law, not the State, to protect foreign interests

The new law's draftsmen appear to have made a substantial effort—greater than in the 1979 Joint Venture Law—to reassure foreign parties that China offers a safe and hospitable environment for investment. Like the Joint Venture Law's assurances, the new Law provides that "the PRC will protect the lawful rights and interests" of foreign ventures in China, including their right to remit profits abroad. But the Law takes even greater pains to assure foreign investors that their long-term rights will not be infringed upon. Article 5, for example, prohibits the State from nationalizing or expropriating such enterprises (or requires that commensurate compensation be paid if expropriation does occur). Article 11 forbids State interference in the operation and management of a wholly foreign-owned enterprise if its conduct conforms to approved articles of association.

The Law's stipulation that "*the laws of China*" will protect the lawful rights and interests of foreign investors demonstrates China's growing legal sophistication. While State support and protection continue to be important, the reference to protection by law suggests that Chinese authorities now recognize the need for less administrative interference by the State and greater autonomy for wholly foreign-owned enterprises.

Protecting China's interests—and workers' rights

If the Law on Wholly Foreign-Owned Enterprises provides greater assurances for the foreign investor than the earlier Joint Venture Law, it also lays greater stress on protecting China's rights and interests. Both laws require the foreign investor to supply advanced technology, observe China's laws and regulations, and establish enterprises that will benefit China. But the Wholly Foreign-Owned Enterprise Law sets a number of additional requirements to protect China's interests, some not explicitly mentioned in earlier laws. Wholly foreign-owned enterprises are directed to either introduce advanced technology or export all or most of their products—common requirements for investors in China. WFOEs are also excluded from certain industries determined by the State Council. While these have yet to be clarified, they are expected to include natural resource development, and areas that could have an impact on national security. WFOEs are required to keep their account books in China, and to accept supervision from financial and tax authorities.

Another feature of the Law is its emphasis on worker's rights, as provided in articles 12 and 13. These articles require the WFOE to incorporate clauses concerning labor protection and labor insurance for staff and workers and to provide "necessary facilities" for a trade union. These provisions, as well as the Law's reference to "social and public interests" reflect sensitivity toward WFOEs, which authorities apparently believe must be subjected to greater restrictions than other forms of investment.

The Law outlines the administrative approval and reporting requirements for wholly foreign-owned enterprises. To establish an enterprise, an application is made to the central authorities, generally the Ministry of Foreign Economic Relations and Trade. The authorities must approve or reject the proposed venture within 90 days. If approved, the foreign investor has 30 days from the date of receipt of the approval certificate to apply for registration and a business license. If the foreign investor does not apply within that time, the venture's business license may be revoked. After the enterprise has been set up, it must report to the authorities on its production and operating plans as well as any important changes, such as reorganization or merger. While these procedures are similar to those in the Joint Venture Law, the introduction of the 30-day deadline on application for registration further strengthens the hand of the Chinese approval authorities.

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Conferring the status of a legal person

A major innovation is the Law's provision that a wholly foreign-owned enterprise meeting certain requirements shall have the status of a Chinese legal person. The definition of a legal person is contained in the General Principles of the Civil Code of the PRC (hereafter the "General Principles"), promulgated by the National People's Congress on the same day as the Law on WFOEs.

The General Principles, which provide China's first statutory definition of a legal person, identify four qualifying characteristics. The entity must: (1) be established in accordance with law; (2) possess the necessary property or funds; (3) have its own name, organizational structure, and location; and (4) independently assume civil responsibility. A wholly foreign-owned enterprise is recognized as a legal person after it has registered with the industrial and commercial administrative authorities.

While these provisions in the new civil code help to clarify what a legal person is, others raise new questions. A legal person, according to the General Principles, assumes liability for the business activities of its statutory representatives and its other employees, but it is not clear who the statutory representatives of a wholly foreign-owned enterprise are, or to what extent any employee can bind such an enterprise. The General Principles further state that in certain cases (e.g., engaging in activities prohibited by law or harmful to State or public interests) the statutory representative can be liable for administrative discipline, fines, or even criminal responsibility, which may raise questions for potential foreign investors.

Given the lack of a corporation law in China, the provisions in the General Principles help to provide a better understanding of the nature of a wholly foreign-owned enterprise. This is particularly true because the Law, unlike the Joint Venture Law, does not identify wholly foreign-owned enterprises as limited liability companies. This seems to leave open the question of whether the foreign investor in a wholly foreign-owned enterprise might be liable beyond the amount of his contribution of capital to the venture. The General Principles mention in Article 48 that a foreign invested enterprise (i.e., a wholly foreign-owned enterprise) legal person assumes civil responsibility "by means of the property it owns unless otherwise provided by law," but it is unclear whether this provision is intended to imply limited liability for the investor.

Fine line between supervision and interference

The Law stipulates that the activities of the wholly foreign-owned enterprise will be reviewed by three Chinese government organizations: (1) the approval authorities who pass on the project, (2) the industrial and commercial administrative authorities who register the enterprise and see that its activities comport with its business license, and (3) the department that oversees the enterprise's business activities.

These three forms of government supervision are the same as those provided for in the Implementing Regulations for the Law of the PRC on Joint Ventures Using Chinese and Foreign Investment (hereafter the "Joint Venture Implementing Regulations"). The Law specifically authorizes the industrial and commercial administrative authorities to "examine and supervise" the investments of wholly foreign-owned enterprises. It also states that the enterprise must submit its production and operating plan to its department in charge. The Law tempers this government role by prohibiting interference (presumably by the department in charge) in their operation and management activities conducted in accordance with the approved articles of association. This language gives greater support for managerial autonomy than the Joint Venture Law itself, but less than the Joint Venture Law Implementing Regulations, which refer specifically to a joint venture's "right to conduct operations and management autonomously."

Enterprise autonomy is a critical issue for wholly foreign-owned ventures in China. Administrative authorities still play a large, albeit decreasing, role in the operation and management of China's enterprises. As the experience of joint ventures reveals, differences of opinion between Chinese authorities and foreign investors are not unusual. But a foreign investor wishing to set up a wholly owned venture will want the complete operational and management control that only a wholly owned enterprise may offer.

WFOEs face stiff foreign exchange rules

The provisions of the Law regarding the balancing of foreign exchange for WFOES are more restrictive than those applying to joint ventures. The Law, like the Joint Venture Law, emphasizes exports as a means of generating foreign exchange. Reportedly, the draft Law would have required *all* wholly foreign-owned enterprises to export all or most of their products, although it was amended at the National People's Congress at the suggestion of delegates from Fujian Province. The Law now exempts projects with advanced technology from the export requirement. But the Joint Venture Law still appears less restrictive by comparison, merely encouraging joint ventures to export their output. In the Joint Venture Implementing Regulations enterprises were urged to maintain a balance of foreign exchange, but assistance from the State was also mentioned as a possible remedy for shortfalls.

China's 1986 regulations on the balancing of foreign exchange receipts and expenditures for joint ventures specified a number of ways in which equity and cooperative joint ventures might achieve a balance of foreign exchange receipts and expenditures, but these Regulations do not specifically apply to wholly foreign-owned ventures.

It appears, then, that the only alternative to resolving its own foreign exchange difficulties will be for a wholly foreign-owned enterprise to seek approval for domestic sales, in accordance with Article 18, from the organization in charge. In such cases, the Law places the responsibility for resolving the imbalance on the organization that approved the sale of the products on the Chinese market.

The experiences of joint ventures and of the most widely publicized wholly foreign-owned venture, 3M-China Ltd., suggest that foreign exchange imbalances will be a major problem for WFOEs. 3M-China Ltd. received approval to use its domestic RMB earnings to purchase Chinese goods and export them, but the Chinese authorities later restricted the total RMB value and types of goods covered by the agreement.

Taxes and other questions

The Law states that a wholly foreign-owned enterprise shall pay taxes in accordance with the relevant tax regulations and may enjoy preferential treatment in tax reductions and exemptions. But the most fundamental question is: which tax regulations apply to wholly foreign-owned ventures? No tax law in China explicitly applies to such entities. Given the similarities between WFOEs and joint ventures, it might be assumed that the Joint Venture Income Tax Law would also apply to wholly foreign-owned enterprises. But instead the Ministry of Foreign Economic Relations and Trade made it clear last year that the Foreign Enterprise Income Tax Law would apply to all WFOEs in China. This was surprising since this tax law originally referred only to foreign corporations not organized under Chinese law, while a WFOE is considered a Chinese, not a foreign, enterprise.

Also uncertain is the degree to which the WFOE is entitled to preferential tax treatment. Tax exemptions and reductions available under the Joint Venture Income Tax Law will presumably not apply to WFOEs. However, WFOEs, unlike joint ventures (which are subject to 10 percent withholding tax on dividends), will reportedly be exempt from any tax on dividends. Further, those enterprises operating for 10 years or more in farming, forestry, animal husbandry, or other low-profit industries can receive, upon approval, exemption from tax in the first profit-making year (compared to a two-year exemption for JVs) and a 50 percent reduction in the second and third years. In addition, upon approval, a 15-30 percent reduction in income tax may be permitted for an additional 10 years. Even if these tax reductions are confirmed in future implementing regulations, the tax treatment of wholly foreign-owned enterprises would not be as favorable as that extended to joint ventures. The maximum tax rate under the Foreign Enterprise Income Tax Law is 50 percent, versus 33 percent under the Joint Venture Income Tax Law.

The Wholly Foreign-Owned Enterprise Law attempts to offer greater protection for both foreign investors and State interests than was provided in the Joint Venture Law. Whether the Law will reassure current and potential foreign investors depends on the content of the implementing regulations to be promulgated by the State Council. But potential foreign investors will welcome the greater security that the new Law brings even as they may question the implications of some provisions, such as those involving legal persons, foreign exchange balance, and taxation. Perhaps at this stage what they appreciate most is the enterprising spirit of China's leaders, who have dared to establish wholly foreign-owned ventures in a socialist state. 完

THE LAW OF THE PEOPLE'S REPUBLIC OF CHINA ON WHOLLY FOREIGN-OWNED ENTERPRISES

Article 1. In order to expand international economic cooperation and technological exchange and to promote the development of China's national economy, the People's Republic of China permits foreign enterprises and other economic entities or individuals (hereinafter referred to as foreign investors) to establish wholly foreign-owned enterprises within China and will protect the lawful rights and interests of such enterprises.

Article 2. Wholly foreign-owned enterprises referred to in this law mean enterprises established within China in accordance with the relevant laws of China, the entire capital of which is invested by foreign investors. Such enterprises do not include branch offices established by foreign enterprises and other economic entities within China.

Article 3. The establishment of wholly foreign-owned enterprises must be beneficial to the development of China's national economy and such enterprises shall adopt advanced technology and equipment or export all or most of their products.

Industries in which the establishment of wholly foreign-owned enterprises is forbidden or restricted by the State shall be stipulated by the State Council.

Article 4. The investment, profits, and other lawful rights and interests of foreign investors within China shall be protected by the laws of China.

Wholly foreign-owned enterprises must observe China's laws and regulations and shall not harm the social and public interests of China.

Article 5. The State will not nationalize or expropriate wholly foreign-owned enterprises. Under special circumstances, the State, based on the need of social and public interests, may expropriate wholly foreign-owned enterprises, according to legal procedures, and give commensurate compensation.

Article 6. Applications for the establishment of wholly foreign-owned enterprises shall be examined and approved by the department under the State Council in charge of foreign economic relations and trade or the authorities authorized by the State Council. The examination and approval authorities shall decide to approve or disapprove within 90 days from the date of receiving the application.

Article 7. After the application for establishing a wholly foreign-owned enterprise has been approved, the foreign investor shall, within 30 days from the date of receiving the approval certificate, apply for registration with the administrative authorities for industry and commerce and obtain a business license. The date on which the business license of the wholly foreign-owned enterprise is issued shall be the date the enterprise is established.

Article 8. A wholly foreign-owned enterprise that meets the requirements regarding legal persons as stipulated by the laws of China shall obtain the status of a Chinese legal person according to law.

Article 9. A wholly foreign-owned enterprise shall make the investment within the period approved by the examination and approval authorities. If no investment has been made at the end of the period, the administrative authorities for industry and commerce shall have the right to revoke its business license.

The administrative authorities for industry and commerce shall examine and supervise the investments of wholly foreign-owned enterprises.

Article 10. The split-up, merger, or other important changes of a wholly foreign-owned enterprise shall be submitted to the examination and approval authorities for approval and shall go through the procedures of the administrative authorities for industry and commerce for changes in the registration.

Article 11. The production and operating plan of a wholly foreign-owned enterprise shall be submitted to its department in charge for the record.

No interference shall be allowed in the operation and management activities of a wholly foreign-owned enterprise conducted according to its approved articles of association.

Article 12. A wholly foreign-owned enterprise employing Chinese staff and workers shall enter into contracts according to law and shall specify in the contracts provisions relating to matters of employment, dismissal, remuneration, benefits, labor protection, and labor insurance.

Article 13. The staff and workers of a wholly foreign-owned enterprise shall establish a trade union according to law, carry on trade union activities, and protect the lawful rights and interests of the staff and workers.

A wholly foreign-owned enterprise shall provide the necessary facilities for the activities of its trade union.

Article 14. A wholly foreign-owned enterprise must keep account books within China, carry out independent accounting, submit accounting statements according to regulations, and accept supervision by the finance and tax authorities.

If a wholly foreign-owned enterprise refuses to keep account books within China, the finance and tax authorities may impose a fine on the enterprise and the administrative authorities for industry and commerce may order it to stop its business operations or revoke its business license.

Article 15. Supplies such as raw materials and fuel needed by a wholly foreign-owned enterprise within the approved scope of business may be purchased in China or on the international market. If the terms are the same, it shall give priority to purchasing in China.

Article 16. All items of insurance on a wholly foreign-owned enterprise shall be insured with insurance companies within China.

Article 17. A wholly foreign-owned enterprise shall pay taxes in accordance with the relevant tax regulations of the State and may enjoy preferential treatment in tax reductions and exemptions.

If a wholly foreign-owned enterprise reinvests its after-tax profits within China, it may apply for a refund of part of the income tax already paid on the reinvested amount in accordance with the regulations of the State.

Article 18. The foreign exchange matters of wholly foreign-owned enterprises shall be handled in accordance with the foreign exchange control regulations of the State.

A wholly foreign-owned enterprise shall open an account with the Bank of China or another bank designated by State Foreign Exchange Control Authorities.

A wholly foreign-owned enterprise shall resolve the balance between its foreign exchange income and expenditure by itself. If the products of a wholly foreign-owned enterprise are sold on the Chinese market with the approval of the relevant authorities in charge, thus causing an imbalance between its foreign exchange income and expenditure, the authorities that approved the sale of the products on the Chinese market shall be responsible for resolving the imbalance.

Article 19. The lawful profits and other lawful income obtained by foreign investors from wholly foreign-owned enterprises and the funds they receive after liquidation may be remitted abroad.

Salaries and other lawful income of foreign staff and workers of wholly foreign-owned enterprises may be remitted abroad after payment of individual income tax according to law.

Article 20. The term of operation of a wholly foreign-owned enterprise shall be submitted by the foreign investors and approved by the examination and approval authorities. If an extension is needed upon the expiration of the term, an application shall be filed 180 days prior to the expiration of the term with the examination and approval authorities, which shall decide to approve or disapprove within 30 days from the date of receiving the application.

Article 21. When a wholly foreign-owned enterprise terminates, a prompt public announcement shall be made and liquidation shall be conducted in accordance with legal procedures.

Prior to the completion of the liquidation, the foreign investors shall not dispose of the assets of the enterprise except for carrying out the liquidation.

Article 22. When a wholly foreign-owned enterprise terminates, it shall go through the procedures for cancelling its registration with the administrative authorities for industry and commerce and return its business license.

Article 23. The department under the State Council in charge of foreign economic relations and trade shall, on the basis of this Law, formulate detailed rules for implementation that shall come into force after being submitted to and approved by the State Council.

Article 24. This Law shall come into force on the date of promulgation.

This law was adopted by the Fourth Session of the Sixth National People's Congress on April 12, 1986. Translated by Baker & McKenzie.

我会活动

COUNCIL MEETS WITH JCCT

The Joint Commission on Commerce and Trade meets every other year, providing a formal opportunity for the Chinese and American governments to air business issues of mutual concern. In May the National Council hosted a private meeting between Council member companies and members of the Chinese delegation to the JCCT, which met in Washington this year. Member companies conveyed their principal concerns to the National Council, which presented them to the Chinese delegation in the form of issue papers. The National Council will continue to press for progress on the issues raised. The following is a brief synopsis of these concerns:

Maintaining business confidence. Recent restrictions on foreign exchange expenditures, expansion of the export licensing system, and growing protectionist sentiment within China have shaken the confidence of foreign firms. American firms want to know what measures the Chinese government plans to take to reassure them of stability and continuity in China's open door policies, and how China will deal with its projected trade deficit for the Seventh Five-Year Plan period.

Profit repatriation. A leading complaint of American firms is China's policy of placing the responsibility for balancing foreign exchange on the foreign investor. They would like to know what China is prepared to do to ease problems of currency conversion and pressures to export most or all joint venture products.

Trade issues. The Council asked the delegation about China's plans for responding to dumping cases brought against them. The delegation was also asked to recommend actions that a foreign firm could take in the event that the goods it imports from China do not meet quality standards. Finally, it was suggested that a reliable system be established for notifying US importers of the name of vessels carrying their shipment.

Countertrade. The Council asked the delegation about China's plans to facilitate countertrade and the role of the new countertrade group recently established by MOFERT. The organizations making—and implementing—countertrade policy in China need to be clarified.

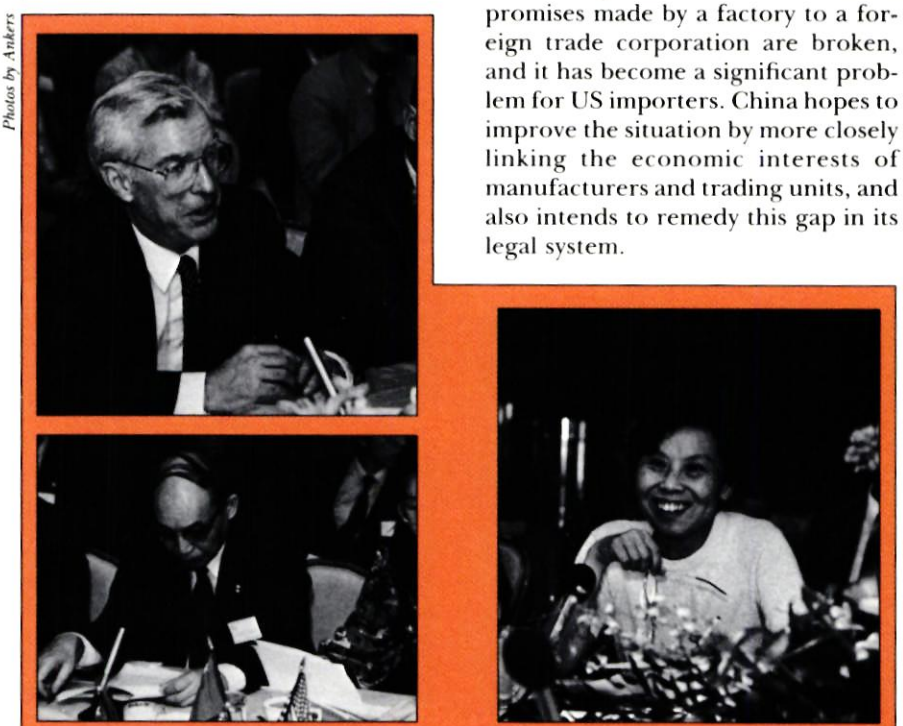
Access to information. US firms remain concerned about their limited access to information in China, particularly concerning policies and decision-making authority. Businesses do not function well in an atmosphere of uncertainty, and need better access to information.

The Chinese team, led by Vice Minister of the State Planning Commission Gan Ziyu, opened the session with prepared remarks about recent developments in China's domestic economy. Next, Zhu Youlan, assistant to the minister of MOFERT, addressed many of the questions raised in the National Council's issue papers.

Madame Zhu conceded that foreign exchange "will remain a problem for a long time to come" although she noted that export earnings in the first three months of 1986 were up over 1985 despite plummeting oil prices. On the issue of profit repatriation Zhu pointed to recent regulations extending the life of joint ventures and encouraging import substitution projects. However, she added that "in principle we encourage joint ventures to be export-oriented so they can achieve a foreign exchange balance by themselves." On the issue of dumping, Madame Zhu noted that the United States and China had just reached agreement to hold friendly consultations whenever possible before dumping cases are filed.

In response to a question concerning cancellation of contracts, Zhu noted that internal Chinese law does not at present address the problem of breach of domestic contracts. This commonly arises in China when promises made by a factory to a foreign trade corporation are broken, and it has become a significant problem for US importers. China hopes to improve the situation by more closely linking the economic interests of manufacturers and trading units, and also intends to remedy this gap in its legal system.

Photos by Ankers



Roger W. Sullivan, Gan Ziyu, and Madame Zhu at the JCCT meeting in May.

AMBASSADOR WINSTON LORD ADDRESSES COUNCIL MEMBERS

China and the United States should not become complacent about the steadily improving state of bilateral relations. Instead, they should take advantage of the current "relatively quiet period of sound relations to chart a course on where we should go." That was the theme of American Ambassador to China Winston Lord's address to the 13th Annual Membership Meeting of the National Council, held this May in Washington, DC. In his first public address since becoming US ambassador last November, Lord urged greater efforts to improve Sino–American commercial relations.

The US side should resist protectionism and abide by its promises to relax export controls, Lord said. China, in turn, should refrain from charging excessively high rates for equipment and services required for foreign businesses. Lord also urged China to draft and implement economic legislation with greater precision, improve consistency of its economic statistics, diversify its exports, and further open its domestic market to US companies.

Lord described China's new policies as "one of the boldest domestic ventures in modern history." Lord said that continuation of the open door policy will generate important changes in the viewpoint of China's leaders and people over the coming decades. But while he applauded the tremendous growth of Sino–American trade—which totaled $8.1 billion last year—and extensive exchanges in science, education, and culture, he also called for broader and deeper bilateral discussions on international questions. He noted the congruence of the two countries' interests in Asia, but observed that "as one moves away from China's periphery, our positions often diverge."

Three other speakers addressed the membership during the morning meeting on China's foreign trade: Dwight H. Perkins, director of the Harvard Institute of International Development; William J. McDonough, executive vice president of the First National Bank of Chicago; and Kim Woodard, president of China Energy Ventures, Inc. Copies of their speeches can be found in the National Council library.

新聞人物

Romancing Hong Kong

When Wang Guangying, —celebrated "red capitalist," brother-in-law of China's former President Liu Shaoqi, and chairman of the Everbright Industrial Corporation in Hong Kong—reflects upon his company's achievements, he seems a satisfied man. In a recent interview in Washington, Wang told *The CBR* that Everbright has grown faster than he ever expected, adding that the company is becoming more capable of negotiating large deals and getting funding from abroad. Current projects include construction of harbors, ports, railways, and bridges in other coastal areas. In the future Wang plans to concentrate the company's efforts more heavily on building power plants, chemical factories, and other projects that will improve China's underdeveloped—and high priority—transportation and energy sectors.

The first Beijing-sanctioned private company to operate in Hong Kong, Everbright has taken a financial stake in 28 enterprises in China since it set up shop in 1983, including joint ventures and contractual joint ventures. It also runs area development projects such as the industrial park in Zhuhai and a ¥100 million land reclamation project also in Zhuhai that Wang says has won the acclaim of State officials.

Tourism projects remain a significant part of the company's business. The focus now is on completing work on six Beijing hotels by 1989. Everbright also plans to establish a series of companies providing cleaning, transport and other services for the hotels. One joint venture taxi service, with a fleet of 550 cars, is already operating in Beijing.

At present, much of Everbright's business is conducted with Japanese and West German partners. But business with US partners may grow, says Wang, as a result of the rising value

Wang Guangying

of the yen and the depreciating dollar. US partners now include Morrison Knudsen, which did the feasibility study for the Zhuhai land reclamation project, and General Electric, which sold aircraft engines to China with Everbright's help. Everbright has also taken advantage of its position as a private company to deal with countries like Singapore that have not normalized relations with China. But, he adds, his company positively will not do business with Israel, South Africa, or South Korea—at least for now.

As an independent ministerial-level corporation, Everbright differs in several respects from its State-run counterparts in Hong Kong, Wang says. Wang and his staff of 400, which includes his wife and daughter, report directly to the State Council. Among the more visible differences: greater flexibility, more foreign contacts, and better facilities.

Wang finds the business environment in Hong Kong stimulating for his company. "A Chinese company can only really be efficient in Hong Kong," Wang says. "The Chinese understand efficiency but they don't understand the importance of economic *results* as do the people in Hong Kong."

Wang is quick to refute reports in an American Chinese-language newspaper alleging that Everbright is losing favor with Beijing. "The story that Everbright has been taken over by MOFERT is just a rumor," Wang says. "Our new first Vice President and Vice Chairman Lin Zhongmin worked for China Resources [under MOFERT] and then as an assistant to the minister of MOFERT." "But," he emphasizes, "Lin has completely severed relations with them and works for me."

Wang is proud of his company's contributions to China's modernization. He estimates that Everbright has helped increase China's output value by $6 billion each year, employed thousands of workers on development projects, and imported $630 million worth of technology and equipment for some 3,000 enterprises.

But most of all, Wang speaks glowingly about construction now underway on Everbright Towers, twin skyscrapers that will overlook Finance Square in Hong Kong. Compared to State-run Chinese companies that began constructing their own buildings in Hong Kong after they had been there 25 to 30 years, Everbright is making its mark on Hong Kong's skyline after just two and a half years.

Everbright Towers will be a symbolic reminder of the company's high profile in Hong Kong. So high a profile, in fact, that when Everbright backed out of an ill-advised $120 million real estate deal in June 1984, the Hong Kong stock market plummeted to record low levels.

Although his credibility was somewhat bruised in the real estate affair, Wang remains optimistic about the future of both Everbright and China. One reason is his firm belief in the benefits of China's open door policies. "What are sunset industries for you are sunrise industries for us," he says with a smile. —DCD

书刊介绍

Directory of Chinese Foreign Trade 1986, by the Department of Public Relations, China Council for the Promotion of International Trade. London: Longman, 1985. Distributed in the US by Longman Group USA Inc., 500 N. Dearborn St., Chicago IL 60610. 294 pp. $95 plus $4.50 postage.

This is the first edition of an annual series that provides directory information for Chinese enterprises and organizations related to foreign trade. The *Directory* begins with a few brief chapters that trace the history and structure of China's foreign trade. Useful charts outline the responsibilities of MOFERT and other key organizations involved in trade.

The remainder of this volume provides each organization's address, cable, telex, and telephone numbers, names of key officials, and a description of business scope. Chapters cover: import–export corporations and their branches; economic cooperation and contract engineering corporations; finance, investment, trust, insurance, and leasing corporations; organizations located in the SEZs and open coastal cities; transportation, commodity inspection, export base, and advertising corporations; and legal organizations.

Unlike many other Chinese directories, this one includes an index; its usefulness would have been enhanced had it listed entries not primarily by location but also by key word. —JLL

China Projection Report, by Rock Creek Research. Washington, DC: Rock Creek Research (1111 14th St., Washington, DC 20005), Fall 1985. 112 pp. Published in fall and spring; both $295; separate editions $175.

The *China Projection Report* analyzes recent Chinese economic and demographic statistics and reviews economic trends. Chapter two provides an overview of China's economy as well as 20-year projections for basic economic indicators.

Other chapters evaluate industry, energy, investment and capital construction, banking and finance, trade and payments, agriculture, commerce and prices, transport, and population. Each chapter is introduced by an executive summary, followed by a discussion of current policy, and prospects for the future.

Numerous tables accompany the text and are current through the second and sometimes third quarter 1985. In analyzing what the future holds for each sector, official targets for the next five years and the year 2000 are included when available. —JLL

China Handbook (1985–86). Hong Kong: Ta Kung Pao (342 Hennessy Road, Hong Kong), 1985. 661 pp. $26 airmail, $22 seamail.

This eclectic collection begins with a chronology of the major events of China's economic reform policy from 1977 to June 1985. Important speeches in 1984, industrial production figures for the years 1980–84, and trade figures from 1950 to 1984 follow.

A large portion of the *Handbook* contains namelists of leaders and members of various government, trade, research, and cultural organizations. The only addresses given, however, are those of import–export corporations, and institutes under the Chinese Academy of Sciences.

Most of the information contained in this *Handbook* can be found elsewhere. In particular, names of Chinese officials are published in the *China Directory* released annually by Radiopress in Tokyo, and the *Directory of Chinese Officials* series published by the US Central Intelligence Agency. However, the *Handbook* does offer a supplement (included in the basic price) with changes through November 1985 to update its namelists. A subject index is provided, but to find a personal name index one must consult one of the other directories mentioned. —JLL

Modernizing China: Post-Mao Reform and Development, edited by A. Doak Barnett and Ralph N. Clough. Boulder, CO: Westview, 1986. 136 pp. $23.85 cloth, $12.85 paper.

This slender volume of essays is the finest introduction yet to the post-Mao era of reforms. The authors, all of whom are leading scholars in their specific fields, have clearly and expertly summarized the impact of current modernization efforts on Chinese society.

The post-Mao leadership's efforts to gain the cooperation of a wide spectrum of institutions and interests is one important theme of the book. Harry Harding reviews the progress China has made in reducing confrontation between the Party and the people, expanding opportunities for political participation among all but the most unrepentant leftists, and transforming arbitrary rule—with all its alienating consequences—into rule by law. Dwight Perkins examines China's efforts to reconcile socialist and free market mechanisms in the agricultural and industrial sectors of the economy. Paul Godwin shows how reforms in the defense establishment have led to greater cooperation between defense and civilian R&D programs to their mutual benefit. Perry Link and Martin King Whyte, in their respective chapters on cultural policy and social trends, conclude that China today is, on the whole, more egalitarian than Mao's China ever was, much as the Maoists would have us believe otherwise.

Can it be said that current policies and trends are irreversible? None of the authors is prepared to go that far. There is, however, so much to recommend the reforms (their contributions to greater efficiency, rationality, and general well-being) that current trends will likely persist, say the authors, even if some specific policies are reversed. —DCD

中外贸易

Betsy Saik
Research Assistant

The following tables contain recent press reports of business contracts and negotiations exclusive of those listed in previous issues. Joint ventures, licensing arrangements, and other forms of business arrangements are included if classified as such in Chinese and foreign media reports. For the most part, the accuracy of these reports is not independently confirmed by *The CBR*.

National Council members can contact the library to obtain a copy of news sources and other available background information concerning the business arrangements appearing below. Moreover, member firms whose sales and other business arrangements with China do not normally appear in press reports may have them published in *The CBR* by sending the information to the attention of Betsy Saik.

中外贸易

CHINA'S IMPORTS THROUGH MAY 31

Foreign Party/ Chinese Party	Product/Value/ Date Reported
Agricultural Commodities	
ITT Rayonier Inc. (US)	Sold 4 million board feet of green hemlock lumber. 3/86.
(Australia)	Shipped 750 dairy cattle. 4/16/86.
Agricultural Technology	
Molins PLC (UK)/Yunnan	Signed contract to supply tobacco machinery to four factories. $9 million (£6 million). 8/85.
Wintersteiger Ges. B.H. Co. (Australia)	Awarded contract to supply precision planters for Land Reclamation Project financed by World Bank loan. $757,995 (A$1.05 million). 11/85.
Spie Batignolles Groupe (France)/Beijing	Signed contract to sell rabbit fodder production line. 12/2/85.
Ibberson International, Inc. (US)/Xiangfan, Hubei	ASSEM: Sold prefabricated feed mill financed by loan from US Export/Import Bank (EXIM), Minnesota State Trade Office, and Norwest Bank of Minneapolis. $700,000. 3/24/86.
(Canada)/Keshan Potato Research Institute of Academy of Agricultural Science, Heilongjiang	Signed five-year agreement to provide financing, equipment, and training for potato research project. $1 million (C$1.4 million). 5/7/86.
NA (Switzerland)/Ministry of Machine Building Industry	Signed contract to sell technology for fodder machinery component. 5/14/86.
NA (Czechoslovakia)/ China National Agriculture Mechanization Service Corp.	Signed contract to import spare parts for tractors. $440,000. 5/21/86.
Chemicals and Chemical and Petrochemical Plants and Equipment	
Farrel Bridge (UK), unit of Emhart Corp. (US)	Received orders to supply three equipment lines and spare parts for rubber and plastics processing. $14.2 million (£9.5 million). 11/85.
Toho Chemical Industry Co. Ltd. (Japan)/Nanjing	Signed 8-year contract to produce 6,000 TPY of non-ionic surface reactive agent. 11/85.
Machi & Borre International (US)	Reached agreement to provide several tonnes of shredded tires per year. 12/85.
M.W. Kellogg Company (US)/CNCCC	Signed contract to provide energy saving design modification and technical services for ammonia plants under Fertilizer Rehabilitation Project financed by World Bank loan. $2.5 million. 12/13/85.
UOP Inc., unit of Allied-Signal Inc. (US)/SINOPEC	Will supply petrochemical processing unit for Huangpu refinery. 1/86.
Lummus Crest Inc., subs. of Combustion Engineering, Inc. (US)/SINOPEC	Will provide engineering, equipment procurement, start-up, and training services to modernize Beijing Yanshan Petrochemical Corp's ethylene plant. $2 million. 1/27/86.
Brady Group, Inc. (UK)/ Kaifeng Chemical Co., Henan	Will provide process design for fiberglass reinforced plastics plant. $90 million. 2/21/86. (See also Joint Venture, Chemicals and Chemical and Petrochemical Plants and Equipment: Tauran, Inc.)
American Natural Soda Ash Corp. (US)	Signed contract to sell soda ash. 3/86.
H.B. Fuller Co. (US)/ Guangdong	Will build adhesives and specialty chemicals plant. 3/86.
Lummus Crest Inc., subs. of Combustion Engineering, Inc. (US)/SINOPEC	Signed contract to help modernize Guangzhou Petrochemical Works' Huangpu refinery. 3/86.
Mark Controls Corp. (US)/SINOPEC	Received order to supply valves for eight new process units in petroleum refineries. $4 million. 3/86.
Bechtel Inc. and Bechtel China, Inc. (US)/SINOPEC	Awarded design and technical service contract for two alkylation units at Fushun, Liaoning and Shengli, Shangdong refineries. 3/17/86.
Humphreys and Glasgow Ltd. (UK)/Luzhou National Gas Chemical Co., Sichuan	Signed contract to provide engineering services for modification of ammonia plant under Fertilizer Rehabilitation Project financed by World Bank loan. $3.7 million. 3/17/86.
KRW Energy System Co. (US)/No. 1 Heavy Machinery Plant of Ministry of Machine Building Industry in Qiqihar, Heilongjiang	Will install raw coal-gasification equipment. $25 million. 3/24/86.
Chevron Research Co., subs. of Chevron Corp. (US)/SINOPEC	Received order for catalysts used in fuel conversion process at Shengli refinery. 3/31/86.
Showa Shell Sekiyu K.K. (Japan)/SINOPEC	Received order to build 7,000 TPY lubricant plant in Lanzhou, Gansu. $1.5 million (J¥270 million). 4/2/86.
Smelt (Yugoslavia)/ SINOPEC	Signed contract to supply equipment and technology and supervise construction of 2 million TPY oil refinery. 4/2/86.

NA = Not available.

NOTES: Contracts denominated in foreign currencies are converted into US dollars at the most recent monthly average rate quoted in *International Financial Statistics (IMF)*. Contracts concluded over two months ago are also included if they were not reported in the last issue of *The CBR*. Leasing (LEAS), Licensing (LIC), Compensation (CT), and Assembling (ASSEM) deals are now included in the "China's Imports" section.

Eastern Petrochemical Co. (Saudi Arabia)	Signed contract to supply 2,500 tonnes of polyethylene used for film. 4/10/86.
Stone & Webster Engineering Corp. (US)/ SINOPEC	Awarded contracts to provide process design and technical services for fluid-catalytic-cracking technology used to produce high-octane gasoline from feedstock at Nanjing, Changling, Hunan, and Guangzhou refineries. 4/10/86.
Zimmer S.A. (France)/ Yizheng Joint Chemical Fiber Industry, Jiangsu	Signed contract to supply know-how and equipment for new 1,600 TPD polyester plant. $360 million. 4/14/86.
Dupont Co. (US)/CNCCC	Concluded agreement to supply three neoprene synthetic rubber production lines for Qingdao (Shandong), Datong (Shanxi), and Changshou (Sichuan). $10.2 million. 4/29/86.
Mitsui Bussam Co. Ltd. (Japan)/Heilongjiang	CT: Signed agreement to set up factory to produce 60,000 TPY of polyester chips and 20,000 TPY of filament, with funds and main equipment provided by Japanese firm. 4/30/86.
SCM Corp. and International Enertech Corp. (US)/Sichuan Nonferrous Metals Industrial Corp.	Signed memorandum of understanding to build plants in Sichuan to produce 50,000 tonnes of titanium dioxide pigment and up to 150,000 tonnes of synthetic rutile. 5/12/86.
PPG Industries (US)	LIC: Negotiating agreement to product silica pigments at Nanchang, Jiangxi plant. 5/14/86.
M&T Chemicals Inc. (US)/Beijing No. 3 Chemical Plant and CNTIC	LIC: Signed agreement to construct plant to produce stabilizers used to make polyvinyl chloride plastics. 6/3/86.

Construction Materials and Equipment

NA (W. Germany)/CNTIC	Signed contract for roller manufacturing technology. 11/85.
Mata Engineering and Equipment Co. Ltd. (HK)	Awarded contract for 3 vibratory rollers for Water and Electricity Project financed by World Bank loan. $259,398 (DM590,000). 11/85.
PPG Industries (US)/ CNTIC and Bengbu Design Institute, Anhui	LIC: Granted license to produce sheet glass at new Wuhan Glass Factory. 12/85.
(Belgium)/CNTIC	Signed contract to supply cement-making equipment. 12/5/85.
Dynapac (Sweden)/ MACHIMPEX	ASSEM: Signed seven-year agreement for roller assembly at Xuzhou Construction Machinery Corp., Jiangsu. 1/86.
Baehre & Greten GmbH KG (W. Germany)/Anhui	Will supply chipboard plant to be built in Chuzhou. $2.2 million (DM5 million). 1/8/86.
Frederick Parker (UK)/ CNTIC	LIC: Signed five-year contract to build 100 TPH Blackmix 1000 asphalt mixing plant. $1.5 million (£1 million). 1/13/86.
Bricesco (UK)/ Guangdong	Received order for sanitaryware factory and ceramic drying system. $1.5 and $598,720 respectively (£1 million and £400,000). 3/10/86.
Laminated Profiles Developments Ltd. (UK)/CNTIC and Yaohua Glass Co.	Signed contract to install glass reinforced plastics sheeting plant financed by World Bank loan. $374,200 (£250,000). 3/14/86.
Congoleum Corp. (US)	LIC: Negotiating floor covering technology agreement. 4/21/86.

Consumer Goods

BUSM Co. Ltd. (UK)/ CNTIC, Beijing branch	Signed contract to supply shoemaking machinery. $297,863 (£199,000). 12/85.
Sharp Corp. (Japan)/ Changchun Washing Machine Factory, Jilin	Signed contract to sell technology and key equipment to produce washing machines. 12/9/85.
William Boulton (UK)	Received order for two machines for porcelain factory. $149,680 (£100,000). 2/13/86.
Gallaher (UK)	Received order for cigarettes. 2/18/86.
Mesbla Trading (Brazil)	Negotiating agreement to supply Brazilian and Italian shoe-making equipment in return for a portion of factory's output. 2/28/86.
E.W. Bliss (UK)	Received order for razor blade press. $74,840 (£50,000). 3/6/85.
International Perfume and Essence Co. (US)/ Guangzhou Baihua Perfumery	Signed barter trade contract for technology and equipment. 4/25/86.
Shiseido Co. Ltd. (Japan)/ Beijing Liyuan Daily-use Chemicals Joint Co.	Signed three-year technological cooperation agreement to introduce hair care products. 5/5/86.

Electronics and Electrical Equipment

Computervision Inc. (US)	Received contract for CDS 4001 computer system for Railway Project financed by World Bank loan. $980,000. 11/85.
Sino-American Co. (HK)/ MACHIMPEX	Signed contract to supply equipment and know-how to produce high-pressure sodium lamps. 11/85.
General Robotics Corp. (US)/Tianjin Computer Corp.	Signed contract for 200 DEC-compatible microcomputers and transfer of assembling know-how. 12/85.
Combustion Engineering Simcon, Inc., subs. of Combustion Engineering, Inc. (US)/SINOPEC	Will provide computer control system for Beijing Yanshan Petrochemical Corp's ethylene plant. 1/27/86.
Deltacam Systems (UK)/ Institute of Automation of Academy of Sciences, Beijing	Will install DUCT 3D design and manufacturing system with software as part of CAD/ CAM training and industry application package. 2/27/86.
Furukawa Electric (Japan)/Shenyang Cable Factory, Liaoning	Concluded 4-year agreement to provide flame-resistant cable manufacturing technology and to train personnel. 3/86.
Marubeni Corp. and Enomoto Seisakusho (Japan)/Shanghai ITIC	Received orders for manufacturing system to produce semiconductor lead frames. $8.5 million. (J¥1.5 billion). 3/86.
Fuji Electric Co. (Japan)/ Rugao Radio Factory in Nantong, Jiangsu	Will ship high-purity silicon wafers and high-voltage silicon diodes. $5.7 million (J¥1 billion). 3/22/86.
Dataprep (HK)/Beijing International Hotel	Signed contract to supply EECO hotel management system. 3/31/86.
Dataprep (HK)/Nanhai Hotel, Shenzhen	Installed EECO-3550 minicomputer on-line operating system. 3/31/86.
Gerber Systems Technology (US)/Shanghai Metallurgical and Mining Machine Manufacturing Factory	Signed contract to sell CAD/CAM software and hardware, including Chinese-character software. $500,000. 4/86.
Thorn EMI PLC (HK)	Concluded technology transfer agreement to supply light bulb producing equipment. $5.8 million (HK$45 million). 4/86.
H.A. Simons Ltd. (Canada)/Guangzhou Bureau of City Planning	Signed contract to provide consulting services, hardware, and software for computerized mapping and urban planning. 4/2/86.
Canon Inc. (Japan)	Delivered two integrated mask alignment systems. $250,000 each. 4/7/86.
Sperry Corp. (US)/China Institute of Petrochemical Research	Sold 1100/72 computer system. 4/7/86.
Business Computer Solutions Inc. (US)/Economic Information Center of the Chinese Economics Bureau, Distribution Committee of the State Planning Committee, Bureau of Material, Xinye Electronics Co. of the Security Bureau, North China Industry of the Weapons Ministry, China Institute of State Farm Economy, and Chinese Academy of Sciences	Installed ZFOUR database management systems. $500,000. 4/8/86.

Philips Hong Kong Ltd./ Bank of China, Zhuhai SEZ	Signed contract to supply and install 12 automatic teller machines in Zhuhai and Guangzhou. 4/9/86.
Unison International Corp. (US)/CNEIC and Beijing Information Technology Institute	Signed contract for 32-bit color graphics workstation. 4/10/86.
Prime Computer Ltd. (HK), subs. of Prime Computer (US)/Shanghai Central Coal Mining Research Institute, div. of Ministry of Coal Industry	Sold 9750 computer-aided design and manufacturing system to improve geological research, construction, management, and safety. $750,000. 4/11/86.
Dataprep (HK)/Hongqiao Guest House, Shanghai	Concluded contract to supply EECO hotel management system. 4/15/86.
CAE Industries Ltd. (Canada)/Yichang, Hubei	Awarded contract to install control and data-acquisition systems for hydropower plant. $2 million (C$2.8 million). 4/25/86.
Gandalf Technologies Inc. (Canada)/Nanjing Radio Factory	Signed agreement to manufacture multiplexers, modems, and interface converters. $341,622 (C$474,000). 5/6/86.
AT&T (US)	Received order for 50 3B2-300 machines. $1 million. 5/15/86.
AT&T (US)	Received order for 500 computers. $5 million. 5/15/86.
AT&T (US)/Zhongyi Co., Hangzhou, and MACHIMPEX	Concluded contract to sell and repair AT&T products at new Hangzhou and Shenyang maintenance centers. 5/15/86.
Mentor Graphics (US)	Won orders, pending US government approval, for computer-aided engineering systems. $2-$3 million. 5/15/86.
Data I/O Corp. (US) CATIC	Signed contract to supply PROM programming system. $11,330. 6/86.
Data I/O Corp. (US)	Signed contract to supply PROM programmers. $28,440. 6/86.
Data I/O Corp. (US)	Signed contract to supply PROM programming system. $15,635. 6/86.
Data I/O Corp. (US)/ Shanghai Foreign Trade Corp.	Delivered PROM programming system. $11,130. 6/86.
Data I/O Corp. (US)/ Shanghai Foreign Trade Corp.	Signed contract to supply PROM programming system. $8,265. 6/86.
Exatron ATE, Inc. (US)	Signed contract to supply 5-sort semiconductor device handler. $7,055. 6/86.
Exatron ATE, Inc. (US)/ Shanghai Foreign Trade Co.	Delivered dual-sort semiconductor device handler. $5,995. 6/86.
Rhino Robots, Inc. (US)	Delivered XR-Robot System. $3,495. 6/86.

Electronics (Consumer)

EMI Music and Capitol Industries (US)/China Record Co.	Reached agreement to supply blank tape stock, exchange repertoires, collaborate in technological efforts, and introduce cassette duplication process. 12/11/86.
NEC Corp. (Japan)/Gansu	Agreed to supply color TV production plant. 4/86.
Philips Singapore Pte. Ltd.	Signed contract to supply 40,000 color TVs. 5/22/86.

Engineering and Construction

Omnium de Traitement et de Valorisation, subs. of Compagnie Generale des Eaux (France)/NA Chongqing, Sichuan	Signed contract to conduct feasibility studies for construction of two water purification stations. 3/31/86.
Chinavest NV (HK-Netherlands joint venture)/ China Engineering and Technology Development Corp.	Signed agreement to introduce technology to small- and medium-sized Chinese enterprises. 4/17/86.

Finance

Yasuda Trust & Banking (Japan)/Industry and Commerce Bank of China	Will provide know-how on banking and trust business. 3/86.
Deloitte Haskins and Sells International (US)/Beijing Foreign Taxation Consultative Corp.	Signed agreement to cooperate on tax consulting services and arranging tax seminars and conferences. 3/31/86.
Chicago Board of Trade (US)/International Trade Research Institute of MOFERT	Signed memorandum of understanding to develop exchange program to educate Chinese in futures trading. 4/30/86.

Food Processing and Food Service

Svanska Handelsbankem (Sweden)/Bank of China	Signed loan agreement to import Aefa-Lavae Co.'s edible oil refining production line for Yongyuan Foodstuff Factory in Hefei, Anhui. $3.2 million (SK23.3 million). Late August/85.
NA (Japan)/Chengdu, Sichuan	Sold automatic rice cooking line for new instant food factory. 11/85.
Spie Batignolles Groupe (France)/Anhui	Signed contract to provide technology to produce alcohol from maize. 12/2/85.
(Denmark)/CNTIC	Signed contract to sell fruit candy production equipment. 12/5/85.
(W. Germany)/CNTIC	Signed contract to sell beer-canning installations. 12/5/85.
Aluminum Schweisswerk AG, Schlieren (ASS) (Switzerland), Feldschlosschen Brewery (Switzerland), and Huppmann GmbH, Kitzingen (W. Germany)/ Huizhou Non-Alcohol Beverage Brewery, Guangzhou	ASS appointed as general contractor for construction of 200,000 hectoliters/year brewery, which it will manage in conjunction with Huppmann. Feldschlosschen Brewery will provide brewery expertise. 2/86.
Mitsubishi (Japan)/ MACHIMPEX and Liaoning Testing Equipment Factory	LIC: Concluded contract to supply semihermetic compressors for refrigeration. 2/86.
Techumseh Products Co. (US)/China North Industries Corp.	LIC: Reached agreement to build refrigerators in Chongqing. 2/86.
Lincat (UK)	Awarded orders to equip more than 100 restaurants. 2/21/86.
Ling Systems (UK)/Beijing No. 1 Foodstuffs Co.	Awarded contract to supply conveyor system for new candy plant. $89,000 (£60,000). 3/20/86.
Coca-Cola China Co. Ltd. (US)/General Service Corp. of the Sixth National Games and CEROILS, Guangdong Foodstuffs branch	Signed agreement to sponsor China's Sixth National Games and sell cola drinks at arenas. 3/24/86.
Ringwood Brewery (UK)/ Hunan	Will build brewery to produce Old Thumper ale. 3/28/86.
Pooca Co. (Japan)/Hebei	Signed contract for 30 tonnes of Weili soft drink concentrate. 4/7/86.
FPE Overseas Corp. (US)/ Chongqing	Negotiating barter trade contract for pork processing plant to produce canned ham for export. $6.5 million. 4/30/86.

Machine Tools and Machinery

KMW Co. (Sweden)/ Fujian Investment Enterprise Co. and Sanming Fiber Board Factory	Signed agreement to supply shaving board production technology and equipment. $4.6 million (SK33.14 million). 7/20/85.
NA (W. Germany)/CNTIC	Signed two contracts for 450,000 TPY automatic hydrocarbon equipment for Nanjing. $15.47 million. 11/85.
NA (W. Germany)/ MACHIMPEX	Signed contract to supply welding equipment for Baoji Steel Oil Pipe Plant. 11/85.
Hydrovane Compressors (UK)/Shanghai Second Compressor Works	LIC: Concluded agreement to manufacture 5.5-10 HP compressors. 11/85.
Machinery Import Corp. (Czechoslovakia)/CNTIC	Signed two contracts to transfer electrostatic enamel dust spraying technology and related equipment. $1.2 million. 11/85.
Dappat Engineering (UK)/ Zhongnan Rubber Co.	Sold conveyor belt drying unit. $17,962 (£12,000). 12/4/85.
USINOR SR (France)/ CNTIC	Signed contract to sell sintering equipment. 12/18/85.
Woozie Water Filtration Systems Inc. (US)/ Shaoguan Water Treatment Equipment Factory, Guangdong	Signed contract to supply water filtration equipment. 2/86.
Horikiri Spring Mfg. (Japan)/Zhangdian Leaf Spring Factory, Shandong	Reached 3-year technology transfer agreement for springs. $2.8 million (J¥500 million). 3/86.
Kobe Steel (Japan)/China Nonferrous Metals Import/Export Corp., Shenyang branch	Received orders for air separation devices. $3.4 million (J¥600 million). 3/86.
Holmens Bruk AB (Sweden)/Jilin Paper Mill	Sold used 60,000 TPY paper machine. 4/86.
Swindell Dressler International Co. (US)	Awarded contract for kiln to fire electrical porcelain insulators. 4/86.
Swindell Dressler International Co. (US)	Awarded contract to revamp tunnel kiln. 4/86.
Thorn EMI PI (HK)	Concluded technology transfer agreement to supply fire prevention equipment for Beijing factory. $1.1 million (HK$9 million). 4/86.
Vacuum Industries Inc. (US)/Carbide tool plant	Awarded contract to provide vacuum sintering furnaces to process cutting tools and drill tips. $1.8 million. 4/86.
(USSR)/Jiamusi Paper Mill	Signed cooperation agreement to upgrade mill. $25 million (¥80 million). 4/10/86.
Kotobuki Co. (Japan)/All China Sports Federation	Signed contract to provide technology to produce plastic seats used in athletic stadiums to Chengdu Glider Factor. 4/19/86.
Coropian Co. (Switzerland)/Harbin Measuring and Cutting Tools Plant	ASSEM. Signed memorandum to jointly produce electronic digital display measuring tools. 5/5/86.

Medical Equipment

Nippon Medical Supply (Japan)/State Medical Management Bureau and Tianjin Medical Apparatus Industrial Corp.	Signed agreement to supply transfusion sets. $2.8 million (J¥500 million). 3/86.
Vickers Medelec (UK)/ Beijing Ear, Nose, and Throat Hospital	Agreed to sell diagnostic equipment. 5/14/86.
Vickers Medical (UK)/ Beijing Children's Hospital	Signed contract to sell health care equipment including baby incubators and infusion pumps. 5/14/86.

Metals, Minerals, and Processing Technology

Toyo Menka Kaisha Ltd. (Japan)	Awarded contract to supply 1,400 tonnes of aluminum steel-cored wired for Water and Electricity Project financed by World Bank loan. $2.7 million (J¥470 million). 11/85.
Davy McKee (Poole) Ltd. (UK)/Shanghai Aluminum Material Factory	Signed contract to supply aluminum foil plant including continuous strip caster, cold mill, two foil mills, furnaces, laminators, foil slitters and separators financed by World Bank loan. $23 million. 12/85.
(Italy)/TECHIMPORT	Signed contract to introduce alloy aluminum production technology. 12/5/85.
(Australia)/Baoshan Steel Plant	Will supply 1.6 million TPY of iron ore. 12/10/85.
Smederevo Metallurgical Plant (Yugoslavia)/ MINMETALS	Signed five-year contract to provide 500,000 tonnes of hot- and cold-rolled sheet metal. $150 million. 12/10/85.
Italiampianti (Italy)/ Tianjin	Awarded contract to build steel factory and pipe plant. $750 million. 12/12/85.
USINOR SR (France)/ China Metallurgical Equipment Corp.	Signed contract to sell secondhand metallurgical equipment. $15.2 million. 1/15/86.
Concast Standard AG (Switzerland)/ TECHIMPORT, China Metallurgical Import/Export Corp., Beijing, and Shoudu Iron and Steel Co.	Awarded contract to build two continuous casting machines for integrated steel plant. 2/86.
Rees Holdings (UK)	Awarded contract to supply rolling machine sections to steel manufacturing plant. $374,200 (£250,000). 2/20/86.
New Energy Development Organization (NEDO) (Japan)	Will survey one of four coal fields in Shandong and Shanxi. 3/14/86.
Hazlett Strip-Casting Corp. (US)/Beijing; Changzhou, Jiangsu; and Xiangtan, Hunan	Sold three sets of continuous casting equipment. 3/18/86.
NA (HK)/Yunnan Aluminum Plant	Shipped aluminum manufacturing line. $2.6 million (¥8.2 million). 4/86.
Sabah Gas Industries (Malaysia)/Ministry of Metallurgy and Industries	Negotiating contract to buy 10,000 tonnes of sponge iron. 4/26/86.
Kobe Steel Ltd. (Japan)/ TECHIMPORT and Anshan Steel Complex, Liaoning	Awarded contract to build 2 million TPY continuous steel slab caster. 5/12/86.

Military Equipment

Flight Refueling Ltd. (UK)/ Chinese Navy	Awarded contract to sell military target system for missile training. 11/85.
Racal Marine Radar (UK)/ Chinese Navy	Sold two tactical command consoles. 11/85.
Gaymarine (Italy)/Chinese Navy	Signed contract to supply a mine-disposal submersible. 12/85.
Radio-Holland (HK)/ Dalian shipyard	Awarded contract to supply radar, sonar, and radio communication and navigation equipment for military tankers. $512 million. 4/86.
Air Force (US)	Will install avionics suite (pending Congressional approval) including fire control radar, central computer, navigation system, head-up display, and maintenance and support equipment in 50 F-8 fighters. $550 million. 4/7/86.

Mining Equipment

C. Itoh Co. Ltd. (Japan)	Awarded contracts to supply 14 sets of hydraulic excavators and two sets of concrete transport trucks for Coal Mining Project financed by World Bank loan. $1.5 million (J¥260 million). 11/85.
Wagner Mining Equipment Co., subs. of Paccar Inc. (US)/Jiang Tie Shan Iron Ore Mine in Jiayuguan, Gansu	Sold underground mining vehicles and parts. $2 million. 12/23/85.
Anderson Strathclyde PLC (UK)/China National Coal Import/Export Corp.	Received order for 10 roadheaders and spare parts. $5.5 million (£3.7 million). 1/3/86.

KHD Humboldt Wedag AG (W. Germany)/CNTIC	Received order for two jigs and accessories for Bailong coal preparation plant in Shanxi. $2.6 million (DM6 million). 3/21/86.
Kaiser Engineers and Constructors, Inc. and Consolidation Coal Co., subs. of Conoco Inc. (US)/Ministry of Coal Industry	Awarded six-month contract funded by TDP to analyze feasibility of using US-made underground continuous mining equipment at new 3 million TPY mine in Huangling, Shaanxi. 4/22/86.

Packaging Equipment

NA (Sweden)/CNTIC	Signed contract to build packaging paper factory in Beijing. 11/85.
(Sri Lanka)	Received order for 9 million jute bags. 12/85.
Yamamura Glass Corp./ Shenyang (Liaoning) and Xi'ning (Ningxia)	Signed agreements to supply beer bottle assembly lines. $11.4 million (J¥2 billion). 12/25/85.
(Sweden) and (W. Germany)/Natong No. 1 Glassworks, Jiangsu	Shipped infusion bottle production line. 4/86.

Petroleum, Natural Gas, and Related Equipment

Atlas Copco (China) Ltd. (HK)	Awarded contract to supply 8 sets of drill accessories for Water and Electricity Project financed by World Bank loan. $1.6 million (DM3.56 million). 11/85.
Dyer Equipment Inc. (Canada)	Awarded contract for two sets of fracturing equipment for Petroleum project financed by World Bank loan. $7.6 million. 11/85.
Hallibarton Co. (US)/ CNTIC	Signed technical service contract to help raise crude oil recovery rate at Shengli Oilfield. 11/85.
Total Co. (France)/CNTIC	Signed contract to provide air-pumping technology for oilfields. 11/85.
Spie Batignolles Groupe (France)	Signed contract to provide floating equipment for Bohai oil extraction. 12/2/85.
Gearhart Inc. (US)/South West Mining District	Signed contract for formation and production logging services for Weiyuan Gas Field Technical Assistance Project financed by World Bank loan. $4.3 million. 1/2/86.
LTV Corp. (US)	Signed seven-year technology transfer agreement for subsurface pump equipment. $1 million. 1/13/86.
Jardine Engineering Corp. Ltd., unit of Jardine Matheson Holdings Ltd. (UK)/Shenyang Pump Manufacturing Co.	Will supply technology to manufacture injection pumps for use at oil installations. $600,000. 1/17/86.
Dreco Services (Canada)/ Daqing Oilfield	Awarded contract to sell five mobile drilling rigs. 3/86.
Manpower Training International (Canada)	Awarded contract to evaluate China's oilfield operations and set up two training centers. $2.2 million (C$3 million). 3/86.
Solum Oil Tool Corp. (US)/Ministry of Petroleum	Received order for injection gravel blender for Shengli Oilfield. 3/86.
NOVACORP International Consulting Ltd. (Canada)	Awarded contract to design 230-mile gas pipeline connecting Zhongyuan Oilfield, Henan, to Cangzhou fertilizer plant, Hebei, including design of compressor controls, telecommunication facilities, and automation system. 3/18/86.
Rolls-Royce (UK)/CATIC	Awarded contract to supply industrial gas turbine for Zhongyuan Oilfield. $9.6 million (£6.4 million). 3/22/86.
(Indonesia)/SINOCHEM	Agreed to sell 1 to 1.5 million barrels of crude oil to be refined at Maoming refinery. 4/24/86.
(Kuwait)	Reached agreement to sell 1.5 million barrels of crude oil. 5/13/86.
Gustavson Associates, Inc. (US)/CNODC	Received two-year contract to provide foreign companies with data on potential fields, conduct tours of undeveloped basins, and help the Chinese assess exploration proposals. 5/19/86.

Ports

Tosho, Chugoku Hyakka, Daino Shoko, and seven other firms (Japan)/ Fuzhou	Reached agreement to supply equipment to develop Luoyuan Bay. 11/85.
PHB Weserhuette, part of Otto Wolff Group (W. Germany)/CNTIC	Awarded contract to provide loading and unloading equipment for third phase construction of coal wharf at Qinhuangdao Port, Hebei. $50 million. 4/16/86.
Peter-Trans (Singapore)/ Tianjin	Awarded contract to provide container cargo handling and management services. $2 million (S$4.4 million). 4/23/86.

Power Plants and Equipment

General Electric Co. (US)/ Daqing Oilfield	Awarded contract to supply equipment, spare parts, and technical advisors for 50 MW power plant. $13.5 million. 11/85.
Hafslund (Sweden)/Yunnan Provincial Import/Export Corp.	Signed contract to construct small hydropower stations including three water turbo generators from Sweden and Norway. $1.7 million (SF12.2 million) and $558,849 (NF4.07 million). 11/85.
Mitsubishi Heavy Industries (Japan)	Will provide technical assistance for Qinshan nuclear power plant. 11/85.
Timberland Equipment Ltd. (Canada)	Awarded contract for tension stringing equipment for Water and Electricity Project financed by World Bank loan. $1.2 million (C$1.7 million). 11/85.
Sprecher and Shuh (Switzerland)/CNTIC	Signed contract for 500-KV disconnecting switches for Second Power Project financed by World Bank loan. $3.4 million. 11/18/85.
BBC Brown Boveri (Switzerland)	Awarded contracts for two converter stations linking hydropower plants on Yangtze River to Shanghai. $870 million. 12/85.
Spie Batignolles Groupe (France)/Qinshan Nuclear Station, Zhejiang	Signed agreement to build preliminary pipeline. 12/2/85.
Kongsberg Vapenfabrik and Kongsberg-Dresser Power (Norway)	Awarded contract to provide gas turbines for Daqing Oilfield. $4.2 million (NK30 million). 12/5/85.
Nissho Iwai Corp. and Hitachi Zosen Corp. (Japan)/China National Metallurgical Import/Export Corp. and Guangzhou Foreign Trade Corp.	Signed contract to supply 11,000 KW industrial power plant. $8.5 million (J¥1.5 billion). 12/11/85.
Brown Boveri (Switzerland)/CNTIC	Signed contract to supply 220 KV circuit breakers for Second Power Project financed by World Bank loan. $2.8 million. 12/14/85.
Brown Boveri (Switzerland)/CNTIC	Signed contract to supply 500 KV lightning arresters for Second Power Project financed by World Bank loan. $1.2 million. 12/14/85.
Mitsui (Japan)/CNTIC	Signed contract to supply conductors and accessories for Second Power Project financed by World Bank loan. $2.1 million. 12/14/85.
Shinnihou Trading Co. Inc. (Japan)/CNTIC	Awarded contract to supply 220 KV and 34.5 KV disconnecting switches for Second Power Project financed by World Bank loan. $1.2 million. 12/20/85.
Sulzer (Switzerland)	Will provide main steam isolation valves, turbine bypass valves, and turbine bypass control system for Qinshan nuclear plant. 1/86.
Sumitomo Corp. (Japan)/ CNTIC	Signed contract for 34.5 KV reactors for Second Power Project financed by World Bank loan. $1.8 million. 1/13/86.
Westinghouse (UK)/ CNTIC	Signed contract to supply four automatic control systems for electricity network. 1/15/86.
Energoinvest (Yugoslavia)/CNTIC	Signed contract for automation equipment for Second Power Project financed by World Bank loan. $3.1 million. 2/7/86.
Cablec Corp. (US)	Will ship 8,000 feet of 15 KV electrical power cable. $40,000. 3/21/86.

Moylan Engineering Associates (US)/Southwest China Electric Power Adm.	Awarded contract to serve as consultants for reconstructing electric power distribution system. 4/86.
Bechtel China Inc. and Bechtel North American Power Corp. (US)/ Guangdong General Power Co.	Awarded contract to construct 60-mile 500 KV transmission line across Pearl River to link Shajiao generating plant (now under construction) with Jiangmen. 5/6/86.
Gruppo Industrie Elettromeccaniche (Italy)/ China International Water & Electric Co.	Received order to enlarge coal-fueled electric power station including construction of 320 MW plant near Tianjin. $200 million. 5/29/86.

Printing Equipment, Publishing & Broadcasting

Information et Publicite and Radio Tele Luxembourg (Luxembourg)/ CCTV	Reached agreement to air commercials on Chinese TV. 12/85.
Rank Cintel Ltd. (UK)/ Shanghai Television	Delivered direct-broadcast telecine and a post-production telecine. 12/85.
Watt Publishing Co. (US)	Began publishing *Pig International*/China Edition in Beijing for distribution throughout China. 12/85.
CBS Worldwide Enterprises, unit of CBS Broadcast Group (US)/CCTV	Signed agreement in which CCTV gets 64 hours of CBS-owned programming free in return for up to five minutes of commercial time each hour. 12/11/85.
Sigma Film Equipment (UK)	Received order for three preassembled film-winding devices. $1.9 million. (£1.3 million). 12/27/85.
BBC Enterprises (UK)/ CCTV	Concluded agreement to sell TV programs. 2/86.
Japan Publications/ Xinhua Bookstore	Will set up publications distribution center in Beijing. 3/86.
Polychrome Corp. (US)/ China National Chemical Construction Corp., Beijing and Second Film Factory in Nanyang, Henan	Signed technology transfer contract for presensitized lithographic printing plates. 4/86.

Property Development

Qiaohui Co. Ltd. (HK)/ Guangdong ITIC	Signed contract to build Chaozhou-Shantou Hotel. 11/85.
Far East National Bank (US)	Signed agreement to finance shopping mall and hotel-office complex in Beijing. $150 million. 1/86.
Holiday Inn (US)	Signed agreement to manage Holiday Inn Lido Beijing Hotel. 1/13/86.
Hasegawa Komuten (Japan)/China Xinxing Corp.	Will build multi-family residences for foreigners in Beijing. $7.4 million (J¥1.3 billion). 3/86.
Meridien Hotel, subs. of Air France	Signed long-term leases to manage hotels in Shanghai, Beijing, Guangzhou, and Chengdu, all scheduled to open in 1988. 3/17/86.
Holiday Inn International-Asia/Pacific (US)	Signed agreement to manage new 350-room hotel in Xi'an. 4/24/86.
Barden-ICL Consultants (Canada)/Shaanxi Renovation and Construction Corp.	Will build 200-room low-rise hotel in Xi'an. $5.1 million (C$7 million). 5/86.
CRS Sirrine, Inc. (US)	Will supervise construction of Beijing Hotel Asia. 5/7/86.
GFIS (China) Ltd. (UK-HK joint venture)	Will provide hotel management services for Beijing Hotel Asia. 5/7/86.

Scientific Instruments

Opton Feintechnik GMBH Co. (HK)	Awarded contract to supply 141 sets of electronic balances for a health project financed by World Bank loan. $237,415 (DM540,000). 11/85.
Taiyo Koeki Co. (Japan)	Awarded contract for 503 microscopes for a health project financed by World Bank loan. $2.4 million (J¥417 million). 11/85.
Toko Bussan Co. Ltd. (Japan)	Awarded contract for 300 sets of instruments including incient-light microscopes for a health project financed by World Bank loan. $1.6 million (J¥275 million). 11/85.
Tokoyo Boeki Ltd. (Japan)	Awarded contract for 17 sets of electronic microscopes for a health project financed by World Bank loan. $1.9 million (J¥330 million). 11/85.
Westinghouse Systems Ltd. (UK)/CNTIC for Ministry of Water Resources and Electric Power	Signed contracts to design and supply energy-management systems for Beijing and Nanjing research institutes and to manufacture master and remote telemetry modules at Nanjing Power Automation Equipment Factory. $18 million (£12 million). 12/85.
Gerber Scientific Instrument Co. (US)/Changchun Automotive Research Institute	Sold precision drafting and video digitizing system. $450,000. 1/13/86.
Gerber Scientific Instrument Co. (US)/No. 2 Automotive Works in Shiyan, Hubei	Received order for precision drafting and video digitizing system. 1/13/86.
Laser Precision (US)	Signed agreement to sell spectroscopic and related equipment including transfer of technology and training. $1.1 million. 2/24/86.
Instron (UK)	Received order to supply 13 materials testing machines financed by World Bank loan for Chinese universities. $2.1 million (£1.4 million). 3/20/86.
Eaton (US)/INSTRIMPEX, China North Industries Corp., Shanghai Electric Apparatus Research Institute, and Xi'an Industrial Institute	Awarded contracts for electromagnetic interference data collection system and computer-aided electromagnetic susceptibility test systems. $2 million. 4/21/86.
Valhalla Scientific, Inc. (US)/CEIEC, Guangzhou branch	Signed contract to supply contact resistance digital ohmmeter. $4,506. 6/86.
Valhalla Scientific, Inc. (US)/CNTIC, Beijing	Signed contract to supply digital ohmmeters. $5,275. 6/86.
Valhalla Scientific, Inc. (US)/INSTRIMPEX, Beijing	Delivered digital multimeter. 6/86.
Valhalla Scientific, Inc. (US)/MACHIMPEX, Beijing	Signed contract to supply automated calibration system. $40,582. 6/86.
Valhalla Scientific, Inc. (US)/Shanghai Instrumentation Electronics Import/ Export Corp.	Signed contract to supply programmable precision DC voltage calibrator. $3,346. 6/86.

Shipping

Souter Ship Spares (UK)/ Chinese Ocean Steamship Co.	Received order to supply parts for auxiliary engine. 1/8/86.
Danfoss Systems Hydraulik (Denmark)/ Shanghai	Received orders to supply four remote control systems for hydraulic ballast and pumping equipment for ships. $596,232 (DK5 million). 4/12/86.
Mercury Marine Division of Brunswick Corp. (US)/ MACHIMPEX	Signed three-year contract to manufacture 7.5 and 9.8 HP outboard engines at Weimin Machinery Factory in Leping, Jiangxi. 5/7/86.
Canada Steamship Lines Inc./CITIC	Signed agreement to cooperate in developing business interests, particularly in dry bulk commodities transportation. 5/9/86.

Telecommunications

Japanese Electric Co. Ltd./Tianjin Post and Telecommunications Bureau	Signed letter of intent to install three 10,000-channel programmed telephone switchboards. 8/15/85.

Infa Corporation Ltd., agency of Japan Radio Company Ltd. (Japan)/ CITIC	Signed agreement to supply radio telephone production technology for Fushun Radio Factory in Liaoning. 9/85.
Nippon Antenna Co. (Japan)/Shanghai No. 36 Radio Factory	Signed agreement to provide rod antennae production equipment. 9/85.
Nippon Electric and Marubeni Corp. (Japan)/ Guangdong Posts and Telecommunications Bureau	Will construct microwave telecommunications network on Hainan Island. $2.7 million (J¥480 million). 11/85.
Television Technology Corp. (US)	Sold 50 1 KW low-power TV transmitters. $2.4 million. 12/85.
Telecom (Australia)/ Qingdao	Agreed to supply digital radio concentrator systems. $721,900 ($A1 million). 12/13/85.
Bell Telephone Manufacturing Co. SA (Belgium)	Will ship 30,000-line program-controlled switchboards for Chongqing, Zhengzhou, Beijing, and Taiyuan. $9.4 million (BF433.83 million). 12/16/85.
Bell Telephone Manufacturing Co. SA (Belgium)	Will supply transmission equipment systems to Zhengzhou, Nanjing, Chongqing, and Taiyuan. $5 million (BF229.52 million). 12/16/85.
Marubeni Corp. (Japan)/ MACHIMPEX, Guangdong branch	Signed agreement to set up three telephone exchanges technology centers in Guangzhou and to supply program-controlled telephone exchange equipment. 12/24/86.
Cable and Wireless Ltd. (US)/CNTIC	Awarded contract for telephone exchange system for Second Power Project financed by World Bank loan. $1.4 million. 12/25/85.
Telettra (Italy)	Awarded contracts to provide digital transmission network for Shanghai Post and Telecommunications Administration, a network of TV transmission signals for Hainan Island, and two digital radio communication stations for Ministry of Hydraulic Resources and Electrical Energy in Jiangxi, Anhui, and Henan. $3.2 million (Lire5 billion). Late 85.
Italtel (Italy)	LIC:Reached agreement to set up factory in Chongqing to produce pulse-code modulation transmission equipment and printed circuit board. $15 million (Lire30 billion). 1/13/86.
Scientific-Atlanta (US)/ INSTRIMPEX	Awarded contract to supply earth-station equipment for hydropower construction site near Beijing. $500,000. 3/86.
Motorola Inc. (US)/ Beijing Telecommunications Administration	Awarded contract to supply cellular radiotelephone system for Beijing. $3.7 million. 3/17/85.
L.M. Ericsson (Sweden)	Received orders to six AXE digital exchanges for Benxi, Fushun, Shenyang, and Shenzhen. $17 million. 3/24/86.
Phoenix Associates, Inc. (US)/Xinhua News Agency	Awarded contract financed by International Development Cooperation Agency to conduct feasibility study on upgrading information processing and communications systems. $350,000. 4/9/86.
Pacific Telesis International and Kaiser Engineers and Constructors, Inc. (US)/Ministry of Posts and Telecommunications	Signed agreement to provide consulting services and prepare feasibility study funded by TDP for modernization of Multi-Channel Carrier Equipment Plant in Meishan, Sichuan. 4/29/86.
Glenayre Electronics (Canada)/Beijing Power Supply Bureau	Sold two mobile radio-telephone systems. 5/86.
Hasler Holding AG (Switzerland)	Signed contracts to supply five telex exchanges for Shenyang, Nanjing, Tianjin, Wuhan, and Chengdu. 5/3/86.
NA (Belgium)/Chongqing Posts and Telecommunications Bureau	Will supply 7,000 units of program-controlled telephone exchanges. 5/5/86.
Intelsat (110-nation consortium)	Sold two TV transmission satellite transponders. 5/11/86.
Rediffusion Ltd. (HK)/ Crystal Palace, Mandarin, Guilin, and Kai Yue Hotels	Awarded contracts to supply and install public address and PABX telephone systems, closed circuit TV, and inhouse movie systems. 5/15/86.
American Electronic Laboratories, Inc. (US)/ Polytechnologies, Inc., Beijing	Signed contract to supply antennas. $2,850. 6/86.
Anaren Microwave, Inc. (US)/China Great Wall Industry Corp., Shanghai branch	Signed contract to supply microwave modulators. $2,790. 6/86.
Anaren Microwave Inc. (US)/Polytechnologies, Inc., Beijing	Signed contract to supply microwave couplers and dividers. $60,945. 6/86.
Avantek, Inc. (US)/ Polytechnologies, Inc., Beijing	Signed contract to supply microwave amplifiers. $5,658. 6/86.
K.L. Microwave, Inc. (US)/CATIC	Signed contract to supply microwave filters. $67,458. 6/86.
K.L. Microwave, Inc. (US)/Polytechnologies, Inc., Beijing	Signed contract to supply microwave filters. $18,480. 6/86.
Logimetrics, Inc. (US)/ INSTRIMPEX, Beijing	Signed contract to supply low power TWT amplifier. $18,485. 6/86.
M/A COM Microwave Power Devices, Inc. (US)/ CEIEC	Signed contract to supply microwave amplifiers. $132,250. 6/86.
M/A COM Microwave Power Devices, Inc. (US)/ INSTRIMPEX, Beijing	Signed contract to supply microwave amplifier. $24,760. 6/86.
Microwave Associates International (US)/ Polytechnologies, Inc., Beijing	Signed contract to supply microwave connector components. $181,900. 6/86.

Textiles and Textile Plants and Equipment

Craig-Crabtree (Contracts) Ltd., subs. of David Crabtree & Son Ltd. (UK)	Awarded contract to supply carpet-weaving equipment. $1.5 million (£ million). 1/21/86.
Simple Symbol (China) Ltd. (HK)/Beijing Silk Flower Factory	Put into operation non-woven fabrics production line. $200,000. 3/1/86.
NA (Italy) and NA (Japan)/Guiyang Stocking Factory, Guizhou	Shipped hose production line to produce polyamide and embroidered socks. 4/86.
Jumko Koshino Design Office Co. (Japan)/Beijing Garment Industry Co.	Concluded agreement to produce and market women's clothes in China, including supply of design technology and marketing and boutique-management know-how. 5/3/86.

Transportation and Transportation Equipment

Automotive Products PLC (UK)/Jiefang Automotive Associated Corp.	LIC: Signed contract to supply clutch design and production technology to new factory in Changchun, Jilin. 10/85.
NA (Japan)/CATIC	Will supply automobile sealing materials production line for Huaxi Hongyang Machinery Works, Guiyang. 11/85.
Toyota Motor (Japan)	Will establish training centers for engineers in Beijing and Guangdong. 11/85.
NA (Japan)/Tianjin Oil Pipe Factory	Signed contract to supply motor vehicle oil pipe manufacturing technology and equipment. 12/85.
NA (Yugoslavia)	Signed agreement to sell 500 tourist buses. $23 million. 12/85.
Iveco (Fiat) (Italy)/Nanjing Joint Automobile Industrial Corp.	Will provide technology and designs for new 60,000 trucks/year plant in Nanjing. $311 million (¥1 billion). 12/85.
Plessey Radar (UK)	Awarded contract to supply surveillance radar for Xiamen International Airport. $2 million. 12/14/85.
Stellmar Ltd. (UK)	Received order to supply 10,000 electric bikes. 12/30/85.
Normalair-Garrett (UK)/ CAAC	Received order to supply spare parts for 10 British Aerospace planes. $449,040 (£300,000). 1/15/86.
China American International Engineering Inc. (US-China joint venture)/ Wenzhou General Economic and Technical Development Corp.	Signed contract to complete phase I engineering for new Wenzhou airport and begin planning for phase II construction. 1/20/86.
Allen Group Inc. (US)	Signed agreement to supply automotive and truck testing equipment. 1/22/86.
London Regional Transport (UK)	Will sell 1,300 double-decker buses. 1/30/86.
Nordam (US)	Awarded contract for 80 airliner cabin interiors. $12 million. 2/86.
Nordam (US)	Awarded contract to produce commercial aircraft cabin. $8 million. 2/86.
Plessey Controls (UK)/ Beijing Research Institute for Traffic Engineering	Awarded contract to supply urban traffic control system. $1.5 million (£1 million). 2/13/86.
Hino Auto Body (Japan)/ Songling Machinery Corp., Liaoning	ASSEM: Signed technology transfer agreement for assembly of buses. 3/86.
Beardsley & Piper (US)	Received order to supply core-making systems for automotive foundry. 4/86.
Mikuni Corp. (Japan)/ CATIC	ASSEM: Will sign five-year contract to produce carburetors at Changchun plant. 4/12/86.
Sumitomo Corp. (Japan)/ CNTIC	Signed contract to sell 80 electric locomotives. $100 million. 4/23/86.
Airbus Industrie (France)/ CAAC, Shanghai branch	Received order for 2 passenger airliners. $100 million. 5/14/86.
Boeing Co. (US)/CAAC	Concluded contract for four 747s and four 767s. $620 million. 5/16/86.
United Technologies Corp. (US)/CATIC	LIC: Signed agreement to assemble Pratt & Whitney aircraft engines. 5/18/86.
British Rail (UK)	Received order to build 3 prototype passenger coaches. $7.5 million (£5 million). 5/19/86.

Miscellaneous

Exporama (UK)	Awarded contract to build negotiating kiosks in Guangzhou exhibition center. $149,680 (£100,000). 11/11/85.
TECO International Ltd. (US)/Fuzhou	Signed two contracts, one to manufacture decorator candles and pencils and one countertrade agreement to manufacture nails. 11/14/85.
West Nally Inc. and Arthur Young (US)	Hired to help China lobby for right to host Olympic games. 3/86.
Ministry of Labor and Social Security (Italy)/ MOFERT	Signed memorandum to set up Italian language training center at Beijing University. 4/2/86.
Buxbaum law firm (US)/ Guangdong Lingnan law office	Signed cooperation agreement for both parties to help in lawsuits, jointly undertake cases, or act as legal advisers. 4/8/86.
Mitsui Bussan Co. Ltd. (Japan)/Heilongjiang	Signed three-year cooperation agreement to develop petrochemical industry, tourism, and natural resources including coal. 4/8/86.
Coropian Co. (Switzerland)/Harbin Flax Co., Heilongjiang	Signed memorandum to assist in importing advanced technology and equipment and train personnel. 5/5/86.

中外贸易 JOINT VENTURES AND DIRECT INVESTMENT THROUGH MAY 31

Foreign Party/ Chinese Party	Arrangement/Value/ Date Reported

Agricultural Commodities

Yamanaga Aquatic Co., Ltd. (Japan)/Shenzhen Nanbao Fishery Development Co.	Established Sino-Japanese (Shenzhen) Sea Fishery Co. deep-sea fishing joint venture. $10 million. 10/85.
NA (US)/Guangxi Dapeng Industrial Trade Corp.	Reached agreement to jointly build Nanmei Rabbit Raising Co. Ltd. in Nanning to raise rabbits. $1 million. 11/85.
Golden Genes (US) and NA (HK)/Guangzhou	Shipped 370 dairy heifers as part of joint venture. 3/86.
Sapporo Breweries and Gunma Yuko Boeki (Japan)/CEROILS, Heilongjiang Bureau of Foreign Economic Relations, and Heilongjiang	Established Hong-Ri Enterprise 20-year joint venture to develop and sell agricultural products including seeds, livestock, and alcoholic beverages. $124,533 (¥400,000). (50-50). 3/86.
State Farms Bureau Pig Improvement Co. (US), subs. of Dalgety (UK), Sand Livestock (US), and NA (Philippines) / Guangdong Provincial Development Corp.	Established Guang Sand Puo Co. joint venture to improve pork production including shipment of 1,839 pigs. $8 million. (PIC:50%-SL:12.5%-P:12.5%-GPDC:25%). 4/2/86.

Chemicals and Chemical and Petrochemical Plants and Equipment

Quanfa Trade Co. (HK)/ Xinghua Plastic Factory in Zhaoyuan, Shandong	Reached agreement for 10-year joint venture to build factory designed to recycle 1,200 tonnes of waste plastics/year. $311,333 (¥1 million). (50-50). 8/85.
Shell Development Co. Ltd. (HK)/Shantou SEZ Development Corp.	Will jointly build oil and gas storage facilities, gas stations, and air-inflating and additive processing factories to produce and sell gasoline, diesel, kerosene, and lubricating oil. $19.2 million (HK$150 million). 10/85.
Shirasesei Corp. and Chori Corp. (Japan)/ Shenyang Agent Factory	Signed 10-year joint venture contract establishing Shenyang-Shirasesei Co. Ltd. to produce 1,000 TPY of metal surface treatment agents and other chemical products. $933,998 (¥3 million). 11/85.
Zhiyinghang Co. Ltd. (Singapore)/Shenyang Petrochemical Works	Signed joint venture contract establishing Shenxin Polyester Products Co. Ltd. $600,000. 11/85.
Borg-Warner Corp. (US)/ Shenzhen Gulf Petrochemical Industrial Corp.	Signed agreement to build plastics plant in Shenzhen. $60 million. 11/26/85.
Security Exchange Diversified Investment Associates (US)/Shenzhen Gulf Petrochemical Industrial Corp.	Signed agreement (pending Beijing approval) establishing joint venture to build 1.5 million TPY oil refinery in Dapeng Bay, Shenzhen SEZ. $150 million. 11/26/86.

Eastman Chemicals Division of Eastman Kodak Co. (US)/China National Tobacco Corp., China National Tobacco Jilin Corp., and Jilin Chemical Industrial Corp.	Signed letter of intent to form joint venture establishing 10,000 TPY cellulose acetate filter tow plant in Jilin. 1/2/86.
Tauran, Inc. (US)/Kaifeng Chemical Co. Construction	Established joint venture to set up fiberglass reinforced plastics plant. $90 million. 2/21/86.
KRW Energy System Co. (US)/No. 1 Heavy Machinery Plant of Ministry of Machine Building Industry, Qiqihar, Heilongjiang	Considering joint venture to promote coal-gasification technology transfer throughout China. 3/24/86.
Marine Shield Inc. (US)/Shantou SEZ Enterprises Development Corp. and Chemical Industrial Development Corp., Shantou	Signed agreement establishing joint venture to manufacture polyacrylic and emulsion paints. 4/4/86.
NCH Co. (US)/China Huayang Technical Trade Corp. and Dalian No. 2 Organic Chemical Industry Factory	Established Huayang-NCH Co. Ltd. 15-year joint venture to produce chemical products and apparatus. $500,000. (US:51%-HTTC:30%-DOCHIF:19%). 4/9/86.
Fluor Engineers Inc. (US)/SINOPEC	Established Sino-Fluor Engineers 16-year joint venture to contract petrochemical projects. $1 million. (50-50). 4/16/86.

Construction Materials

Raifuku Co. Ltd., Mitsutobira Co. Ltd., and Matsuda Co. Ltd. (Japan)/Tianjin Water Conservancy Engineering Corp.	Signed contract establishing Tianjin-Raifuku Co. Ltd. to produce construction-related products. 9/85.
(HK)/Tianjin Economic and Technological Development Zone	Will cooperate to build floor ceramic block factory. 10/85.
International Trading Co. (US)/Yinlong Corp. Ltd.	Will jointly build plastic door and window factory. $5 million. 10/85.
Seibu Department Stores Ltd. (Japan)/China National Arts and Crafts Import-Export Corp.	Signed joint venture contract establishing company to sell beds and other furniture to joint venture hotels and restaurants in China. $933,998 (¥3 million). (J:40%-PRC:60%). 12/28/85.
China Cement Co. Ltd. (HK)/Shenzhen Cement Co.	Signed coproduction agreement establishing Shenzhen Huaying Cement Co. Ltd. to manufacture concrete. $9 million. 2/6/86.

Consumer Goods

Dainissan Co. Ltd. (Japan)/Shanghai Furniture Corp., Shanghai Investment Corp., and Jiefang Furniture Factory	Signed joint venture agreement establishing Shanghai-Dainissan Furniture Co. Ltd. to produce 120,000 pieces of furniture per year. $1.5 million. 8/26/85.
Playmates (Holdings) Ltd. (HK)/Shenzhen	Established 5-year joint venture to build doll manufacturing plant. $384,369 (HK$3 million-first phase). 11/85.
Unitoys Company Ltd. (HK)/Guangzhou Xianda Light Industrial and Electronic Accessories Co. and China Light Industrial Economic and Technical Cooperation Co.	Guangzhou Unitoys Tooling Company Ltd. 11-year joint venture to manufacture moulds for plastic toys and other products went into operation. $1 million. 3/18/86.
Givaudan Dubendorf Ltd. (Switzerland)/China National Light Industry Foreign Economic and Technical Cooperation Corp., Beijing Liyuan Daily-use Chemicals Joint Co., and Beijing Liyuan Perfumery	Signed agreement to coproduce perfume at Beijing Liyuan Perfumery. $183,640 (SF350,000-equipment and parts). 5/5/86.
D. Swarovshi Co. (Australia)/Foshan Arts and Crafts Industry Corp.	Established Fosl Fashion Jewelry and Crafts Co. Ltd. joint venture to manufacture rings, earrings, necklaces, and bracelets. $5 million. 5/16/86.

Electronics and Electrical Equipment

Hong Kong Transistor and Electronics Corp./Shijiazhuang No. 11 Radio Factory	Signed 10-year joint venture contract establishing Photoelectricity Corp. Ltd. to import liquid-crystal display screen production line. $1.8 million. (HK:25%-PRC:75%). 9/85.
AVA International Co. Ltd. (HK)/Shanghai Broadcasting and TV Industrial Corp., Shanghai ITIC, and Shanghai Minhang United Development Corp., Ltd.	Established Shanghai United Electronics Engineering Corp. Ltd. joint venture to design, assemble, install, and debug electronic equipment; also offers technological consulting and maintenance services. 9/4/85.
Jinxing Tape Corp. Ltd. (HK)/Industrial Company of the Economic and Technological Development Zone, Ningbo, Zhejiang	Signed joint venture contract establishing Ningbo Mingjin Tape and Electronics Corp. Ltd. to produce and sell video, computer, and other tapes and magnetic discs. 9/24/85.
Acrobe Automation Technology Inc. (US)/CATIC	Signed joint venture agreement to manufacture industrial robots. $500,000. (50-50). 10/28/85.
Delishi Electronics Co. and Yida Computer Co. (HK)/Feilong Technology Development Co. in Gansu and Gansu Provincial Seismological Sciences and Technology Development Co.	Established 10-year joint venture to develop technology. $800,000. (HK:30%-PRC:70%). 11/85.
Zhaohua Electronics Co. Ltd. and Weikang Electronics Engineering Corp. (HK)/Fushun Hualian Computer Corp. Ltd., Shenyang Engineering College, and CNTIC, Dalian branch	Established joint venture to produce microcomputers in Dalian. 11/85.
Anritsu Electric Co. Ltd. (Japan)/INSTRIMPEX	Opened Anritsu Electric Product Service Center in Beijing. 11/12/85.
Asiagraphics Corp. (US)/Jiaotong University, Shanghai	Signed cooperative venture agreement to market computer software program, including jointly developing software products for Chinese language market. 12/9/85.
Yamatake-Honeywell (Japan) and Honeywell, Inc. (US)/China Electronic Technology Import/Export Corp., Beijing branch	Established service center for integrated control building systems. 1/86.

Electronics (Consumer)

Lotus Engineering International Corp. (US)/Ministry of Electronics Industry	Established joint venture to produce color TVs in Shenzhen SEZ. 12/18/85.

Engineering and Construction

Wakoboeki Co. (Japan)/Harbor Engineering Co.	Established Chuwa Trading Co. joint venture to strengthen economic and technical cooperation between two nations, including import and export of machinery, equipment, materials, and technology needed for construction of harbors and other projects. 3/9/86.
Lummus Crest Inc., subs. of Combustion Engineering, Inc. (US)/SINOPEC	Established Hua-Lu Engineering Co. Ltd. joint venture to provide feasibility studies, engineering design, and technical services for petroleum refining, petrochemicals, natural gas, and power industries. 4/15/86.
Daedalus Industries Ltd. (US-Italy joint venture)/Shanghai Pharmaceutical Industries Design Institute and Shanghai ITIC	Established Shanghai Daedalus Technical Consultancy Service Center offering technical consulting on industrial development of Shanghai Economic Zone. 4/24/86.

Finance

Peat, Marwick, Mitchell & Co. (US)/Nanhai East Oil Corp.	Agreed to set up Peat Marwick Guangzhou Corp. joint venture to offer audit, accounting, financial, and tax consulting services and to undertake feasibility studies. (50-50). 3/31/86.

Food Processing and Food Service

NA (HK)/Northeast China Jincheng Joint Industrial and Commercial Co., Dalian branch	Reached 18-year agreement to jointly build and run Jincheng Restaurant in Dalian. $35 million. 8/1/85.
NA (US)/Public-use Industrial Corp of Tianjin's Economic and Technological Development Zone and Tianjin Non-Staple Food and Seasonings Corp.	Signed contract establishing Tianjin Xinlu Foodstuff Corp. Ltd. to process farm products and other specialties. 9/14/85.
Tokyo Maruyichi Trading Co. Ltd. (Japan)/Dalian International Sailors' Club	Established Dongfang (Oriental) Foodstuff Corp. Ltd. joint venture to produce bread, Western-style cakes, and other pastries. 9/21/85.
Tourism Investment Co. Ltd. (HK)/Shanghai Exhibition Center	Established Friendship Restaurant joint venture. 10/85.
Nisshin Flour Milling Group (Japan)/Qingdao Foodstuffs Factory	Will establish joint venture to produce biscuits. $1.1 million (¥3.6 million). 11/85.
Zhuancheng Enterprise Corp. (HK)/Jilin Soybean Products Factory	Reached agreement to jointly produce bean curd. 11/85.
Brasseries Bronenbourg, Surete, Malteries Franco-Belge, and Banque Paribas (France)/CITIC, Zhejiang ITIC, Ningbo ITIC branch, and Ningbo Light Industry	Will establish joint venture Ningbo brewery to produce 50,000 tonnes of beer and 2,000 tonnes of malt per year. $24.3 million (¥78 million). (50-50). 11/7/85.
Annuss Sleisch Co. Ltd. (W. Germany)	Agreed to invest in slaughter house and meat processing center in Hebei. $1 million. 12/19/85.
Sara Lee Corp. (US and Dairy Farm Co. (HK)/ Ningbo Light Industry Corp., Ningbo Economic and Technical Development Zone, and CITIC	Established Ningbo Sara Lee Food Corp. joint venture to produce beverages for Chinese consumption and processed foods for export at plant to be built near Ningbo, Zhejiang. $5 million. (50-50). 3/17/86.
Blue Ribbon Beer (US)/ Shenzhen	Signed cooperation agreement to build 80,000 TPY Shenzhen brewery. $100 million. 4/86.
Shimizu Marine Products Co. (Japan)/Dalian Marine Fisheries Co.	Opened joint venture restaurant in Dalian. 4/8/86.
Spatenbraeu, Ingenieurbuero AMS Hamburg, Deutsche Entwicklungs Gesellschaft (W. Germany), and NA (HK)/NA	Established joint venture brewery in Wuhan, Hubei. $10.1 million (DM23 million). (S:5%-AMS:10%-DEG:13%-HK:28%-PRC:44%). 4/14/86.

Machine Tools and Machinery

Sunnen Products Co. (US)/Ministry of Aeronautics Industry	Established partnership to distribute precision sizing and hole finishing machines in China. $50,000. 11/85.
JGC Corp. (Japan)/Ministry of Light Industry	Signed agreement to promote exports of industrial plants to China and other countries. 12/28/85.
Resources Mark Ltd. (HK)/Wah-Shi Machine Co. Ltd., Shijiazhuang	Established 10-year joint venture to produce labeling machines. $250,000. (HK:40%-PRC:60%). 1/6/86.
Catec Industrial Ltd. (HK)/Yantai Standard Parts Factory, Changchun Machinery Factory under Ministry of Aviation Industry, and Shenzhen Aviation Standard Parts Co. Ltd.	Established Ya Dong Standard Parts Co. Ltd. joint venture to product 1,000 TPY of screws. $1 million. 3/86.
Chujo Electrical Appliances Co. and AKO Trading Co. (Japan)/Shanghai Running Water Co., Shanghai ITIC, and Shanghai Foreign Economic and Technological Cooperation Co.	Established Shanghai-Chujo Piping Co. joint venture to clean and coat pipes. 4/86.
Thorn EMI PLC (HK)/ Nanjing and Shanghai	Negotiating joint venture to manufacture gas meters and street lamp stands. 4/86.
HEM Inc. (US)/CITIC, Hunan Machine Tools Co., and Great Wall China Saw Co.	Signed joint venture and coproduction contract to sell industrial saw components and technology. $1 million. 4/1/86.
Marples International (UK)/Shenzhen Municipal Concrete Products Factory	Will establish Shenzhen City Sino–British Concrete Products joint venture to manufacture concrete drainage pipes in Shenzhen SEZ. $4.5 million (£3 million). 4/14/86.
Wong Ho Holdings Ltd. (HK)/Jingan Equipment Corp. and Shanshui Zhineng Electric Appliances Factory	Established Jingan Electric and Mechanical Appliances Tooling Co. Ltd. joint venture in Shanshui, Guangdong, to manufacture moulds for traffic signal outer casings and police radios. 4/18/86.
Coropian Co. (Switzerland)/Harbin Measuring and Cutting Tools Plant	ASSEM: Signed memorandum to jointly produce electronic digital display measuring tools. 5/5/86.
Power Corporation (Canada)/CITIC	Signed agreement to establish joint ventures in pulp, paper, and packaging projects in China and North America. 5/9/86.

Medical Equipment and Devices

International Hydron Corp. (US)/Shanghai Globe Biotechnology Develpoment Corp.	Established Shanghai Hydron Lens Corp. joint venture to produce contacts. 1/22/86.

Military Equipment

Cougar Marine (UK)/Chinese Navy	Signed agreement to design and coproduce high-speed patrol boats in Shanghai. 11/19/85.
Vickers Shipbuilding and Engineering Co. (UK)/ China North Industries Corp. and Yong Ding Machine Factory	Signed agreement to jointly develop armored personnel carrier. 1/8/86.

Metals, Minerals, and Processing Technology

Far East Machine Engineering Co. Ltd. (Singapore), Asada Machine Making Factory (Japan), Kyokudo Bank Co. Ltd. (Japan), and Baili Trading Corp. (HK)/Metallurgical Products Industrial Co. of Shanghai Metallurgical Bureau	Established Shanghai International Steel Products Co. Ltd. joint venture to process molded steel pipes and cold-shaped steel materials. 9/5/85.
NA (US)/Lanzhou Steel Works	Established joint venture to produce galvanized welded pipes. $2 million. 11/85.
Guanrong Co. (HK)/ MINMETALS, Heilongjiang branch	Signed letter of intent to jointly develop granite and marble resources. $660,000. 12/85.

Mining Equipment

Zeltweg (Austria)/ Huainan Coal Mining Machinery Plant	Will jointly produce 157 coal-mine tunnelers, beginning with supply of parts for 25 tunnelers, at Anhui coal mining/thermal power generation center. 3/31/86.

Packaging Equipment

NA (Australia)/ Guangdong Province Food Industry Corp. and Industrial Development Corp. of Guangzhou Economic and Technological Development Zone	Signed joint venture contract establishing Sino-Australian Canmaking Co. Ltd. to produce 7.5 million tin-plated cans and 200 million bottle tops annually. $2.5 million (¥8 million). (50-50). 12/30/85.
Ball Corp. (US) and MC Packaging Ltd. (HK)/ Guangzhou Beverage Industrial Co., China National Packaging Import/ Export Corp., China Light Industry Enterprise Ltd., and Industrial Development Co. of Guangzhou Economic and Technological Development Zone	Shipped 250 million can/year aluminum can-making line as part of joint venture. $7 million. 6/5/86.

Petroleum, Natural Gas, and Related Equipment

Japan Steel Pipe Corp./ Tianjin Shipping Industry Corp.	Established joint venture to manufacture and market steel structures for use in offshore oil and natural gas exploitation sites. 10/8/85.
Philips Petroleum International and Asia and Pecten Orient Co. (US)/ CNOOC	Signed contract for joint exploration and development of Pearl River Mouth Basin block in South China Sea. 12/17/85.
Chronar Corp.	Agreed as part of previous joint venture to construct and operate 10 TPY silane gas manufacturing facility in Harbin. 3/7/86.
Fluor Engineers, Ic. (US)/ SINOPEC	Signed joint venture contract establishing Sino-Fluor Engineers to build hydrocarbon tank yard for Daqing Oilfield. 4/15/86.
Smit-Lloyd BV (Netherlands)/Guangzhou Dredging Corp. and Guangzhou Consultants for Foreign Economic Relations and Trade under Ministry of Communications	Established Red Dragon Marine Services Ltd. joint venture to provide specialized marine support services to oil and gas exploration and production companies. (N:50%-GDC:40%-GCERT:10%). 4/26/86.

Pharmaceuticals

Lihua Trade Corp. (HK) and Andrew Feubo Co. (US)/Zinjiang Pharmaceutical Corp., Xinjiang Medicine and Health Products Import/Export Corp., and Xinjiang Bachu Licorice Root Cultivation Co.	Signed agreement to jointly establish licorice root cultivation experiment center in Xinjiang. $108,966 (¥350,000). (50-50). 7/85.
NA (US) and Genetic Scientific and Instrumental Co. (Canada)/Luoyang Prefectural Biochemical Pharmaceutical Factory, Henan and CITIC	Established Huamei Biological Engineering Co. to produce enzyme and other molecular biochemical products. 11/85.

Power Plants and Equipment

Chronar Corp. (US)/Harbin Electronic Instruments Co. and Harbin Steam Turbine Corp.	Signed joint venture agreement to build photovoltaic panel production facility able to generate one megawatt of electricity annually. $10 million. (US:28%-PRC:72%). 1/17/86.
Lamas Co. (Turkey)/ Chongqing International Economic and Technical Cooperation Co.	Signed joint venture agreement establishing company to produce small-sized hydro-turbine power generating sets. (T:51%-PRC:49%). 4/18/86.
Enerex International (US)/ Beijing Solar Energy Institute	Signed joint venture contract to manufacture solar heating exchangers. 4/21/86.
Hopewell Power (China) Ltd. (HK)/Shenzhen SEZ Power Development Co.	Established joint venture coal-fired power plant at Xiajiao, Shenzhen. $423 million (HK$3.3 billion). 5/12/86.

Printing Equipment, Publishing, and Broadcasting

Business Press International (UK)/China Prospect Publishing House	Established China Business Publishing partnership to develop series of technical magazines for circulation in China, including "Electronics for China." 11/85.
Far East Express Inc. (US)/ China Tourism Audio-Visual Publication Co.	Established China Media Services Ltd. joint venture to represent media products in US and coordinate and produce feature films in China and US. 11/85.
Vogel-Verlag's Exportmarkt Organisation (W. Germany)/Chinese Medical Association	Signed agreement to produce edition of Medical Focus magazine. 12/85.
(Japan)	Jointly produced "The Go Masters" movie. 12/20/85.
Art Film 80 (Yugoslavia)/ Guangxia Culture Corp., Shenzhen	Will coproduce "The Last of the Veteran Corps." 12/24/85.
Ministry of Foreign Affairs and Association of Printing and Converting Machinery Manufacturers (Italy)/China Printing Corp.	Established China-Italy Printing Training Center in Shanghai to offer training in offset, gravure, flexography, and screen printing. 3/86.
National Printing Converters and World China Trade/Tianjin No. 3 Paper Mill	Will supply technical equipment and training to paper mills and printing factories in Beijing and Tianjin as part of joint venture. 4/86.

Property Development

Mingyi Investment Co. (HK)/Beijing Daguanyuan Industrial Corp.	Signed 14-year agreement to establish Beijing Daguanyuan Tourist Center. $50 million. 8/25/85.
Antuo International Co. Ltd. and China Offshore Oil Service Co. Ltd. (HK)/ Shenyang Department Store and Liaoning Worker-Staff Technical Cooperation Service Center	Signed 15-year joint venture agreement to build Shenyang Zhongshan Building. $16.8 million (¥54 million). 9/10/85.
Geluo Company Ltd. (HK)/Suzhou Economic and Technological Development Corp.	Signed contract to jointly build Dongwu Hotel. 9/30/85.
Comprehensive Trading Co. Ltd. (Japan)/ Changping County Foreign Economic Relations and Trade Corp.	Signed contract to jointly build Ming Tomb Amusement Center. 10/8/85.
Club Corp. of Asia Ltd., subs. of Club Corp. (US)/ Donghu Hotel and Shanghai ITIC	Signed letters of intent for 20-year joint ventures to build and manage three golf and country clubs, two in Shanghai and one in Beijing. $20 million. 10/22/85.
Northern European hotel consortium led by Scandic Hotel Group (Sweden)/Shanghai Xinya Group	Signed letter of intent to build 3-star hotel in Shanghai. (NE:30%-PRC:70%). 11/85.
Cursor Co. Ltd. (HK)/ Friendship Hotel, Beijing	Signed 12-year joint venture contract to build recreational center at hotel. $8.2 million. (HK:56.5%-PRC:43.5%). 12/25/85.
United Investment Group (Thailand)/Shanghai International Exchange Service Corp.	Signed contract to jointly construct two buildings for Shanghai International Club. 12/25/85.
Daiwa House Industry Co. (Japan) and Westlake (US)	Established 15-year joint venture to build 28-story apartment building in Shanghai. (J:25%-US:25%-PRC:50%). 3/86.
NA (HK)	Will build 500-room joint venture hotel in Beijing. $55 million. 3/17/86.
NA (HK) and NA (Singapore)	Will build 450-room joint venture hotel in Guangzhou. 3/17/86.
NA (HK) and NA (Singapore)	Will build 400-room joint venture hotel in Chengdu. $34 million. 3/17/86.
NA (HK) and NA (US)/ Shanghai Science and Technology Association	Will build 380-room joint venture hotel in Shanghai. $40 million. 3/17/86.
Holiday Corp. (US)/Tian An Development Co. Ltd.	Signed joint venture agreement establishing Tian An Hotels International Ltd. hotel management company. (50-50). 3/19/86.
Golden Lion Resources Ltd. (US)/China Water Resources Enterprises Development Corp.	Signed letter of intent establishing Yantai Bohai Hotel Ltd. joint venture to build 50-room hotel in Shangdong and seafood processing plant to service company's hotels in China. $5 million (50-50). 4/4/86.
Holiday Inn (US)/Tibetan Tourism Co.	Signed agreement to jointly manage the Lhasa Hotel. 4/13/86.
Daiwa House Industry Co. (Japan)/CAAC	Established joint venture to construct and manage 18-story building in Dalian. 4/14/86.
Scan Dev A/S (Norway)/ Hua Yuan Economic Development Co.	Agreed to jointly establish Beijing Hua Wei Center Co. Ltd. to build Hua Wei Center in Beijing. $45 million. (50-50). 5/6/86.

Scientific Instruments

Riber, div. of Instruments SA (Italy)	Will open maintenance center in Shanghai. 4/11/86.

Telecommunications

OKI Electric Industries (Japan)	Established China Equipment Corp.-PKI Electric Facsimile Service Center. 11/85.
Furakawa Electric Company Ltd. (Japan)/Xi'an Electric Manufacturing Co. and Xi'an Cables Factory	Established 20-year joint venture company to manufacture 20,000 km/year of optical fiber cables. $5.7 milion (¥1 billion). (50-50). 4/15/86.
Mitel Corp. (Canada) and Tricom Systems (HK)/ Nanhai Oil Electronic Corp. and PT&T Industrial Corp. in Nantou, Shenzhen	Will establish joint venture to manufacture smal PABX systems. $50 million. (C and HK:25-30%-PRC: 70-75%). 4/28/86.

Textiles and Textile Plants and Equipment

Yishang Trading Co. Ltd. (HK)/Dazhuangzi Township Industrial Corp in Tianjin and Tianjin Economic Development Corp.	Established Tianjin Synthetic Lining Fabrics Factory joint venture to produce adhesive bonded fabrics. $2.7 million. 8/8/85.
Miller Group (US)/ Shandong	Established joint venture to produce children's apparel. 11/13/85.
Atlantic Corp. (US)/ Guyuan County in Ningxia	Concluded 15-year joint venture agreement establishing Ningyang Economic and Technological Development Corp. to build 1,000 TPY hemp textile mill, 5,000 TPY spinning wool and hemp textile mill, and 3,000 TPY oil refinery. $4.9 million. (50-50). 4/86.
Charming Shoppes Inc. (US)/Shantou SEZ Enterprises Development Corp. and Shantou SEZ Fancy Fashion Enterprises Co. Ltd.	Signed agreement establishing joint venture to manufacture women's apparel. (50-50). 4/1/86.
Junko Koshino Design Office Co. (Japan)/Beijing Garment Industry Co.	Planning to establish joint venture to provide fashion apparel to stores in China. 5/3/86.

Transportation and Transportation Equipment

Mitsubishi Motors (Japan)	Established depots for parts supply and repair service. 1/86.
Daihatsu Motor (Japan)	Established service facilities for Daihatsu vehicles in Beijing, Tianjin, Shanghai, Shenyang, and Chengdu. 3/86.
EAS Express Aircargo System Ltd. (HK)/Jingan Holding Co.	Established EAS Express Aircargo System (China) Ltd. joint venture. $117,000. (¥375,000). 4/23/86.

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