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# China's Civil Aviation: Expanding With Western Equipment



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A Research Paper

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October 1984

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# China's Civil Aviation: Expanding With Western Equipment

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A Research Paper

This paper was prepared by [Redacted]  
Office of East Asian Analysis. Comments and queries  
are welcome and may be directed to the Chief,  
China Division, OEA, [Redacted]

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**China's Civil Aviation:  
Expanding With  
Western Equipment** [Redacted]

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**Summary**

*Information available  
as of 1 October 1984  
was used in this report.*

The General Aviation Administration of China (CAAC) operates the national airline and has greatly expanded both domestic and international operations since the late 1970s. China now has aviation agreements with 46 countries, and CAAC has established business connections with more than 180 airlines throughout the world. CAAC will, however, soon face competition from several provincial-level airlines. [Redacted]

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Much of CAAC's expansion has come through the purchase of US passenger jets, and we believe China will continue to depend heavily on Western suppliers, at least until the 1990s when its aircraft industry may be able to serially produce a passenger jet. China's acquisition of foreign equipment is hampered, however, by overlapping organizational responsibilities and a continuing struggle among Chinese agencies for the final say in aircraft purchases. CAAC now operates some 20 different types of aircraft, many of them obsolete in terms of today's technology. [Redacted]

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We believe the Chinese are more likely to buy from foreign firms that already are purchasing Chinese-produced parts. Boeing, McDonnell Douglas, and Canadair all buy Chinese-produced parts and have in turn sold aircraft. Airbus Industrie recently signed a contract for production of parts in China, probably because it has failed to make a sale despite having taken its aircraft to China a number of times. [Redacted]

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CAAC apparently is well satisfied with US aircraft, and we believe the United States will remain the major supplier for large- to medium-sized passenger aircraft. Since the mid-1970s, the United States has been the sole supplier for the larger passenger jets. CAAC, however, probably will continue to maintain some diversity in its suppliers, if only to loosen its presently heavy reliance on US companies. [Redacted]

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By 1990, CAAC reportedly hopes to acquire about 100 additional long- to medium-haul aircraft and another 100 smaller feeder-type aircraft for domestic services. China recently ordered 25 Canadian-built feeder-type aircraft and reportedly is in the market for two more Boeing 747s for its new Australian route. China also has ordered another five medium-haul 737s for domestic operations. [Redacted]

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Opportunities for foreign sales of ground support equipment will also grow as Chinese airports and air traffic control facilities are upgraded to handle modern jets. Modernized traffic control facilities are being installed at key airports to make better use of CAAC's own diverse inventory and to provide more sophisticated control of the larger volume of modern jets using China's airspace. The Chinese claim to have developed a number of international-class airports, but Beijing and Shanghai are the only two airports now served by scheduled foreign airlines. Only about 35 of China's 100 airfields now can handle CAAC's medium-to-large transports. US companies continue to supply both airport and navigational equipment, but the Chinese also are approaching other foreign firms for assistance. Most recently, CAAC has requested bids for airport surveillance radars from Japanese and British firms 

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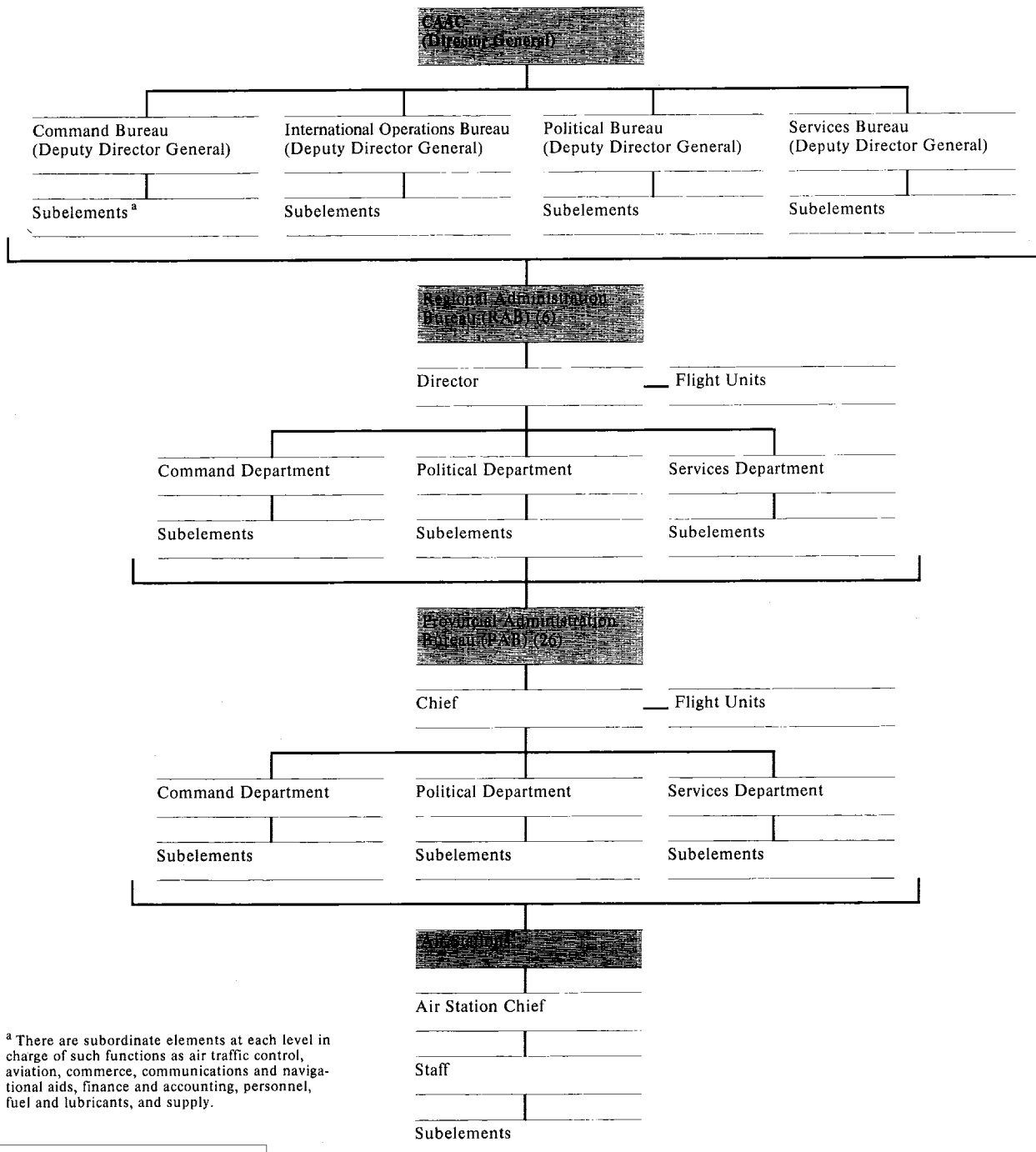
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Figure 1  
Organization of the General Administration of Civil Aviation of China (CAAC)



<sup>a</sup> There are subordinate elements at each level in charge of such functions as air traffic control, aviation, commerce, communications and navigational aids, finance and accounting, personnel, fuel and lubricants, and supply.

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**China's Civil Aviation:  
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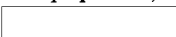


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China's civil air sector has displayed phenomenal growth, especially since the late 1970s. By purchasing long- and short-range jet aircraft from abroad and signing a number of air agreements, the General Aviation Administration of China (CAAC) has expanded the total route mileage, both domestic and international, by more than nine times since 1970. CAAC has also upgraded selected air terminals and runways to handle larger jet aircraft, growing numbers of foreign and domestic travelers, and a larger volume of air cargoes.



Nevertheless, CAAC's aging fleet—more than half of its aircraft are over 20 years old—and its underdeveloped ground facilities are hard put to meet the increased demand for air services. For instance, the Chinese admit that only 70 percent of the passengers who want flights between Beijing and Guangzhou can be accommodated during the peak tourist season—August to October. This paper reviews the current status of China's aviation establishment and its attempts to meet these problems with additional purchases of Western aircraft and ground equipment, particularly from the United States.



**Organization and Structure of the CAAC**

Civil aviation in China is administered by the General Administration of Civil Aviation of China. Formerly known as the Civil Aviation Administration of China (CAAC), the organization was renamed in 1962, but the acronym was retained. Until 1980, CAAC operated as a special agency of the State Council and was charged with maintaining and operating China's civil air transport system. In 1980 CAAC was designated an independent enterprise—ostensibly free from military control—with no change in its duties and responsibilities. In addition to passenger, freight, and industry support operations, CAAC is also responsible for navigational aids and airport facilities, a function similar to that of the US Federal Aviation Administration (FAA).



The central authority for CAAC administration and operation is the Main Bureau, located in Beijing. The Main Bureau constitutes the decisionmaking and staff body for CAAC Director General Shen Tu and his

deputy director generals (see figure 1 and inset, "CAAC Officials Most Visible on the International Scene").<sup>1</sup>



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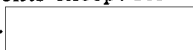
The Main Bureau is the top administrative level of CAAC. Four bureaus—titled *Command, International Operations, Political, and Services*—are charged with overseeing the major functions of CAAC. Each, in turn, has subordinate offices. The offices are in charge of air traffic control, aviation, commerce, communications and navigational aids, finance and accounting, personnel, POL, and supply. They are aligned under the four main bureaus and oversee the main functions of CAAC.



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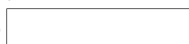
At the second level of administrative control are the Regional Administration Bureaus (RABs). There are six regional bureaus—each encompassing three to six provinces—headquartered at Beijing, Lanzhou, Guangzhou, Chengdu, Shanghai, and Shenyang. Each RAB is responsible to the Main Bureau for all CAAC activity within its jurisdiction. The regional organizations have departments and subelements that correspond to the Main Bureau elements except for the International Operations Bureau.



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The third level is the Provincial Administration Bureau (PAB). The headquarters for the 26 provincial bureaus are usually located at the provincial or autonomous regional capital cities. The provincial bureaus are subordinate to their respective regional bureaus and structurally are carbon copies but on a more limited scale. Wherever the two are colocated, the provincial bureau is usually only a shadow organization, existing on paper but with its functions carried out by the regional bureau.



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<sup>1</sup> The specific assignments of the deputy director generals are unknown, but Hu Yizhou, Guo Hao, Yan Shixiang, and Wang Yamin were identified as deputy director generals as early as July 1983. The deputy director title also is used in some subelements



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### CAAC Officials Most Visible on the International Scene

*Shen Tu, CAAC director general since January 1978, has been with the CAAC and its predecessor organization for 30 years. Under his leadership, the CAAC has changed from a semimilitary organization to a largely civilian airline company. According to a US Embassy official, he has skillfully cut deadwood and appointed competent administrators, actions which have resulted in handsome profits.* [redacted]

*Shen has been involved with China's civil aviation since the early 1950s. He was appointed deputy director of the CAAC in 1962, a post he held until his disappearance during the Cultural Revolution (1966-69). In mid-1973 he reappeared and was again named deputy director of the CAAC. Shen was elected a member of the Central Committee of the Chinese Communist Party in September 1982. A year later he became China's permanent representative to the International Civil Aviation Organization (ICAO).* [redacted]

*Throughout his career, Shen has been active in negotiating international civil air agreements. He has led numerous aviation delegations abroad and has visited the United States several times. In 1979, Shen represented China at the signing of an agreement calling for flights between the United States and China. He has hosted US civil aviation delegations and has been associated with China's purchase of US-built commercial aircraft. In addition, he has publicly advocated increased cooperation between the United States and China in aerotechnology.* [redacted]

*In early May 1983 he led an official delegation to South Korea to negotiate the release of a hijacked CAAC aircraft. Those negotiations constituted the first official contact between the two countries since 1949. In October 1983 Shen publicly expressed China's willingness to allow Taiwanese civil airliners*



Shen Tu

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*to use the mainland's coastal international airports in emergencies. He further stated a willingness to negotiate a civil air agreement with Taiwan.* [redacted]

*Li Shufan, director of the CAAC's International Affairs Department, is one of China's most visible civil aviation officials. He has served as principal negotiator for the CAAC during bilateral talks with the United States, Hong Kong, and Japan. In February 1980 he represented China during talks with the United States for the purchase of a US air traffic control system. Later that year he headed negotiations to establish direct air service between the United States and China. In February 1983, when China threatened to withhold Pan American Airways landing rights if that carrier resumed service to Taiwan, he was the chief CAAC spokesman during its negotiations with Pan Am. He also led similar negotiations between CAAC and Northwest Orient.* [redacted]

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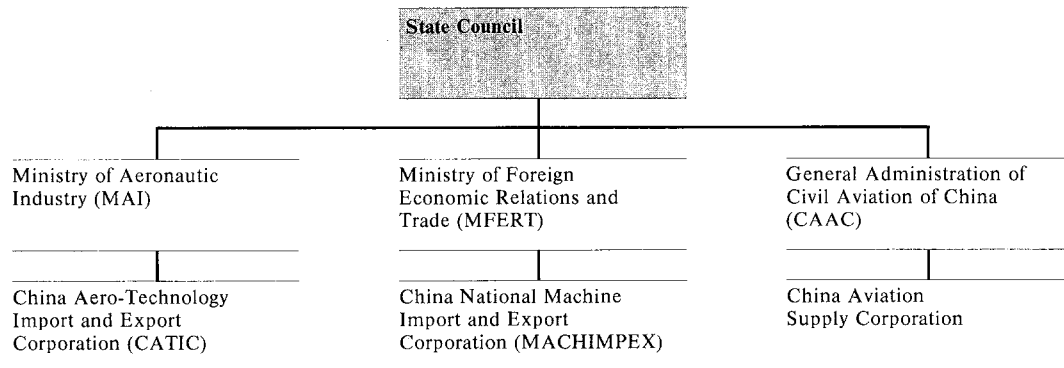
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**Figure 2**  
**China: Ministries and Their Subsidiaries Involved**  
**in Acquiring Civil Aviation Equipment**



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The lowest level of administrative control is the Air Station. This is headed by the Air Station chief who, with his staff, is responsible to the PAB. The Air Station is the firstline working level of the CAAC for day-to-day CAAC operations. Pilots, crews, dispatchers, air traffic controllers, mechanics, load masters, and other personnel are assigned at the Air Station level. The Air Station chief and a small staff handle administrative and support functions. [REDACTED]

#### **Principal Organizations in China's Civil Aviation Industry**

There is considerable overlap in responsibilities and a high potential for bureaucratic conflict among the organizations involved in China's civil aviation industry (see figure 2). Foreign aerospace companies dealing with China have found organizations struggling among themselves and lines of responsibility unclear. For example, one company's most recent sales contract was negotiated with China Aviation Supply Corporation (CASC) where previous sales had been signed with China National Machine Import and Export Corporation (MACHIMPEX). [REDACTED]

MACHIMPEX is under the Ministry of Foreign Economic Relations and Trade (MFERT) and is now the chief negotiator for purchases of civil aircraft and associated equipment. The Ministry of Aeronautic Industry (MAI) controls most processes associated with the civil aircraft industry from basic research through the manufacturing stage. The China Aero-Technology Import and Export Corporation (CATIC) operating under the MAI is involved with joint ventures and offset agreements with foreign companies for production of aircraft parts and components. It also plays a role in aircraft purchases. CASC acts as the purchasing agent for civil aircraft parts and equipment, navigational aids, and at times for aircraft for the CAAC. [REDACTED]

There have been unconfirmed reports that China has established a group under the State Council to coordinate China's civil aviation development. The new group—initially identified as the Civil Aviation Production Leading Group—is to reconcile the interests

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of MACHIMPEX, CATIC, and CASC while attempting to develop domestic production capabilities and match them with end user needs. Past purchases of aircraft have been delayed because of conflicts of interest between domestic producers and the end user. For example, CAAC has sought the outright purchase of aircraft, particularly the Boeing 700 series, to increase flight operations. Domestic aircraft producers, however, are primarily interested in improving production capabilities and have pushed for the McDonnell Douglas 80 series for which they have been negotiating for coproduction since 1978. [redacted]

### Civil Aviation Network

During the early 1970s, China began to expand and reequip its domestic and international civil air services, in keeping with China's increased political and economic contacts with foreign countries. Until 1973, CAAC's international routes were confined to the USSR, North Korea, North Vietnam, and Burma. Beginning in 1974, when China joined the International Civil Aviation Organization (ICAO), foreign service has steadily increased. China now has aviation agreements with 46 countries, and CAAC has established business connections with more than 180 airlines throughout the world. Only 16 foreign airlines, however, are serving China, and most are funneled into Beijing (see table 1). CAAC, on the other hand, provides regular service to 23 cities in 19 countries, including Hong Kong.<sup>2</sup> Its service stretches from Japan across the Pacific to the United States, and from South Asia to Eastern and Western Europe and to Africa (see figure 3). On 5 September, CAAC began a weekly 747 service to Sydney, Australia, that significantly increases the length of its international routes. The length of international and domestic routes now totals about 376,000 kilometers. Within China, approximately 180 domestic routes—up from 75 routes in 1971—cover some 150,000 km and connect 80 cities. CAAC operates more than 670 scheduled flights a week, including flights established to accommodate the rapidly expanding number of foreign visitors. [redacted]

<sup>2</sup> CAAC serves Los Angeles, New York, and San Francisco in the United States, and Nagasaki, Osaka, and Tokyo in Japan. CAAC service to other countries is limited to a single city. [redacted]

**Table 1**  
**Foreign Airlines Serving**  
**Chinese Airports**

Beijing Airport	Shanghai Airport	Guangzhou Airport
Aeroflot	Cathay Pacific Airways	None—serves as an alternate for some Hong Kong-bound flights.
Air France	Japan Airlines Company	
British Airways	Northwest Orient Airlines	
Ethiopian Airlines	Pan American	
Iran National Airlines		
Japan Airlines Company		
Lufthansa		
Pakistan International		
Pan American		
Philippines Airlines		
Qantas		
Thai Airways International		
Tarom-Romanian Air Transport		
Swissair		

### Airport Expansion

To support CAAC's expansion, China gradually is improving its airport facilities and associated services.<sup>3</sup> China has about 100 airfields, but only about 35 can handle CAAC's medium-to-large transports. Most of the remainder have thin macadam or small, sod runways. The Chinese claim to have developed a number of international-class airports, but Beijing and Shanghai Airports are the only two used by international carriers. Northwest Orient has approval to provide service to Guangzhou but has not begun service. Beijing, the largest of the international airports and the hub of the aviation network, rebuilt its terminal, enlarged one runway, and added another to support a rise in wide-body jet traffic. Beijing handles most of the international flights—some 70 a week.<sup>4</sup>

<sup>3</sup> Although CAAC owns and operates the larger civil airports, the Chinese Air Force owns and operates many of the airports into which CAAC has scheduled operations. [redacted]

<sup>4</sup> According to the *China Daily*, the busiest airports are Beijing, Shanghai, and Guangzhou, which together handled almost 90 percent of all domestic and international traffic. [redacted]

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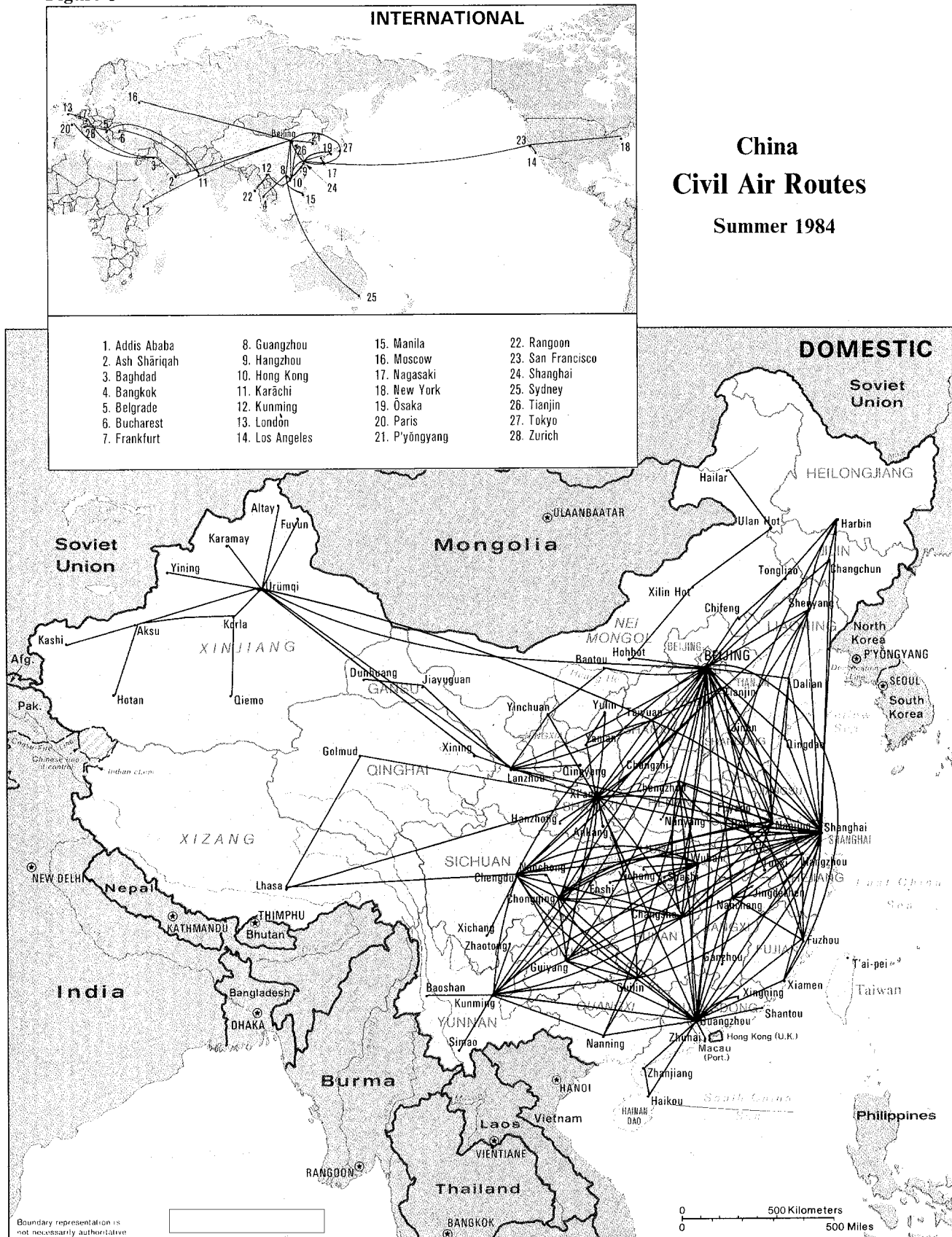
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Figure 3



**A Chinese Fire Drill**

CAAC has only recently begun to improve its ability to deal with aircraft fires, and then only at its major airports. For example, CAAC has vastly improved Beijing Airport's firefighting capabilities through the purchase of US-made firefighting equipment. Earlier this year, CAAC reportedly gave a well-rehearsed drill of the new equipment extinguishing a simulated fire on board a 707. The plane—half filled with CAAC employees—was foamed down while employees were "smoothly" evacuated before the invited representatives of every foreign airline serving Beijing. In a similar drill conducted two years earlier, firehoses on Chinese-made equipment leaked in everyplace but where they should have, [redacted]

CAAC has yet to conduct an unrehearsed fire drill. The interest in Western firefighting equipment probably stems from a 1980 aircraft fire which CAAC was ill equipped to handle—reportedly the firetruck had neither foam nor water in its tank. [redacted]

Shanghai and Guangzhou Airports—primarily used by foreign businessmen and tourists—have been only slowly developed in response to growing needs. Guangzhou serves mainly as a feeder and alternate airport for Hong Kong. In the far west, Urumqi—an international-class airport in Xinjiang Province that now handles no foreign carriers—has been expanded to handle large jet aircraft. [redacted]

Additional airports for handling wide-body jets are scheduled for expansion, are under construction, or have been completed recently. The airports at Tianjin and Hefei have been upgraded to serve as alternate airports for Beijing and Shanghai, respectively. Upgrading of runways for jet traffic has been completed at Chengdu, Guilin, and Wuhan, and new jet airports have been built at Harbin and Xiamen. Airports at Changsha, Dalian, Hohhot, Kunming, and Shantou are also to be upgraded for larger jetliners (see inset, "A Chinese Fire Drill"). [redacted]

**Air Traffic Control**

Air traffic control is generally adequate for the amount of daily traffic now handled, which is less than 1 percent of the volume handled daily in the United States. However, modernized traffic control

facilities are being installed at key airports to make better use of CAAC's current inventory and to provide more sophisticated control of the larger volume of modern jets using China's airspace. At its most modern airports—Beijing, Shanghai, Guangzhou—China has installed conventional avionics and flight control equipment capable of handling current traffic volume: low-frequency, nondirectional beacons (NDBs); very-high-frequency omnidirectional range stations (VORs); instrument landing systems (ILSs); distance measuring equipment (DME); and precision approach radars. [redacted]

Most large airports have a precision approach radar, but only the largest have an instrument landing system. At the smaller airports, rudimentary en route navigational aids and airport control facilities now generally limit operations during periods of darkness and bad weather. Those airports having no electronic glide slope provide VOR and NDB signals for use in standard instrument approach procedures. [redacted]

CAAC is modernizing and expanding its air traffic control system with air surveillance and computer-automated radars purchased from Western sources. French-made Thomson-CSF LP-23 and TA-10 radars have been installed along the Beijing-Shanghai air corridor. The Chinese reportedly have had a number of problems with the French equipment and are looking elsewhere. Terminal and en route automated systems along the Beijing-Shanghai corridor provide tracking data such as altitude, ground speed, and identity of transponder-equipped aircraft. An automated TPX-42 supplied by the AIL Division of Eaton Corporation, a US company, provides automated radar service at the Guangzhou Airport. According to trade journals, the Chinese are negotiating for four more AIL systems for installation at interior airports. [redacted]

CAAC is just beginning to upgrade and expand its limited air navigation network. Some 70 NDBs and about 18 VORs are the backbone of the basic air navigation system. The sparse network of VORs—some 95 percent less than the number available in the US network—partly explains the Chinese use of five-man flightcrews that include a navigator and radio

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**Table 2**  
**CAAC's Civil Aviation Fleet <sup>a</sup>**

Aircraft	Inventory	On Order	Aircraft	Inventory	On Order
<b>Total</b>	<b>508</b>	<b>36</b>	<b>Propellers (continued)</b>		
<b>Jets</b>	<b>49</b>	<b>30</b>	<b>Soviet</b>		
<b>American</b>			AN-2/Colt	320	
B-747SP	4		AN-12/Cub	2	
B-747-200 Combi	1		AN-24/Coke	29	
B-737-200	5	5	LI-2/Cab	12	
B-707-320B	4		IL-12/Coach	4	
B-707-320C	6		IL-14/Crate	43	
MD-82	2		IL-18V/Coot	10	
Cessna Citation II	3		<b>Helicopters</b>	<b>29</b>	<b>6</b>
Gates Learjet 36A	1		<b>American</b>		
<b>British</b>			Bell-212	9	
Trident 2E	18 <sup>b</sup>		Sikorsky-76	2	
<b>Canadian</b>			Sikorsky-70C		... <sup>d</sup>
CL-601/Challenger		25	<b>French</b>		
<b>Soviet</b>			Alouette-3	NA	
IL-62/Classic	5		Super Puma SA-332		6 <sup>e</sup>
<b>Propellers</b>	<b>430</b>		<b>German</b>		
<b>American</b>			BO-105	2	
Beechcraft Super King 200	3		<b>Soviet</b>		
<b>Canadian</b>			MI-4/Hound	16	
<b>Chinese</b>					
Y-5	... <sup>c</sup>				
Y-7	1				
Y-8	2				

<sup>a</sup> Trainer aircraft are not included in inventory.

<sup>b</sup> The Chinese have another 16 Tridents that alternate between military and civilian control.

<sup>c</sup> The Chinese reported producing some 700 Yun-5s that are being used for agricultural support, cargo, passengers, and aerial ambulances. We do not know how many of these 700 are actually flying under CAAC control.

<sup>d</sup> Although 24 helicopters were ordered by civilian agencies, we believe most, if not all, will be operated by the military.

<sup>e</sup> Ordered for VIP transport, but we do not know if they will be operated by civilian, military, or Public Security Bureau personnel.

operator. In many cases, VOR signals only are receivable in aircraft operating above 20,000 feet, even along major airways. Aircraft operating at lower altitudes, especially in the interior, depend on NDB equipment.

**Civil Aircraft Fleet**

The Chinese penchant for multiple suppliers and earlier reliance on the USSR have given CAAC one

of the world's most diverse air fleets (see table 2). CAAC had 157 aircraft in its passenger fleet in August 1984 and over 400 smaller aircraft in specialized aviation services. The fleet uses some 20 different types of aircraft, many of them obsolete in terms of today's technology. CAAC service began with Soviet

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aircraft; AN-12s, AN-24s, IL-14s, IL-18s, and IL-62s still constitute a large portion of its passenger fleet. Through 1970 the fleet consisted mostly of piston-driven propeller aircraft. By 1971 China had acquired the Soviet IL-62, CAAC's first long-range jet aircraft. At the same time, China acquired its first medium-range British-built Trident jet. By the late 1970s, the Chinese had acquired more than 30 Tridents, mainly for domestic flights, and 10 long-range Boeing 707s, mainly for use on the international routes. [redacted]

CAAC expansion during the 1980s has been largely with US-built passenger jets. In 1980, the Chinese acquired three long-range wide-body Boeing 747SPs in an attempt to compete with foreign airlines. Since then, CAAC has acquired another 747SP and a 747-200 Combi. In 1983, CAAC began purchasing shorter range aircraft—five Boeing 737s and two McDonnell-Douglas MD-82s. Another five Boeing 737s are to be delivered by March 1986. However, the addition of these new aircraft has not led to the rapid retirement of the older Trident or Antonov aircraft as expected.<sup>5</sup> Many of these aircraft are still used because of the low utilization rate of Western aircraft, in part attributable to a lack of qualified crews. [redacted]

[redacted] language problems are making it difficult to shift flight and maintenance crews from the older Soviet aircraft to new Western aircraft. Aircraft crews, long proficient with Russian from handling Soviet aircraft, now find it difficult to familiarize themselves with English manuals. Moreover, older aircraft still are needed because traffic volume over the past few years has grown faster than new aircraft acquisitions. [redacted]

CAAC apparently is well satisfied with the performance of US aircraft. Since the last British Trident was delivered in the mid-1970s, the United States has been the sole supplier for the larger passenger jets.

<sup>5</sup> [redacted] aircraft have been retired, crashed, or sold since January 1983—six Viscount-843s, seven LI-2s, and two Tridents. The Tridents were lost in 1983 accidents—one charged to error by a military air traffic controller and the other was hit by a military fighter aircraft while taxiing. [redacted] the Chinese will phase out the Soviet IL-62s, a 162-passenger transport purchased in 1971, because CAAC does not intend to replace the wings when the aircraft reach the 15,000-hour wing replacement ceiling. The IL-62 was designed for military requirements where flight frequency is much lower than in airline use. Two of the five IL-62s will hit the 15,000-hour ceiling before the end of 1984. [redacted]

CAAC has told the Chinese press that about 100 long- to medium-haul aircraft and another 100 smaller aircraft are needed for expanding domestic service between 1983 and 1990. [redacted]

[redacted] CAAC will soon need to acquire two more 747s for the new Australian service. And last July, [redacted] China ordered 25 of the 19-passenger Challenger 601 twin-jet Canadian aircraft for delivery beginning in September 1984. [redacted]

In addition to passenger-cargo aircraft, the Chinese use over 400 aircraft in specialized aviation services. Only a few US-built aircraft have been purchased for this sector. Cessnas and Beechcrafts are being used to flight-check navigational aids and for aerial and geological survey work. A few US-built helicopters provide air service to offshore drilling rigs. The Soviet AN-2, and its Chinese copy, the Y-5—a single-engine general purpose aircraft—are used for agricultural support and as aerial ambulances as well as for ferrying passenger-cargo traffic into small airfields. The lone Y-7, a Chinese version of the Soviet AN-24 twin-turboprop transport, began passenger operations out of the Shanghai Bureau earlier this year. We expect that more of the 50-seat Y-7s will be added to the CAAC's inventory as they come off the newly opened production line at the Xian aircraft factory. Two newly acquired four-engine turboprop Y-8s are being used as multipurpose cargo carriers on the Lhasa-Chengdu run. [redacted]

**Traffic and Operations**

Although it provides a number of specialized services, civil aviation's contribution to the total transport sector is minor when compared with rail, water, and road services. The volume of cargo is small, and passengers are mostly government officials and foreign visitors. China has, nevertheless, expanded cargo and passenger volume on both domestic and international flights (see table 3). From 1975-83, air freight turnover has risen at an average annual rate of 18.2 percent. Between 1980 and 1983, freight turnover increased at a near steady rate, averaging 17.8 percent a year—from 140 million ton-kilometers to 229 million ton-kilometers in 1983. During 1981 and 1982, passenger turnover had grown at a slightly faster rate of 22.5 percent until leveling off last year.

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**Table 3**  
**China: Civil Air Performance**

	Freight Turnover (million ton-kilometers)	Passenger Turnover (billion passenger-kilometers)
1975	60	1.5
1976	70	1.6
1977	80	1.8
1978	100	2.8
1979	120	2.5
1980	140	4.0
1981	170	5.0
1982	200	6.0
1983	229	5.9

Passenger turnover in 1983 was down about 100 million passenger-kilometers, largely as a result of domestic travel restrictions imposed after a CAAC aircraft was hijacked to South Korea. With the lifting of restrictions, passenger traffic in 1984 is expected to resume its rapid increase. At least part of this growth in passenger transport can be attributed to the increasing number of tourists since 1978 (see table 4). Some of the freight increase is a result of China's recent entry into the field of containerized air shipments (see inset, "Growing Number of Tourists").

The present CAAC fleet is underutilized. Chinese aircraft average about three hours a day in the air; in most industrial nations, the average is about eight hours a day per plane.

CAAC is beginning to make better use of US-built aircraft.<sup>6</sup> Management practices, as well as the small number of qualified aircrews, probably account for the underutilization rate rather than a poor maintenance program.

**Customer Service.** Sudden flight cancellations and difficulty in making reservations are the most frequent criticisms of CAAC. Foreign travelers frequently encounter crowded flights with passengers

<sup>6</sup> For December 1983 through March 1984, the daily utilization rate for US aircraft was—five hours for 747s, nearly four hours for 707s, and three hours for the new 737s. By August 1984, the 737s were averaging more than five hours in the air.

**Table 4**  
**Tourists Visiting China<sup>a</sup>**

Thousand persons

	1978	1980	1983
<b>Total</b>	<b>1,809</b>	<b>5,703</b>	<b>9,500</b>
Overseas Chinese <sup>b</sup>	1,580	5,703	8,627
Foreigners	229	529	873
Of which:			
Japanese	24	72	265
Americans	11	39	168
Australians	NA	NA	54
Britons	NA	NA	50

<sup>a</sup> Excluding official, professional, and scientific delegations; also businessmen visiting trade fairs.

<sup>b</sup> Including visitors from Hong Kong and Macau.

occupying makeshift seats or, at the other extreme, flights that are canceled because of too few passengers. Darkness and bad weather also produce unscheduled stopovers, because CAAC plays it safe with its relatively sparse network of navigational aids. CAAC is attempting to correct both problems with modern equipment. The most recent effort is the introduction of computerized reservations for the busy Beijing-Shanghai route. The Beijing-Shanghai air corridor also is the only corridor with computerized radar tracking. CAAC plans to computerize reservations on other major domestic routes within the next year and, eventually, the whole system.

Computerized reservations probably will not add much to CAAC's service. Many of its problems stem from its regional bureaus; these jealously control ticket sales for flights originating in each region. Passengers must pick up their tickets in person and round trip tickets are unheard of. CAAC also is not overly concerned with in-flight service. There are no full meals on domestic flights, only snacks. Service on CAAC's international flights is not much better. Although Beijing Airport's in-flight kitchen prepares quality meals under a venture with a Hong Kong firm, CAAC purchases half-price meals—20 yuan each—of much lower quality than do the flights of

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**Growing Number of Tourists**

Since opening the gates to tourism in 1978, the tourist industry has become one of the most rapid growth industries in China—earning some \$900 million in 1983 and greatly increasing the demand for air transport. Between 1978 and 1983, the total number of overseas Chinese and foreign tourists increased more than five times. The number of foreign tourists actually grew less rapidly—3.8 times—largely because of a shortage of hotel rooms (see table 4). According to a report on tourism approved by the State Council, China plans to attract 3 million foreign visitors by 1990. The large number of Australian tourists accounts for China's interest in opening air service to Australia. [redacted]



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Flightcrews have little opportunity to exchange experiences or broaden themselves because they tend to remain in the regional bureau with which they started. Probably because of the shortage of flightcrews, crews are almost never transferred to a different region. Even the temporary loan of an exceptionally skilled pilot to another region for a couple of weeks proved to be a very difficult task for one foreign company to arrange. The practice of typing flightcrews according to the range of the aircraft they have previously flown also reduces the flexibility of crew scheduling. For example, a 737 captain does not become a 747 copilot as could be the case with a US airline. In China, flightcrews selected for training in the 747 had operated the long-range 707, and those selected for the short-range 737 had previously flown Tridents or Antonovs. [redacted]

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other international airlines using the same kitchen.



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[redacted] In-flight entertainment, however, has improved significantly, [redacted] passengers no longer encounter a stewardess leading sing-alongs of Chinese revolutionary songs as was the case in 1979; but, as other travelers report, they still engage in swatting flies. [redacted]

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**Flightcrews.** Flightcrews tend to disregard standard safety checks and drills common to Western airline operations. Instructions on fastening seatbelts and not smoking during takeoff and landing frequently are not given on domestic flights. Pamphlets on procedures to be used in case of emergency generally are missing. Moreover, safety checkouts of the flightcrews and periodic emergency procedure drills for the flight and cabin crews are not mandatory and are not regularly conducted. [redacted]



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**Maintenance.** Although the pool of trained manpower is small, CAAC capabilities for performing routine maintenance could support additional flight time. Scheduled overhauls on jet-powered aircraft present no problem because they are generally contracted out to foreign-based firms. For instance, scheduled overhauls for Boeing 707 aircraft have been done under contract by a Hong Kong-based firm since 1973. CAAC, however, is attempting to upgrade its engine maintenance capabilities and is actively seeking the necessary equipment and test stands. The CAAC is also anxious to obtain a US Federal Aviation Administration repair station certificate. Without the certificate, CAAC maintenance crews cannot maintain US-flag aircraft serving China (see inset, "Airworthiness Certification"). [redacted]

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Maintenance on the older piston-engine aircraft and turboprop aircraft is done domestically. Chinese maintenance crews for 747s and 737s have had some training in the United States. Chinese maintenance crews reportedly are not as well prepared as most

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**Airworthiness Certification**

Since 1980, the Chinese have repeatedly approached US officials and company representatives for assistance in meeting the basic requirements for a bilateral airworthiness agreement. China's aircraft manufacturers particularly want FAA-type certification to make their products more attractive on the world market. Under a 1982 revision in FAA policy, Chinese manufacturers are exporting more complex parts and components to US aircraft companies. Previously only the simplest parts that could be easily inspected were being shipped to the United States. The long-term goal is to produce a passenger aircraft under certification for the world market. To this end, the Chinese are negotiating the coproduction of a feeder-type aircraft with two US companies. We believe the Chinese aircraft industry would greatly benefit from the experience of either US company, much more so than if they tried to upgrade a domestically produced aircraft such as the Y-12 for certification. [redacted]

The Chinese have found the certification process much more complex than they first envisioned. There currently is no FAA-type organization in China. And within the various Chinese organizations involved in aviation, no organization has the authority to override another and to ground aircraft that are deemed unsafe. [redacted]

students upon arrival at the training site. But with dedication and hard work, they get top grades and leave with a good working knowledge but limited experience. [redacted]

Moreover, maintenance personnel trained in the United States on earlier purchased 707 aircraft have not reappeared as maintenance trainees for 747 or 737 aircraft. Each purchase thus produces a new set of trainees with only a limited exposure to high-tech aircraft. This lack of experience can cause problems as in Guangzhou, where all the wheels on the new 737s recently had to be replaced because of excessive corrosion. Chinese maintenance personnel had been

polishing the wheels with a stone device which removed all the anticorrosion materials that had been applied at the factory.

[redacted]

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CAAC has four maintenance bases for its fleet of more than 500 aircraft. Beijing, its largest base, is responsible for maintaining the larger jets—mainly 707s, 747s, Tridents, and the Soviet IL-62s. Chengdu takes care of medium-sized aircraft and two 707s. Shanghai does the maintenance on the MD-80s and two 707s in addition to smaller aircraft such as the AN-12s. The new 737s flying routes in southeast China are maintained in Guangzhou. [redacted]

**Prospects**

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China will have to depend on foreign aircraft suppliers for continued expansion of commercial aviation until its aircraft industry has a jet passenger plane in serial production. To this end, China's aircraft industry is attempting to improve its capabilities through agreements with foreign firms, especially with US aircraft manufacturers for whom some Chinese aircraft plants are producing parts. The Chinese continue to express a preference for US-built passenger aircraft over those manufactured by other foreign firms. However, China probably will continue to maintain some diversity in its suppliers if only to loosen CAAC's presently heavy reliance on US companies. In general, we believe the Chinese are more likely to buy from foreign firms that already are purchasing Chinese-produced parts. Boeing, McDonnell Douglas, and Canadair all buy Chinese-produced parts and have in turn sold aircraft. Airbus Industrie recently signed a contract to produce aircraft parts in China. [redacted]

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Airbus is probably following US and Canadian examples in its efforts to crack the Chinese market. Airbus has taken its aircraft to China a number of times and has given Chinese aerospace officials the "royal treatment" on European visits, but it has yet to make an aircraft sale to the Chinese.

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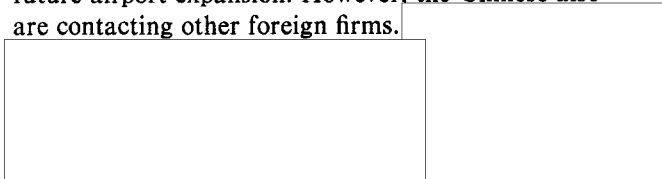
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China has always constructed its own airports and until recently only made limited purchases of foreign navigation equipment. The new Xiamen Airport was

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constructed with the help of a long-term loan from Kuwait and the installation of navigational aids supplied by Northrop's Wilcox Electric Division. In addition to the ILSs, DMEs, and radars already purchased from US companies, the Chinese are looking at more US-built navigational equipment for future airport expansion. However, the Chinese also are contacting other foreign firms.



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According to the Chinese press, CAAC will soon face competition from several provincial airlines. New airline service is planned for Fujian, Guangdong, Guangxi, Shanghai, and Xinjiang Provinces.

CAAC already has delegated authority to selected political administrators at local levels to negotiate joint-venture agreements for aircraft services and even for the purchase of aircraft. Press reports indicate local officials in Fujian Province already have organized a joint venture with Hawaiian-based Aloha Airlines and signed an agreement with Philippine Air Lines for flights between Manila and Xiamen where a new international-class airport was completed recently. Wuhan City and the Chinese Air Force's Wuhan Command began operating a one-aircraft cargo airline between Wuhan and Guangzhou on 8 September. This joint military-civilian airline plans to establish passenger service both domestically and on international routes. While these policies of decentralization may make CAAC more efficient by providing competition, we suspect the effort will further complicate negotiations between Western suppliers of aircraft and equipment and Chinese aviation entities.

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