

1.3.5 TRANSPORT NETWORK

1. AIR TRANSPORT

1.1 THE POSITION FOR THAILAND/SOUTHERN THAILAND IN THE INTERNATIONAL AIR TRANSPORT NETWORKS

Thailand is located in the center of the Southern East Asia region and leading the other countries in this region in terms of economic activities. Also in the international air transport networks, the Bangkok International Airport has played an important role as a major airport following Hong Kong and Singapore in the South East Asia region.

The Bangkok International Airport is not only the gate way of Thailand but also the transit airport connecting Far East and Middle East/Europe. In fact, the transit passenger ratio is the highest among the major airports in the South East Asia region. Looking into the linkage with other countries in terms of the number of seat available of direct flights, Bangkok has large capacity routes to/from Hong Kong, Singapore and India which takes less than 4 hours from Bangkok by air, followed by to/from Japan which is further than Malaysia, Philippines and Taiwan, etc. and takes about 6 hours from Bangkok by air. Therefore, considering the time distance, the connection of air transport between Thailand and Japan is relatively stronger than that between Thailand and the other countries.

In the Southern Thailand, there are two international airports such as Phuket and Hat Yai. The Phuket Airport has direct routes to/from Hong Kong, Penang and Kuala Lumpur, while the Hat Yai Airport does those to/from Penang, Kuala Lumpur and Singapore. Chiang Mai and Khon Kaen which is the regional centers in the Northern and the Northeastern Thailand respectively don't have direct routes to/from the cities in southern countries such as Kuala Lumpur/Singapore, so the airports in Southern Thailand have played an important role in the relations to Malaysia/Singapore.

FIG. 1-15 AIR TRAFFIC NETWORK IN THAILAND

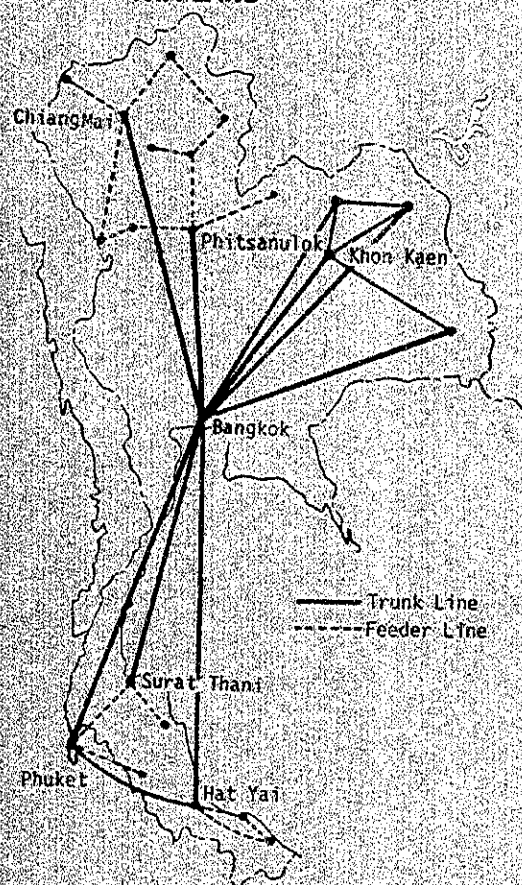
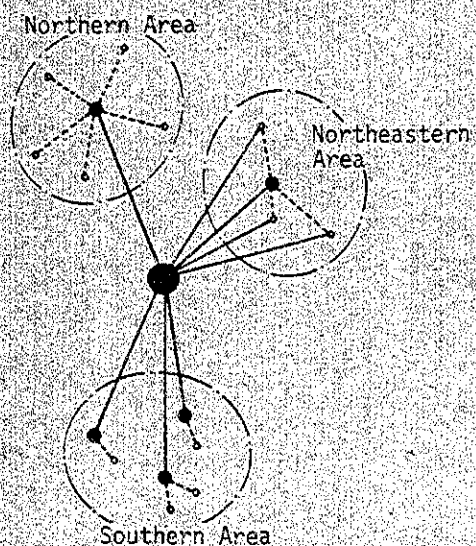


FIG. 1-16 THREE SUB-NETWORK SYSTEMS/CLUSTERS IN THAILAND



1.2 CHARACTERISTICS OF THE SOUTHERN THAILAND REGARDING TO THE AIR TRANSPORT NETWORK AND AIR TRAFFIC FROM A GENERAL VIEW OF WHOLE THAILAND

1) AIR TRANSPORT NETWORK

The air traffic network in Thailand is shown in Fig. 1-15, and the characteristics of air transport network in each region are summarized as follows.

a. Northern region

Chiang Mai and Phitsanulok have direct route to/from the Bangkok International Airport, and are linked radially with other local airports.

b. Northeastern region

Each airport has direct routes to/from the Bangkok International Airport, and Khon Kaen which is the regional center in this region has the route to/from other local airports.

c. Southern region

Three major airports, Phuket, Hat Yai and Surat Thani, have direct routes to/from the Bangkok International Airport. Whereas the other local airports don't have direct routes to/from Bangkok, and are linked only with these three major airports.

Compared with the characteristics of each region, it is identified that the air transport networks in the Northern and the Northeastern regions have been completed with a shape of "hub and spoke" and "direct connection" respectively. On the other hand, the air transport network in the Southern Thailand is divided into three sub-network systems/clusters because of an incomplete network among three major airports as shown in Fig. 1-16.

2) AIR TRAFFIC

a. Passenger

Viewing the transition of the number of passengers carried at the major airports by region as shown in Fig. 1-17, passengers have steadily increased at all airports except Hat Yai. During the last few years, the number of passengers carried at the Hat Yai Airport has stagnated and rather decreased. In opposition to the Hat Yai Airport, the number of passengers carried at Phuket Airport which locates in Southern Thailand same as Hat Yai has increased at the highest rate among five airports.

Meantime, with regard to monthly variations of passengers carried at each airport as shown in Fig. 1-18, the numbers of passengers at the Chiang Mai and the Phuket airports intensely vary from one month to another because of the seasonal fluctuation. On the other hand, that at the Hat Yai airport has not changed through the year.

b. Load Factor

Monthly variation of load factor at each airport is shown in Fig. 1-19. The load factor at every airport in the Southern Thailand is higher than that of the Northern and the Northeastern Thailand. Particularly at the Phuket Airport, the load factor during the tourist peak-season becomes more than 80% and almost 100% in December, therefore, evidently the seat capacity is short.

FIG. 1-17 NUMBER OF PASSENGERS CARRIED AT THE MAJOR AIRPORT

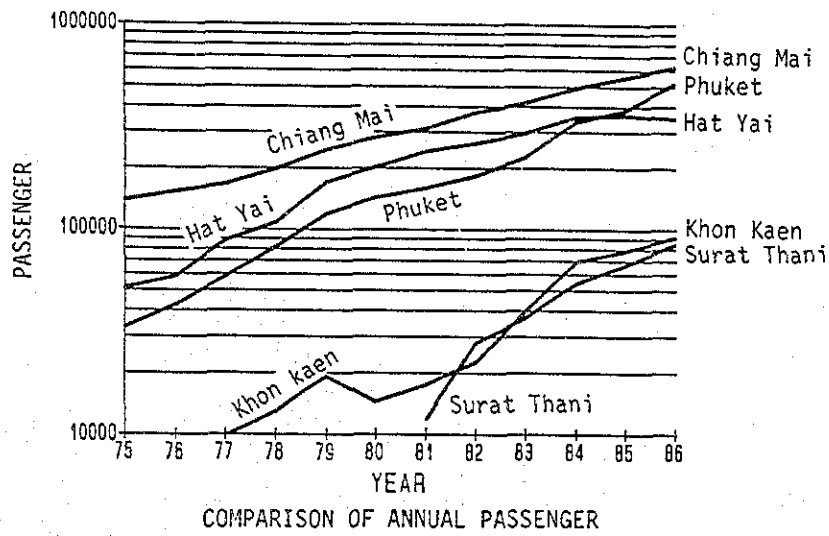


FIG. 1-18 MONTHLY FLUCTUATIONS OF PASSENGERS

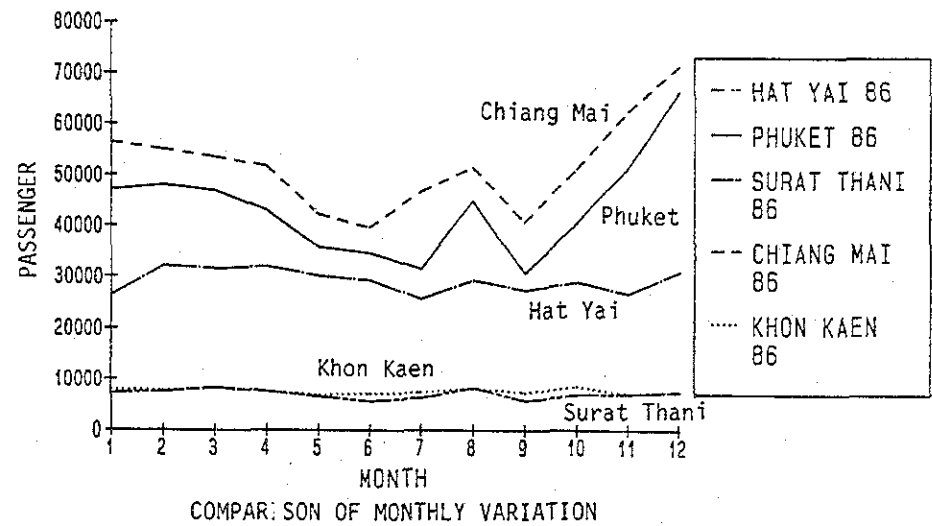
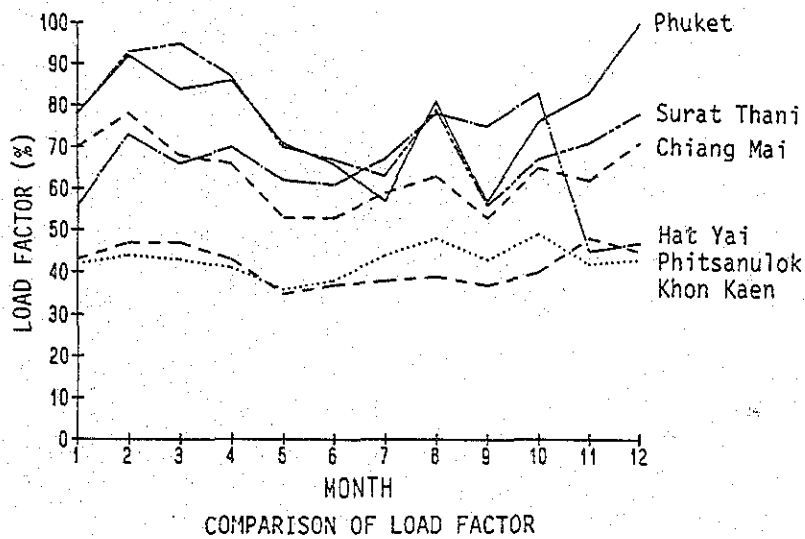


FIG. 1-19 COMPARISON OF LOAD FACTOR



1.3 PROBLEMS ON AIR TRANSPORT NETWORKS IN SOUTHERN REGION

The air transport network in the southern region consists of seven airports, of which three major airports such as Phuket, Hat Yai and Surat Thani have direct routes to/from the Bangkok International Airport, while the other four local airports do not have direct routes to/from Bangkok. Each local airport is linked only with one of three major airports.

In such a situation, as the relations among three airports are incomplete, the air transport network in the southern region is considered not to be an ideal figure. It is required that the air route between Hat Yai and Surat Thani is reopened immediately.

On the other hand, there are some aerodromes in the southern region which do not have air routes, namely, Ko Samui, Krabi and Ranong. To open these aerodromes in operation of feeder services by small aircraft becomes to strengthen the air transport network in the southern region. Actually, the Bangkok Airways has a plan for feeder services based on a concept of a supplement of air routes operated by the Thai Airways, and these three aerodromes is included in the air route network Bangkok Airways intends to operate.

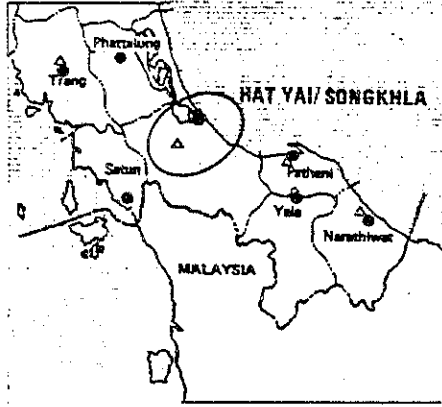
1.4 ON-GOING PROJECTS FOR AIRPORT

1) PHUKET

At the Phuket Airport, extension of runway from 2,500 m to 3,000 m long is underway now, and at the same time, an Instrument Landing System (ILS) facilities such as the off-setted localizer antenna and the glide path antenna, and the lighting facilities including Simple Approach Lighting System (SALS) will be installed. Simultaneously with the runway extension project, the new terminal facilities including new apron with two parking spaces for B747, the new terminal building and the new car parking are being constructed.

Above mentioned on-going project will be completed in 1989, and the Airport Surveillance Radar (ASR) will be installed in 1989 as well.

By completion of these on-going projects, it will be able to operate some type of B747 aircraft, and to increase the air transport capacity.



2) HAT YAI

There is non on-going project for the Hat Yai Airport. It seems that the existing facilities can respond to the demand in near future. The radar system will be installed after 4 or 5 years.

3) SURAT THANI

At the Surat Thani Airport, the construction of overlay on the existing facilities including runway, taxiway and apron will be carried out from 1988 to 1990, in consequence, it will be able to operate A310 aircrafts. At the same time, the taxiway connecting runway and apron will be newly constructed. Secondary Surveillance Radar (SSR) will be installed in 1989.

1.5 NOTICEABLE MATTERS FOR TOURIST TRANSPORT

- 1) Up-Grading of airport facilities at Samui, Krabi and Ranong aerodromes is required to realize the operation by the Bangkok Airways which has a policy to contribute for tourism and supplement the air routes being operated by Thai Airways.
- 2) By the merger of the Thai Airways International and the Thai Airways, aircrafts will be utilized efficiently. In consequence, the airliner will be able to correspond to a certain extent to the seasonal demand variation.
- 3) Landing to the Phuket Airport by Japanese airliner contributes to attract Japanese Tourists.
- 4) Charter flights from West Germany, Switzerland and Austria etc. to Phuket Airport operate every week in tour season, and contribute to increase tourist into Phuket.

1.6 CONSIDERATION AND THE REQUIRED PROJECT IN FUTURE FOR TOURISM

a. Phuket Airport

Safety of transportation greatly influence tourism. The projects for improvement of safety at the Phuket International Airport are required next to the on-going projects according with increasing demand. The projects for widening of the runway strip and installing the localizer antenna on the center line of the runway, which cost about 180 million Baht in rough estimation excluding earth work for getting obstacles out of the localizer course. These are considered to be indispensable for the Phuket International Airport to become a first-class international airport.

b. Surat Thani Airport

The Surat Thani Airport is going to be improved for the operation of A310 aircraft as major domestic airport in a few years. By the operation of A310 aircraft, it is required to construct new passenger terminal building respond to more peak hour demand, and it costs about 40 million Baht in rough estimation.

c. Hat Yai Airport

There is no on-going project for the Hat Yai Airport, it seems that the existing facilities can respond to the demand in near future. However, it is required to install the radar for the safety of operation.

d. Feeder Airport

For the improvement of accessibility to the tourist resort which has not sufficient means of transportation, it is required the improvement of existing aerodromes such as Ko Samui, Krabi and Ranong for realization of feeder service operated by small aircraft.

e. Ko Samui Airport

The Ko Samui Airport is required to meet the ICAO standard in order to improve service and safety for tourist. Besides, it is required to construct and install the related facilities such as drainage facility for flood control, navigational aids, passenger terminal building and access road etc. These projects cost about 20 million Baht excluding navigational aids in rough estimation, and about 40 million Baht for navigational aids. With improvement at the Ko Samui Airport, the air transport feeder network is strengthened on account of operation among Ko Samui, Surat Thani and Phuket, and thereby leading to expansion of tourist's mobility.

f. Krabi Airport

As the Krabi Airport has the runway of 1,200 m long and only 12 m wide, it is required to widen the runway to 30 m wide at least for safety of aircraft operation. This improvement costs about 5 million Baht in rough estimation, and is useful for strengthening of the air transport feeder network system in Southern Thailand.

FIG. 1-20 AIR ROUTE OPERATED BY THAI INTERNATIONAL AIRWAYS

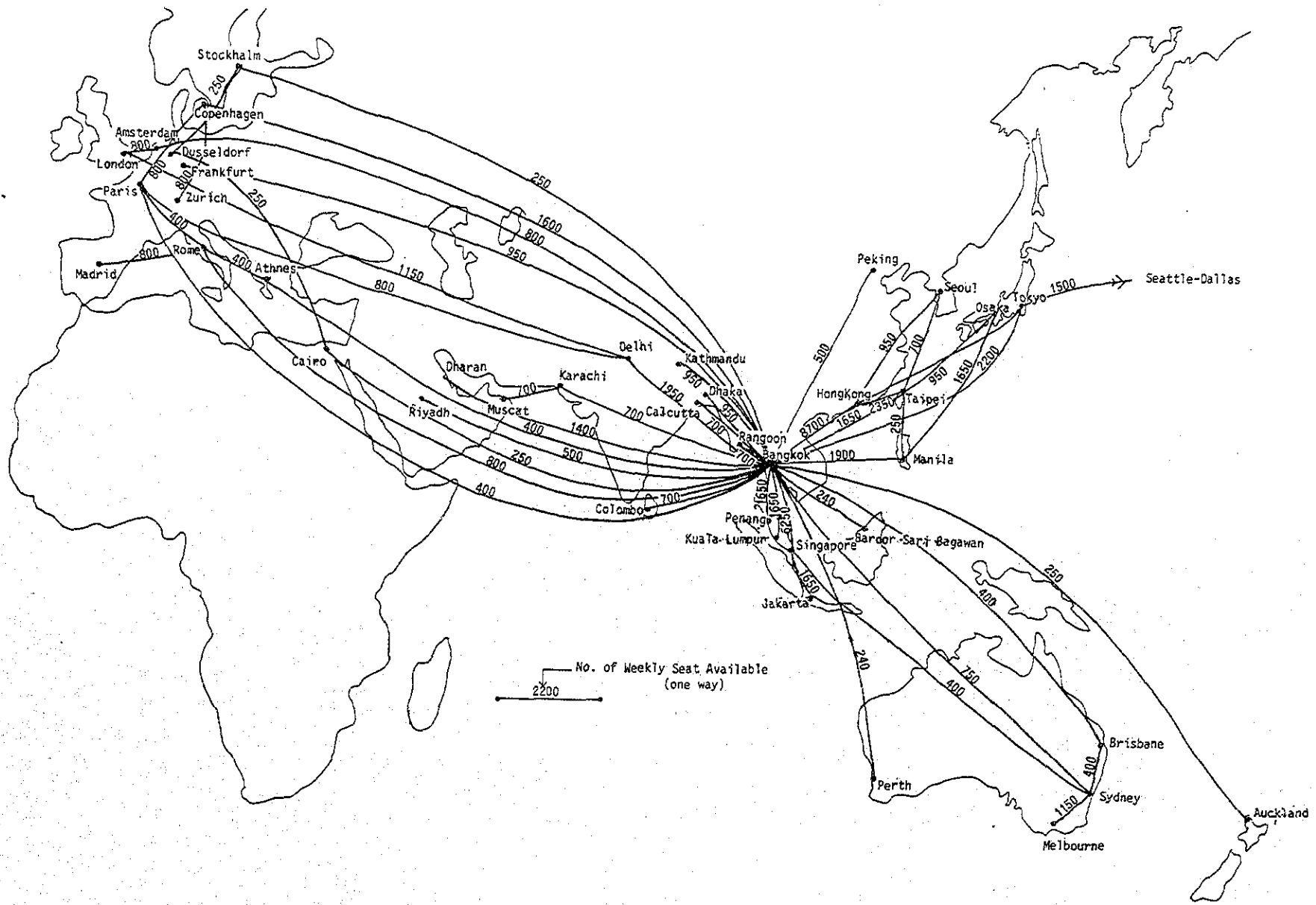
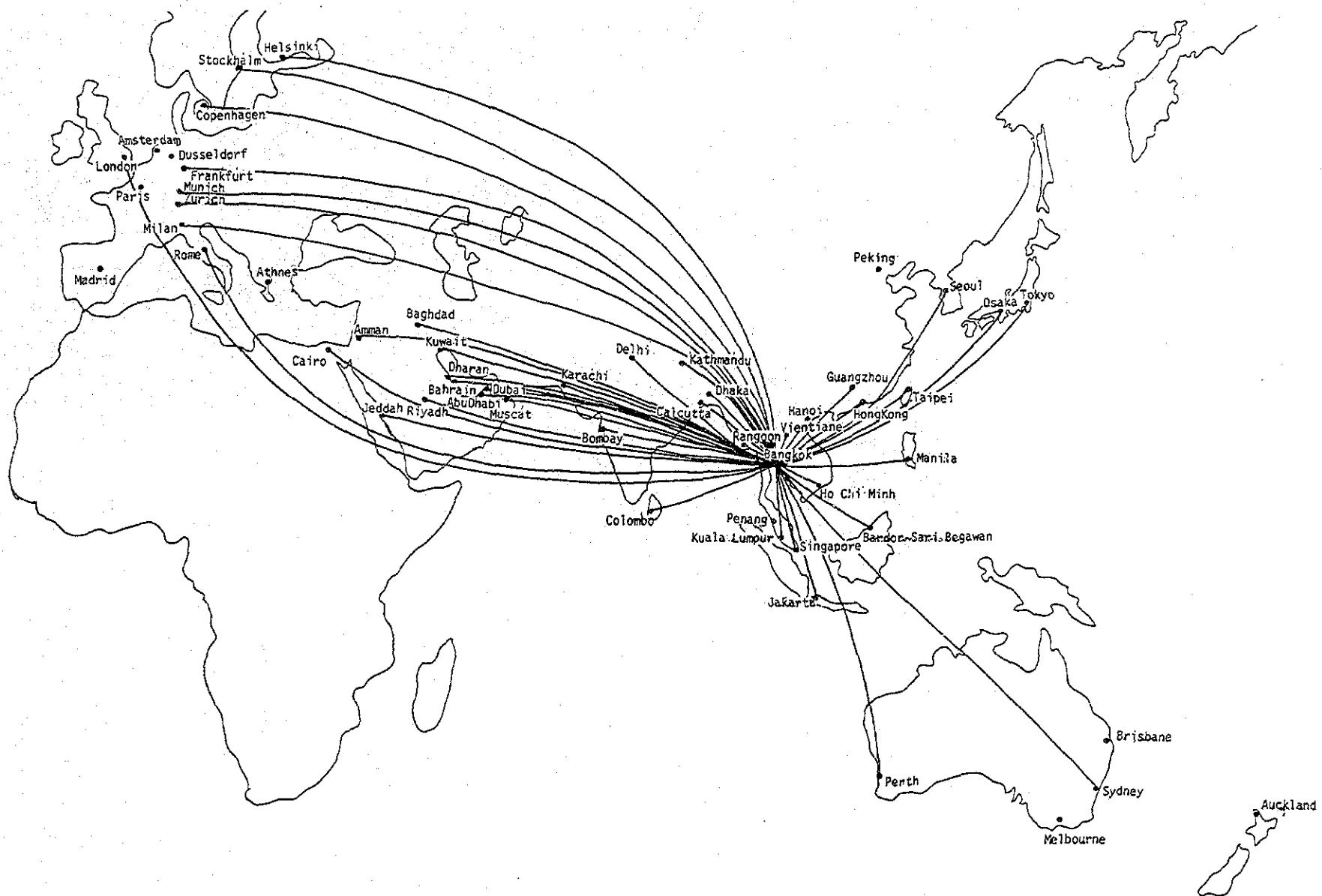
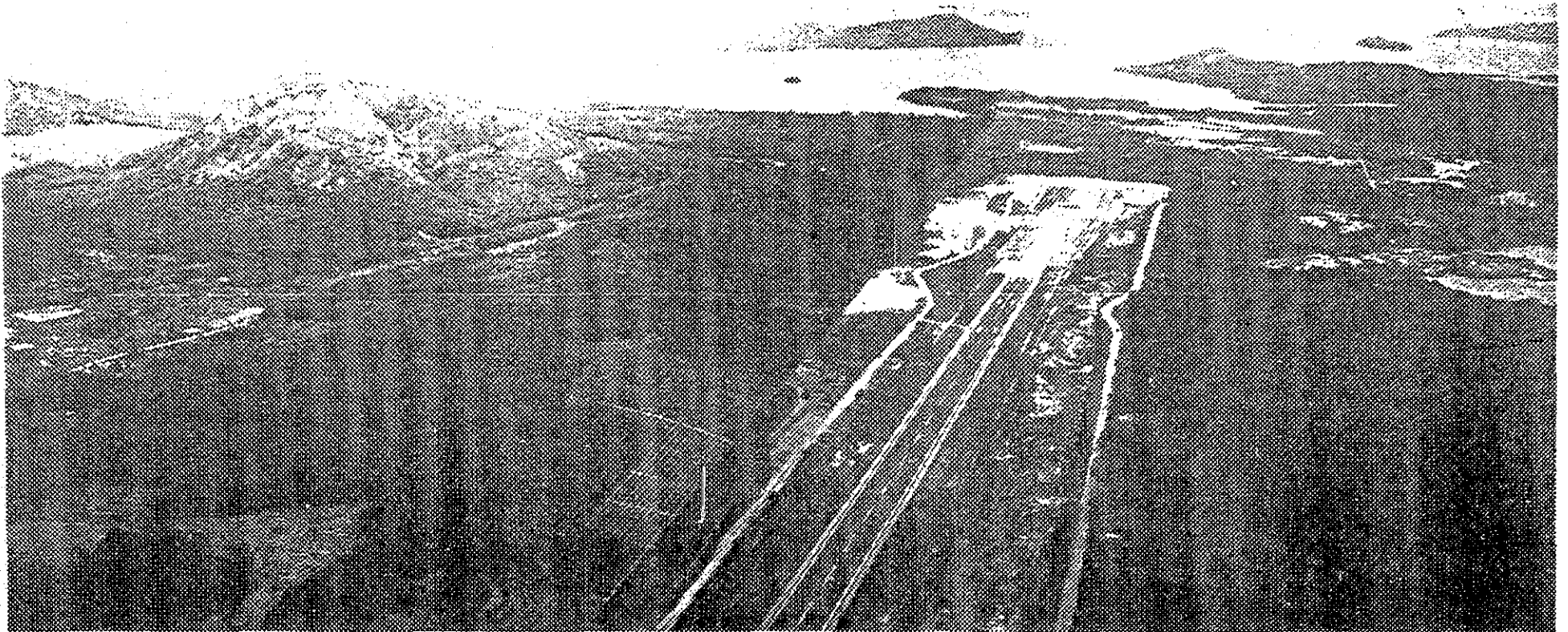


FIG. 1-21 AIR ROUTE OPERATED BY ALL AIR CARRIERS OTHER THAN THAI INTERNATIONAL AIRWAYS

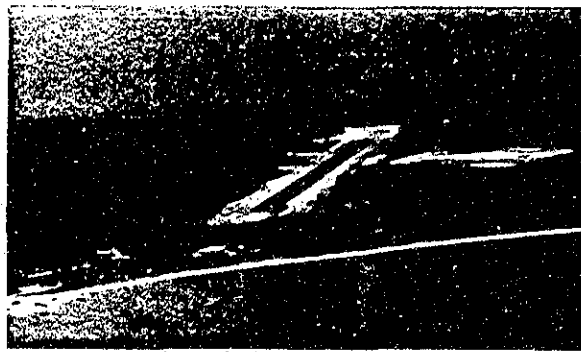




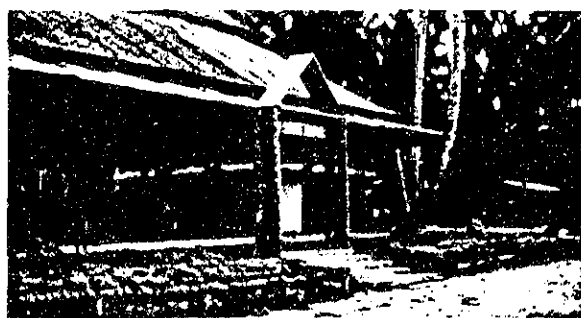
Phuket Airport



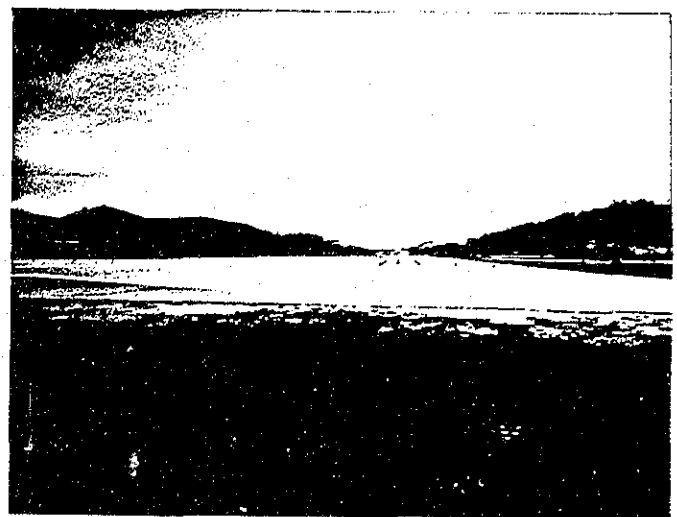
Photos: By Bangkok Airways



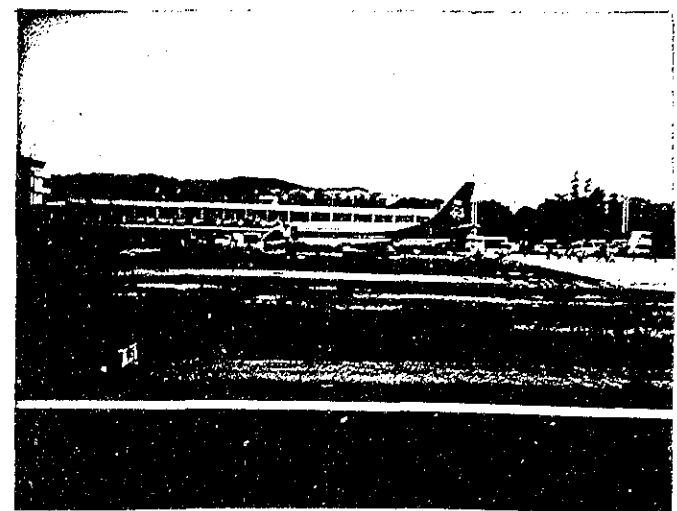
Runway of Samui Airport



Tropical Atmospheric terminal building



Phuket airport



Hat Yai airport