技術及策劃

TECHNICAL AND PLANNING

技術及策劃部負責規劃、統籌、提供航空交通管制和客運服務設施及儀器，以應付啟德機場的空運需要；並購置航空交通管制和導航等設施及儀器給予赤鱲角新機場使用。此外，還為香港飛行情報區及負責區提供航空通訊服務。

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I. 啟德機場運作

在一九九八年七月六日啟德機場關閉之前，民航處已就情況需要，改良了各航空交通管制系統、導航儀器和客運服務設施，以增強它們的可靠性及維持啟德機場的高服務水準。

啟德航空交通管制儀器

民航處在啟德和赤鱲角的兩個航空交通管制中心增添了額外通訊設施，以協助在赤鱲角新安裝的航空交通管制系統的早期測試。自一九九八年四月二十日開始，新機場在早上時段已開始提供區域管制服務，啟德空管中心則擔當監察角色。這些測試分期進行至新機場開始運作，以確保航空交通服務能安全、有效和平穩地從啟德過渡到新機場。

自一九九八年七月六日至一九九九年四月二十九日，啟德航空交通管制中心亦暫作保留，以為新機場系統應變之用。

The Technical and Planning Division is responsible for the planning, co-ordination and provision of air traffic control (ATC) and passenger services facilities and equipment to meet the needs of the old airport at Kai Tak. The Division is also responsible for the provision of ATC and air navigation equipment for the new Hong Kong International Airport (HKIA) at Chek Lap Kok. It also provides aeronautical telecommunication services for the Hong Kong Flight Information Region.

I. KAI TAK AIRPORT

System improvements were carried out on a need basis to enhance the availability and reliability of various air traffic control systems, air navigation equipment and passenger services facilities to upkeep the high service standards at Kai Tak until its closure on July 6, 1998.

Air Traffic Control Equipment at Kai Tak

Additional communication facilities were provided between the Air Traffic Control Centres at both Kai Tak and Chek Lap Kok to support the early trials of the new ATC System at Chek Lap Kok. On April 20, 1998, Area Control services were first provided from the new airport during the morning hours with Kai Tak Air Traffic Control Centre assuming a monitoring role. These trials were conducted in phases prior to the opening of the new airport so as to ensure a safe, efficient and smooth transition of air traffic services from Kai Tak.

As a contingency measure, the Kai Tak Air Traffic Control Centre would be retained from July 6, 1998 to April 29, 1999 to serve as a backup to the new system installed at the new airport.

II. 新機場

新機場航空交通管制系統

新機場的航空交通管制系統包括20多個總值十億元的最尖端及最先進的儀器及設備，其操作容量較啟德機場的空管系統超出三倍有多。

隨着航空交通管制員訓練的完成，新機場的航空交通管制系統亦於一九九八年六月進行啟用前的全面測試，結果令人滿意。事實上，自新機場在一九九八年七月六日啟用以來，新的航空交通管制系統運作可靠，並未發生任何重大的儀器故障或系統失靈事故，就一個如此複雜的系統而言，實屬一項卓越的紀錄。

位於大帽山的新終端管制區雷達的改善工程亦已完成，以加強其偵察功能。隨着一系列的嚴格測試，該雷達已於一九九八年七月獲正式接收及投入運作。

飛機噪音監察

為了幫助評估飛機進出新機場時使用航道的情況及其噪音的影響，飛機噪音及航迹監察系統已進行了改裝及加增了設備。全港現已設置六個噪音監察站，以收集飛機噪音的數據，位置分別為沙螺灣、東涌、汀九、大欖、青衣及大圍。此外，專責處理公眾對飛機噪音的查詢及投訴的電話熱線亦已投入服務。

II. NEW AIRPORT

New Airport Air Traffic Control System

The Air Traffic Control (ATC) System for the new HKIA, consists of more than 20 major and state-of-the-art equipment items costing approximately $ 1 billion, has a capacity of at least three times larger than that of Kai Tak.

Following the completion of air traffic controller training, an extensive pre-airport opening test on the new ATC System was conducted in June 1998 before the system was put into operational use. The result was satisfactory. In fact, since the new HKIA opened on July 6, 1998, the new ATC System performed reliably and no major equipment fault or system outage had occurred – this was really a remarkable record for a system of such complexity.

The new Terminal Area Radar at Tai Mo Shan was modified by the supplier to improve its detection capability. Following a series of stringent tests, the radar was accepted for operational use in July 1998.

Aircraft Noise Monitoring

The aircraft noise and flight track monitoring system was modified and expanded to help evaluate the track keeping performance and noise impact of aircraft operating to and from the new HKIA. A total of six noise monitoring terminals were installed at Sha Lo Wan, Tung Chung, Ting Kau, Tai Lam, Tsing Yi and Tai Wai for aircraft noise data collection. A telephone hotline service was also provided to handle enquiries or complaints from the public on aircraft noise issues.

During the initial period of new airport operations, a considerable number of complaints on aircraft noise were received from the public under the new flight paths. Measurements of aircraft noise

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在新機場運作初期，民航處收到不少在航道下市民對飛機噪音的投訴。但由實地量度所得的飛機噪音數據所顯示，除了北大嶼山一小地區，所有其他地區均在飛機噪音預測(NEF) 25等量線範圍之下（而舊啟德機場則為NEF 30）。雖然如此，民航處亦已向各臨時區議會進行一系列的簡介，並實施各種措施以減少飛機噪音的影響。該些噪音消減措施包括在凌晨時分指示飛機採用不同的航道以減少飛越民居的次數。隨着該等措施的執行，投訴飛機噪音的個案在一九九八年年底已大幅減少。

民航處現正購置更多噪音監察器，以幫助監察經東北面航道離場的飛機所引致的噪音，及第二條跑道運作後而引致的飛機噪音情況。該等安裝工程將會在一九九九年五月完成。

新機場第二條跑道及備用航空交通管制中心及指揮塔的設施

為新機場第二條跑道提供第二類及第三類運作的儀表着陸系統，已於一九九八年十一月完成安裝及驗收。為第二條跑道新添的甚高頻通訊儀器亦已在一九九八年九月完成安裝及驗收。根據機場管理局的工程

data indicated that apart from a small area in North Lantau, all areas had a noise level less than Noise Exposure Forecast (NEF) 25 (as against NEF 30 for the old airport at Kai Tak). Despite this, the Department conducted a series of briefings to the Provisional District Boards and at the same time investigated and implemented a number of measures to minimise the impact of aircraft noise on residents living under the new flight paths. Such mitigation measures included using different flight paths at small hours of the day to reduce the number of flybys over residential areas. As a result, the number of aircraft noise complaints had significantly reduced towards the end of 1998.

Additional noise monitoring terminals are being procured for the monitoring of aircraft noise arising from the northeast departure flight path and the second runway operations. It is expected that the work would be completed by May 1999.

Second Runway and Backup Air Traffic Control Complex (BATCC)

To support the second runway operations, two sets of Instrument Landing System (ILS), one capable of Category II and the other capable of Category III operations were installed and commissioned in November 1998. Additional Very High Frequency (VHF) communications equipment serving the second runway was installed and accepted in September 1998. Based on the current works progress by the Airport Authority, the use of the second runway for contingency purpose to backup the first runway was scheduled for April 1999.

The contract for a Precision Runway Monitor valued at $104 million was awarded in July 1997. Equipment delivery was scheduled for August 1999 with a ready for service date by end 1999.

The procurement of the other equipment to be installed in the BATCC was in progress. Contracts for the most critical ones, including the Backup

進度，第二條跑道可望於一九九九年四月開始用作緊急備用，以支援第一條跑道的操作。

民航處於一九九七年七月批出價值一億四百萬元的精密跑道監察系統的合約，此系統將於一九九九年八月付運，並預計在一九九九年年底投入服務。

此外，民航處已經展開為備用航空交通管制中心及指揮塔所需各類儀器之購置工作，其中主要儀器包括話音通訊處理系統、航空電報自動轉送系統及微波連接系統等之供應合約已相繼批出，並將於一九九九年八月開始付運。整套備用航空交通管制系統的儀器測試和驗收預計可於一九九九年年底完成。

公元二千年電腦數位問題的工作計劃

民航處早於數年前設計赤鱲角新機場的新空管系統時，察覺到公元二千年電腦數位問題及其對航空交通管制操作上的影響。事實上，在新空管系統的規格或驗收條款之內已包括符合二千年數位標準的要求。除了對每個系統進行測試，在新機場啟用之前，一項整體性的新空管系統二千年過渡測試亦已於一九九八年六月順利完成。

Speech Processing Equipment, Backup Automatic Message Switching System, Backup Microwave Link System etc. had been awarded. Equipment delivery was expected to commence from August 1999. The overall commissioning date of the BATCC is scheduled at end 1999.

Year 2000 (Y2K) Programme

The Department was well aware of the Y2K problem on computer systems and its impact on ATC operations several years ago when designing the new ATC System for the new airport. In fact, the Y2K compliance requirement was included in the equipment specifications or as part of the acceptance tests for the new ATC System. Apart from individual system tests, an overall Y2K transition test for the integrated ATC System was conducted and satisfactorily completed in June 1998 prior to the opening of the new airport.

From December 1998 to March 1999, a large-scale confirmation test was conducted on the ATC System with Y2K modifications. In addition to the millennium changeover, the test also covered other critical dates such as April 9, 1999, August 22, 1999, September 9, 1999 and February 29, 2000. The results indicated that the various systems would be able to operate properly during the transition of these critical dates.

The Department also set up a Y2K Compliance Task Force in September 1998 to monitor the progress of rectification work in respect of the safety and security related computer systems of Hong Kong's key aviation related organisations. The task force, chaired by CAD, included other relevant government departments, Airport Authority Hong Kong, Hong Kong-based airlines (Cathay Pacific Airways Limited, Hong Kong Dragon Airlines Limited, AHK Air Hong Kong Limited and Metrojet Limited), helicopter operators and aircraft

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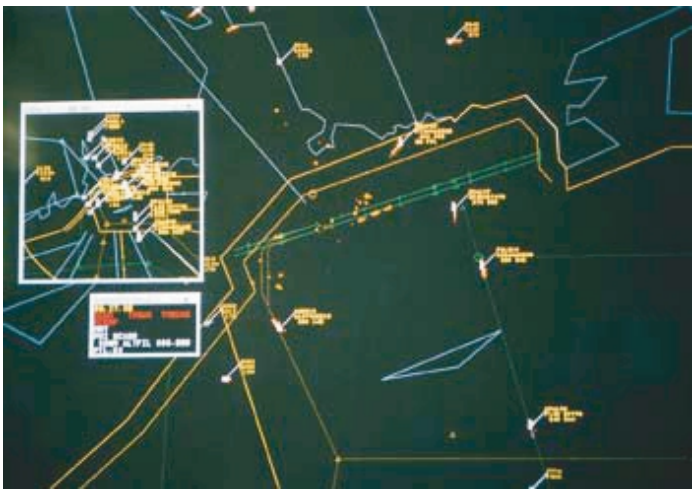
為確保新空管系統在二千年及其他關鍵日子亦可順利過渡，包括一九九九年四月九日、一九九九年八月二十二日、一九九九年九月九日及二零零零年二月二十九日等，一項大規模的確定測試，包括對有關系統作出的修改，亦已於一九九八年十二月至一九九九年三月期間完成。所得結果顯示民航處的系統在過渡二千年及其他關鍵日期時將會正常地運作。

民航處亦於一九九八年九月成立了一個專為處理公元二千年數位問題的工作小組，監察香港與航空安全及保安有關的主要機構的電腦系統修正工作進度。此小組由民航處領導，成員包括有關的政府部門、香港機場管理局、香港註冊的航空公司(包括國泰航空公司、港龍航空公司、香港華民航空公司和邁特捷出租飛機有限公司)、直升機服務公司及飛機維修公司等。小組的工作範圍主要是監察香港各相關的民航系統對符合二千年數位標準及修正工作的進展，並且協助各成員進行風險評估及制訂必須的緊急應變計劃。

在工作小組內各成員的全力參與及努力工作下，大部分有關系統和設備對符合二千年數位標準的工作都有滿意的進展，目標是於一九九九年六月底完成。

為確保千禧年過渡時亞太區的航空安全，國際民航組織亞太區辦事處已統籌了多次會議，處理公元二千年電腦數位問題，並且制訂區域性的應急計劃。民航處將繼續積極地參與接着而來的策劃和實施工作。

雖然民航處所有的系統已順利通過符合二千年數位標準的測試，但是本處亦將會制定適當的應變方案和後備支援設施，以確保在過渡千禧年時會維持安全和暢順的航空交通管制運作。



maintenance service agents. The Task Force would keep track of the Y2K compliance status and the progress made on remedial actions required on various systems under the purview of CAD as well as the various organisations. It also provided assistance to its members to conduct impact analysis and formulate the necessary contingency plans.

With full participation and dedicated effort by various members of the Y2K Compliance Task Force, good progress had been achieved for most of the critical systems under the purview of the task force. The target completion date to achieve Y2K compliance is end June 1999.

To ensure a safe ATC operation in the Asia/Pacific Region during the millennium changeover, a series of meetings were held under the auspices of the International Civil Aviation Organisation (ICAO) Asia/Pacific Regional Office to tackle the Y2K issues. A region-wide contingency plan was being developed. The Department would continue to participate actively in the planning and the subsequent implementation work.

Despite the verification of Y2K compliance for all the CAD systems, contingency plans as well as backup measures would still be developed and instituted as an additional safeguard to ensure a safe and smooth ATC operation during the Y2K rollover.

< 民航處位於畢拿山的
高頻螺旋錐形接收天線
CAD HF Spiracone Receiving
Antenna at Mount Butler

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^ 儀表着陸系統(航向信標天線)
Instrument Landing System (Localiser)

^ 位於大帽山的航站管制區雷達站
Tai Mo Shan Terminal Area Radar Station

^ 位於筆架山的進場二次監察雷達站
Beacon Hill Approach Secondary
Surveillance Radar Station

^ 民航處位於太平山頂的甚高頻無線電站
CAD VHF Radio Site at Victoria Peak

位於航空交通管制大樓上的天線場 >
Antenna Farm on Air Traffic Control Complex

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III. 邁向新里程

衛星通訊、導航及監察/航空交通管理系統

為遵行國際民航組織就衛星通訊、導航及監察/航空交通管理系統全球實施計劃的要求，本處需為香港空管系統的演進及過渡至新衛星系統而制定一個總綱發展計劃。

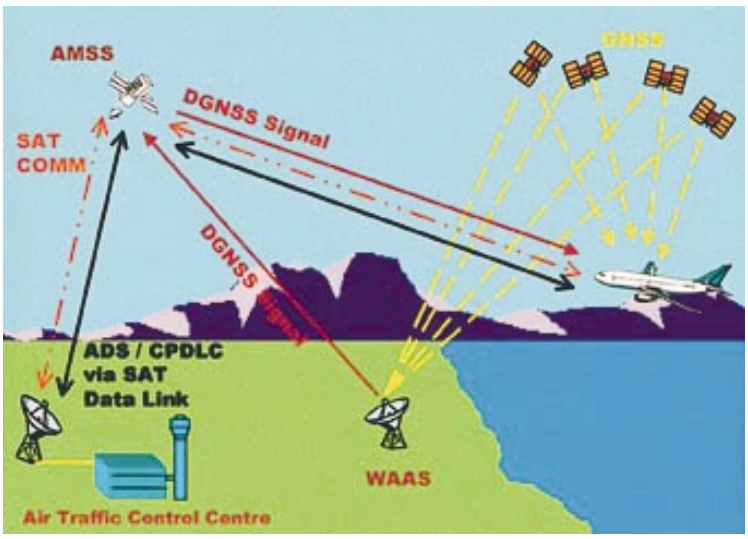
有關計劃將會分以下三個階段進行：

研究階段 – 系統研究和分析
(一九九九年至二零零四年)

測試階段 – 系統測試和評估
(二零零零年至二零零七年)

實施階段 – 系統實施和過渡
(二零零三年至二零一六年)

由於此項目涉及重大投資及需時18年才能完成，本處計劃首先申請研究及試行這兩階段的撥款，並已於一九九九年三月二日向立法會經濟事務委員會作出簡介，及準備於一九九九年五月向立法會財務委員會申請撥款。



III. NEW INITIATIVES

Satellite-Based Communications, Navigation and Surveillance/Air Traffic Management (CNS/ATM) Systems

To comply with the Global Implementation Plan of the ICAO for the satellite-based CNS/ATM systems, it is necessary for the Department to start a project so as to define a master plan for Hong Kong on the evolution of and transition to the new satellite-based systems.

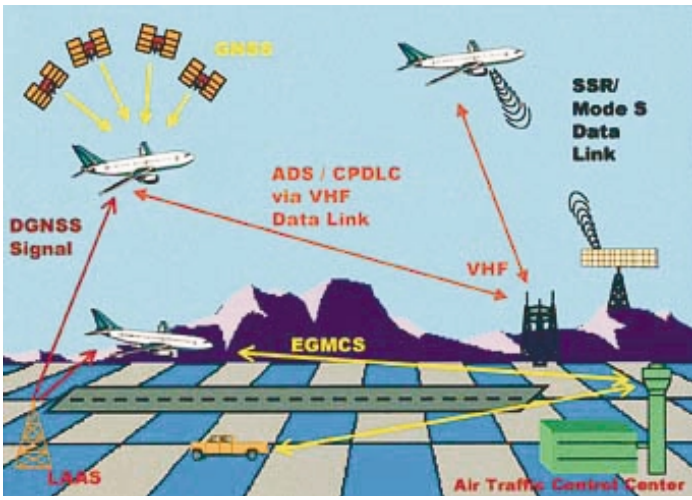
It is intended to implement the project in three phases as follows:

Study Phase – Systems Study and Analysis (1999-2004)

Trial Phase – CNS/ATM Trial and Evaluation (2000-2007)

Implementation Phase – CNS/ATM Implementation and Transition (2003-2016)

Since the project would involve significant investments and take about 18 years to complete, the Department plans to seek funds for the Study and Trial Phases initially. The Legislative Council Panel on Economic Services was briefed on March 2, 1999. It is intended to put the case up to the Finance Committee for funding approval in May 1999.



IV. 電訊服務

電訊組專責提供固定航空通訊、流動航空通訊、航空氣象廣播和搜索及拯救行動通訊等服務，並在有需要時提供有關通訊事務的專業意見。

固定航空通訊服務於一九九八年六月二十九日遷往新機場，而流動航空通訊及航空氣象廣播服務則於一九九八年七月六日新機場啟用當天，同步遷進赤鱲角機場。

固定航空通訊服務概況

	一九九八/九九	一九九七/九八	升降率
處理電報總量	16 378 401	13 284 775	+23.29%

流動航空通訊服務概況

	一九九八/九九	一九九七/九八	升降率
與航機聯絡次數	276 265	289 839	-4.68%

航空氣象廣播服務概況

氣象廣播服務共提供195 246次氣象報告予航機，較上年微降1.9% 。

航空氣象情報系統測試

利用數據鏈以作為自動航站情報(ATIS)和自動氣象情報廣播(AVBS)的訊息發放，經有關設備完成改裝後，已順利於一九九八年九月展開技術測試。如測試效果滿意，進一步的運作測試將計劃於一九九九年五月舉行。

IV. TELECOMMUNICATIONS SERVICES

The Telecommunications Unit is responsible for the provision of aeronautical fixed, mobile and broadcasting services as well as search and rescue communications. The unit also provides expert advice on operational communications matters.

In line with the airport relocation, the aeronautical fixed service was provided from the new airport on June 29, 1998 whereas the aeronautical mobile and broadcast services were moved to the new airport on July 6, 1998, the date of opening of the new airport.

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Aeronautical Fixed Service

	1998/99	1997/98	% change
Messages handled	16 378 401	13 284 775	+23.29

Aeronautical Mobile Service

	1998/99	1997/98	% change
Aircraft contacts	276 265	289 839	-4.68

Aeronautical Broadcast Service

The broadcast service provided a total of 195 246 weather messages to aircraft in flight. This figure was 1.9 per cent lower than the previous year.

Trial on Data Transmission on VOLMET

Following equipment modification, a technical test trial using a ground test bed commenced in September 1998 for the broadcasting of the Airport Terminal Information Service (ATIS) and Volmet Broadcast Service via data link. Subject to satisfactory evaluation results, the operational trial is planned for May 1999.