THE CONTROLLER

the journal of Air Traffic Control

Kai Tak

Goodbye

Also in this issue IFATCA at the I Ith IGAO Air Navigation Confèrence

Hong Kong ATC – an historical review

Sea of Change in Air Traffic Management (ATM) Training

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nited Kingd	om, Decem	ber 2003	Volume	42 No 4
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Foreword IFATCA's Future Role in ICAO	4-5
Cherry Point Cherry Point ATC Training Program Reaches 1,000,000 Operations Joseph G. Hendrickson	6
What flying the Wright Brothers "Flyer" is like! Philippe Domogala – European editor	7
AMC IFATCA at the 11th ICAO Air Navigation Conference Bert Ruitenberg	8-13
Danish Air Traffic Control The creation of an Aviation Safety Reporting Culture in Danish Air Traffic Control Peter Majgård Nørbjerg – Head of incident investigation, Naviair; Kastrup, Denmark	14-16
Hong Kong Air Traffic Control Hong Kong's First Flights	17
Hong Kong ATC – an historical review Phil Parker – VP Technical/Professional HKATCA	18-22
Welcome to Chek Lap Kok	23-24
Goodbye Kai Tak	25-27
Invitation letter: Greetings from Hong Kong!	28
Centennial December 2003: The Centennial of flight Philippe Domogala – European editor	29
Ueberlingen Collision Follow up of Ueberlingen Collision, TCAS LOGIC FLAWS – an update Philippe Domogala – European editor	30
Travel Report Travel Report from Jordan Roger Almqvist – Air Traffic Controller	31
Air Traffic Management Sea of Change in Air Traffic Management (ATM) Training	32-33
Charlie's column	34
Agenda	35

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Hong Kong's First Flights

Many of the millions of passengers who pass through Hong Kong International Airport every year do not have time to cast more than a cursory glance at the fragile wood, wire and fabric bi-plane with a smiling mannequin in the pilots seat, hanging in the main terminal building. It is a pity that they are all too busy rushing to the check-in desks and immigration queues and do not have time to spend a few moments to admire the replica of a 1910 Farman aircraft, and perhaps wonder what is the aircraft's connection with Hong Kong.

The aircraft hanging in the Hong Kong Terminal Building is a replica of the 1910 Farman biplane aircraft that made the first powered flight in Hong Kong in 1911. This flight was made by a Belgian, Mr. Charles Van den Born, on the afternoon of 18 March 1911 at Shatin, at a point approximately 12 miles out on the final approach to the present airport's runway 25L. Unfortunately because of high winds and rain at the planned take off time early in the afternoon, the flight was delayed and when the Farman finally got airborne in the late afternoon all of the dignitaries and invited guests had departed. Therefore only a few curious villagers were there to witness history being made just before sun-set.

For a brief time in 1997 the aircraft that is now cocooned in the air conditioning of the Airport Terminal Building recreated that momentous event of 86 years before, and at the same it created a bit of history of its own - by being one of the first aircraft to use the new Hong Kong International Airport.

The idea and planning for the project of building a replica of the first aircraft to fly in Hong Kong was initiated and organised by the Hong Kong Historical Aircraft Association (HKHAA). The



project literally started from scratch as there were no plans of the Farman flown by Charles Van den Born. A few Farman bi-planes still exist around the world, but they all differ considerably from the aircraft flown in Hong Kong. Fortunately a number of photographs of the aircraft that flew in Hong Kong were obtained from the Belgian Military Museum and plans were drawn up based on these photographs. The HKHAA approached various vintage aircraft specialist companies in England and New Zealand, but eventually contracted Vintage Aviation Services of Marion, Texas, USA, to construct the aircraft. The replica was to be built as close as possible to the original specifications of the 1910 aircraft within the requirements of modern airworthiness regulations. One obvious exception to this was the engine - a modern 150 h.p. Lycoming engine replacing the original 50 h.p. rotary Gnome engine.

In August 1997 the aircraft made its first flight, and after a series of test flights at Marion, a FAA Permit to Fly was issued. Immediately afterwards the aircraft was dismantled, and courtesy of a Cathay Pacific B747 freighter aircraft, the Farman was delivered to Hong Kong's Kai Tak airport. The Government Flying Services provided hangar space for the reassembly of the aircraft in Hong Kong.

The site of Charles Van den Born's flight is now

a park in the middle of one of Shatin Town's many highrise housing areas, so the commemorative flight would have to take place at another location. At that time Kai Tak was at its busiest with one movement scheduled for every 90 seconds during the daylight hours. therefore there was no way of flying the frail craft there, sharing the single runway with the non-stop stream of wide-body jets.

It was fortuitous that the new Hong Kong Airport at Chek Lap Kok was nearing completion, ready for opening in July 1998, and the Airport Authority of Hong Kong gave permission for the Farman to fly from the new runway eight months before the official opening. Therefore apart from a few calibration and test flights, the Farman was to become one of the first aircraft to take off and land at the new airport! Once again the aircraft was dismantled and loaded on to a barge for a short journey across Hong Kong harbour and around Lantau Island to the new airport at Chek Lap Kok. There the Government Flying Service once again provided hangar space at their brand new facility for the Farman to be re-assembled.

After a number of test flights on 16 and 17 November the Hong Kong Civil Aviation department issued a Certificate of Airworthiness and the aircraft was registered as B-HMB for its brief flying career in Hong Kong.

On 18 November 1997 in front of 500 invited guests, some wearing costumes of the 1911 era, Mr Roger Freeman, owner of Vintage Aviation Services, piloted the aircraft from runway 07R and completed 6 circuits before the final landing of the Farman.

The aircraft was then carefully transported across the airport to the Terminal Building where it was lifted up to its current position in the Terminal's south hall.

Charles Van den Born had flown the original aircraft in Saigon and Bangkok before arriving in Hong Kong and then went on to fly in Canton (now known by the name of Guangzhou) before he returned to France. The replica aircraft's flying career had been much briefer, but its display at Hong Kong International Airport gives the millions of passengers that pass through the airport each year an opportunity to marvel at the progress of aviation from wood, wire and cloth of 1911 to the sleek modern airliners of today.



HONG KONG ATC – an HISTORICAL REVIEW

Phil Parker – VP Technical/Professional HKATCA

The move to the new airport at Chek Lap Kok on July 6th. of 1998, meant the closure of Kai Tak, and with it, the closure of one of the most unique airport environments in the world. Like all controllers who used to work at Kai Tak, I still miss the old aerodrome. Its famous curved approach to runway 13, close to the buildings and surrounding hills of the Kowloon Peninsula, is still in aircraft simulators, both military and civil with every major operator in the world. Most airlines had very strict criteria before they would allow their crews to operate at Kai Tak and for those aircrew who only flew there 2 or 3 times a year, I had the utmost sympathy, as they tried to cope with windshear, weather and close terrain along with complex approach and missed approach procedures.

I had the privilege of working at Kai Tak for 12 years and Chek Lap Kok for 5 years as both a Tower and Radar Approach Controller and thought that I would take the opportunity to write about the operating environment, equipment and procedures of ATC over the years here.

ATC HISTORY

The Japanese occupation of World War II, led to the expanded development of Kai Tak from a 180 acre grass field without runways to 380 acres with 2 concrete runways 13/31 & 07/25, 4686' and 4755' in length respectively.

After the Second World War, when British forces re-occupied Hong Kong, the military initially looked after the aerodrome. In 1946 the Civil Aviation Department was formed to regulate civil aviation and Kai Tak operations.

In 1947 the responsibility for Air Traffic Control was handed over to the Civil Aviation Department and the controllers operated from the RAF Tower. VHF and HF radios were available as well as Direction Finding equipment and some navigation aids. There were 5,500 movements that year and 82,000 passengers and 1000 tons of freight carried. In 1948 the staff moved to a new control tower. From 1947 until 1952, traffic steadily built up and a number of world airlines commenced operations. Due to the severe limitations of the two runways, the Government decided to look at options for a new airport. After extensive survey work, it was decided that the best and cheapest option was to build a single runway on reclaimed land in Kowloon Bay on the Western edge of the then current airport location. This would enable Hong Kong to take jet aircraft. To save money approval was only given to build the runway 8000' long. This was false economy as in 1970 approval had to be given to increase the length at great expense to the 11,130'.

The new runway was 13/31 and was positioned to enable aircraft to be able to depart straight ahead on RWY13 with a curved approach for landing or straight in RWY31 with a curved track for departure. The new runway was officially opened on September 12th. 1958. The old runways were closed and then formed part of the apron, cargo complex and maintenance area. Because of the position of the new runway, a temporary tower was built near the runway and was in operation until 1962.

The mid 50's saw the first recruitment of local controllers as assistants. Our first local Director of Civil Aviation, Mr. Peter Lok, was one of those first assistant controllers.

In 1959, the lighting system came into operation allowing night operations and with the new runway, jet operations were on the increase. In 1960, work commenced on the new terminal building. In 1962 the ATC Centre, located on the 5th floor of the new building, where it still was when Kai Tak closed, and the new Tower at the end of the terminal building right above the ATC centre, were moved into. The then latest in ATC equipment and navigation aids were

available to controllers and pilots, including Precision Approach Radar to help pilots in bad weather on both approach on runway 31 & departure on runway 13. The PAR was still in use until Kai Tak closed, in an updated form of course, and Kai Tak was one of the only few civil airports in the world with this equipment.

1970 was the first landing in Hong Kong of the B747 on April 11th. How times changed. I think Kai Tak had one of the highest proportions of 747's of total movements of any airport in the world when it closed. 1970 also saw the commencement of work on the runway extension which was completed in 1974. The entire length of the runway was grooved. One of our problems at Kai Tak was the runway promontory width. It meant that the parallel

taxiway was very close to the runway. 111 meters from the centerline of the taxiway to the centerline of the runway. IFALPA had a black mark against Hong Kong for this reason and we had instructions in place governing the use of the taxiway. For example, no more than 3 aircraft on it at any one time - a sterile taxiway if an aircraft was landing with brake, steering or engine out problems - only experienced light aircraft pilots could land or depart with an RPT aircraft on the taxiway.

The 1970's were a time of expansion at the airport. A further terminal expansion was completed along with a new cargo terminal. In 1976, Hong Kong handled 4,000,000 passengers and 150,000 tons of freight for the year. On the ATC side, at the end of the 70's we had around 80 Controllers including supervisors plus 40 Student ATCO's and Assistants. Due to the lack of contact with, and, flights to and from China, Hong Kong had very limited airspace to the North due to its geographical location against the southern boundary of the Guangzhou FIR. In fact the radar was blanked out so that controllers could not look across the border and was therefore limited to an arc of approximately 140 degrees from the East through South to the South West. Also by this time, the majority of the ATC workforce were local, with some expatriate controllers, mainly British.

Hong Kong was by now well equipped with radar and navigation aids including Surveillance Radar with SSR, Approach Radar (without associated SSR), PAR, 3 VORs, 3 NDBs, 4 DMEs, the ILS to RWY31 and the famous IGS (instrument guidance system) to RWY13. The IGS came into operation on the 7th. of January 1974. By the early 70's, the military presence at Kai Tak was almost gone and the only military operations were in the form of helicopters. Kai Tak was by now a totally civilian airport operating RPT traffic and some light aircraft. The only military aircraft allowed into Kai Tak were transport types.

With the opening up of China, after the end of the Cultural Revolution, aviation in China really "took-off". Flights between Hong Kong and cities in China started with CAAC providing daily flights using mainly Tridents. Long haul flights to Europe were allowed to transit China, reducing flying time and allowing shorter flights to London and other European cities for the first time. By this time around 70% of all movements were wide-body types. By the mid-80s CAAC were really expanding and buying ever more Western type aircraft such as the B737, A300, B747, MD80 etc. Business was expanding rapidly between Hong Kong and China and this was the incentive to start another airline in Hong Kong to fill this market. This airline was called Dragonair and they started with B737s changing to a fleet of A320's and A330's by the time Kai Tak closed. Cathay Pacific were not standing still either and by 1985 they had a fleet of 9 Tristars and 9 B747s, later adding more B747's, L1011's plus A330, A340 & B777 aircraft to their fleet as time went by.

The late 1980s & the 1990s brought further expansion to Kai Tak within the physical boundaries of the airport. There was firstly the expansion of the Eastern side of the airport which eventually added a total of 15 parking bays as well as parking for General Aviation jets. This included a new taxiway bridge across the nullah (open drain). The final expansion was what was known as the South Apron with eventually another 13 bays, a taxiway and a new bridge joining the Southern end of the apron with the runway promontory taxiway. This gave a total of 65 usable bays. What did this mean for ATC? It meant a very tight apron with nearly every bay having a different limitation applied to it, from what type could use it, to which way the aircraft could enter and which way it could push back or taxy. Everything at Kai Tak was right on the limits for space. The division of responsibility between ATC and Apron Control was that Apron owned the parking bays and did the bay allocation and ATC owned the rest and it was ATC's job to get the aircraft into and out of the bays.

Starting and pushback at Kai Tak were very tightly controlled. To say that this place was busy was an understatement. This little airport in it's last year handled 29,000,000 passengers and 1,500,000 tons of freight, making it the 3rd. busiest International airport after London and Frankfurt and was 2nd. busiest for freight after Narita. The design capacity of Kai Tak was 24,000,000 passengers, so the place was working way over capacity by the time it closed. These figures were not obtained by a huge increase in aircraft movements, which, due to movement capacity constraints, were around

4% over the last couple of years, but by the use of more and more wide body aircraft. A300s and Tristars were replaced by A330s, MD11s and B777s. Even Cathay Pacific was using its B747-200/300 aircraft for "local" flights of 2-4 hours. Every available landing and departure slot had been allocated. Because of the lack of high speed turn-offs, geographical limitations which effect missed approach procedures, and other limitations, for example the high proportion of ultra-long-haul flights effecting runway occupancy time, the scheduled number of movements per hour was 32. I had seen up to 38 aircraft handled but this depended on the mix of traffic and the weather, which can be diabolical in Hong Kong. We had built an additional 90 degree taxiway at the South East end of the runway to facilitate aircraft vacating the runway if they missed the only high speed we had down there, but this was the last major works program at the airport before its closure. The result was that up to 150 flights a week were being turned away from Kai Tak during its last 2 years of operation.

For the airlines the new airport couldn't come soon enough. Cathay and Dragonair were also pushing the limits. At the time Kai Tak closed, Cathay operated 62 aircraft including B747 / A330 / A340 / B777 and Dragonair had 11, 4 A330s & 7 A320s. There were not enough parking bays to park all of their aircraft.

ATC EQUIPMENT

To keep up with the traffic demand there was a continuing program of equipment upgrades for both ATC and in the form of navigation aids. In the last couple of years of Kai Tak operations, the equipment included Toshiba Route Surveillance Radar with a range of 200 nm, and Alenia Approach Surveillance Radar with a 60 nm range. We had a Cardion Approach Secondary Surveillance Radar and a Cossor long range monopulse SSR with a range of over 250 nm. All radars were housed in domes for protection in Typhoons. In addition, at the airport we had a Thomson CSF digital Airport Surface Detection Equipment. This was very useful not only in bad weather but on a day to day basis. The Control Tower at Kai Tak was adjacent to the beginning of runway 13 and quite close to the runway. This meant that the tower controllers had no depth perception when looking at activity at the South East end of the runway. The ASDE allow us to determine whether for instance, an aircraft could make a particular taxiway after landing. The new using airport opened the same approach/enroute systems with the addition of another approach radar at Sha Chau, an island just north of Chek Lap Kok. The new airport also has a NORCONROL (now PARK AIR SYSTEMS SMR).

All of the radars were fed through a radar display data processing system to amber monochrome Alenia displays. Viewing was in a darkened environment. This was because the Approach Radar was right next to the Precision Approach Radar, which because of the nature of the beast, had to be viewed in a darkened environment. All positions in the Radar Centre and Tower had access to displays of weather, current and forecast, a wind analyzer and clearance and departure data. The Tower had a small radar display, Surface Movement Radar, Wind Analyzer with in-built windshear warning, Runway Visual Range displays, touch screen lighting panel, Ceilographs for cloud base readings at the middle marker for each end of the runway and a voice synthesized ATIS

AIRSPACE & GEOGRAPHY

The size of the Territory of Hong Kong of 870 sq km, had no bearing on the size of our FIR, which was guite large. The FIR extended from the Southern coast of China to the South and South West out to approximately 330 nautical miles and to the East around 200 nm. It therefore covered most of the South China Sea. Beyond this was an "Area of Responsibility", which extended even further South along side the Northern part of Vietnam. Adjacent FIRs included Guangzhou (China) 12 nm to the North, Taipei to the East, Manila to the South East, and Ho Chi Mihn to the South. The ATC Centre had speech circuits or direct lines to Guangzhou, Shenzhen & Macao and satellite links to Taipei, Manila & Ho Chi Mihn. From the East thru South to SSW we had 5 major air routes with the Eastern one by far the busiest. This still handles traffic to and from Hong Kong and Taiwan, Korea, Japan, Canada & the USA.

The other main routes are through China. About 30% of all of our traffic came from or through China. This is probably up to more than 40% now. There is a route to the South West which is for some flights to Europe but is mostly for aircraft going to Hainan Island. There is a transfer point about 100nm East for aircraft to and from the Eastern coastal cities of China which continues dramatic increases of traffic. The main route for the rest of China and approved operators to Europe enters China 12 nm North of the old Kai Tak. The inbound route was just a couple of miles North of where the new airport is but now is situated a few nm further West. Apart from aircraft from China, the route was also the main inbound track for aircraft from Europe. Our main problem with China being so close was and is that they use metre levels, while we of course use feet.

Except for the Kowloon Peninsula, where Kai Tak was sited, Hong Kong is covered by very rugged terrain up to over 3,000' high. There is a range

Hong Kong Air Traffic Control

of hills up to 2,000' high which paralleled the 13 IGS localizer to the North and wrapped around the Eastern side of Kai Tak to within 2 nm. To the SE, on the extended centerline of RWY 13, aircraft had to fly through a gap between the mainland area of Kowloon and Hong Kong Island which itself is covered with rugged hills up to 2000' high. This terrain had a major effect on our approaches and procedures and contributed greatly to weather, wind shear and turbulence effects in the vicinity of Kai Tak. Although we now have straight in approaches for all runways at Chek Lap Kok, we still have terrain problems with mountains up to 3000' just south of the airport causing Windshear and Turbulence in the vicinity of the airport.

ARRIVALS & DEPARTURES

The primary tracking aid during the Kai Tak era was the Cheung Chau VOR which is still situated on the island of Cheung Chau 11 nm SW of the old Kai Tak. Runway 13 was used about 90% of the time because of local winds as well as other factors. It had a longer operational length for departures, which were over water, while the 31 departures were over the built up areas of Kowloon and required a left turn as soon as the aircraft was airborne. The main approach flown by aircraft was of course, the IGS (Instrument Guidance System) approach to RWY 13. To quote the AIP " The system uses ILS components but is offset from the landing direction by 47 degrees. Pilots on final approach on the IGS must therefore make a visual right turn to line up with the runway after reaching decision height. During this visual portion it is imperative that the correct visual cue with the surface is carefully maintained, making reference to aeronautical ground lights where appropriate. In view of the local terrain and the IGS being offset from the runway, operators intending to use the system must ensure, for flight safety reasons, that their pilots are fully conversant with, and have practice published adequate in, procedures."

The system was designed for the instrument flight segment of the approach to be completed not later than the Middle Marker when visual flight had to be established or an immediate missed approach procedure initiated. Other notes included :-

"After passing the Middle Marker the indications are not relative to the required aircraft visual and missed approach flight paths and must be ignored. WARNING -Continued flight on the IGS flight path after passing the Middle Marker will result in loss off terrain clearance."

In other words, you would crash into a hill. The hill where the IGS was situated was painted with



huge orange and white checks and was lit at night. The site was known as the Checkerboard. The approach itself was very long (around 28 nm), if done in its totality and commenced at Cheung Chau VOR. The aircraft flew West for 7 nm on descent to 6000', turned right on a track of 040, descended to 4500' and after another 7 nm intercepted the localizer at 4500', The aircraft then descended on the localizer until reaching the Middle Marker, at the MM turned right 47 degrees to line up with the runway. This final leg of the approach on the localizer to touchdown was around 14 nm. Obstacle Clearance Limit for the approach was 660'.

Because of air traffic numbers during the last couple of years, very few aircraft carried out the full procedure. Normally the Approach Controller would vector aircraft onto the localizer to have more control on spacing. By the way, at Kai Tak we needed about 8-9 nm between aircraft on final to enable us to get a departure away in between. Because we had so many long-haul aircraft for departure and because of taxiway and holding point configuration, it took up to 1 minute for a 747 to line up and up to minute to get airborne when cleared for take-off. During that time an aircraft on final had gone 5 to 6 nm. Now all we need is 1 runway length between the departure and the landing to be legal but the problem was the missed approach. If an aircraft made a missed approach, he had to go out on the centerline and due to the surrounding terrain he could not turn off the centerline until he was about 6 nm out. The lowest altitude ATC could hold an aircraft on missed approach was 2500'. One runway length is 2 nm. Therefore if we had one aircraft which has just rotated and another went around you had two aircraft locked on the centerline with no radar, longitudinal, lateral or vertical separation and vou couldn't turn either of them. If conditions were visual in this context it would be have bad enough, but Hong Kong is not known for its good weather, so we spaced aircraft even further apart when weather deteriorated.

Departure off runway 13 was straight forward but the departure 31 was not. For a start, the pilot had available a much reduced operational runway length. Just off the end of the runway was Kowloon City with buildings of up to 6 floors. Also, if the pilot flew straight ahead, he would go into the 2000' range of hills North of the airport. He therefore turned left as soon as he crossed the end of the runway and tracked towards Stonecutters Island to the West. The pilot then turned further left and tracked towards Cheng Chau VOR and there-after onto his planned route.

CONTROL POSITIONS

The control room at Hong Kong was directly below the Tower at the Western end of the terminal building. All radar positions worked in the same room. At one end of this cramped environment was Approach and Precision Approach radar and at the other end of the room was the Enroute radar and procedural positions. Beyond 250 nm to the South of Hong Kong, the control was procedural as the area was outside of radar coverage and over water. Communication in this area was through Hong Kong Radio using HF.

Normal staffing on Approach was 2. One radar controller and one coordinator. The Approach controller was responsible for all arrivals and departures from Hong Kong, all local flights and IFR training, flights to and from Guangzhou and Shenzhen transiting Hong Kong airspace on climb and descent and about 80% of all movements into and out of Macao (40 nm West) - Kai Tak provided an Approach Radar service to Macao for all aircraft transiting Hong Kong airspace, while Macao itself provided an Aerodrome Control Service -Approach handled all of this traffic out to around 45 nm, sea level up to unlimited. It was a very busy position. The Coordinator was another very busy position as his job, apart from overseeing Approach was to coordinate with basically everyone within the Centre and Tower as well as Macau, Shenzhen and Guangzhou. He was also the Flow Controller. Although movement rates at Kai Tak had only increased marginally over its last couple of years, (around 460 per day with a curfew between midnight and 6.30 am), through area traffic had been increasing at the rate of 20-25% per year meaning that all radar positions were at their absolute maximum capacity.

At the other end of the room was Enroute Control. The airspace was divided into East and West and each had 3 positions. One radar, one procedural and one assistant, who did the coordination with adjoining FIRs.

The Tower had one Clearance Delivery position, one Ground Movement Controller, one Aerodrome Controller and one Zone Controller (who looked after local helicopters and light aircraft). We also had a Tower Supervisor and a number of ATC assistants who carried out noncontrol functions necessary at the airport.

CONTROLLING AIRCRAFT

Aircraft from China came inbound through TAMOT (19 nm NW of Kai Tak) and were given levels to be at by TAMOT in accordance with a Letter of Agreement with Guangzhou. This stipulated that the lowest level at TAMOT was FL150 with 10 minutes between following aircraft at the same level. If we didn't have 10 minutes, the following aircraft are stepped up at 2000' intervals. i.e. 170, 190, 210 etc. These aircraft called Approach direct about 3 minutes before crossing TAMOT and we did not get an electronic hand-off (due incompatible equipment and the fact that China only provided a radar monitoring service backing up procedural separation at that time). This meant that Approach couldn't even start to handle inbound aircraft from China's airspace until they were 3 minutes from overhead.

WORKLOAD & STAFFING

Our problems at Kai Tak were the result of rapid increases in movements both into Hong Kong and thru-area in the last 6 years before closure with no corresponding increase in the number of working positions to handle the traffic. Because of this traffic increase and to increase the number of working teams from 4 to 5, the Civil Aviation Department in 1995 embarked on a recruitment campaign where they advertised worldwide for experienced controllers. This was very successful and by January 1996 we standardized on 5 teams working a 5 day cycle, 4 days on, 1 day off, which compared with the 4 teams 8 day cycle, 7 days on, 1 day off we had previously.

The recruitment was on-going to expand control

positions and for the manning and training for the new airport. New arrivals were running at the rate of 7 every 2 months at the time Kai Tak closed (about the limit of our training capacity). The Hong Kong Government have a localization policy for all Government Departments and was, until the downturn in the Asian economies, still vigorously recruiting local Student ATCOs. Over the last few years we have gone from around 9% expatriates to around 40% with the expatriates working on 3 year contracts. To maintain flexibility for rostering and as part of the over-all promotion structure for local controllers, all ATCOs have multiple ratings in Hong Kong. Either Enroute-Procedural, Enroute/Radar and Approach/Radar or Approach Radar/ Coordinator and all Tower positions. This was modified when we were training for the new airport as the requirement for 2 ratings on the day of opening would have required too much from our training resources and time. Gradually, most controllers are back to 2 or more ratings.

Hong Kong ATC is a real United Nations. It might be of interest to readers to note that the largest number of expatriates come from Australia and New Zealand. In fact, the third highest number of Australian Controllers working in one location after Melbourne and Brisbane is Hong Kong.

WORKING at KAI TAK

What was it like? Well from my perspective working both Approach and Tower for all those years it was the best time of my now 35 years in ATC. Sure Kai Tak had its problems coping with the airspace, ramp space, terrain, weather and the occasional accident and near accident, but there was something about the place. Everyone who flew there, or worked there, worked hard to make Kai Tak a success and considering all of its limitations, it was a remarkably safe airport. I know many pilots enjoyed the challenge of a good approach and landing at Kai Tak and I can assure you that ATC also enjoyed the challenge of facilitating that approach and landing.

CHEK LAP KOK

Planning for the move to Chek Lap Kok started some 5 years before the new airport opened. ATC required to train all staff, within a limited time frame, for not only a new radar system, but a new airspace structure, an increase in the number of operational working positions, a new tower with its associated new equipment, a completely new airport layout, a new geographical location, and, to do all of this while keeping the third busiest international airport in the world operating in an efficient and safe manner. We also had to change from one

system to the other overnight with no loss in traffic handling capacity, and in a safe and orderly manner. Kai Tak closed at midnight and Chek Lap Kok opened at 6 a.m. Through area traffic was controlled between those hours from Chek Lap Kok. The first landing at the new airport was a Cathay B747- 400 flying the first direct, non-stop flight from New York to Hong Kong via the North Pole. From an ATC perspective, the move and change-over was flawless. The same can't be said for the rest of the airport in the first week of operation. However, the problems were dealt with quickly and Hong Kong International Airport has since won a number of awards. It's one of the busiest International Airports in the world and is the busiest freight airport.

As far as I am aware, Hong Kong is one of the only places in the world that has managed an ATC move like this and has had such a smooth transition from one airport to another. Other places have moved to new airports but the ATC Centre was the same. Only the Tower controllers required training. In Hong Kong, everything changed. It must also be one of the only places in the world where the radar system was delivered on time and worked as advertised.

AIRSPACE DESIGN

The ATC ramifications of Macao, Zhuhai, and Shenzhen airports being so close to Hong Kong and a little further a field, Guangzhou airport, mean that management had to put some very complex procedures in place to handle the respective flights to and from these airports through Hong Kong airspace. These procedures are mainly for use in the Approach / Departures area. Hong Kong Approach Radar now just handle approaches and sequencing from FL130 down. Departures Radar handles all departures out of Hong Kong and all departures out of Macao and Shenzhen which enter Hong Kong airspace. Departures Radar has airspace from Sea Level to FL 250 & from FL 140 to FL 250 over the top of Approach airspace. Departures is also responsible for all arrivals through Hong Kong airspace to Shenzhen, Guangzhou and to-Macao. With the Macao traffic, Departures looks after them until he hands them over to the Hong Kong radar position responsible for Macao and inbound China traffic. Macao departures off runway 34 (by far the most used runway) enter Hong Kong airspace from the North West at 6000' and Shenzhen departures, also from the North West at 7000'. They virtually go straight over the top of Chek Lap Kok, hence the departing aircraft from Hong Kong initially maintain 5000' on the departure SID.

From the Hong Kong ATC point of view, there are 4 possible combinations of operation for Macao, each requiring different procedures. i.e. RWY25 Hong Kong / RWY16 Macao, RWY25 Hong Kong

Hong Kong Air Traffic Control

/ RWY34 Macao, RWY07 Hong Kong / RWY16 Macao and RWY07 Hong Kong / RWY34 Macao. Because of the lower minima for the 34 ILS at Macao, RWY 34 is favored for approaches. The letter of agreement with China stipulates that Hong Kong will provide a radar control service to:-

- Arrivals Macao RWY34 (i.e. All arrivals irrespective of where from)
- Departures on Macao RWY34 and RWY16 transiting Hong Kong airspace. Traffic to & from the East, thru South to the South-West & traffic to East China, e.g. Shanghai, which transit our airspace thru DOTMI (100nm to the East of Hong Kong)

Zhuhai ATC now provides a radar service for Zhuhai, Shenzhen and :-

- Departures on Macao RWY16 & RWY34 transiting Shenzhen airspace.
- Arrivals , Macao RWY16
- Missed approach RWY16

Macao Tower provides an aerodrome control service, flight information service and alerting service to aerodrome traffic.

The airspace design, validation and cooperative nature of all concerned in the run up to the opening of Chek Lap Kok, has meant that apart from some very minor changes, the airspace structure as envisioned has worked extremely well. Hong Kong has, in the last 5 years, already experienced some very busy traffic periods associated with Chinese New Year and other holidays and a continuing increase of over all traffic movements. This increased traffic has validated the soundness of the original airspace structure. (Of course we had a huge drop in passenger traffic due to SARS, however Cargo movements remained unchanged and movements are now back to normal.)

Other major changes over the years since opening have been:-

- Opening of the North Parallel runway in 1999
- The opening of a new Chinese FIR (SANYA), south of Hong Kong taking over our Area of Responsibility in November 2001. (This occurred at the same time as a major change in China's upper level Metric level scheme and required a great deal of training for Hong Kong controllers) It also included a major airspace restructure sponsored by ICAO covering all of the South China Sea area.
- RVSM implementation in October 2002.
- Pre- Departure clearance via Data-Link
- ATIS & VOLMET via Data-Link

Unfortunately, we have had 1 major accident since the airport opened when a MD11 crashed on touchdown on the 22nd of August 1999. The right wing snapped and it rolled upside down in front of the tower in a ball of fames.

CONTROLLER

Fortunately, only 3 people died, but many were injured. I'll always remember that accident as I was the Aerodrome Controller at the time.

WORKING at CHEK LAP KOK

What is it like ? Well from those controller's point of view who worked there for any length of time, we still miss Kai Tak. We miss its convenience and the "buzz" the place generated. It was unique. It worked because everyone at that airport made it work, and the place had character.

CHEK LAP KOK is 'just another airport'. Everything works, we move the traffic, we have generally good equipment and procedures, the working environment is better, we have a supportive management, Hong Kong has an airport it can be proud of, certainly one of the best in the world, but it's just not the same. The travel to & from the new airport taking an average of at least an hour each way for most controllers doesn't help either with the additional problem of the ATCX & Tower being "air-side". This means going to work is like taking an International flight every shift.

However, if you are ever in Hong Kong, (and not just during IFATCA 2004), please visit us. Hong Kong controllers always like to see their colleagues from around the world and we will be happy to arrange the security and escort aspects for you. **Welcome to IFATCA 2004**.

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Go to page 28 for subscription form

...Welcome to Chek Lap Kok

Few of the 34 million passengers that pass through Hong Kong's new International Airport every year realise that only a few years ago Chek Lap Kok was a small isolated island with a little fishing community, and the site of today's passenger terminal building is where a village with less than 100 people used to be.

The story of how this tranquil spot came to be the home of one of the most modern airports in the world can be traced back over many years and starts long before the announcement in 1989 that a new airport was to be built to replace Kai Tak Airport.

As far back as 1946 it was realised that the scope for further development at Kai Tak Airport was very limited and a number of alternative sites were considered as locations for a new airport. All of the 15 sites were eventually rejected for a number of reasons, including finance, difficulty of access for passengers and closeness to the Chinese border. One of those sites was to the west of Chek Lap Kok island, at exactly the location of the present south runway. How prophetic that a site rejected more than 40 years previously would eventually be chosen in 1989 ! In the intervening years there were to be many more surveys, studies and reports on replacement airports for Kai Tak, but always the final decision was to expand and develop Kai Tak yet one more time.

The decision to finally replace Kai Tak was







announced on 11 October 1989, but the planning and building of the new airport was fraught with problems because of the troubled situation political that existed between the British Administration and the Chinese Government. However, all these troubles were eventually resolved, but original date for the completion of the airport, June 1997 (just prior to the British handover of the Territory and the establishment of the Special Economic Region of Hong

Kong, China on 1 July 1997) had to be postponed. On 20 February 1997 a Hong Kong Government Flying Service King Air became the first aircraft to land at the new airport and a series of test flights by a number of airlines then followed. The airport was officially opened by the Chinese Premiere, Mr Jiang Zemin on 2 July 1998 and Chek Lap Kok finally became the new Hong Kong Airport

at 0600 on 6 July 1998.

Prior to the decision to build the new airport at Chek Lap Kok, the location was already well known to all the pilots flying into Kai Tak Airport - the 'LT' NDB sited at the top of the 400 foot hilll which was the highest point on Chek Lap Kok island, was the turning point for intercepting the localiser for the famous runway



13 IGS approach to Kai Tak, landing over Kowloon City with the 47∫ right turn at one mile final.

Before the building of the airport Chek Lap Kok island was a tranquil place, visited by few, apart from a small number of nature observers seeking the rare wildlife that lived on the island and some archeaologists searching for more signs of the earliest settlements in Hong Kong.

With the commencement of construction in 1990, Chek Lap Kok island became a building site and home for over 25,000 workers who daily toiled over the now unrecognisable landscape as it was transformed into the new airport. Because construction of the bridges linking the airport to the rest of Hong Kong were not ready until 9 months before the airport opening, everything from bulldozers and cement to hard-hats and food had to be brought to the site by boat.

Over 38,000 tons of explosive were used to flatten the hills of Chek Lap Kok, the earth and rocks then became part of the fill for the 1,250 hectares of reclamation that now makes up the airport. Only one part of Chek Lap Kok island is now recognisable - in the south east corner of the airport a 100 foot hill with a Chinese pavilion on top has been retained as a noise barrier for the benefit of the residents of Tung Chung new town which is being developed on Lantau adjacent to the airport. The rest of Chek Lap Kok island is now hidden beneath the Passenger Terminal Building, south apron and landside buildings.

The entire airside area of the airport is either currently utilised or reserved for a specific purpose, including a second mid-field terminal, a second aircraft maintenance base and a second air cargo terminal. Development of the landside area continues with the recent opening of a coach station dedicated to mainland China services, the establishment of a marine cargo terminal for rapid trans-shipment of cargo from air to sea and vice versa, and the construction of a ferry terminal with high speed ferry services to



Chinese cities in the Pearl River Delta area. There are a number of plans for developing the remaining landside areas of the airport, these include a conference and exhibition centre, a high-tech industrial park and a golf course.

It is anticipated that Hong Kong will be one of the initial destinations for the new Airbus A380 when it enters service - the north runway and associated taxiways, together with the north west concourse of the terminal building and apron, were all designed for the new large aircraft. Therefore Hong Kong will be able to accept the A380 with no changes to the current procedures.

Picture – CLK during construction.

At Kai Tak Airport passengers use to be able to gaze out at the high rise blocks of flats and factories that surrounded the airport on three sides and feel the energy and vibrancy that makes Hong Kong such an exciting city. At the new airport passengers can look out at the serene green hills of Lantau Island and wonder at the many contrasts that Hong Kong has to offer the traveller.

Goodbye Kai Tak ...

Even though Hong Kong's new airport has been open for more than five years, for many people, be they pilots, passengers, aviation enthusiasts or ordinary people, Kai Tak will forever be THE Hong Kong airport.

Picture – Night view of Kai Tak

11

The entries in the control tower log book for Sunday 5 July 1998 simply say, '1538 HDA 841 landed RWY 13 last arrival at Kai Tak' and '1705 CPA3340 departed RWY 13 last departure from Kai Tak', a very brief and unceremonial report to the end of 74 years of history.

In the weeks leading up to the final day of operations at Kai Tak all of the vantage points looking out over the airport and the famous curved approach over Kowloon City were thronged with people. Some were elderly, remembering the pre-jet times when the piston powered airlines graced the air routes with DC6s, DC7s and Constellations being regular visitors, others were parents with their children, giving them a chance to view yet another part of Hong Kong that was about to change for ever.

The story of Kai Tak Airport is as amazing as the development of Hong Kong itself.

Apart from a few intrepid early aviators making demonstration flights from fields in the New Territories and Hong Kong Island, all early flights in Hong Kong had been by seaplanes from the many harbours and bays around the area. All this changed in 1924 when a company was

formed by Dr Kai and Mr



newly reclaimed site on the edge of Kowloon Bay. Unfortunately this business venture failed and the company went bankrupt, forcing Messrs Kai and Tak to sell part of the site to the Hong Kong Aero Club – the small grass airfield was called the Kowloon City Field, or by some, Kai Tak Field.

From this humble beginning the airfield went through an endless series of expansion and development. On 25 January 1925, Chinese New Year's Day, it was officially opened as Kai Tak





Hong Kong Air Traffic Control

Airport with the Abbot School of Aviation as the resident operator. In 1927 the Hong Kong Government realised the potential of the airport and took control of the site. During these early years it was the military that mainly used the airport and at the behest of the Royal Air Force (RAF) the airport was expanded with further reclamation from Kowloon Bay adding to its area.

In 1930 the Hong Kong Flying Club was formed and the airport officially came under the control of the Harbour Master. This was because there were still a large number of sea planes operating at that time and because these came under the jurisdiction of the Marine Department, it was considered that all aeroplanes should be his responsibility!

This changed in 1936 when the airport was divided into two separate areas, the RAF military area and the civilian area, and an Airport Manager was appointed to handle the burgeoning commercial flights. On 23 March 1936 the first Imperial Airways DH 86 arrived from Saigon to add Hong Kong to the 'Empire Air Routes' emanating from Croydon Airport in England. Many other routes were still flown by seaplanes and a Pan American Airways Martin M130 arrived from the USA via Manila on 23 October 1936. This landed in Kowloon Bay then moored close by the airport - the passengers completing their journey

to the terminal building by launch. The Chinese CNAC also operated seaplanes - their Douglas Dolphin commenced regular flights from Canton on 6 November 1936.The next year Lufthansa started operations in to Kai Tak in conjunction with Eurasia Aviation of China and a Junkers Ju 52 arrived from Berlin via Canton on 29 June 1937.



Picture – Kai Tak from Kowloon Peak.





Commercial operations continued to develop with more airlines, larger aircraft and increased frequency of flights – in 1937 there were 3,685 recorded passengers and in 1938 this had increased to 9,969 passengers.

Private aviation was also developing with the Far East Flying Training School commencing business in November 1933. Apart from offering flying training the FEFTS also organised aeronautical engineering courses and many students from Hong Kong, Macau, China and other countries around the region gained ground engineers licences.

In 1938 Kai Tak Airport was still a grass field, but plans for a 1,500 feet tarmac runway 13/31 were drawn up. However the dramatic developments of the Sino-Japanese War and Second World War curtailed these plans. Instead it was the Japanese occupying forces that carried out the next stage of development at Kai Tak. They organised the construction of two 4,000 feet runways, 13/31 and 07/25 using building material from many structures that had been demolished in Kowloon City as foundations for the runways.



After the war t Kai Tak Airport quickly resumed civil operations again although the majority of flights were military aircraft. A Director of Airport Services was now in charge of the airport. It was soon realised that the war-time runways were unsuitable for the large commercial aircraft that were now operating the main commercial air routes. In 1946 the Government undertook a study of sites for

development as an airport, but it was concluded that building a new airport at another location would be too costly, therefore it was decided that Kai Tak Airport would be eveloped further. The airport was to be expanded and runway 13/31 rebuilt and lengthened.

In September 1946 the company Cathay Pacific Airways Limited was registered and with a fleet

Top left – Kai Tak in late 50's; Top right – Flat top Radar early 80's; middle – Old Kai Tak; bottom – Kai Tak today.



of 2 DC3s a business that was closely linked with the post-war development of Kai Tak Airport was created.

Because of the limitations to the increasingly larger and heavier aircraft operating into Hong Kong, (a one way operation was required runway13 take off only, runway 31 land only, runway 07 land only and runway 25 take-off only), in 1951 another review of sites for a new Hong Kong airport was carried out. Once again it was concluded that the most economical solution was the further development of Kai Tak Airport. In 1954 the final plan for the reclamation of another large area of Kowloon Bay and the construction of a new runway was completed. Over the next four years the shape of Kai Tak Airport changed radically with the completion of an 8,405 feet runway and taxiway on a promontory pointing out into Hong Kong harbour. On 12 September 1958 the new runway was officially opened, with the star of the ceremony, a BOAC Comet 4, being the first commercial jet aircraft to land in Hong Kong. Although this was the 'official' opening of the new runway, it had been used on 31 August 1958 when a USAF C54 blocked the old runway and the new runway was pressed into service earlier than planned.

After the runway the next major development was the construction of the new terminal building. However until it was completed in 1962 the old freight terminal was utilised as an additional passenger terminal for the increasing number of passengers - in 1961 478,300 passengers passed through the airport.

With the introduction of the Boeing 747 and increasing demands for long-haul flights the decision to lengthen the runway was made in 1970. A 2,525 feet extension giving a 10,930 feet runway was opened in June 1974.

In 1989 the Government announced that following yet another study of sites for a new airport, the island of Chek Lap Kok on the north coast of Lantau Island would be developed as the location of the new Hong Kong Airport.

In spite of its impending demise, the expansion of Kai Tak Airport continued with the conversion of the old military area into additional apron area in 1989, whilst in 1992 yet more of Kowloon Bay was reclaimed for parking aprons, and the passenger terminal building was extended in 1989 and again in 1994.

On 5 July 1998 the world lost one the great airports, but on 6 July 1998 Hong Kong opened a new world class airport. Although the new airport may lack the never to be forgotten atmosphere and heritage of Kai Tak, it has consistently won awards from the aviation industry for being the best and most efficient airport. CHARLIES COLUMN

(Almost) Overheard on the PA of one major European Low cost carrier :

Ladies and gentlemen, this is the captain speaking. We will be landing in 35 minutes, the outside temperature is minus 53centigrade., but don' t worry, this aircraft is not exactly brand new but at least the heating is working .We hope not to be late because if we are our Ops are not going to be pleased as they need the aircraft for 6 more legs today. When the aircraft comes to a complete stop , we will ask you to leave the aircraft as guickly as possible, as we have no time to lose . I still have £8000 to repay for my training and I need my bonus. The airport at which you will disembark is generally totally deserted, at about 100 Km from the city you purchased a ticket for, but do not worry, a bus should eventually come to take you there. Okay, it is not perfect, but what do you expect for 20 euros? Good bye and thank you for flying with US.

RYANAIR CHIEF INTERVIEW

In a recent edition of NEWSWEEK (June 23), Michael O'Leary talks unconventionally about future air travel :

Excerpts: "In 2 years we will carry more passengers than British Airways with 20 times less staff. At the moment, British Airways have a tagline in their advertisements : "Fly BA, the world's favorite airline " It is based on them carrying the most international passengers. We are going to write to them and demand that we have the slogan . It's going to be : "Welcome to the Paddies, the world's favorite airline" We are not worried about competition, the only thing that worries us is laser travel, you know like " Star Trek" . then we'll be really screwed. I think some time in the near future passengers will fly free. The days when you could charge consumers \$500 or \$1000 per flight are over. We're running glorified bus services ... "

Interesting stuff. I wonder if he, and his management team, consider his pilots as glorified bus drivers, but I know of another profession that sometimes does...

OVERHEARD ON THE FREQUENCY :

- United 93 taxi into position and hold .
- We are unable to, we have a passenger in the lavatory.



- Continental 234 do you have a passenger in the lav ?
- No sir !
- Continental 234, you're up !

Pilot : Berlin TWR we just passed a fox crossing the taxiway right to left..

Controller: yes, we know him, this is the local fox. He is trained to avoid aircraft and is transponder equipped. We have him totally under control..

Pilot : Zurich, good afternoon Eurowings 1651, level 140.

Controller : Good afternoon Lufthansa 1651, direct Tango .

Pilot : Direct Tango, Thanks, but could you call us Eurowings ?

Controller : Sure, but only if you call me Munich ..

CULTURAL DIFFERENCES:

NOTAM : 12. Sept. 2003 :

EGTC Affecting London Arrivals : Runway Blocked : Reason : Migrating Geese. In England, it is considered a curse : they stop traffic and cause delays. While, in France, such a NOTAM is viewed with great joy, as they shoot the geese to eat..

OVERHEARD on 121.5

To anyone : if you see a white and red Cessna 152 currently circling overhead a big runway that says 31-13 can you please tell me which airport it is ?

Over Frankfurt Airport about 15 years ago : During an international military exercise in the German Eiffel area, 2 Norwegian F16s got lost at low level and ended up overflying the Frankfurt airport :

TWR controller on 121.5:

" The 2 F16's now over Frankfurt airport, please identify yourselves !"

One of the pilot replied with a strong

Scandinavian accent : " We might be lost but are not stupid !"

CHECK-IN STORIES :

Man walks up to the counter : Airline girl : Can I help you ? Man : I want a round trip ticket .. Airline Girl : Where to ? Man : Right back to here (Telephone rings) Airline girl : Good morning, big airlines, can I help you ? Female voice : How long does it takes to fly to New York ? Airline girl : just a minute Voice : Thank you , and she hangs up.

LAST CONCORDE FLIGHT:

The last commercial flight of Concorde took place on 24 October 2003.By chance I was in the cockpit of a transatlantic flight that afternoon when Concorde BAW flight 002 was eastbound back to London for the last time. Everyone on the frequency wanted to part of history and wish the Concorde crew well. So numerous calls were made just asking : What is the Concorde position now? etc.... when suddenly a very strong American voice came up on the frequency (possibly the Gander controller ?) saying :

" All you guys did not give a £\$%^&* about it for 25 years and now suddenly you all want to know where it is ?" After a silence, the very typical British voice came in and said " Errr, we are 31W passing FL600 climbingÖ.good bye to you all, its been a pleasure... " We did not see it, but as we were cruising at Mach 8.2 at Fl 320, I realized that should we be exactly underneath, the altitude and speed difference would mean that it would be the same as watching a 747 passing overhead at FL300 from the ground.

Merry Christmas to you all and all the best for 2004 ..