

**For discussion  
on 10 November 1999**

**EC(1999-2000)22**

## **ITEM FOR ESTABLISHMENT SUBCOMMITTEE OF FINANCE COMMITTEE**

### **HEAD 28 - CIVIL AVIATION DEPARTMENT Subhead 001 Salaries**

Members are invited to recommend to Finance Committee the creation of the following permanent posts in the Civil Aviation Department, with effect from 1 January 2000 -

1 Chief Electronics Engineer  
(D1) (\$98,250 - \$104,250)

1 Chief Air Traffic Control Officer  
(D1) (\$98,250 - \$104,250)

### **PROBLEM**

The existing staffing structure of the Air Traffic Management Division (ATMD) and the Technical and Planning Division (T&PD) of the Civil Aviation Department (CAD) cannot cope with the increased workload at the new airport and that arising from other new commitments, notably the development of satellite-based systems for Communications, Navigation, Surveillance and Air Traffic Management (CNS/ATM).

### **PROPOSAL**

2. The Director of Civil Aviation (DCA) proposes to create one permanent post of Chief Electronics Engineer (CEE) to lead a new Electronics Engineering (Projects) Section of T&PD, and one permanent post of Chief Air Traffic Control Officer (CATCO) to lead a new Project and Development Section of ATMD, with effect from 1 January 2000.

**/JUSTIFICATION .....**

## JUSTIFICATION

### Need For An Additional CEE

Encl. 1

3. The T&PD is currently headed by the Assistant Director (Technical and Planning) (D2), underpinned by one CEE (D1) and one Chief Operations Officer (D1). It looks after the planning, provision, operations and maintenance of air traffic control and air navigation equipment for the Hong Kong International Airport. It also provides aeronautical telecommunication services for the Hong Kong Flight Information Region. Enclosure 1 shows its existing organisation structure.

4. The existing CEE in T&PD, which was created in 1973, has two main areas of duty. The first area is supervision of the Division's Computer System Unit and the Telecommunications Unit. The second area is to oversee the operations and maintenance of the existing ground-based Air Traffic Control (ATC) systems. The latter includes supervising the maintenance contractors, devising criteria to protect the integrity of navigation signal, formulating flight calibration programme/procedures, working out arrangements to ensure the reliability of power supply and preparing contingency plans for ATC equipment and systems.

5. Since the opening of the new airport in July 1998, the CEE's workload has grown substantially because of the new operational mode and the more complex equipment at the new airport. The ATC system for the new airport under his area of responsibility costs over \$1,500 million, and is at least three times that of the Kai Tak system in terms of size, complexity and capability. The 24-hour operation of the new airport and increased runway capacity (with dual runways since August 1999) also call for much more operational and maintenance support. The number of maintenance contractor's staff appointed has increased from 123 in 1994 to 148 in 1999. To cope with these new operational requirements, the Telecommunications Unit has also expanded in terms of its staffing level from 88 in 1994 to 105 in 1999, adding further to the CEE's staff management responsibility. We expect further increase in his workload upon commissioning of the equipment facilities for the Backup ATC Centre and Tower starting from December 1999. The DCA considers this CEE post considerably overloaded, and that it would be desirable to relieve him of part of his responsibility in order to maintain effective performance of the team.

6. At the same time, CAD needs to develop a new CNS/ATM system to replace the existing ground-based ATC systems. The study and trial phases, the funds for which were approved by the Finance Committee in May 1999, will last

/from .....

from 1999 to 2008. DCA plans to create a core team of staff to formulate the implementation plan, specify the equipment requirement, and set out testing and evaluation criteria. Although the existing CEE would have the technical expertise to assist in the project, he clearly does not have the spare capacity to do so. As foreshadowed in paper FCR(1999-2000)10, this team will need to be headed by a new CEE. It will form part of a new Electronics Engineering (Projects) Section in T&PD.

7. As the CNS/ATM project manager, the new CEE will formulate the necessary policies and guidelines on the study/trial of CNS/ATM elements, oversee the conduct of relevant studies/trials and lead his team in the analysis of the results. He will also be responsible for working out the project implementation options and time programmes. Specifically, the new CEE will be responsible for specifying equipment requirements, initiating procurement tendering, evaluating tenders, executing contract administration, overseeing equipment production/installation, as well as monitoring software development and system integration. In the process, he will need to liaise closely with the International Civil Aviation Organisation (ICAO), equipment manufacturers and our aviation partners, in order to keep track of and be involved in the development of the relevant technologies and standards. To relieve the existing CEE of part of his workload, the new CEE will take over from him the responsibility of supervising the Computer System Unit.

Encl. 2 8. The proposed job description of the new CEE is at Enclosure 2. The  
 Encl. 3 organisation structure of the T&PD after the creation of the Electronics  
 Encl. 4 Engineering (Projects) Section is at Enclosure 3. The revised job description of  
 the existing CEE is at Enclosure 4. He will be re-titled as CEE (Operations &  
 Maintenance) and the existing Electronics Engineering Section will be re-titled as  
 Electronics Engineering (Operations & Maintenance) Section.

### **Need For An Additional CATCO**

Encl. 5 9. At present, the ATMD is headed by the Air Traffic General Manager ranked at Assistant Director of Civil Aviation (D2), and underpinned by three Deputy Air Traffic General Manager (DATGM) ranked at CATCO (D1). The Division is responsible for the provision of air traffic control service, flight information service and alerting service within the Hong Kong Flight Information Region and Area of Responsibility as assigned by the ICAO. The existing organisation chart of the ATMD is at Enclosure 5. To accommodate the CNS/ATM project, the ATMD would need to conduct operational research and testings of the CNS/ATM functionality, trials and evaluation of aircraft flight procedures, and develop ATC operating procedures for the new equipment. DCA

/has .....

has reviewed the duties of the ATMD and is of the view that the existing three CATCOs in ATMD do not have any spare capacity to take up these duties. As in the case of the existing CEE in T&PD, their workload has grown in recent years as a result of the 24-hour operation of airport. In addition, they are facing increasing work pressure from the following -

- (a) increase in the maximum aircraft movement rate : from the existing 37 movements per hour progressively to an expected 50 movements per hour by 2001, which necessitates enhanced management of the provision of ATC services; and
- (b) growth in the number of ATC personnel : from 214 in May 1996 to 341 in April 1999 (i.e. an increase of 59%), which necessitates strenuous efforts in personnel management, training and assurance of controller standards.

10. As such, DCA sees a need to create a new permanent post of CATCO to head a new Projects and Development Section (P&D Section) under the ATMD. The major responsibilities of this new post will be as follows -

(a) CNS/ATM Systems

The proposed CATCO will be responsible for directing the operational trials, the evaluation and validation of the CNS/ATM systems, and providing operational inputs to the equipment requirements from the ATC operation viewpoint. He will also lead his Section to design, evaluate and validate new flight procedures, and ATC operating procedures on the basis of the new CNS/ATM concept. The tasks involved include examining the scope to reduce aircraft separation, designing flight routes based on satellite navigation, working out operation procedures for the various CNS/ATM component systems, reviewing ATC coordination arrangement and operating techniques etc.

It is envisaged that for some years after its implementation, the CNS/ATM systems will be used in parallel with the ground-based systems. The new CATCO will have to work out the related transitional arrangements. He will subsequently be responsible for the extensive and demanding co-ordination work involved in the transition and implementation processes, including liaison with ICAO, other regional and international organisations and neighbouring civil aviation authorities.

/(b) .....

(b) Integrated mode of operation

The existing ATC arrangements for the runways only cater for a segregated mode of operation, i.e. of the two runways, one is designated for departures and the other for arrivals. This mode of operation limits the runway capacity to about 50 aircraft movements per hour. In order to increase the capacity, an integrated mode of operation which can allow departures and arrivals at both runways will be required in the long term.

To achieve the integrated mode, the new CATCO will formulate a new and improved ATC scheme. He will have to work out new optimum flight profiles, minimum airspace constraints, relief of air traffic congestion and flight safety assurance etc. Detailed co-ordination with the civil aviation authorities of the Mainland and Macau will also be needed.

Although the current runway capacity is expected to be able to meet the demand for a few years, CAD needs to start the design of the new ATC scheme now, as this is a complicated task that will require at least two years to complete.

The workload arising from this new commitment is not one-off. Regular updates to the ATC scheme are needed to cater for developments in ATC/aviation technologies, growth in air traffic and expansion of the airports in the Pearl River Delta etc.

- Encl. 6 11. The job description of the proposed CATCO post is at Enclosure 6. The new CATCO will oversee nine non-directorate Air Traffic Control Officers in the new P&D Section, including three posts which are re-deployed from the Procedures for Air Navigation Services - Aircraft Operations (PANSOPS), Systems and Standards Section and six new Air Traffic Control Officer II posts. The proposed organisation structure of ATMD after the creation of the P&D Section is at Enclosure 7.
- Encl. 7

**Other Sections of the ATMD**

12. Noting that the introduction of the CNS/ATM systems will likely be a focus of the international aviation community in coming years, DCA also considers that the new P&D Section should take over the duties of liaison with -

/(a) .....

- (a) ICAO over air traffic services matters from the existing Air Traffic Services Procedures and Personnel Management Section; and
- (b) T&PD over matters relating to the ATC equipment acquisition etc. from the existing PANSOPS, Systems and Standards Section.

The revised job descriptions for DATGM (Air Traffic Services Procedures and Personnel Management), who will be re-titled as DATGM (Air Traffic Services and Personnel Management), and DATGM (PANSOPS, System and Standards) are at Encls.8&9 Enclosures 8 and 9 respectively.

**Alternatives considered**

13. We have critically examined the feasibility of various alternatives to the proposed creation of the CEE and CATCO posts, including re-deployment of existing staff, creating more junior posts and postponing the creation. However, none of these alternatives is viable in view of the heavy workload of the existing staff, the scale and complexity of the CNS/ATM project, and the need to take forward the project in accordance with the ICAO Global Implementation Plan.

**Review of the need of the posts**

14. The Government is committed to introducing the CNS/ATM systems in accordance with the ICAO Global Implementation Plan. To ensure that implementation of our local systems is in compliance with the Global Plan, the proposed new posts will have to be created by 1 January 2000. We will review the need of the posts together with other capital and staffing requirements for the implementation phase of the CNS/ATM project before 2008 when the study and trial phases are expected to have been largely completed.

**FINANCIAL IMPLICATIONS**

15. The additional notional annual salary cost of the proposed posts at mid-point is -

|       | \$               | No. of post |
|-------|------------------|-------------|
| CEE   | 1,213,200        | 1           |
| CATCO | 1,213,200        | 1           |
| Total | <u>2,426,400</u> | <u>2</u>    |

The full annual average staff cost of the proposal is \$3,976,884, including salaries and staff on-cost.

16. In addition, the study and trial of CNS/ATM Systems will necessitate the creation of the following non-directorate posts to support the two proposed posts -

CEE : 2 Senior Electronics Engineers and  
1 Personal Secretary II  
CATCO : 6 Air Traffic Control Officers II

The total notional annual mid-point salary costs are \$6,672,600 and the full annual average staff costs are \$14,053,512. DCA has included sufficient provision in the 1999-2000 Estimates to meet the cost of these posts.

17. The costs for provision of air traffic control services, including the cost for these posts, are to be recovered from the Airport Authority (AA) and through the En-route Navigation Services charges. The proposed creation of the CATCO post would increase the charges on the AA by less than 0.05% of the total annual operating costs of AA based on its present cost structure. The cost of CEE will not affect the charge to AA until 2007 when the first satellite-based CNS/ATM Systems are commissioned. For the En-route Navigation Services, the increase in total cost is expected to be less than 0.2%.

## **BACKGROUND INFORMATION**

18. At the Finance Committee meeting on 7 May 1999, Members considered paper FCR(1999-2000)10 and approved the creation of a new commitment of \$233.8 million in money-of-the-day (MOD) prices for the study and trial of the satellite-based CNS/ATM Systems. Members noted that these systems would provide numerous significant benefits, including enhancement of flight safety and efficiency, increase in airspace capacity, savings in flight time and fuel, as well as reduction in disruption to air services arising from adverse weather. The total estimated cost of the project is \$1.32 billion in MOD prices. It is planned to be undertaken in three phases, namely study phase, trial phase and implementation phase. The proposed CEE and CATCO will be responsible for the essential technical and operational inputs respectively to ensure successful implementation of this project.

## **CIVIL SERVICE BUREAU COMMENTS**

19. The Department has considered carefully alternative means to provide appropriate level of service bearing in mind the need for efficiency and productivity but considers this proposal the most appropriate way to proceed. Having regard to the reasons put forward, Civil Service Bureau considers the proposal justified and the grading and ranking appropriate.

/ADVISE .....

**ADVICE OF THE STANDING COMMITTEE ON DIRECTORATE SALARIES AND CONDITIONS OF SERVICE**

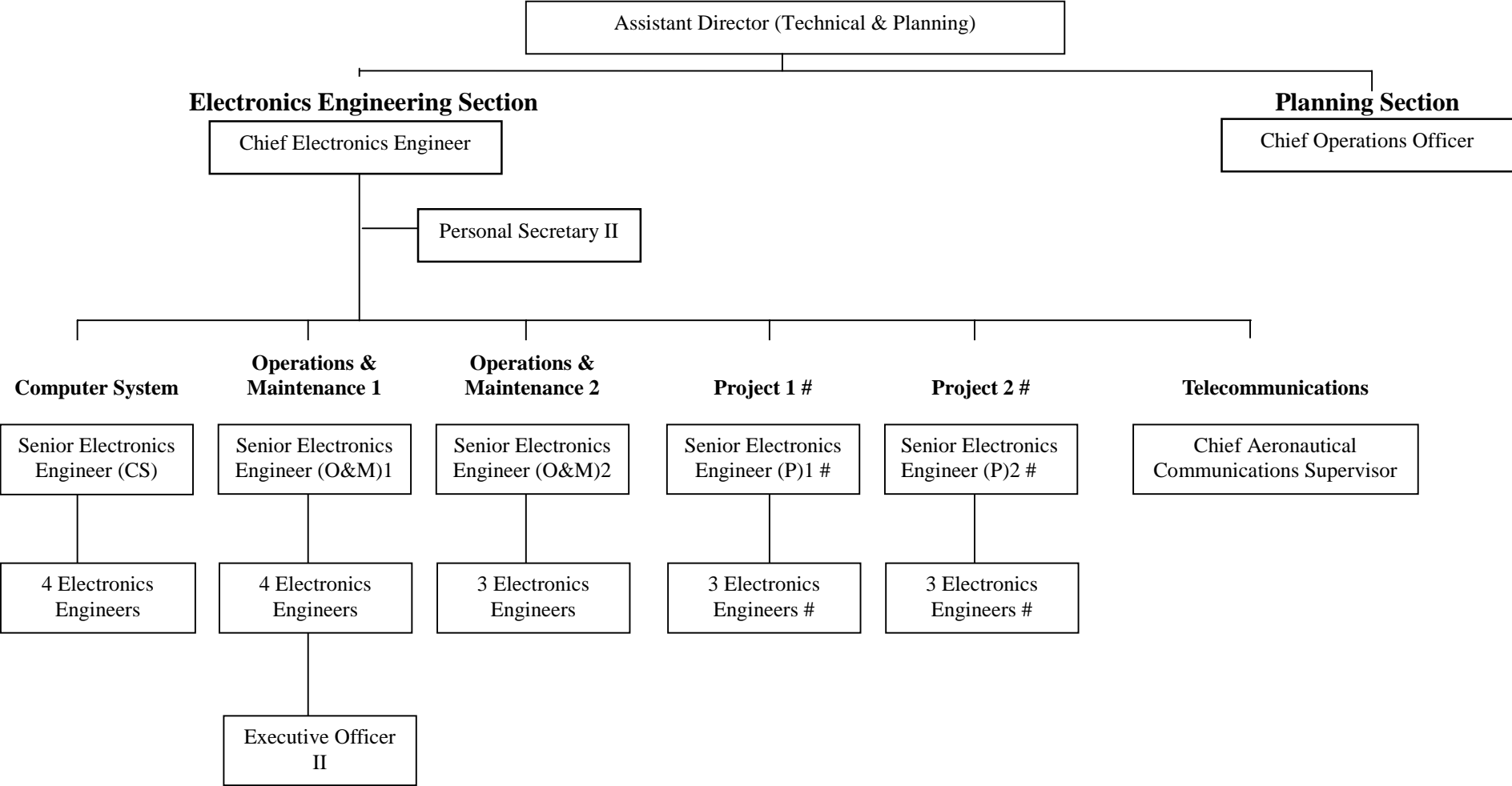
20. The Standing Committee on Directorate Salaries and Conditions of Service has advised that the proposal would be appropriate if the posts were to be created.

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Economic Services Bureau  
November 1999



**Electronics Engineering Section, Technical and Planning Division  
Organisation Chart as at 1 August 1999**



# Airport Core Programme/Port and Airport Development Strategy posts to be deleted in phases in 1999-2000

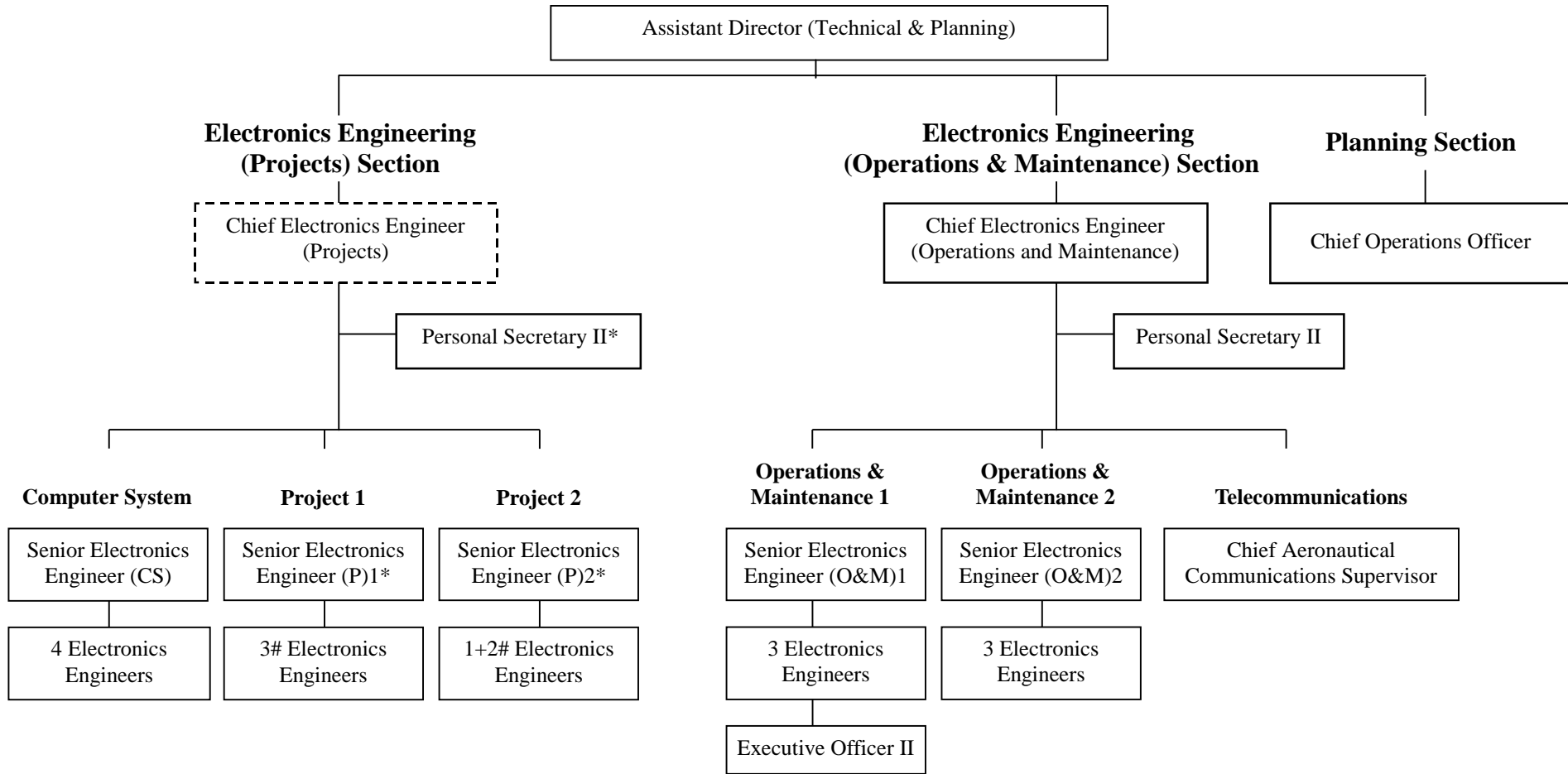
**Job Description**  
(for proposed CEE)

**Title** : Chief Electronics Engineer (Projects)  
**Rank** : Chief Electronics Engineer  
**Responsible to** : Assistant Director (Technical & Planning)  
**Responsible for** :

1. Overall direction, supervision and co-ordination of staff and work in the Electronics Engineering (Projects) Section.
2. Overall direction, supervision and co-ordination of all aspects associated with the study and trial of the satellite-based Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) Systems including formulation of relevant policies and guidelines, technical framework, conducting cost-effectiveness analysis, and liaison with other aviation authorities.
3. Overall direction and supervision of, and liaison with the maintenance contractor to ensure the provisions of the Technical Services Agreement are fulfilled in respect of project needs of Civil Aviation Department (CAD), as well as the handling of appropriate staffing, finance and policy matters with the contractor.
4. Overall direction, supervision and co-ordination of all engineering and technical aspects associated with the maintenance of CAD's local area networks, air traffic control system data administration and security, and the trial/maintenance of Aeronautical Telecommunications Network etc.
5. Attendance of International Civil Aviation Organisation or international technical conferences on CNS/ATM. Provision of information and the preparation of working papers and documents with presentations to international agencies, airlines and professional bodies, etc.
6. Chairman of the Operational Planning Coordination Committee, which is to review the progress in operational planning and the implementation of projects.

7. Chairman of the CAD/Airlines Liaison Committee on CNS/ATM Trial and Evaluation, which is to coordinate with participating airlines in the trial and evaluation of different potential CNS/ATM system elements and the formulation of test schedules and procedures.
8. Providing electronic engineering support to the investigation team in case of aircraft accidents.

**Electronics Engineering Sections, Technical and Planning Division  
Proposed Organisation Chart**



Proposed new post

# On non-civil service contract terms and outside Civil Aviation Department's establishment

\* Non-directorate posts to be created in 1999-2000 for supporting the new Chief Electronics Engineer

**Job Description (Revised)**

**Title** : Chief Electronics Engineer (Operations & Maintenance)

**Rank** : Chief Electronics Engineer

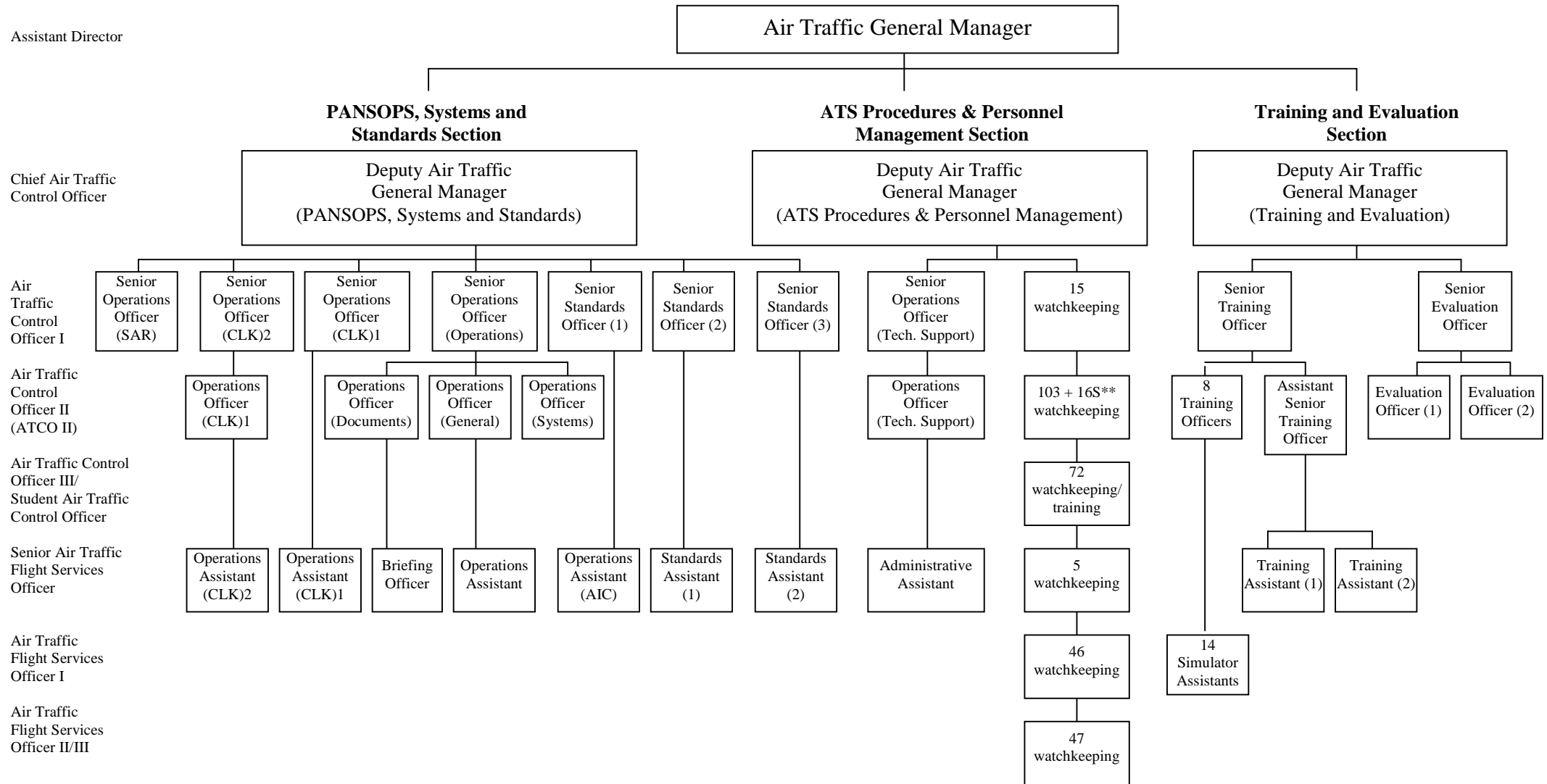
**Responsible to** : Assistant Director (Technical & Planning)

**Responsible for** :

1. Overall direction, supervision and co-ordination of staff and work in the Electronics Engineering (Operations & Maintenance) Section.
2. Overall direction and supervision of maintenance of various air traffic control (ATC) systems under the Maintenance Supervision Scheme, such as to set out approved technical standards and procedures for services provided by the maintenance contractors, particularly with regard to satisfactory maintenance and safe operation of radars, radio navigational aids, communications, data processing systems, ATC simulators etc.
3. Liaison and co-ordination at senior level with other Government Departments and organisations in connection with operation, maintenance and sharing of facilities at out-stations.
4. Liaison with the maintenance contractor and other Government Departments on the administration of the Technical Services Agreement.
5. Technical liaison and co-ordination with other authorities for radar, navigation aids and communications system interfaces with neighbouring airports/ATC centres.
6. Arranging regular and efficient flight calibration on radio navigational aids by an acceptable authority in accordance with International Civil Aviation Organisation (ICAO) or other recognised standards, and ensuring that these aids are operated and maintained by maintenance contractors to a high standard.
7. Attendance of ICAO regional meetings concerning electronic engineering and telecommunications. Provision of information and the preparation of working papers and documents with presentations to international agencies, airlines and professional bodies, etc.

8. Chairman of the Departmental Metrication Committee, which is to review and advise on any change in Civil Aviation Legislation associated with metrication and to be responsible for the overall coordination of metrication within the Department.
9. Chairman of the Aeronautical Communications Staff Meeting, which is to discuss and resolve matters on the day-to-day operations of the Aeronautical Communications Centres and recommend improvements to the provision of aeronautical communications services.
10. Providing electronic engineering support to the investigation team in case of aircraft accidents.

## Air Traffic Management Division Organisation Chart as at 1 August 1999



\*\*16 temporary ATCO II posts not included in Civil Aviation Department's establishment

**Job Description**  
(for proposed CATCO)

**Title** : Deputy Air Traffic General Manager  
(Projects and Development)

**Rank** : Chief Air Traffic Control Officer

**Responsible to** : Air Traffic General Manager

**Responsible for** :

1. Directing the operation of the Air Traffic Management Projects and Development Section.
2. Assisting in the planning of the new satellite-based Communications, Navigation, Surveillance/Air Traffic Management (CNS/ATM) Systems in Hong Kong, defining operational requirements for the provision of relevant equipment and systems and conducting trials with airline operators and neighbouring air traffic control (ATC) centres in accordance with standards/recommendations of the International Civil Aviation Organisation (ICAO).
3. Liaison with Technical and Planning Division for the procurement, testing and acceptance of the CNS/ATM systems.
4. Participating in ICAO working groups and task forces, including the attendance of Regional Planning and Implementation Group Meetings, and co-ordinating with other aviation authorities in the Asia/Pacific region in the formulation of regional Air Traffic Services procedures for CNS/ATM-based ATC systems.
5. Directing the re-design of airspace structure in the Hong Kong Flight Information Region and changes to flight procedures with the a view to integrating regional and Hong Kong traffic into the satellite-based systems.
6. Directing and overseeing the formulation of new ATC scheme for the integrated mode operation of the airport to maximise the runway capacity.
7. Co-ordinating and working closely with ATC authorities of adjacent airports (Macau, Guangzhou, Shenzhen and Zhuhai), with particular emphasis on the harmonisation between the existing ground-based system and the future satellite-based system, and the transition from the former to the latter system.



## Air Traffic Management Division Proposed Organisation Chart

Assistant Director

Chief  
Air Traffic  
Control  
Officer  
(CATCO)

Air  
Traffic  
Control  
Officer I

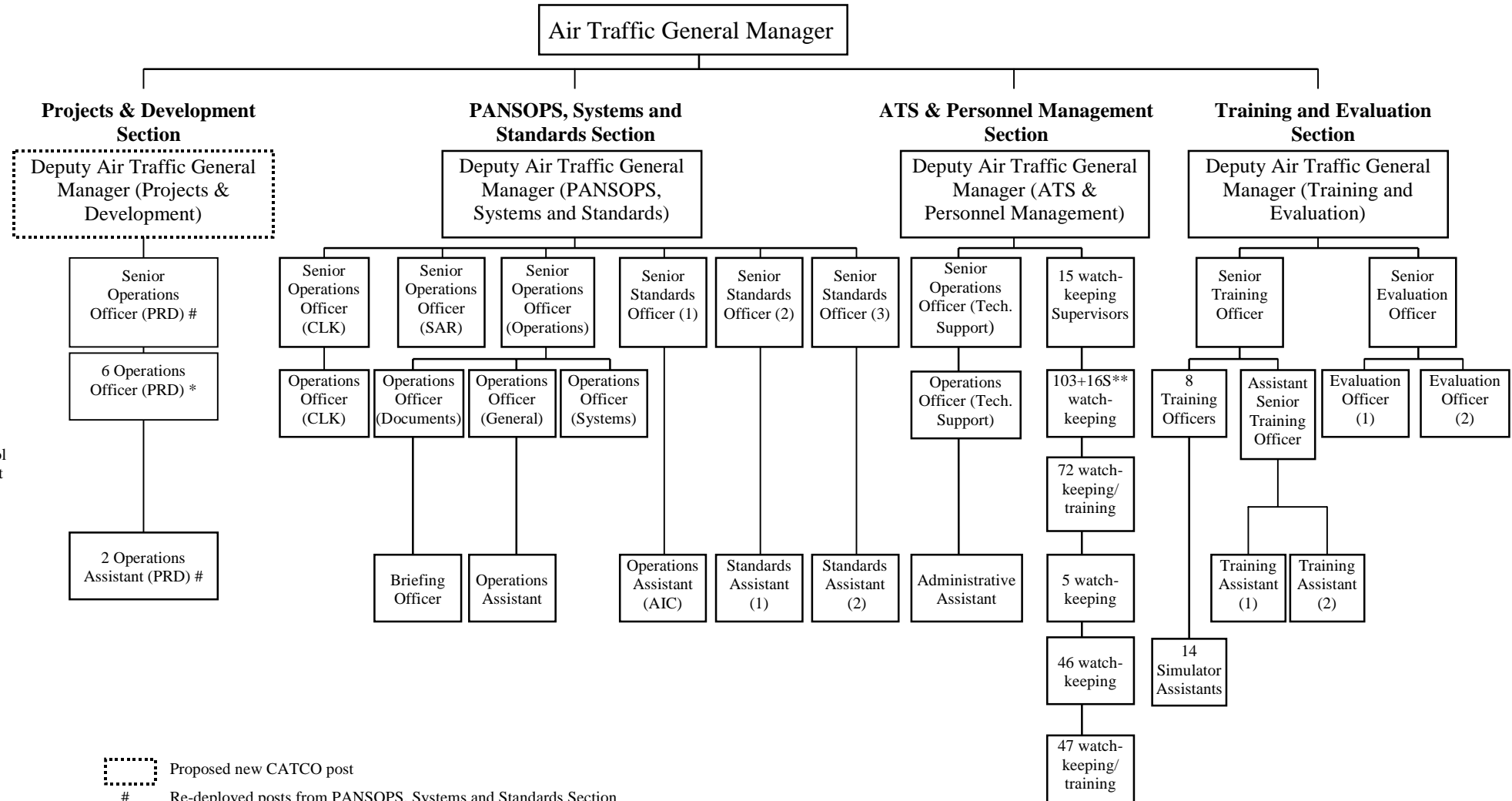
Air Traffic  
Control  
Officer II  
(ATCO II)

Air Traffic Control  
Officer III/Student  
Air Traffic  
Control Officer

Senior Air  
Traffic Flight  
Services  
Officer

Air Traffic  
Flight Services  
Officer I

Air Traffic  
Flight Services  
Officer II/III



- ⋯ Proposed new CATCO post
- # Re-deployed posts from PANSOPS, Systems and Standards Section
- \* Non-directorate posts to be created in 1999-2000 for supporting the new CATCO
- \*\* 16 temporary ATCO II posts not included in the establishment of Civil Aviation Department

**Job Description (Revised)**

**Title** : Deputy Air Traffic General Manager  
(ATS and Personnel Management)

**Rank** : Chief Air Traffic Control Officer

**Responsible to** : Air Traffic General Manager

**Responsible for :**

1. Overall management of watch-keeping personnel to ensure the safe, efficient and orderly provision of air traffic services in accordance with International Civil Aviation Organisation and Air Navigation (Hong Kong) Order 1995 provisions.
2. Supervision of staff deployment including the assignment of duties, leave applications, training courses, attendance of meetings and familiarisation flight applications, and taking charge of all personnel and staff welfare matters.
3. Reviewing staffing plan of Air Traffic Management Division (ATMD), resource allocation and rendering advice and assistance to Air Traffic General Manager (ATGM) in the formulation of staff requirements and divisional budget.
4. Conducting staff review and making recommendations to ATGM for the purpose of promotions, confirmation to established posts, passage over efficiency bars and disciplinary actions.
5. Effecting co-ordination with divisions within Civil Aviation Department, other Government departments, airlines and airspace users, and Air Traffic Services Chiefs of neighbouring Air Traffic Control Centres (ATCC) to enhance safety and efficiency in aircraft operations.
6. Supervising operations of the ATCC and Control Tower and directing necessary actions to ensure flight safety and efficiency.
7. Taking charge of analysis of ATC incidents in conjunction with Senior Standards Officers and initiating follow-up actions as necessary in liaison with Deputy Air Traffic General Manager (PANSOPS, Systems and Standards).

8. Directing security policy for ATMD. Approving visits to ATCC and Control Tower from outside organisations.
  
9. Chairman of Air Traffic Services Management Meeting, which is an internal forum between senior management and frontline supervisors to discuss management issues such as staffing, performance, conduct, training, etc.

**Job Description (Revised)**

**Title** : Deputy Air Traffic General Manager  
(PANSOPS, Systems and Standards)

**Rank** : Chief Air Traffic Control Officer

**Responsible to** : Air Traffic General Manager

**Responsible for** :

1. Promulgating procedures for air navigation services and aircraft operations in the Hong Kong Flight Information Region/Area of Responsibility (HKFIR/AOR) in accordance with the statutory requirements of the Air Navigation (Hong Kong) Order, International Civil Aviation Organisation (ICAO) Standards and Recommended Practices and ICAO Procedures for Air Navigation Services and Aircraft Operations (PANSOPS). This is to ensure that flights within HKFIR/AOR are conducted in accordance with statutory and international requirements so as to achieve safety, efficiency and regularity of air navigation services.
2. Reviewing and directing amendments to the Aeronautical Information Publication, Manual of Air Traffic Control and Emergency File to ensure conformity with statutory requirements and ICAO standards and recommended practices.
3. Studying the operation of scientific, commercial or recreational aviation activities of low mobility such as parachute descent displays, parascending activities, balloon and airship flights and assessing their impact on air traffic control (ATC) operations for the purpose of processing and approving/disapproving applications for such aviation activities in liaison with other divisions in Civil Aviation Department and/or government departments as appropriate.
4. Co-ordinating with ICAO Asia/Pacific office concerning the application of PANSOPS and Standards and Recommended Practices.
5. Examining and analysing the ATC operations with a view to incorporating enhancements as necessary to ensure operational integrity and efficiency of the ATC system.

6. Directing specialised studies and research to identify and update requirements for non-CNS/ATM related equipment, facilities, procedures and working routine of Air Traffic Management Division (ATMD). Producing operational specifications of new ATMD projects.
7. Providing professional advice from an ATC point of view on aircraft noise issues to Technical & Planning Division and/or other Government Departments in formulating policies for measures in mitigating aircraft noise.
8. Supervising the assessment of staff performance standards and the validation/re-validation of ATC ratings, and ensuring staff are adhering to operational standards and recommended practices. Ensuring all staff are properly licensed or qualified for ATC operations.
9. Analysing ATC incidents in conjunction with Deputy Air Traffic General Manager (ATS and Personnel Management). Taking remedial actions or making recommendations as a result of the findings.
10. Overseeing search and rescue operations and directing search and rescue policy.