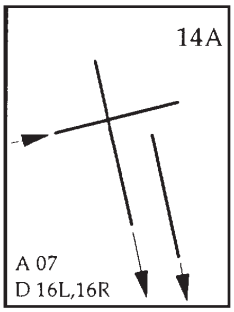
Mode 14A

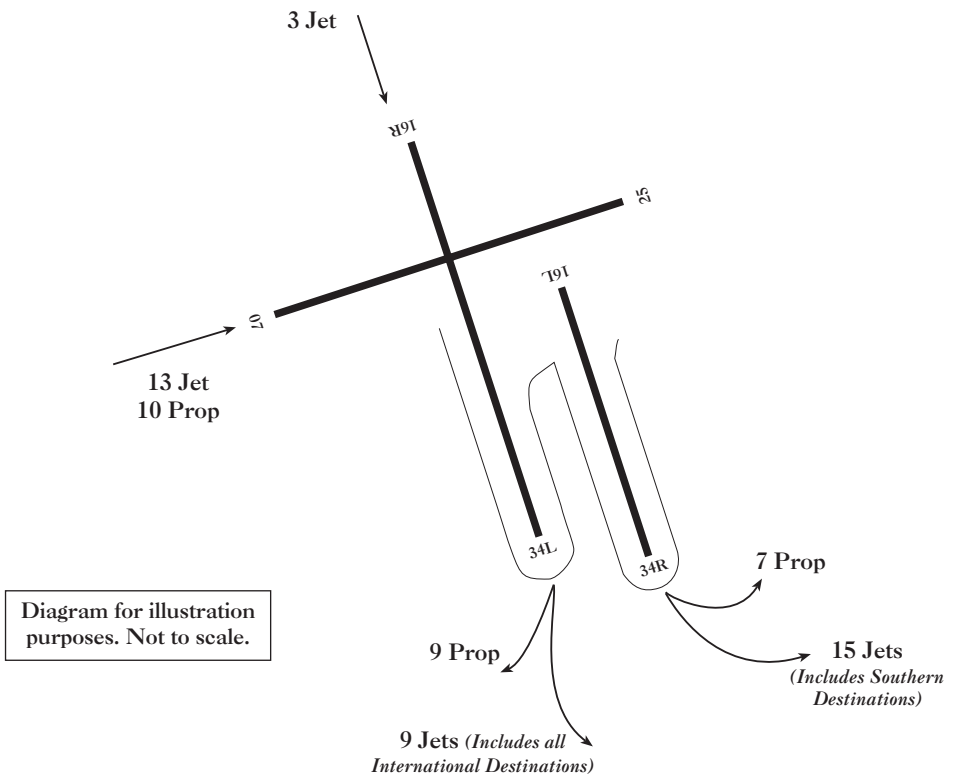


Method of operation

Departures to the south from Runways 16L and 16R.

Arrivals from the west on Runway 07. Arrivals from the north for those aircraft requiring the use of the long runway.

Runway 16L/R Departures/07 Arrivals 16R (Long Haul) (Mode 14A)



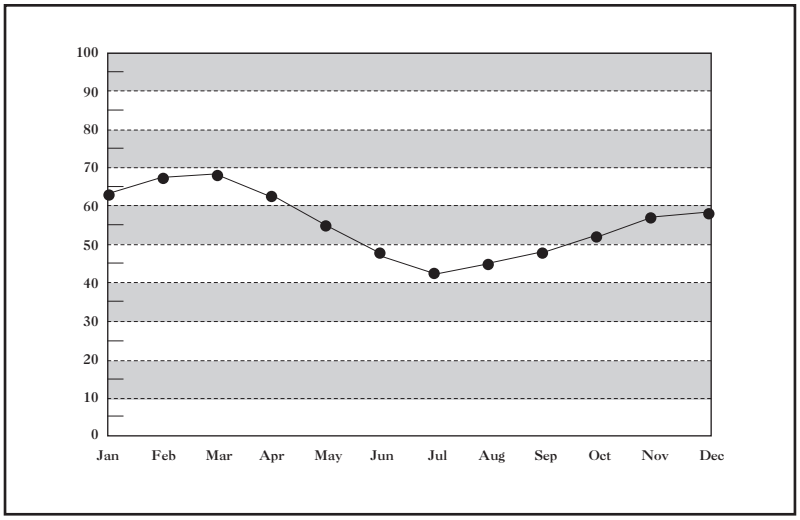
These traffic distribution figures represent estimated hourly movements for a Mode 14 operation based on a sustained capacity of 66 movements per hour consisting of 26 arrivals and 40 departures (refer Sydney Runway Capacity Study prepared by Sabre. Decision Technologies). These calculations assume an assignment of 55% of departures to Runway 16L and 45% to Runway 16R.

Availability of configuration

Operationally acceptable in wind conditions from east to south, or light south-west to north-west. These conditions occur throughout the year.

The Bureau of Meteorology wind data for the 55 years to December 1995 indicates that:

- **average yearly availability over 55 years was 55 per cent.**
- **average monthly availability over 55 years ranged from 43 per cent in July to 67 per cent in February and March.**



The graph indicates the 55-year average availability from January to December. Where nil downwind criteria is specified the average of all months availability is 32 per cent

Operational capacity

Sabre SIMMOD modelling indicated a sustained capacity of 66 movements an hour consisting of 26 arrivals and 40 departures. Peak capacity was 67 movements.

Sabre indicated this capacity was reached by assigning 55 per cent of the departures to runway 16L and 45 per cent to runway 16R.

Sabre indicates this mode would not be likely to attain 80 movements an hour because the active runways intersect and inability to use LAHSO given current procedures.

However, Sabre indicates that if all runway 16R (non long haul) would begin take-off from taxiway H, the resultant capacity of the Mode would likely reach 80 movements per hour. This was based on

- the distance of runway 16R from taxiway H to the southern threshold being newly 2,200 metres, the same length as runway 16L
- the departures from runway 16R being independent from runway 07 arrivals as are the runway 16L departures

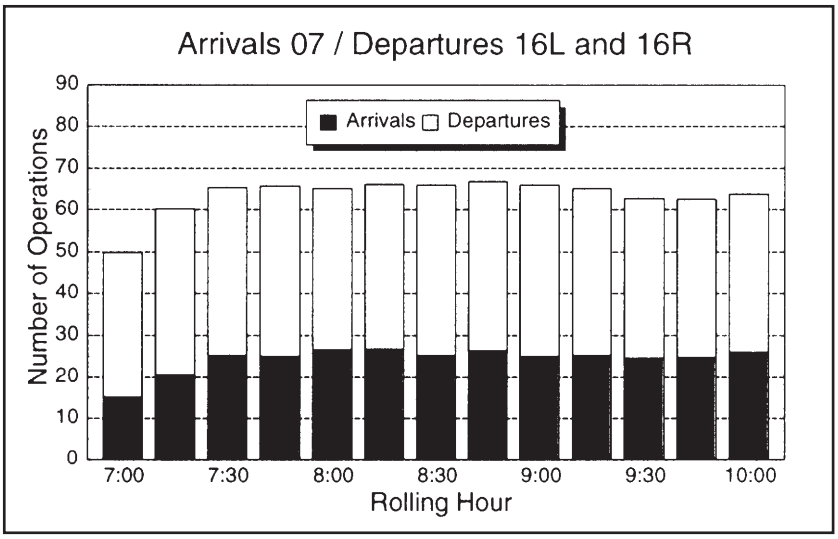
Further Sabre modelling found a sustained capacity of 75 movements per hour when non long haul departures on runway 16R were moved south of runway 07, consisting of 26 arrivals and 49 departures. Peak observed capacity was 77 movements

Sabre indicates this scenario assumes that ground controllers could officially manage the runway crossing of runway 07 at taxiways B and C (departures to

the taxiway H intersection of runway 16R would taxi south on taxiway B and departures for runway 16L would taxi south on taxiway C). Sabre states that

- the model predicted 39 delayed crossings with an average delay of 24 seconds during a 4 hour period
- arriving light and medium commuter aircraft may either have to taxi longer to exit at taxiway G3 rather than taxiway B or C, or departures may have to be held north of taxiway G to allow those aircraft to use the taxiway B and C exits when required.

Graph below presents SDT simulation results for a rolling hour period.



Operational complexity

Less complex than Mode 14, requiring only sequencing of Runway 16R departures with arriving traffic. Some additional airspace complexity as northern and southern arrival streams are blended.

Management of aerodrome traffic would increase in complexity as traffic levels increased. Taxiway congestion can quickly become a problem in the north east sector of the aerodrome and a significant number of taxiing aircraft will be required to cross active runways.

Sabre suggested that some departures off runway 16R may commence from a taxiway, intersection south of runway 07/25 to enhance capacity. This would enable these aircraft to depart independently of arrivals on runway 07. Consideration of this proposal has identified the difficulties of managing the additional runway crossings required, the potential for taxiway congestion in critical areas, and the effect on other operations.

The additional wake turbulence separation required with aircraft departing from north of runway 07 also has to be considered where landing aircraft are still generating lift as they cross Runway 16L in their landing roll.

Constraints to optimisation of capacity

Not suited to high arrival rates.

The potential for ground conflict between aircraft taxiing after landing with those aircraft taxiing for departure from Runway 16L may impact on capacity. The non-availability of Taxiway C to vacate Runway 07, where it is occupied by aircraft waiting to cross the runway may increase the runway occupancy times for arrivals and require greater spacing between successive arrivals.

There may be some scope to counter this by the provision of some taxiway enhancements.

Environmental implications

Arrivals 07

The number of people exposed to noise of 70 dB(A) or more for B747-200 aircraft is a total of 72,600.

At the outer tip of the contour for each particular type of aircraft the noise reaching the ground will be close to 70 dB(A) and the aircraft will be at the following heights.

B747-200	3,400ft	at	Royal National Park
B747-400	3,100ft	at	Royal National Park
B767	2,900ft	at	Padstow Heights
Saab 340	850ft	at	Hurstville

Arrivals 16R (Heavy)

The number of people exposed to noise of 70 dB(A) or more for B747-200 aircraft is a total of 134,400.

At the outer tip of the contour for each particular type of aircraft the noise reaching the ground will be close to 70 dB(A) and the aircraft will be at the following heights.

B747-200	3,400ft	at	Turramurra, Beecroft.
B747-400	3,100ft	at	West Pymble, Epping.

Departures 16L &R

The number of people exposed to noise of 70 dB(A) or more for B747-200 aircraft is a total of 9,800.

At the outer tip of the contour for each particular type of aircraft the noise reaching the ground will be close to 70 dB(A) and the aircraft will be at the following heights.

B747-200	10,000ft	at	Over Water
B747-400	6,500ft	at	Over Water
B767	6,000ft	at	Over Water
Saab 340	3,000ft	at	Botany Bay

For further details refer to Appendix 9

Conclusions

This Mode has the potential to provide high levels of throughput when there is a traffic bias in favour of departures. This is a suitable mode for operations for providing respite to the east and to the north, except where a landing aircraft requires the long runway for its operation. It provides for all departures to operate over Botany Bay.

Proposed use

During non peak periods, in accordance with the runway selection plan, to achieve equity of noise sharing

SYDNEY MODE 14A DEPARTURES 16L, 16R ARRIVALS 07

MP 36/544.0.14
November 1996

Built-up-area (1993)

Note: Tracks shown are indicative

0 km 6

Scale approx

N

DEPARTURES

- Jet track
- Non-Jet track
- Dual track

ARRIVALS

- Jet track
- Non-Jet track
- Dual track

SYDNEY NOISE IMPRINT MODE 14A JET DEPARTURES 16L, 16R ARRIVALS 07

The noise imprints shown on the map above are a worst case scenario based on the single movement of a 747-200 series aircraft

0 km 6

Scale approx

N

Note: The noise imprints shown are based on a single aircraft movement on the centreline of the indicative flight track

The diagram above indicates that a 767, 737 and similar aircraft leave a significantly smaller imprint than 747-200 series aircraft

Noise imprint Arrivals (70dBA or above based on a single movement of a 747-200 series aircraft)

Noise imprint Departures (70dBA or above based on a single movement of a 747-200 series aircraft)

Built-up-area (1993)