SEPARATION STANDARDS - CIVIL

PROVISION OF STANDARD SEPARATION

1. Standard vertical or horizontal separation shall be provided, unless otherwise specified, between:

   a. IFR flights in controlled airspace and special rules airspace below FL 245.

   b. IFR flights participating in the air traffic advisory service.

   c. IFR flights and Special VFR flights.

   d. Flights operating on Special VFR clearances.

   e. IFR flights outside controlled airspace receiving an approach control service.

   f. Flights operating in special rules airspace above FL 245.

2. Separation standards are MINIMA and shall be increased:

   a. When requested by the pilot.

   b. When a controller considers it necessary.

   c. When directed by NATS headquarters.

3. Standard separation may be reduced:

   a. In the vicinity of aerodromes.

   b. When an escort is provided by search and rescue aircraft.

   c. When authorised by NATS headquarters.

   Note: In the event of radar failure reduced vertical separation (500 ft below FL 290 or 1000 ft above FL 290) may be employed temporarily if standard separation cannot be provided immediately.

ESSENTIAL TRAFFIC

4. Essential traffic is traffic, flying according to IFR, which is separated for any period by less than the standard specified separation. Information giving details of conflicting traffic must be passed to all aircraft concerned.

VERTICAL SEPARATION

5. The minimum vertical separation shall be:

   1000 feet at and below FL 290
   2000 feet above FL 290

HORIZONTAL SEPARATION

6. The three types of horizontal separation are:

a. Lateral separation.

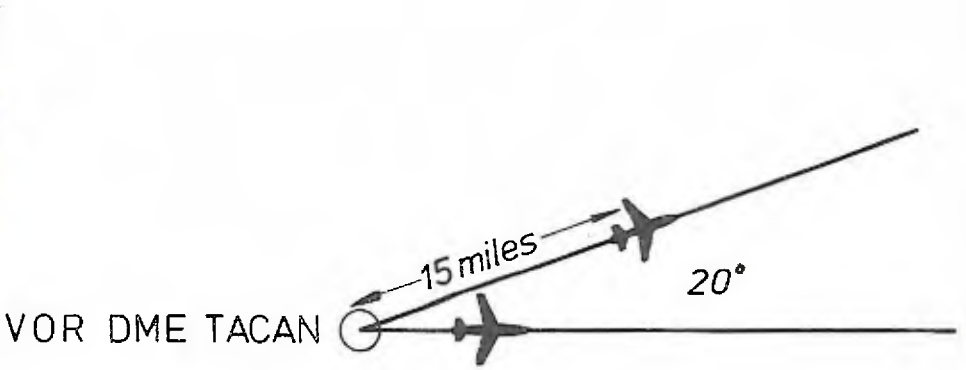
b. Longitudinal separation.

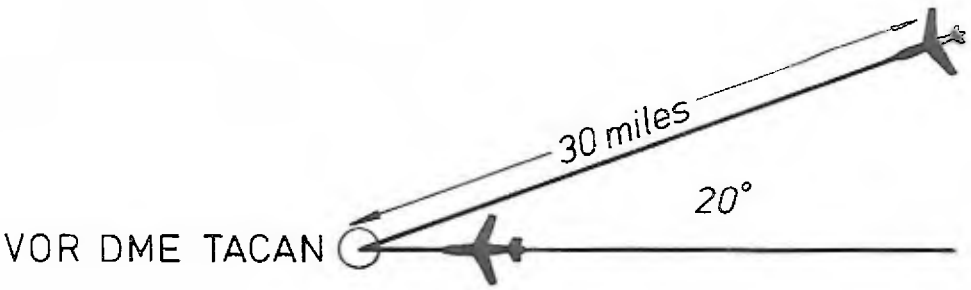
c. Radar separation.

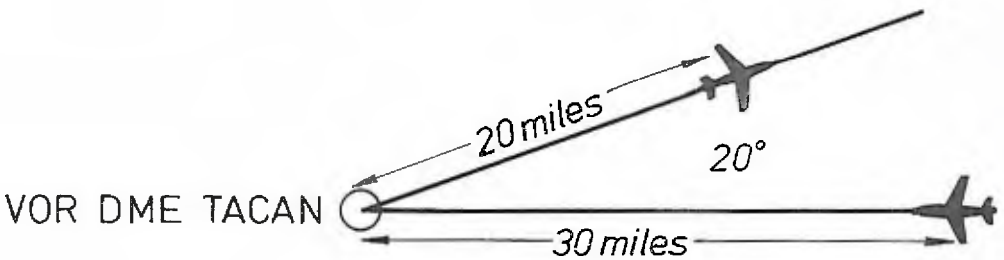
LATERAL SEPARATION

7. Track separation requires aircraft to fly on specified tracks which are separated by a minimum amount appropriate to the navigation aid employed. Examples are given in the diagrams below.

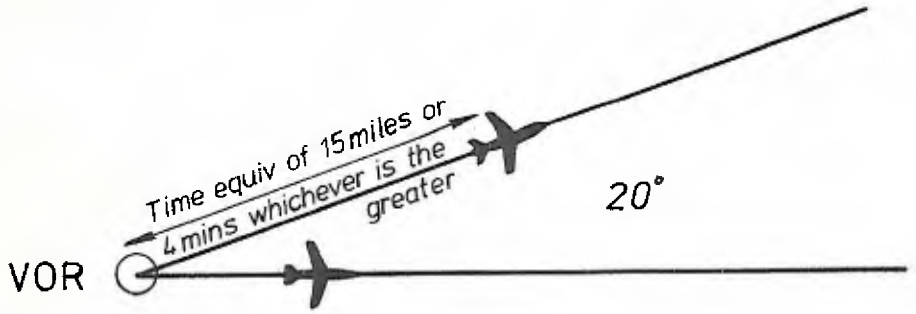
a. VOR and associated DME/TACAN. Both aircraft must have reported on radials at least 20° apart.

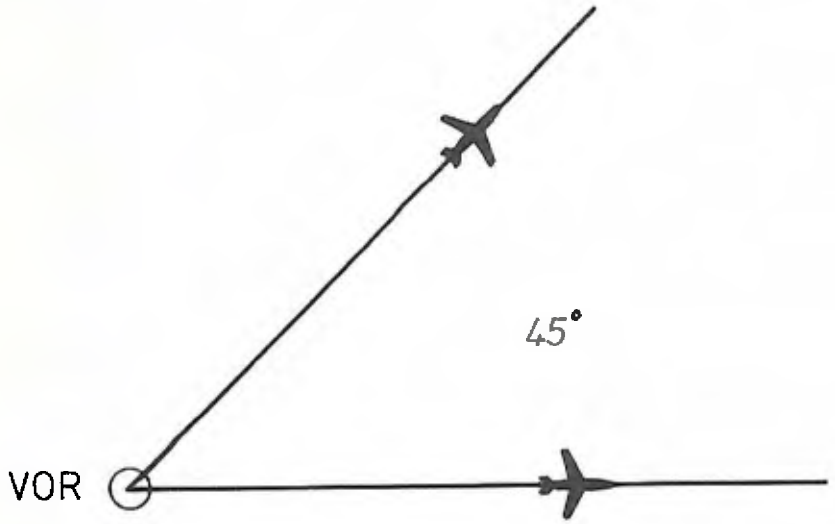




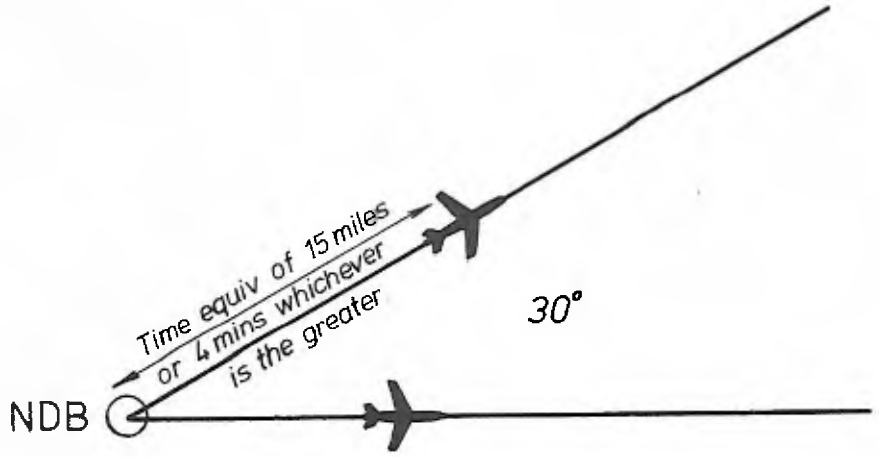


b. Track separation using VOR radials:





c. Track separation using specified tracks from an NDB:



8. Geographical separation must be positively indicated by position reports over different geographical locations and constant or increasing.

LONGITUDINAL SEPARATION

9. Longitudinal separation may either be based on times which have been calculated by ATC and recorded on flight progress strips, or on distances reported by pilots using DME/TACAN. It is applied so that the spacing between estimated positions of the aircraft being separated is never less than the prescribed minima. It is achieved by requiring aircraft to:

a. Depart at a specified time.

* b. Lose or gain time to arrive at a geographical location at a specified time.

c. Hold over a geographical location until a specified time.

10. Separation minima based on time are specified in table 1 below.

TABLE 1

Aircraft En-Route	Minimum Separation	Provisions
Same Cruising Level and Same Track	2 minutes *	Provided the 2 minute departure separation has been applied.
	5 minutes *	Provided the preceding aircraft has filed an airspeed of 20 knots or more faster than the following aircraft
	5 minutes *	When specifically authorised by NATS Headquarters
	5 minutes *	Provided both aircraft are: (i) equipped with functioning transponders, and (ii) monitored by radar and the actual distance between them is never less than 30 miles (This separation must be authorised by NATS HQ)
* BASIC LONG.	10 minutes	
Climbing and Descending on the Same Track	5 minutes at time levels are crossed 10 minutes	Provided that the level change is commenced within 10 minutes of the time the second aircraft has reported over the same exact reporting point

*This separation should be based on actual aircraft position reports; forward estimates are not sufficiently reliable for this purpose.

TABLE 1 (CONTD)

Aircraft En-Route	Minimum Separation	Provisions
Crossing Tracks	10 minutes	———
Reciprocal Tracks	10 minutes before and after estimated passing time	Vertical separation shall be provided for at least 10 minutes both prior to and after the estimated time of passing unless it is confirmed that the aircraft have actually passed each other by: (i) radar derived information. (ii) a visual sighting report from both pilots (by day only), or (iii) aircraft position reports over the same exact reporting point; provided vertical separation is maintained for sufficient time to take into consideration possible navigation errors.

11. Separation minima based on distance are specified in table 2:

TABLE 2

Aircraft En-Route	Minimum Separation	Provisions
Same Cruising Level & Same Track	15 miles	Provided the preceding aircraft maintains a true airspeed of 20 knots or more faster than the following aircraft and both are within 100 miles of the DME TACAN station.
	20 miles	Provided the preceding aircraft maintains a true airspeed of 20 knots or more faster than the following aircraft.
	20 miles	Provided both aircraft are within 100 miles of the DME TACAN station.
	25 miles	———
Climbing or Descending on the Same Track	15 miles at the time levels are crossed	Provided that one aircraft maintains level flight while vertical separation does not exist.

TABLE 2 (CONTD)

Aircraft En-Route	Minimum Separation	Provisions
Reciprocal Tracks	40 miles	The 40 mile separation need not apply if it has been positively established that the aircraft have passed each other and are at least 10 miles apart. The 10 miles may be further reduced to 5 miles when both aircraft are within 100 miles of the DME TACAN station.

AIRCRAFT HOLDING

12. When aircraft are being held in flight, the appropriate vertical separation shall continue to be provided between holding and en-route aircraft while such en-route aircraft are within 5 minutes flying time of the holding aircraft's flight path or holding area where published, except where it is notified by NATS HQ that lateral separation is deemed to exist.

RADAR SEPARATION

13. The radar separation minimum is 5 miles.

INCREASED SEPARATION

14. Greater separation than the minimum may be required when certain processed radar systems are used and when SSR is used without supporting primary radar. Details of increased radar separation are published in unit instructions.

REDUCED SEPARATION

15. When authorised by NATS headquarters the radar separation minimum may be reduced to 3 miles between:

a. Identified aircraft, or

b. aircraft being controlled by approach control radar units and operating in adjacent radar vectoring areas geographically separated by a 3 mile wide zone approved by NATS headquarters,

provided both aircraft are below FL 245 and within 40 miles of the antenna.

APPLICATION

16. a. When radar separation is applied it shall be assumed that the centre of the radar echo or SSR response or radar position symbol represents the location of the aircraft. However, radar separation does not exist if the blips are allowed to touch or overlap.

b. When the radar echo of one aircraft and the SSR response of another are used to provide separation between them, such separation shall be applied so that the distance between the centre of the primary radar echo and the edge of the position element of the SSR response never represents less than 5 miles.

c. When the radar echo of one aircraft and the radar position symbol of another are used to provide separation between them, such separation shall be applied so that the distance between the centre of the radar position symbol and the nearest edge of the radar echo are never less than the published minimum.

IFF RESPONSE

17. The use of IFF responses to provide radar separation is only permitted when:

a. The ends of the responses are kept apart by a distance representing at least 5 miles, and

b. The main beam responses can be resolved; if they cannot, due to side lobe responses, radar separation shall note be used.

It is accepted that these conditions may result in excessively large real separation between aircraft.

USE OF SSR FOR HORIZONTAL SEPARATION

18. The use of SSR without supporting primary radar or to overcome known deficiencies in primary radar cover is permitted in the following circumstances:

a. Outside primary radar cover to provide separation between aircraft with functioning SSR equipment:

(1) Within controlled airspace notified for the purposes of Rule 21.

(2) Outside controlled airspace in areas designed by NATS Headquarters.

In both cases non-radar separation is to be applied between transponding and other aircraft.

b. In areas where there are known temporary or permanent deficiencies in the primary radar (eg clutter, aircraft reflection characteristics).

(1) Between the SSR responses of transponding aircraft.

(2) Between the SSR response of one aircraft and the primary echo of another, provided the primary and secondary position elements of any aircraft being displayed coincide.

In both cases pilots are to be informed of any limitation of services provided.

c. SSR may be used to provide separation between aircraft in any airspace when the primary radar fails until non radar separation is established or an alternative primary radar is brought into operation. Pilots are to be informed of any limitations of service provided.

USE OF MODE C FOR VERTICAL SEPARATION

19. Mode C transmissions are to be verified at least once by each suitably equipped air traffic service unit as soon as possible after initial contact with the aircraft. After verification, Mode C information may be used to ascertain:

a. That aircraft are maintaining assigned levels.

b. That aircraft have vacated, reached or passed levels.

c. The vertical displacement between transponding aircraft

Verified Mode C data may be used to determine that vertical separation exists between aircraft for which the controller is responsible or between such aircraft and an observed aircraft whose behaviour and intention is known through co-ordination. For this purpose co-ordination may be understood to include standing agreements approved in unit instructions under which aircraft are proceeding to agreed levels on transfer. There is no general requirement to monitor altitude readouts, but whenever vertical separation is being determined solely by Mode C information, the readouts are to be continuously monitored for the period necessary to ensure that the minimum separation is not infringed. Military controllers and civilian controllers at MOD PE Establishments and Contractors aerodromes, when authorised by NATS Headquarters, are allowed to use Mode C for determining vertical separation between aircraft under their control and other observed aircraft the intentions of which are not known. In this case a vertical separation of 5,000 feet or more will be applied. Unverified Mode C is not to be used for vertical separation except when the data is associated with an aircraft displaying one of the emergency codes.

20. In some circumstances it may be necessary to apply separation between an aircraft under radar control or receiving radar advisory service and known traffic outside radar cover. Bearing in mind the radar coverage separation should be applied as follows:

a. Opposite Direction Traffic. Vertical separation must be provided at least 10 miles before the point at which the conflicting traffic can be expected to enter radar cover.

b. Same Direction Traffic.

(1) Proceeding into radar cover. Vertical separation must be provided until the identified aircraft is at least 10 miles within the point at which the conflicting traffic can be expected to enter radar cover.

(2) Proceeding out of radar cover. Vertical or other non-radar separation must be established at least 10 miles before the aircraft is expected to leave radar cover.