Template Manual for Holding, Reversal and Racetrack Procedures

SECOND EDITION — 1986

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International Civil Aviation Organization
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Part III, 4.6.2, of the above document lists the basic parameters that are used to construct areas for racetrack and reversal procedures. Part IV lists the basic parameters for holding procedures. Attachment III-C describes the detailed process of necessary calculations and the drawings both for reversal procedures and for racetrack or holding. The first step in the area construction process is to construct the template and the second is to use the template in several ways to obtain the complete area, which includes both the basic and entry areas in a procedure called Template Tracing Technique (TTT).

The templates referred to in the first step above are contained in this manual and cover most cases the procedures designer is likely to encounter. Use of a template from this manual permits the designer to go directly to the second step of the process and develop the protection areas with only a few calculations.

The detailed information concerning the selection of the proper template and how to use it, is contained in Chapter 1 "General" of this manual.

The templates contained in this manual have been drawn by a computer-driven plotter system. The system provides the capability to develop additional templates to the conditions specified by the user (i.e. wind speed, altitude, aircraft speed, outbound time and scale). Additional information concerning this computer-driven plotting system and the associated computer programme may be obtained by addressing inquiries to:

International Civil Aviation Organization
Attention: Chief, OPS/AIR Section
1000 Sherbrooke Street West
Suite 400
Montreal, Quebec
Canada H3A 2R2
Cable: ICAO MONTREAL
Telex: 05-24513
Tel: (514) 285-8155

Any error found in this manual should be reported, without delay, to the above address.

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Necessary identification data are listed on the upper left corner of each drawing. In some cases two templates for two altitudes appear on the same sheet. How to select a template or derive a new one using those in the manual is explained below.

1.1.2 Speeds

The speed considered for the procedure is an indicated airspeed (IAS) and appears both in km/h and in kt.

a) Racetrack or reversal procedures:

The set of templates covers all aircraft categories, according to PANS-OPS, Volume II, Part III, Table 1.1 as follows:

Procedure intended for:	Speed
Cat A and B only	260 km/h (140 kt)
Cat A, B, C restricted*, D restricted*	345 km/h (185 kt) and 410 km/h (220 kt)
Cat A, B, C, D	465 km/h (250 kt)

*Note.- For speed restriction see 1.9.3 (PANS-OPS, Volume II, Part III).

Additionally, a curve or a template is produced for the minimum speed of Category A aircraft, 165 km/h (90 kt) for the base turn and the procedure turn.

b) Holding procedures:

Speeds for holding are specified in PANS-OPS, Volume II, Part IV.

1.1.3 Altitudes

The altitude (measured from the mean sea level) is indicated on the template in metres and feet. Reversal and racetrack procedures templates are provided for the following altitudes:

900 m (3 000 ft)
1 850 m (6 000 ft)
2 450 m (8 000 ft)
3 050 m (10 000 ft)

the secondary area boundary is the outer dotted line (lighter).

b) A template for holding procedures will consist of the nominal track and the basic area boundary. The buffer area boundary (9.3 km/5.0 NM from the basic area) is not shown.

1.1.5 Scale

The scale appears on each template; the scales used are 1/250 000 and 1/500 000 depending on the case. A conversion line between kilometres and nautical miles is drawn to scale in the lower part of a sheet showing one template, and in the middle of a sheet showing two templates.

1.2 - TEMPLATE SELECTION

1.2.1 To construct the protection area for a given procedure, the template drawn for the procedure altitude should be used. If such a template does not exist one possibility is to use the template drawn for the nearest altitude above the procedure altitude.

1.2.2 Another possibility is to work out a linear interpolation based on two templates nearest to the procedure altitude.

1.2.3 A third method is to construct the template manually in accordance with the instructions given in Attachment III-C to PANS-OPS, Volume II. New templates may be drawn also by the computer/plotter system as explained in the Foreword.

1.3 - DRAWING THE COMPLETE AREA

Instructions on how to derive the complete protection area for a procedure are contained in PANS-OPS, Volume II, Attachment III-C and are not repeated. For the procedure turn, a more detailed method is described in Chapter 4 of this manual.

times from 1 to 3 minutes, with half minute increments. It allows the procedure designer to have a better picture of the relative airspace required for each time, and to select the convenient time more easily.

2.1.2 The racetrack template is composed of:

- the nominal point of the procedure and the nominal track for 1 minute outbound time;

Note 1.- In order not to overload the picture, only one nominal track has been drawn, for one minute, and a small gap in the drawing at the end of the outbound leg reminds the user that the nominal track corresponding to a time greater than one minute has to be adjusted.

- the primary area boundaries for various outbound times;

- the entry curve (common to all 5 cases);

- the symmetrical of the entry curve, used for the protection of the entry into VOR/DME racetrack procedures;

- line "3" for various outbound times;

- secondary area boundaries, partly around the 1 minute procedure and partly around the 3 minute procedure; and

- point E.

Note 2.- Only one point E is drawn because, although the location of point E varies with the outbound time, it does by less than 0.04 NM which, at the scale of 1/250 000, represents 0.3 mm, the thickness of the pen used in the drawing.

In addition, the fix tolerance area for a procedure overhead a VOR or NDB is shown to scale for the corresponding altitude (see Figures 2-1 to 2-6 for detailed explanations of the template and of the combination process from five individual templates).

2.2 - USE OF THE TEMPLATES

See PANS-OPS, Volume II, Attachment III-C.

IAS km/h (kt) \ Altitude m (ft)	900 (3 000)	1 850 (6 000)	2 450 (8 000)	3 050 (10 000)
260 (140)	RT 1	RT 2	RT 3	RT 4
345 (185)	RT 5	RT 6	RT 7	RT 8
405 (220)	RT 9	RT 10	RT 11	RT 12
465 (250)	RT 13	RT 14	RT 15	RT 16

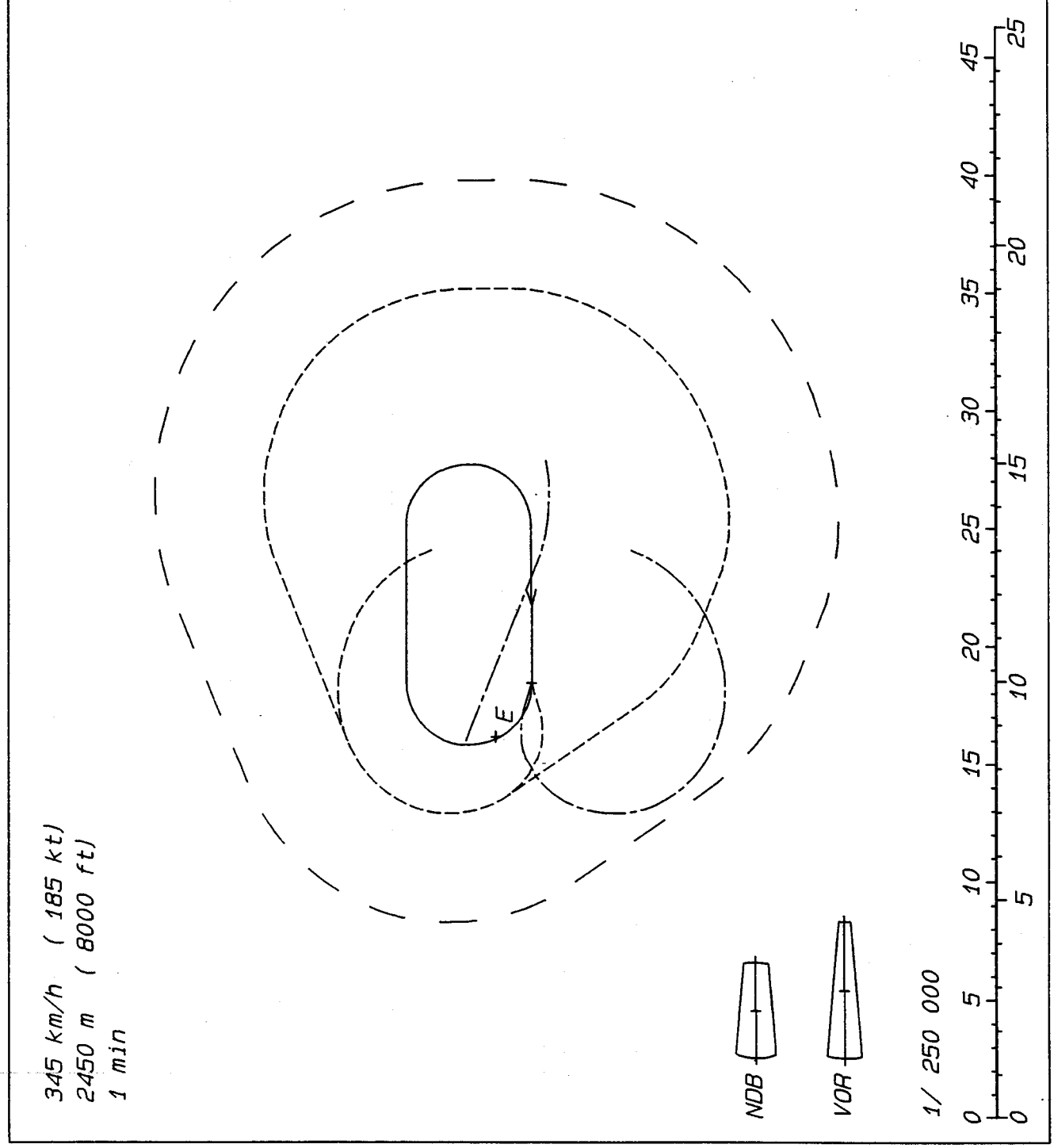


Figure 2-1. Example of an individual template for 345 km/h (185 kt), 2 450 m (8 000 ft) and 1 min, which has been combined in the racetrack template shown in Figure 2-6.

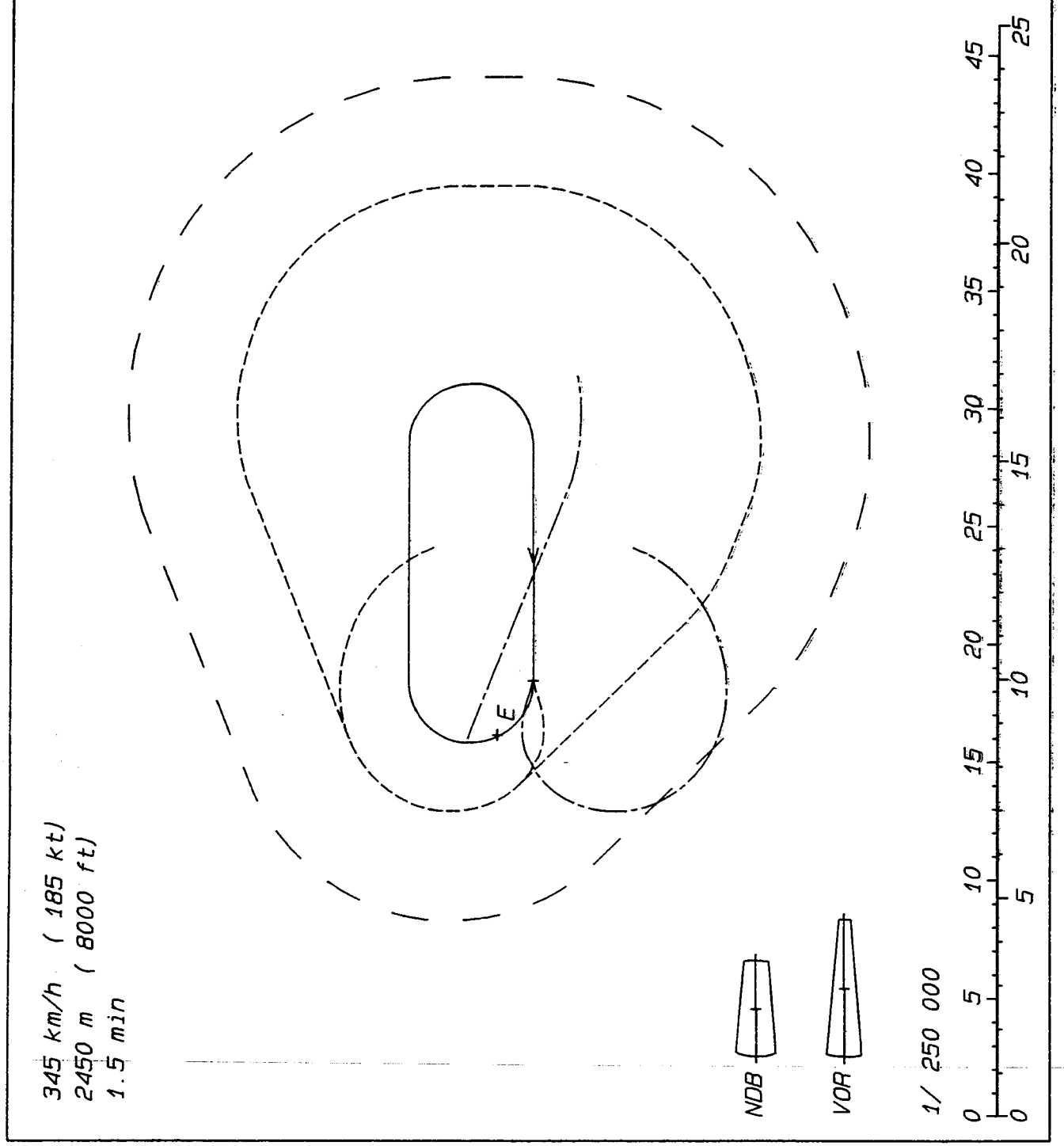


Figure 2-2. Example of an individual template for 345 km/h (185 kt), 2 450 m (8 000 ft) and 1.5 min, which has been combined in the racetrack template shown in Figure 2-6.

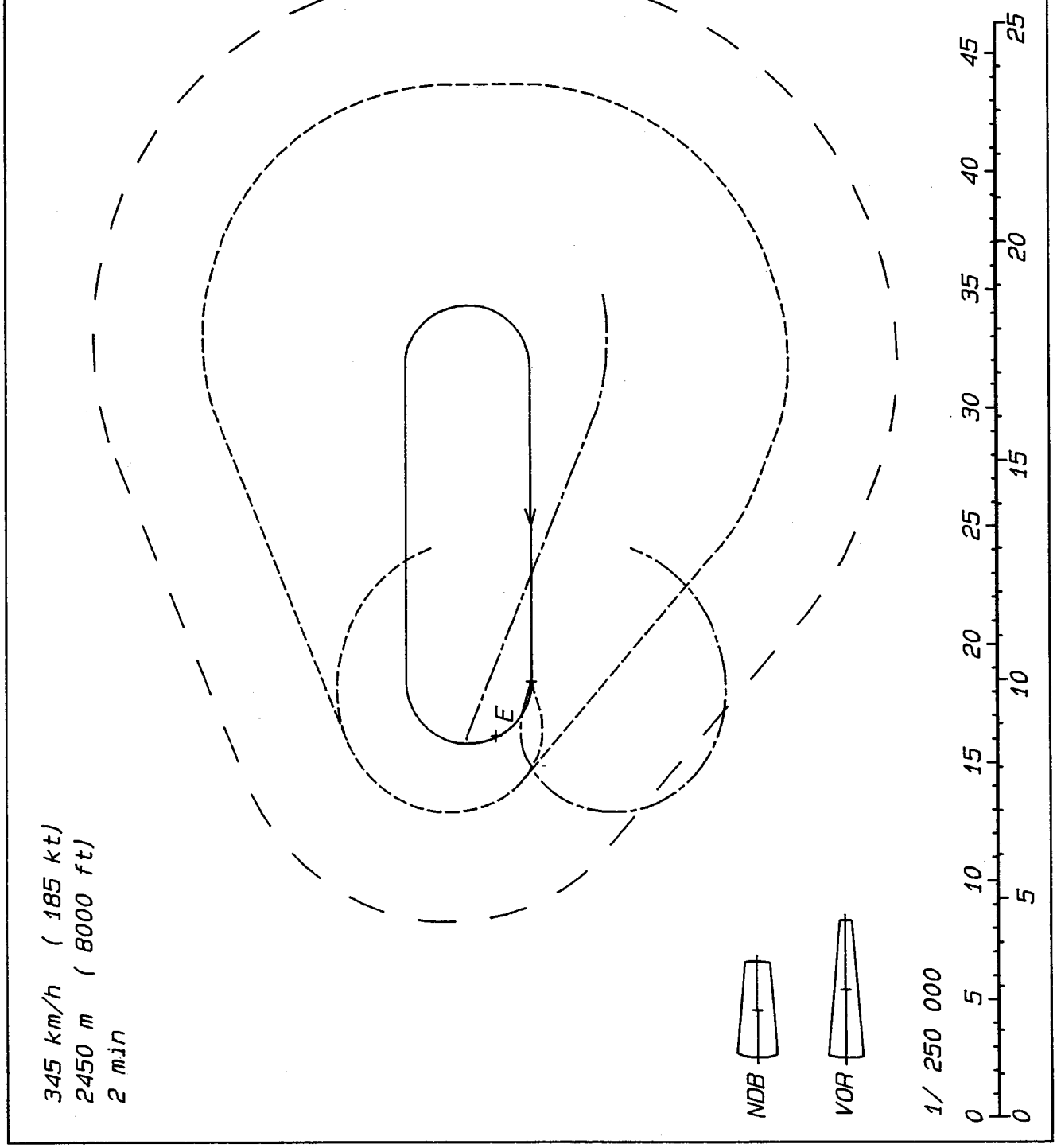


Figure 2-3. Example of an individual template for 345 km/h (185 kt), 2 450 m (8 000 ft) and 2 min, which has been combined in the racetrack template shown in Figure 2-6.

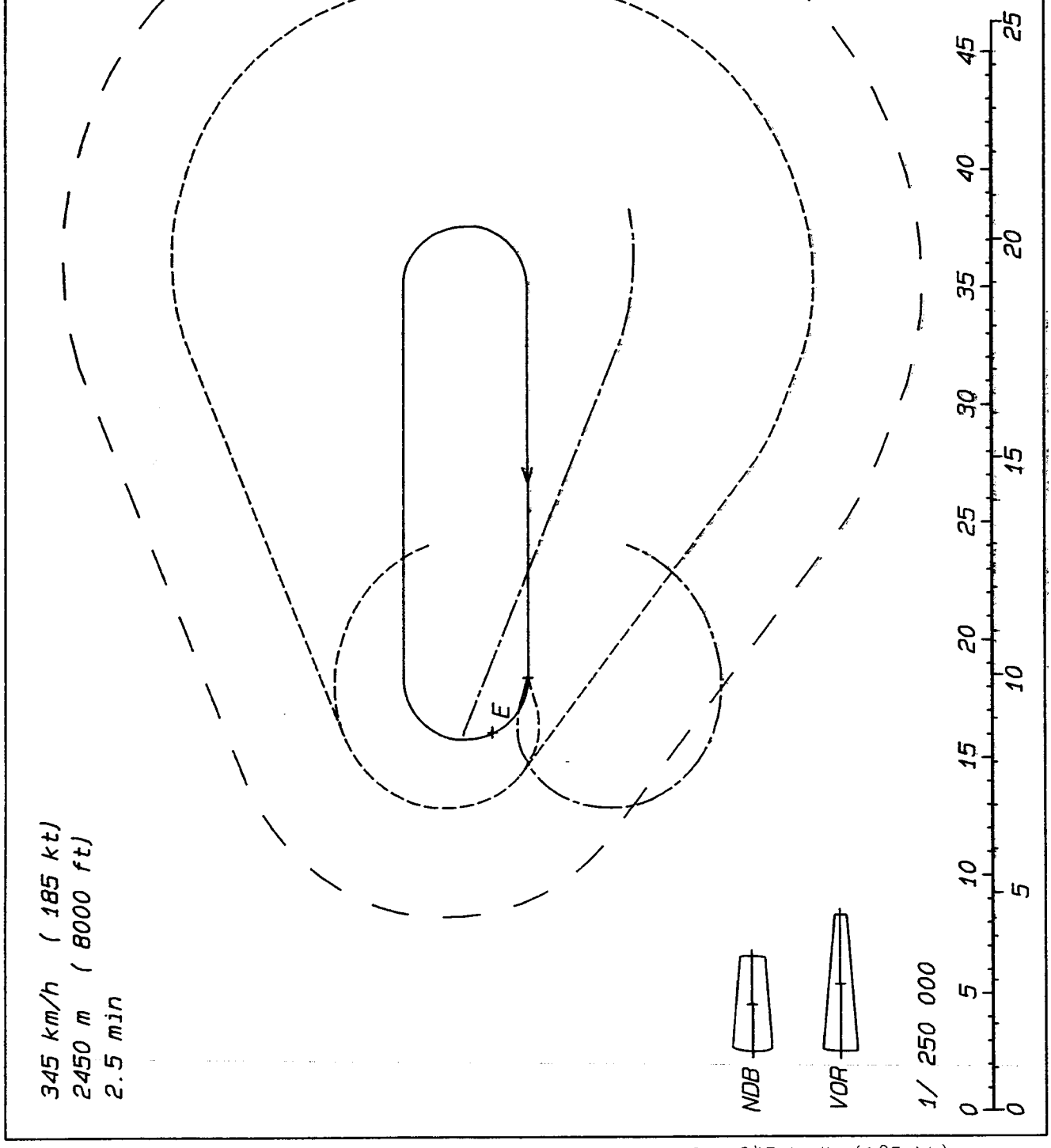


Figure 2-4. Example of an individual template for 345 km/h (185 kt), 2 450 m (8 000 ft) and 2.5 min, which has been combined in the racetrack template shown in Figure 2-6.

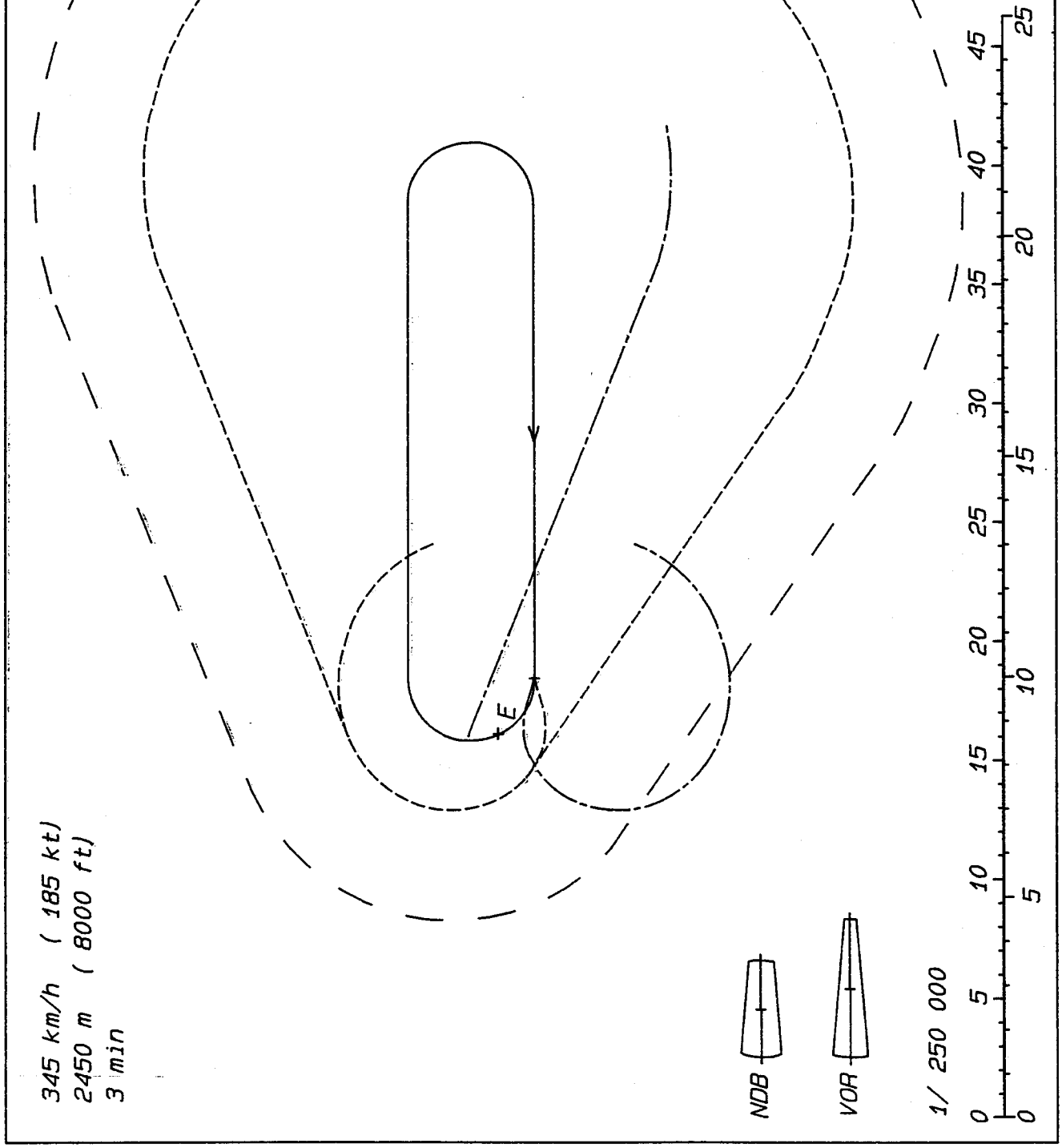
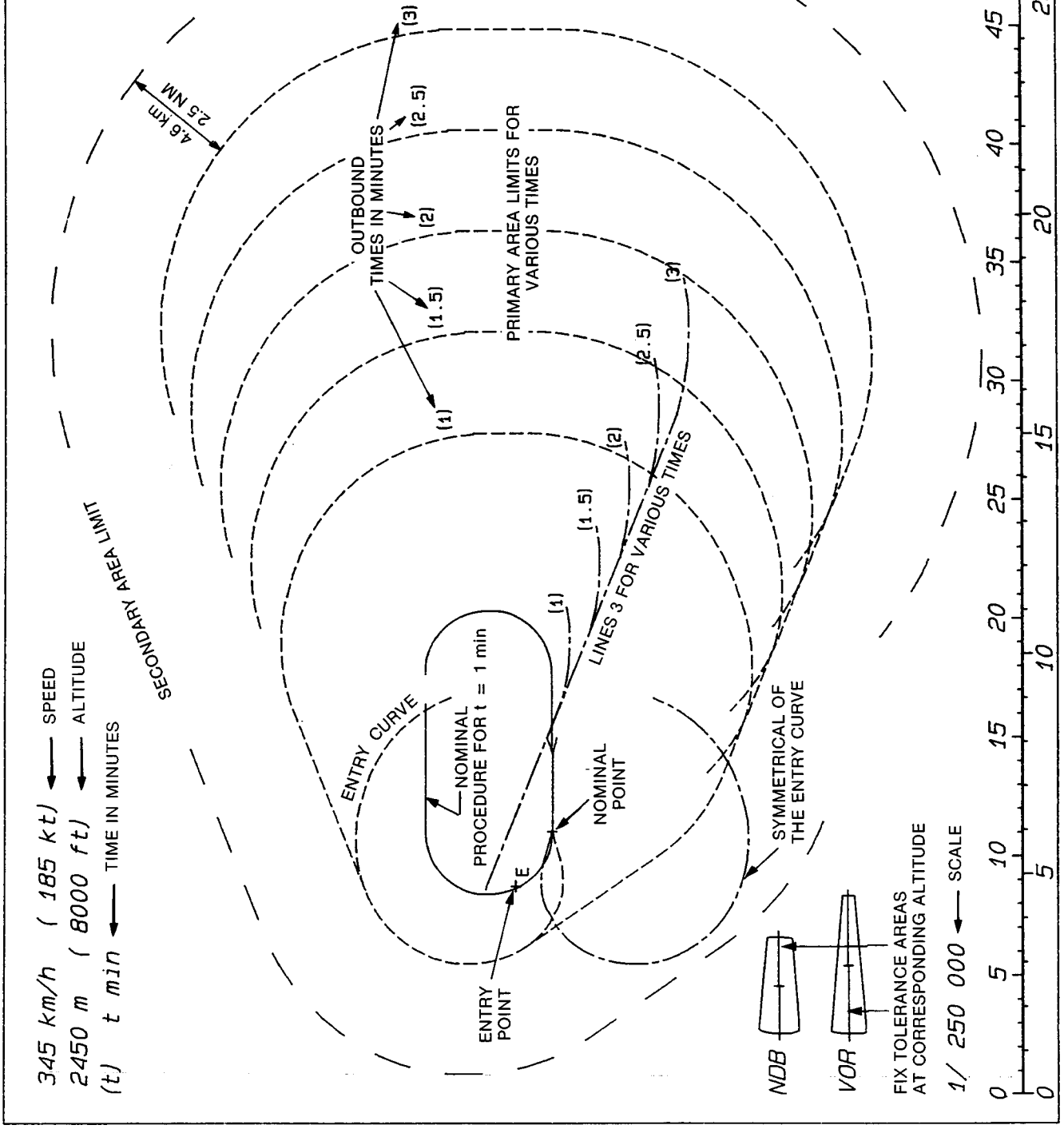


Figure 2-5. Example of an individual template for 345 km/h (185 kt), 2 450 m (8 000 ft) and 3 min, which has been combined in the racetrack template shown in Figure 2-6.



RT 7 ← TEMPLATE NUMBER 1986/06

Figure 2-6. Example of a racetrack template for 345 km/h (185 kt), 2 450 m (8 000 ft) and times from 1 to 3 minutes, which is a combination of the five individual templates shown in Figures 2-1 to 2-5.

indicated);

- the maximum offset entry axis at 30° from the outbound track;

- the primary area boundary including the protection of the maximum offset entry;

- the secondary area boundary; and

- the 165 km/h (90 kt) line, corresponding to the slowest initial speed considered for Cat A aircraft.

See Figure 3-1 for detailed explanations.

3.1.2 VOR and NDB tolerances

Since fix tolerances and track guidance tolerances are included in the calculation of the template, the decision has been taken to use the more conservative values in each case, so that the templates may be used safely for NDB and VOR. The values that were used are:

50° for the cone angle overhead the facility; and

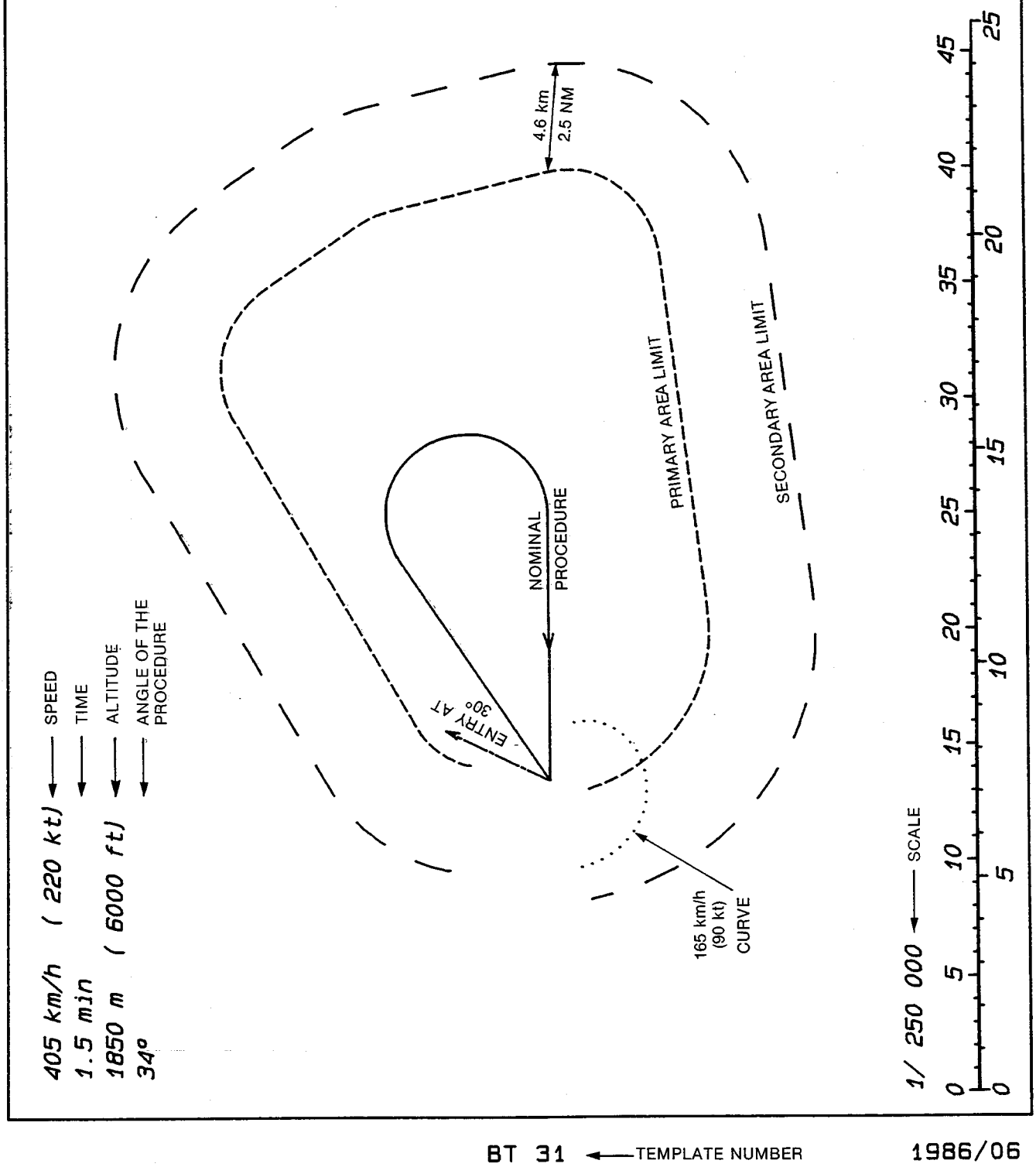
±6.9° for the track guidance.

Differences between the conservative template and the VOR-only or the NDB-only template are minor, especially at low altitudes.

3.2 - USE OF THE TEMPLATES

As described in PANS-OPS, Attachment III-C, the base turn template is in fact the basic area itself since the fix tolerance is already included.

IAS km/h (kt)	Outbound time (min)	Template number
260 (140)	1	BT 1 - BT 2
	1.5	BT 3 - BT 4
	2	BT 5 - BT 6
	2.5	BT 7 - BT 8
	3	BT 9 - BT 10
345 (185)	1	BT 11 - BT 13
	1.5	BT 14 - BT 16
	2	BT 17 - BT 19
	2.5	BT 20 - BT 22
	3	BT 23 - BT 25
405 (220)	1	BT 26 - BT 29
	1.5	BT 30 - BT 33
	2	BT 34 - BT 37
	2.5	BT 38 - BT 41
	3	BT 42 - BT 45
465 (250)	1	BT 46 - BT 49
	1.5	BT 50 - BT 53
	2	BT 54 - BT 57
	2.5	BT 58 - BT 61
	3	BT 62 - BT 65



BT 31 ← TEMPLATE NUMBER 1986/06

Figure 3-1. Base turn template with explanations.

- the nominal track;

- the primary area boundary; and

- the secondary area boundary.

See Figure 4-1 for detailed explanations.

4.2 - USE OF THE TEMPLATES

In order to draw the complete area, the template for the maximum speed is used as described in Attachment III-C to PANS-OPS but in addition, a template for the minimum speed considered (normally 165 km/h (90 kt)) should be used as follows:

a) calculate the earliest points of the turn initiation area for the minimum speed considered;

b) locate the corresponding template at these points and draw the complete area (see Figure 4-2).

4.3 - LIST OF TEMPLATES

The templates for procedure turns are listed in the table below and are located at PT 1 to PT 27 of this manual.

Template scale is 1/250 000.

LIST OF PROCEDURE TURN TEMPLATES

IAS km/h (kt)	45°/180°	80°/260°
165 (90)	PT 1 - PT 2	PT 15 - PT 16
260 (140)	PT 3 - PT 4	PT 17 - PT 18
345 (185)	PT 5 - PT 6	PT 19 - PT 20
405 (220)	PT 7 - PT 10	PT 21 - PT 23
465 (250)	PT 11 - PT 14	PT 24 - PT 27

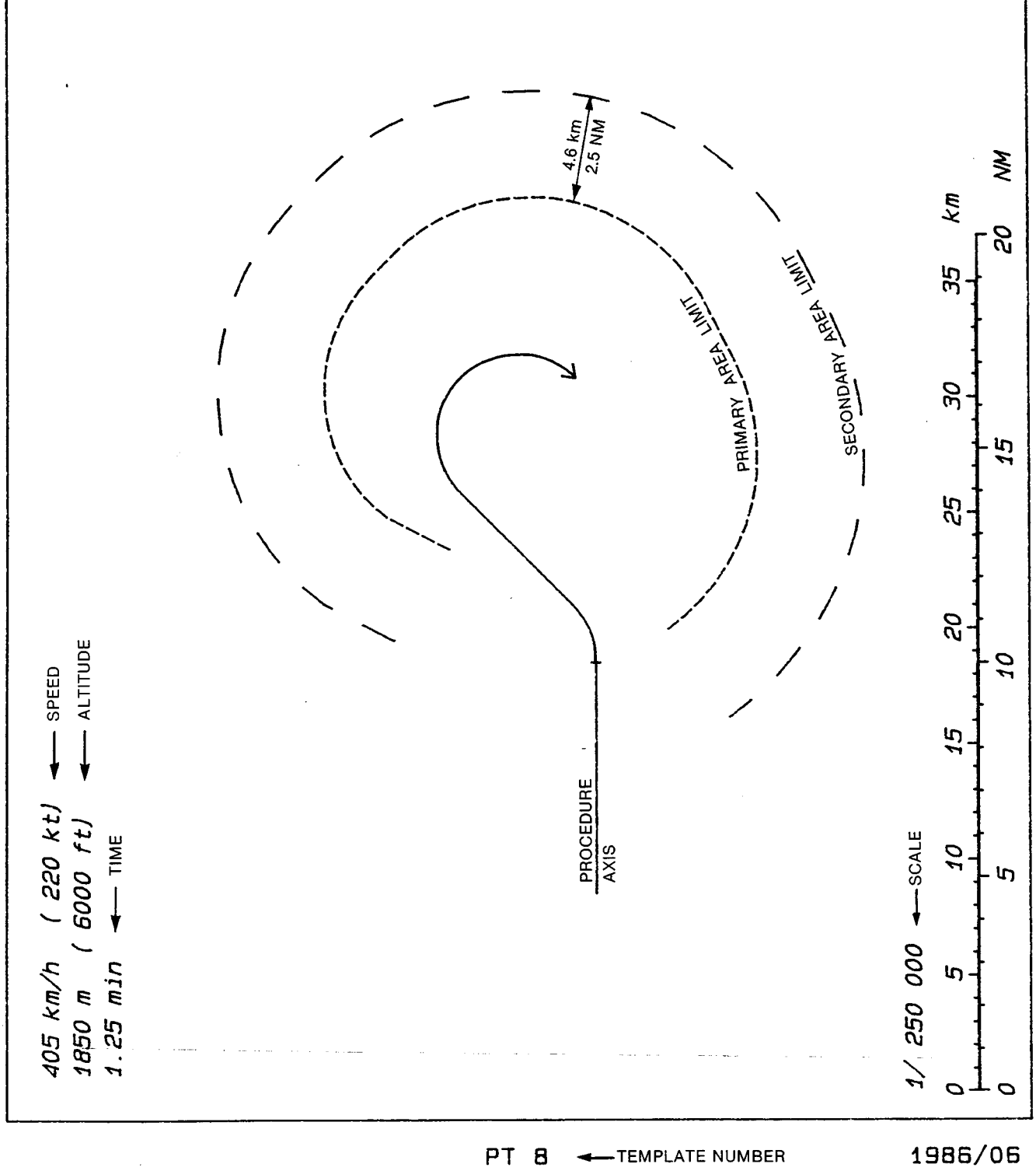


Figure 4-1. Procedure turn template with explanations.

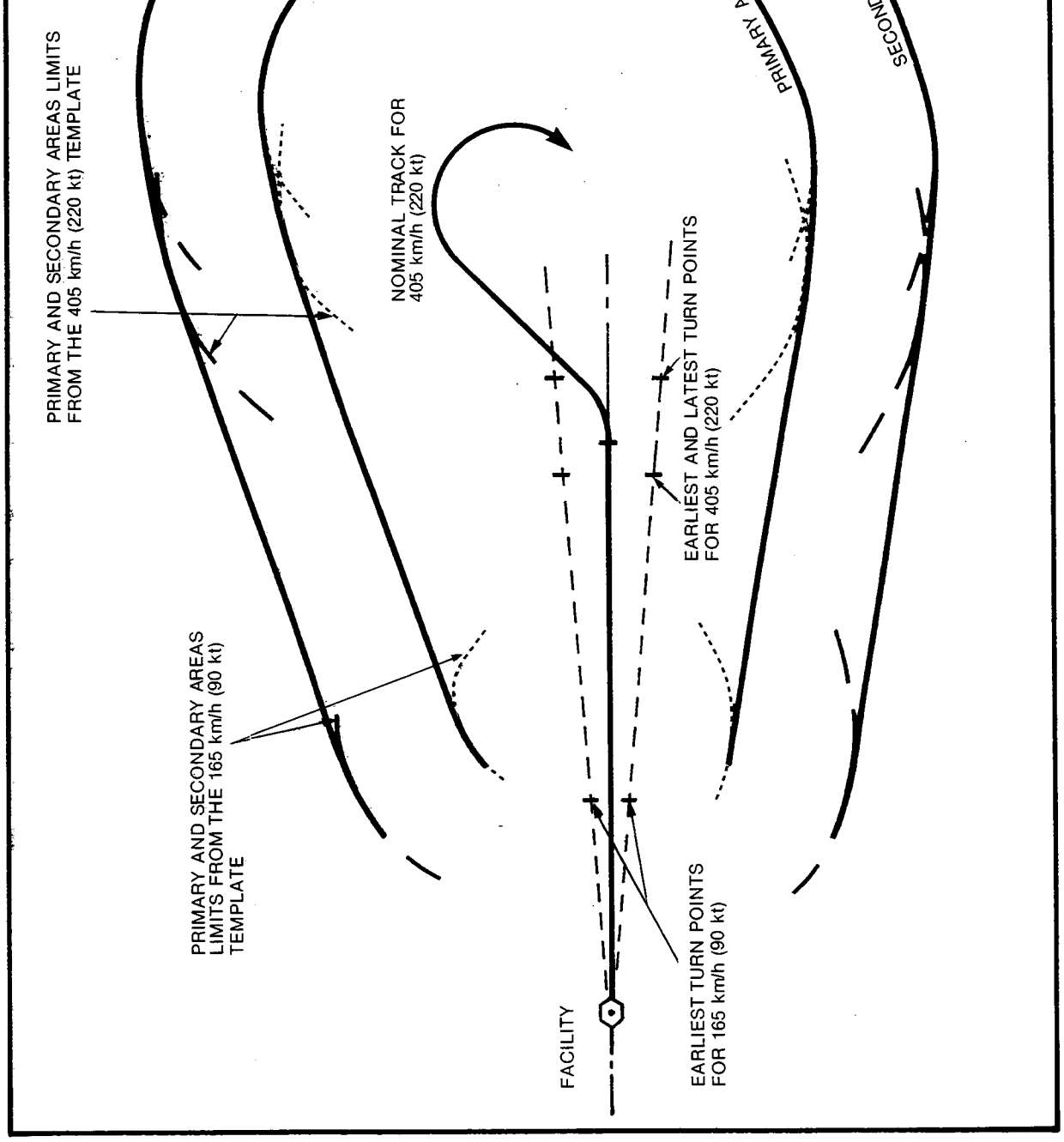


Figure 4-2. Construction of the protection area for a 45°/180° procedure turn, based on 405 km/h (220 kt) and taking into account the slowest speed of 165 km/h (90 kt).

- the primary area boundary;
- the entry curve and its symmetrical;
- line "3"; and
- point E.

In addition, the fix tolerance area for a procedure overhead a VOR or a NDB is shown for the corresponding altitude (see Figure 5-1 for detailed explanation).

5.2 - USE OF THE TEMPLATES

See PANS-OPS, Volume II, Part IV and Attachment III-C.

315 (170)	1/250 000	up to 4 250 m (14 000 ft)	H 1 - H 4
425 (230)	1/250 000	up to 4 250 m (14 000 ft)	H 5 - H 9
445 (240)	1/250 000	4 250 m (14 000 ft) to 6 100 m (20 000 ft)	H 10 - H 12
520 (280)	1/250 000	up to 6 100 m (20 000 ft)	H 13 - H 22
315 (170)	1/500 000	up to 4 250 m (14 000 ft)	H 23
425 (230)	1/500 000	up to 4 250 m (14 000 ft)	H 24
445 (240)	1/500 000	4 250 m (14 000 ft) to 6 100 m (20 000 ft)	H 25
490 (265)	1/500 000	6 100 m (20 000 ft) to 10 350 m (34 000 ft)	H 26 - H 30
520 (280)	1/500 000	up to 10 350 m (34 000 ft)	H 31 - H 37
0.8 M	1/500 000	10 350 m (34 000 ft)	H 38
0.83 M	1/500 000	above 10 350 m (34 000 ft)	H 39 - H 40

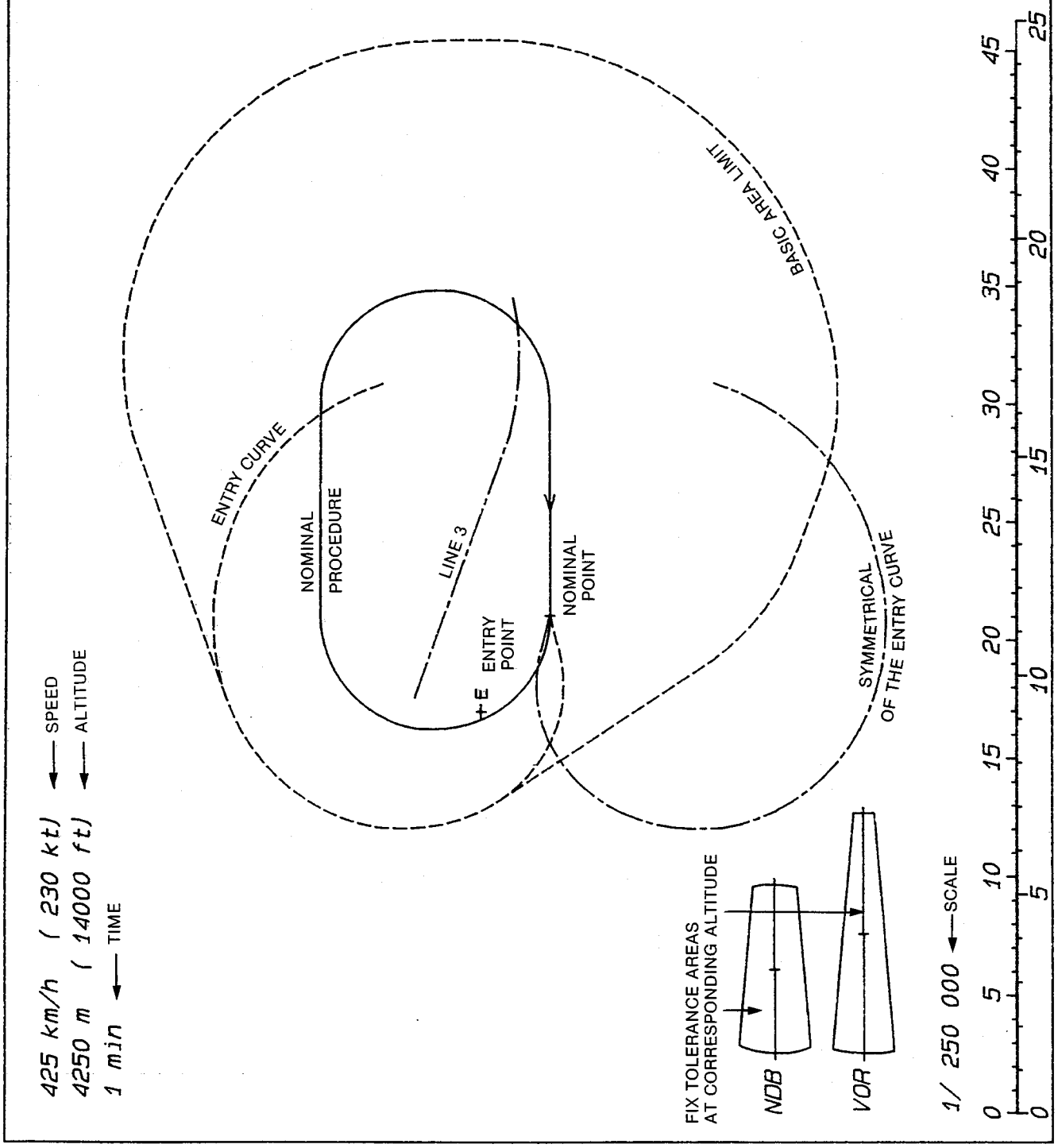
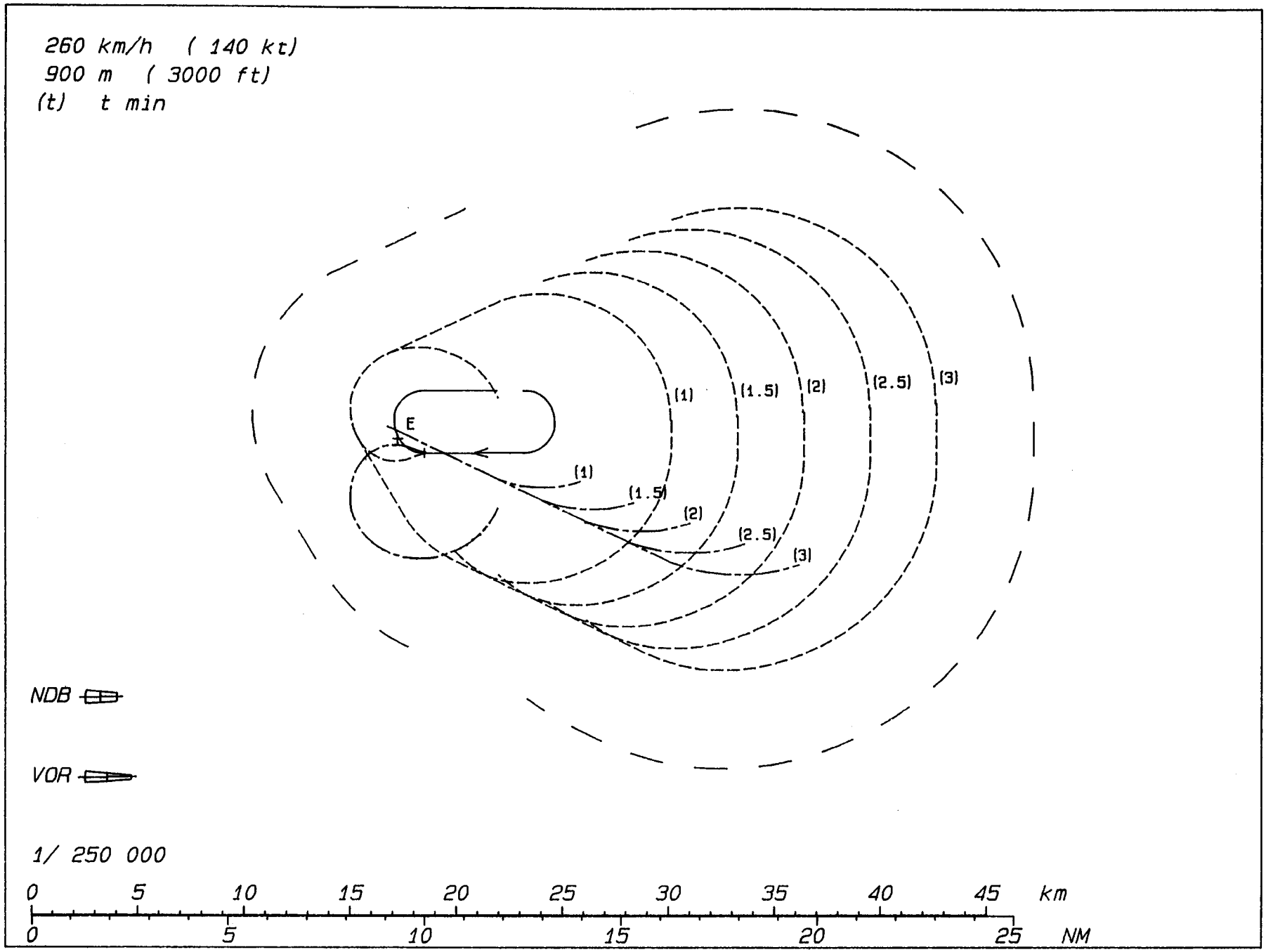
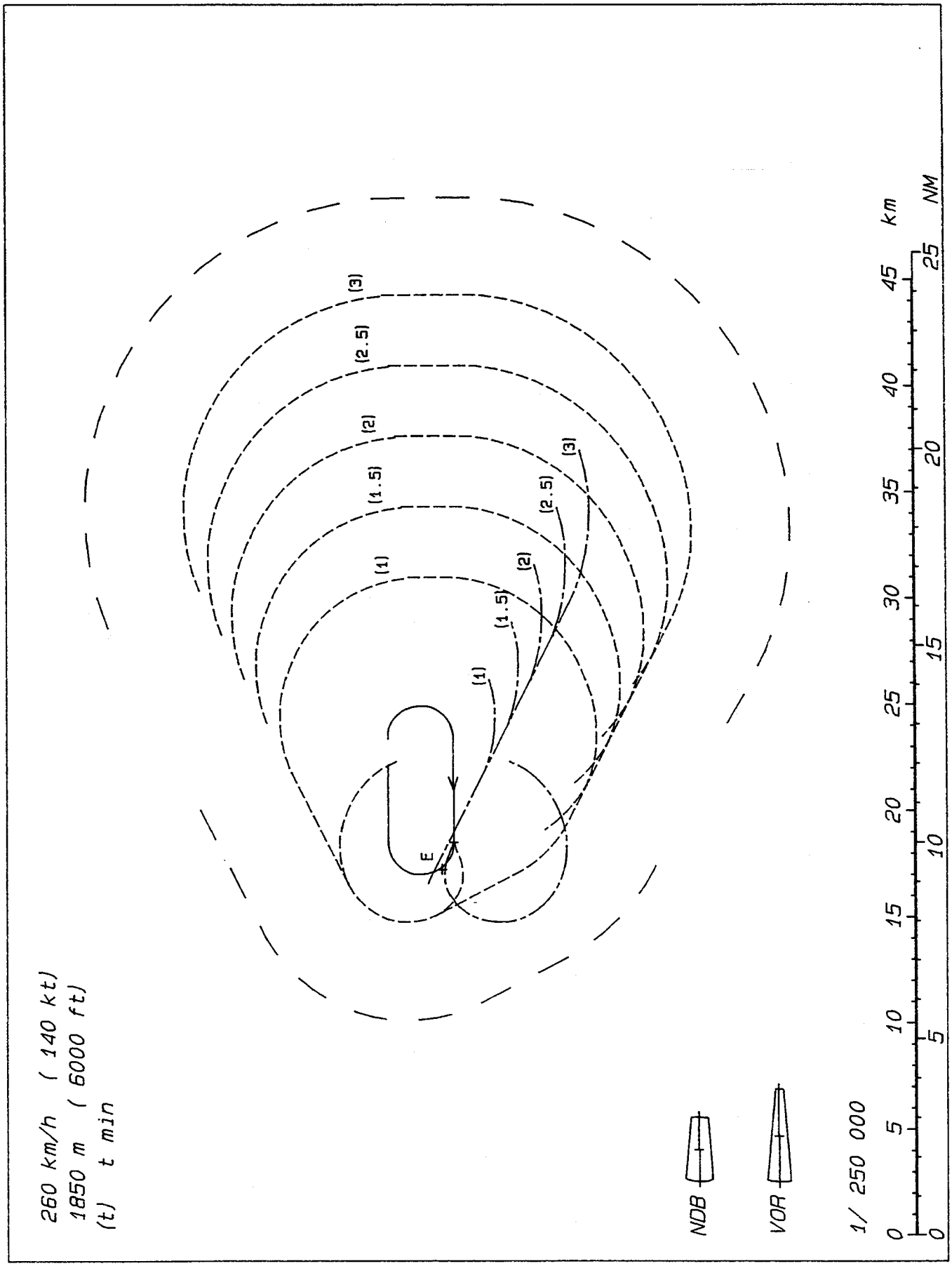


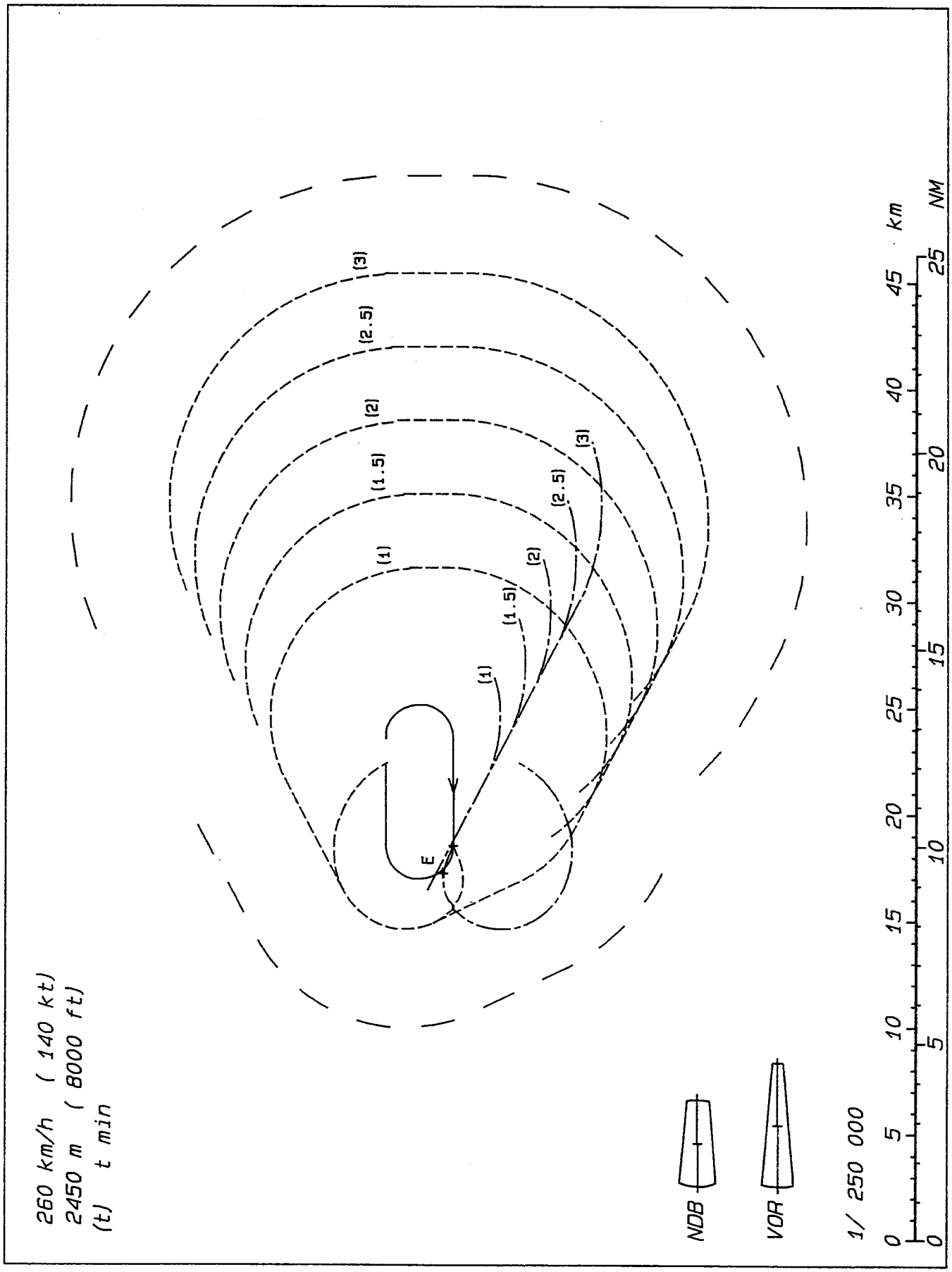
Figure 5-1. Holding template with explanations.

RACETRACK TEMPLATES

RT 1 - RT 16


260 km/h (140 kt)
900 m (3000 ft)
(t) t min
E
(1)
(1.5)
(2)
(2.5)
(3)
(1)
(1.5)
(2)
(2.5)
(3)
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


260 km/h (140 kt)
1850 m (6000 ft)
(t) t min
(1)
(1.5)
(2)
(2.5)
(3)
E
NDB
VOR
1/ 250 000
0
5
10
15
20
25
30
35
40
45
km
0
5
10
15
20
25
NM


260 km/h (140 kt)
2450 m (8000 ft)
(t) t min
(1)
(1.5)
(2)
(2.5)
(3)
E
NDB
VOR
1/ 250 000
0
5
10
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km
0
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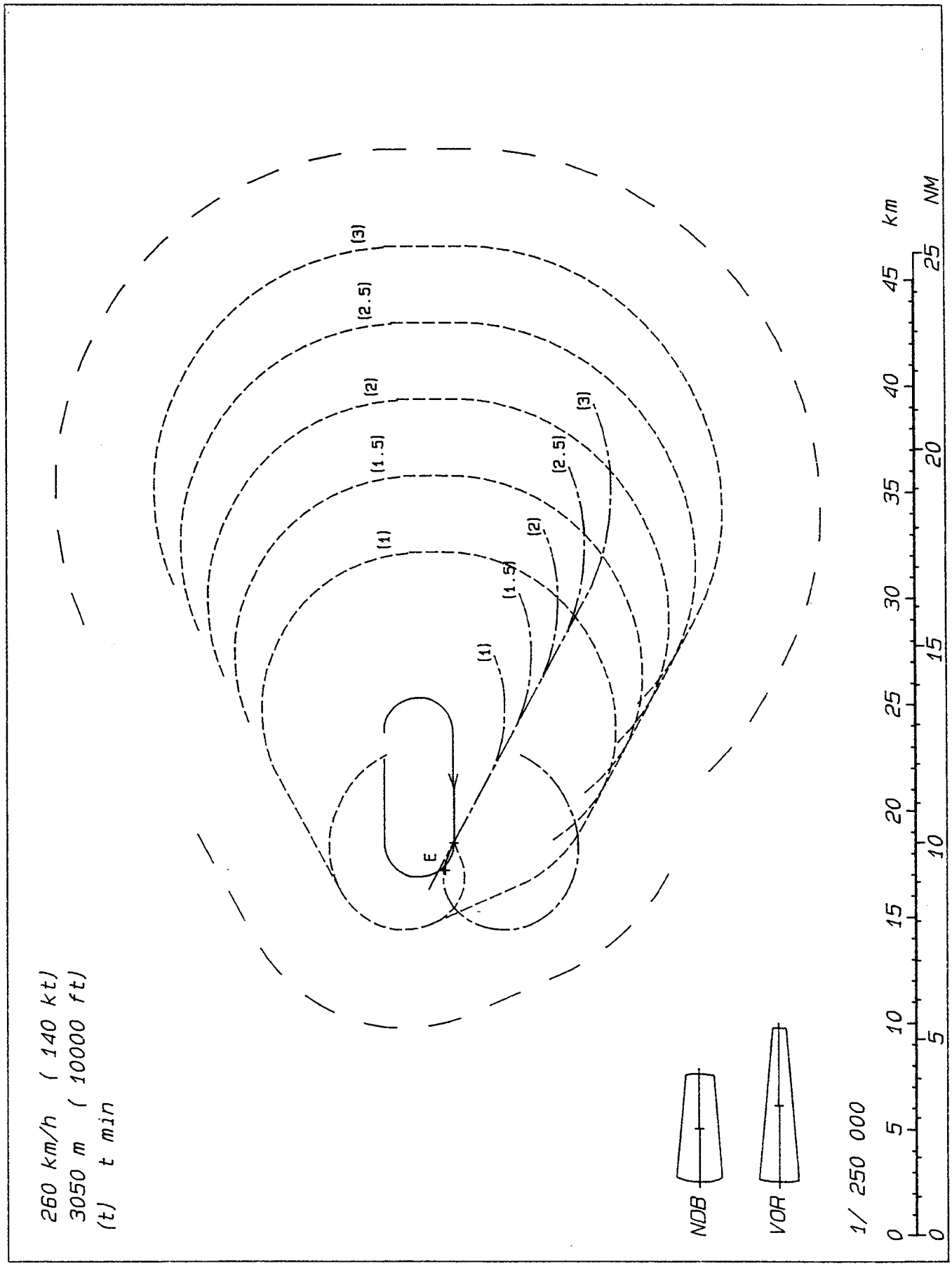
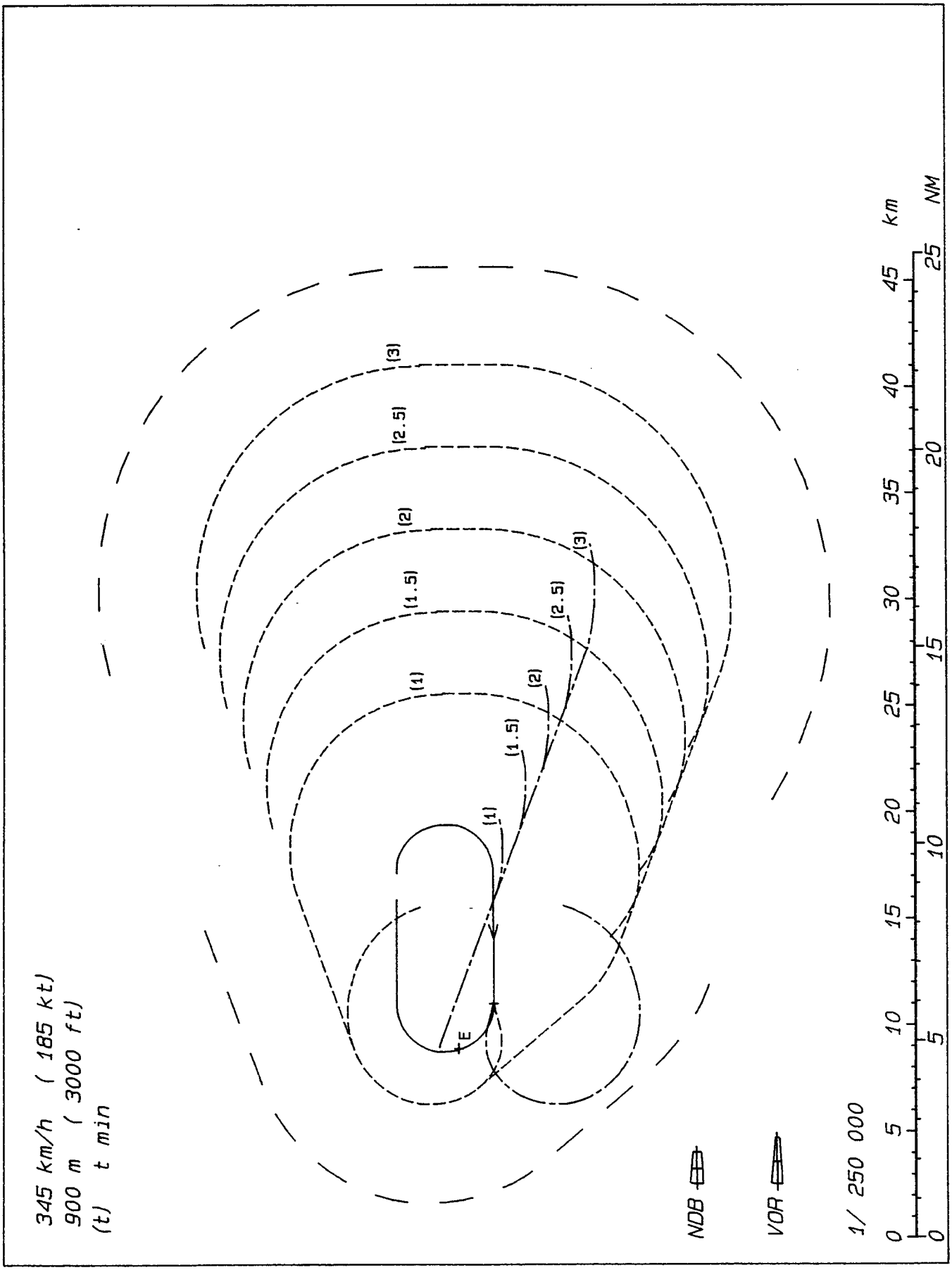

260 km/h (140 kt)
3050 m (10000 ft)
(t) t min
(1)
(1.5)
(2)
(2.5)
(3)
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


345 km/h (185 kt)
900 m (3000 ft)
(t) t min
(1)
(1.5)
(2)
(2.5)
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E
NDB
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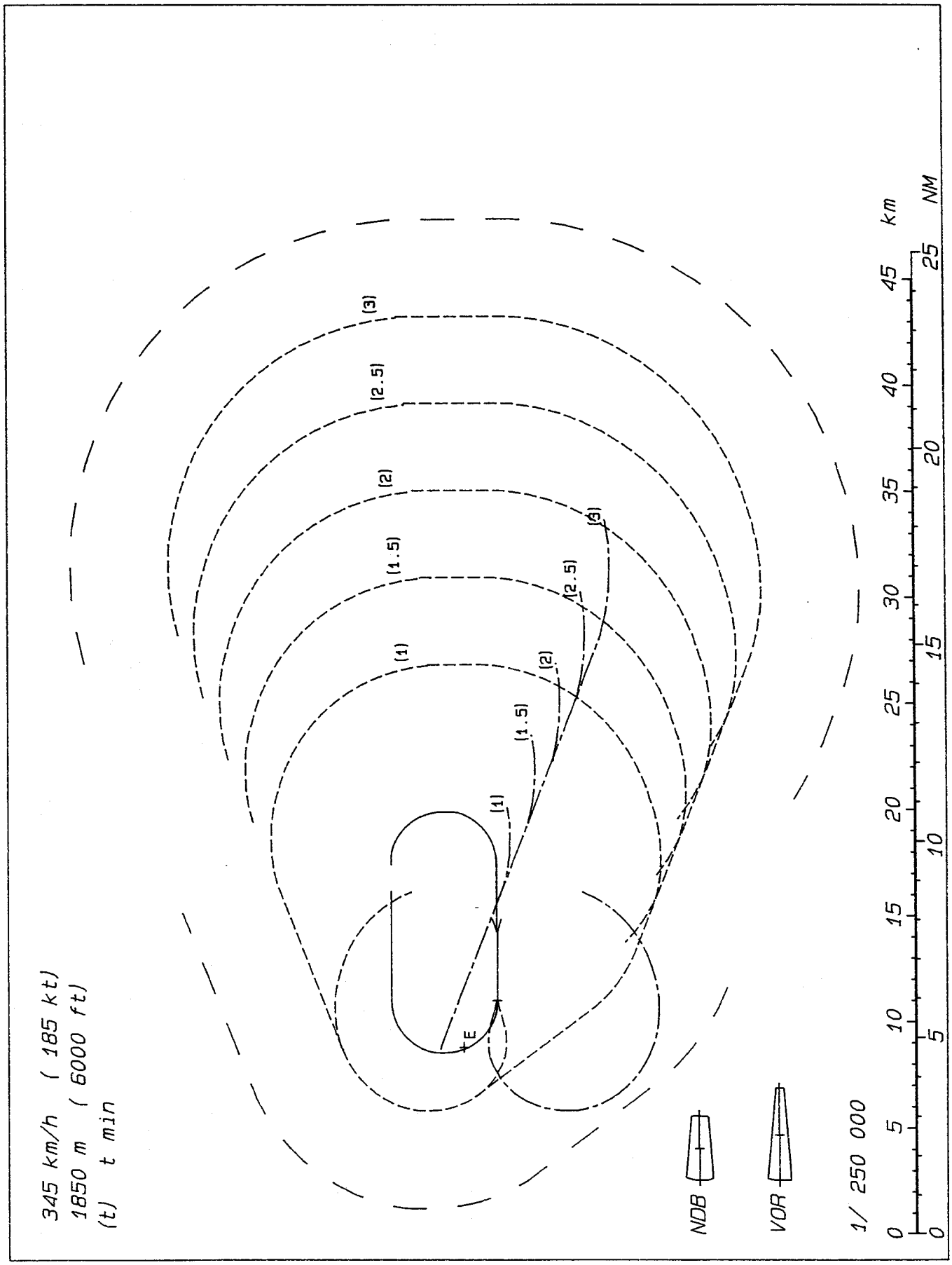
345 km/h (185 kt)
1850 m (6000 ft)
(t) t min
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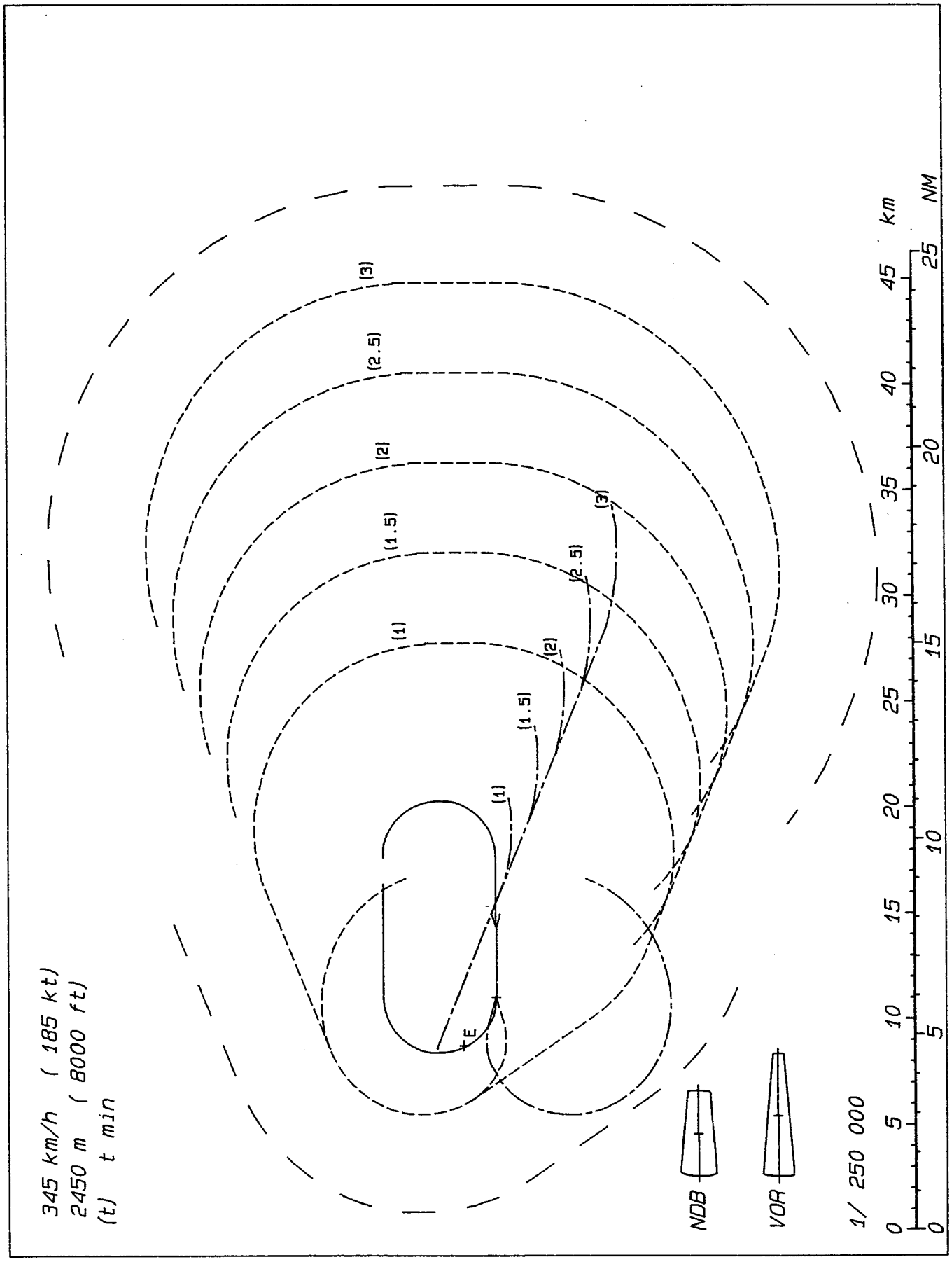
345 km/h (185 kt)
2450 m (8000 ft)
(t) t min
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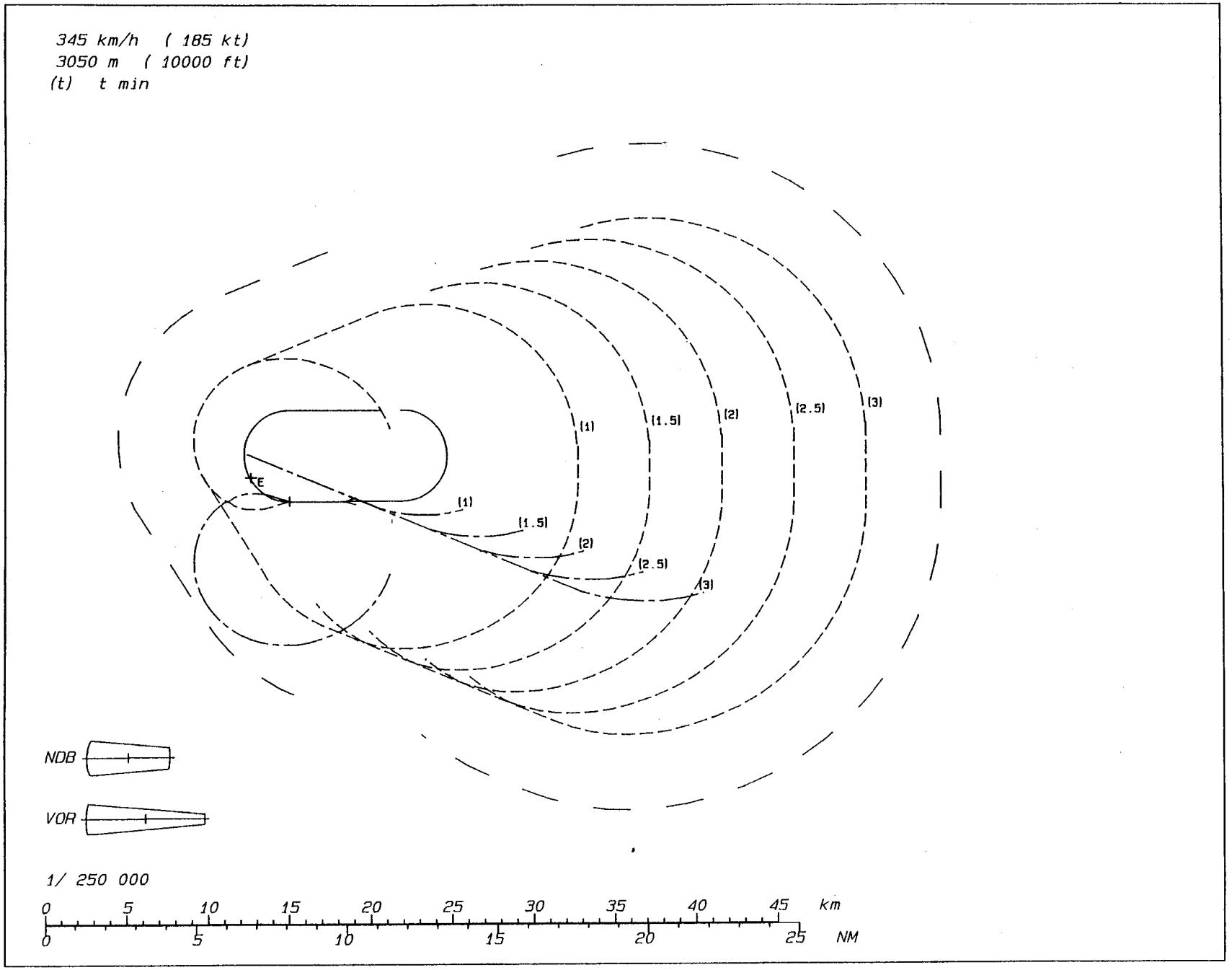
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3050 m (10000 ft)
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(1)
(1.5)
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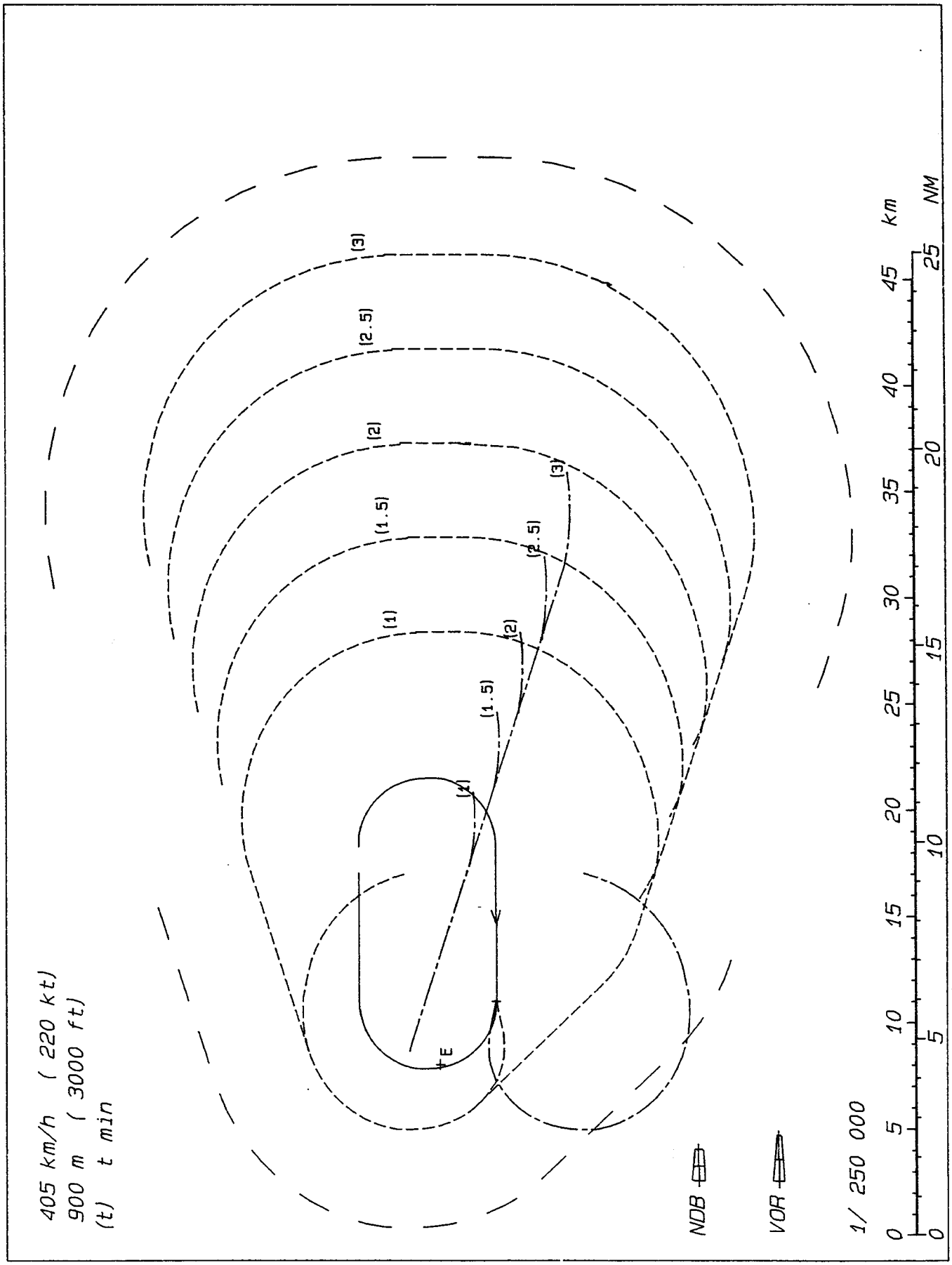
(2.5)
(3)
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


405 km/h (220 kt)
900 m (3000 ft)
(t) t min
(1)
(1.5)
(2)
(2.5)
(3)
E
NDB
VOR
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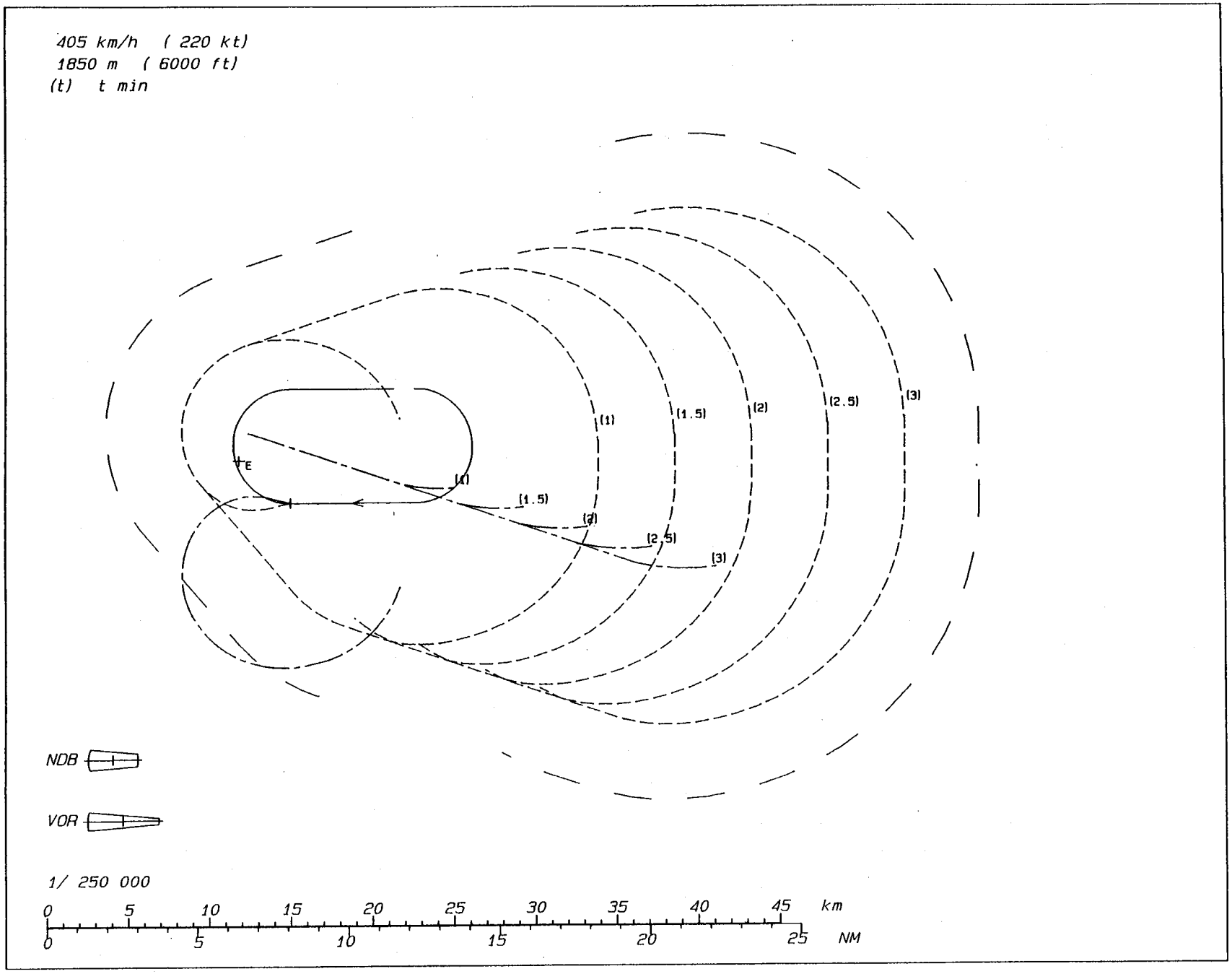
405 km/h (220 kt)
1850 m (6000 ft)
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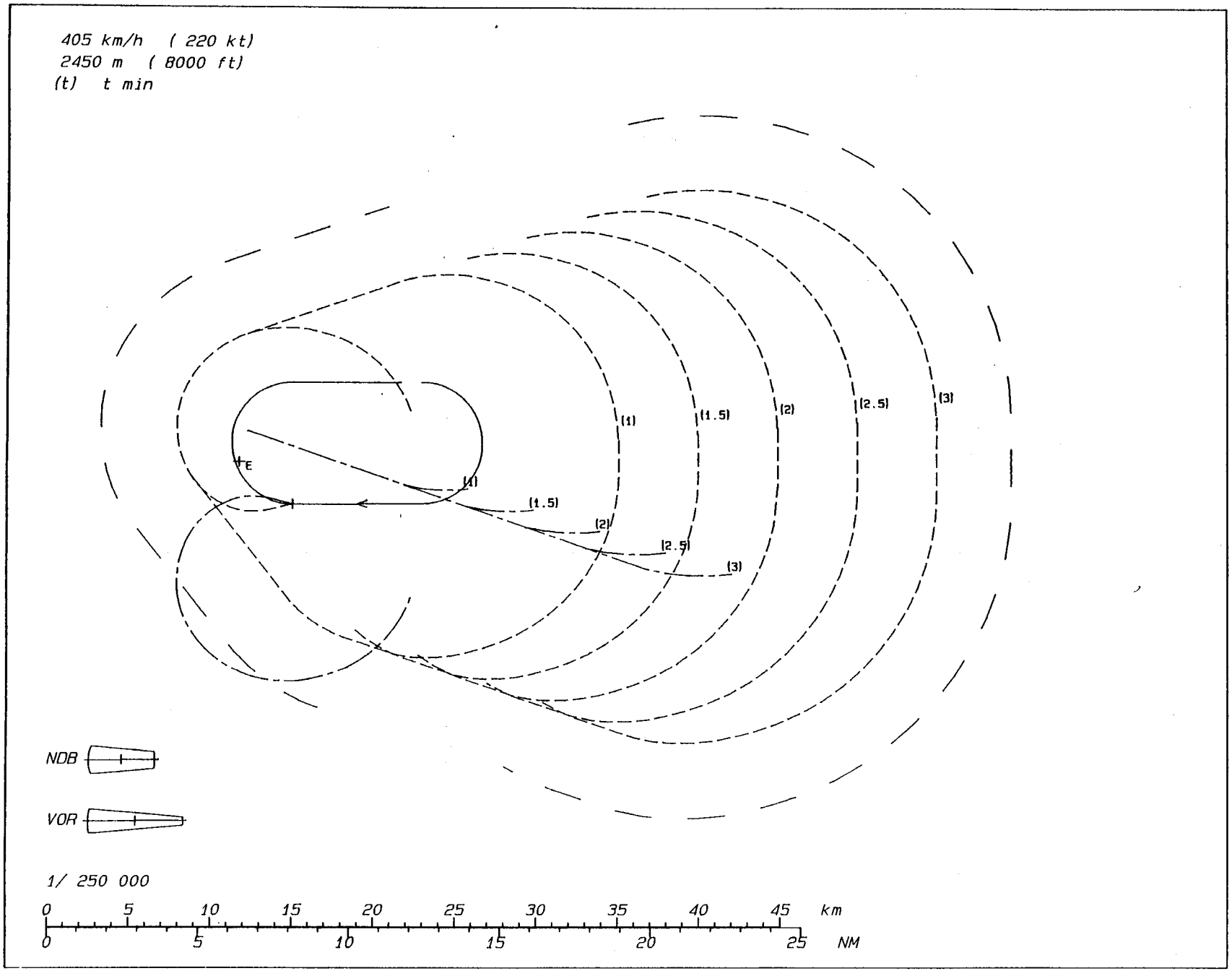
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


405 km/h (220 kt)
2450 m (8000 ft)
(t) t min
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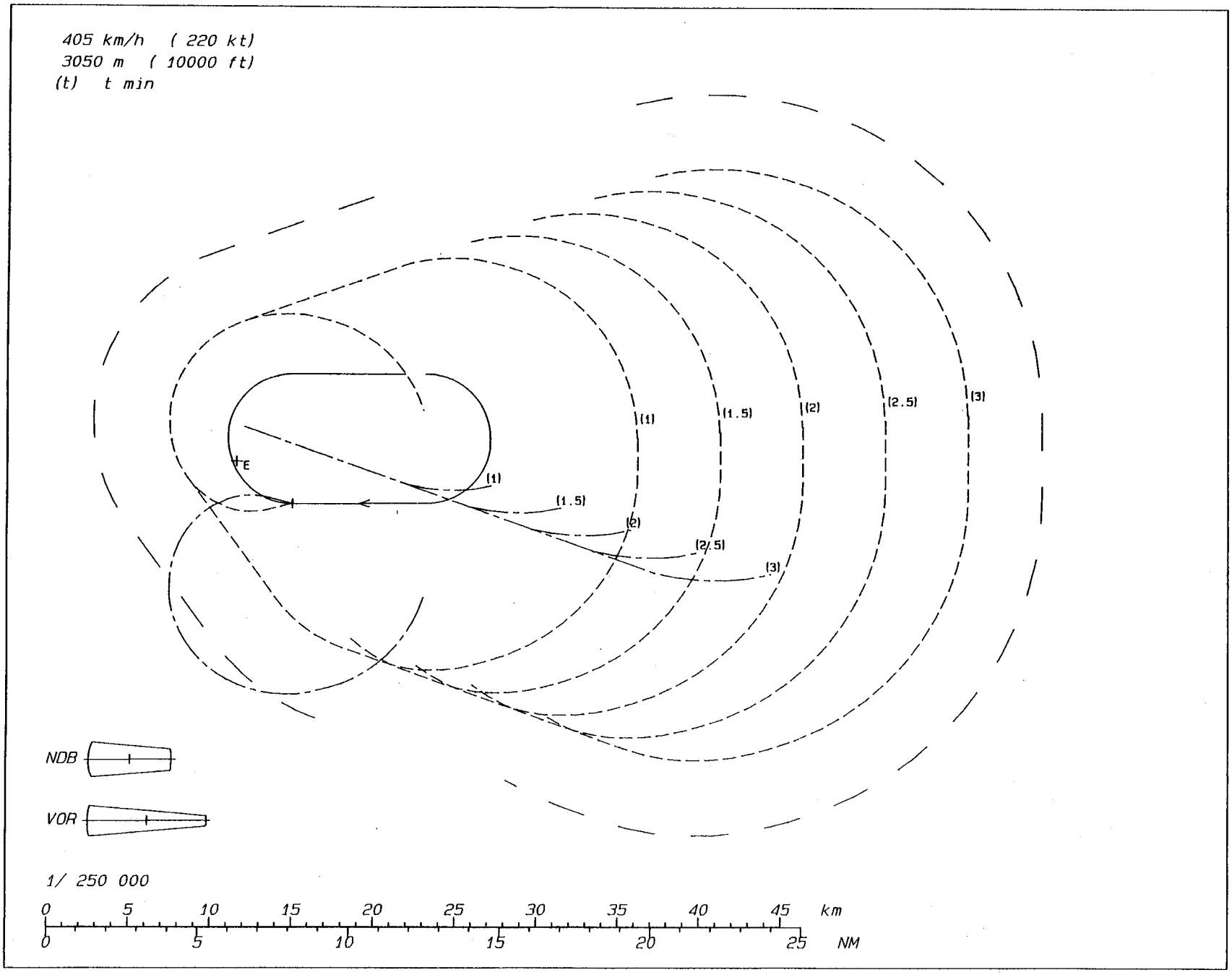
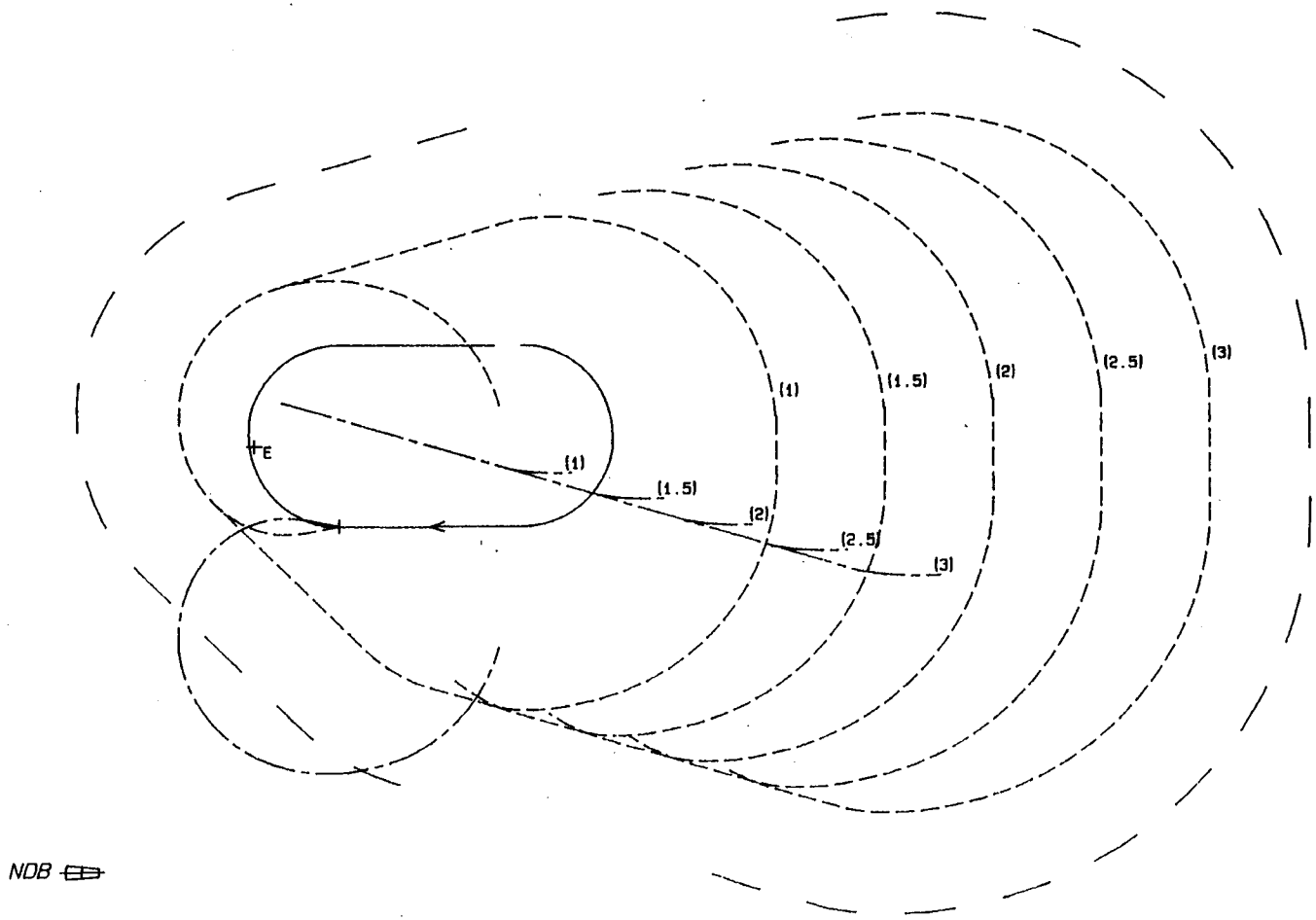
(1.5)
(2)
(2.5)
(3)
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


405 km/h (220 kt)
3050 m (10000 ft)
(t) t min
E
(1)
(1.5)
(2)
(2.5)
(3)
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM

465 km/h (250 kt)
900 m (3000 ft)
(t) t min



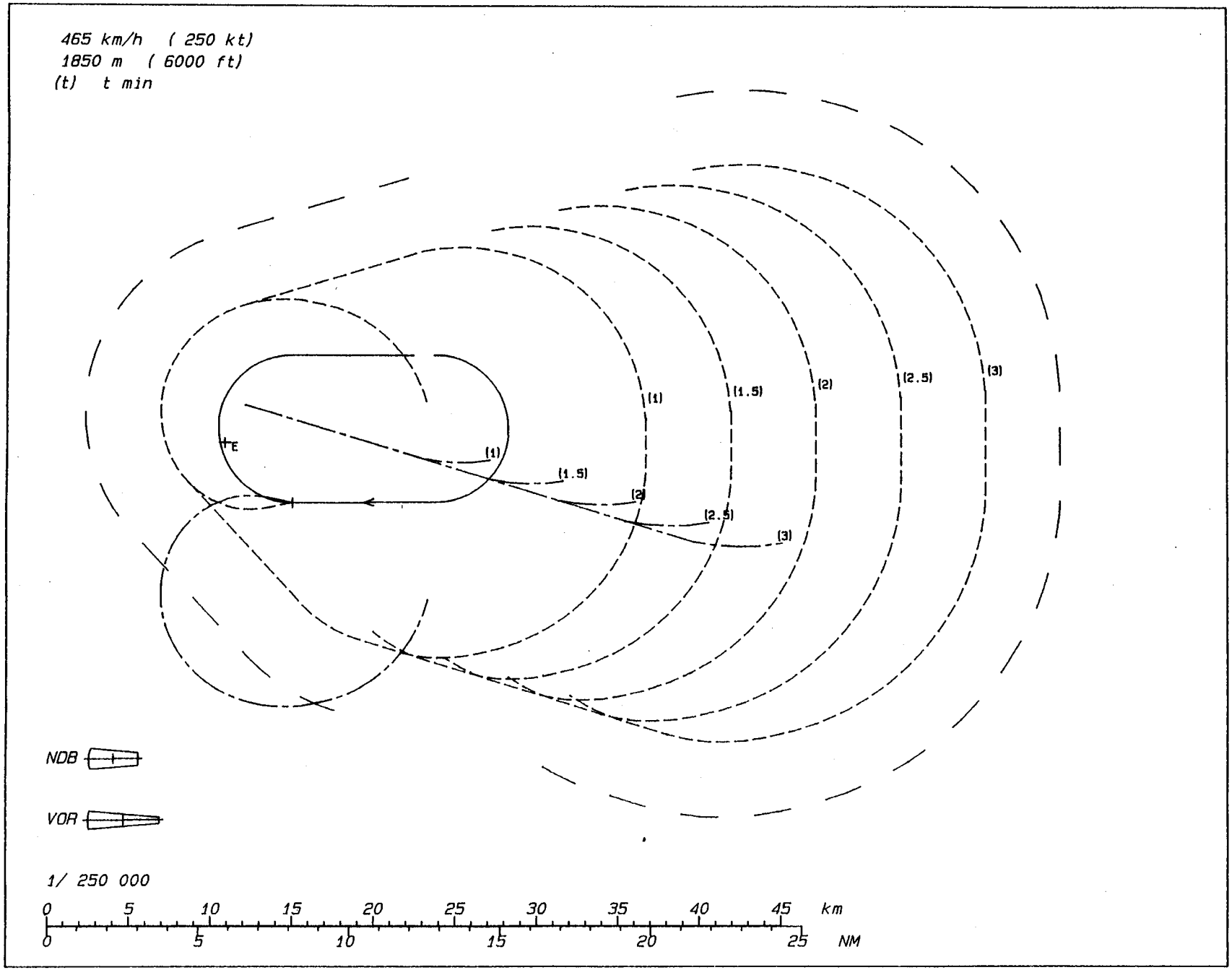
NDB

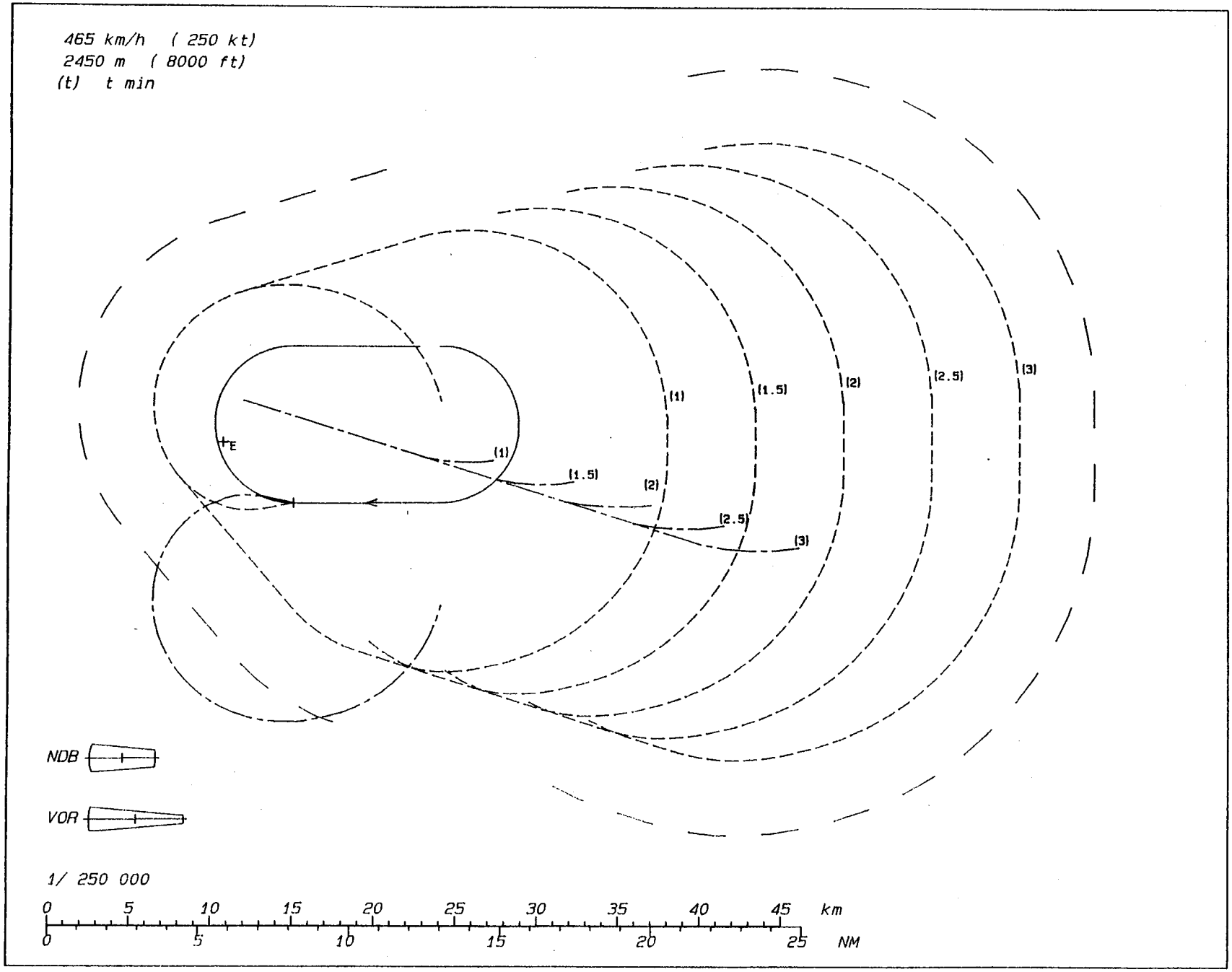
VOR

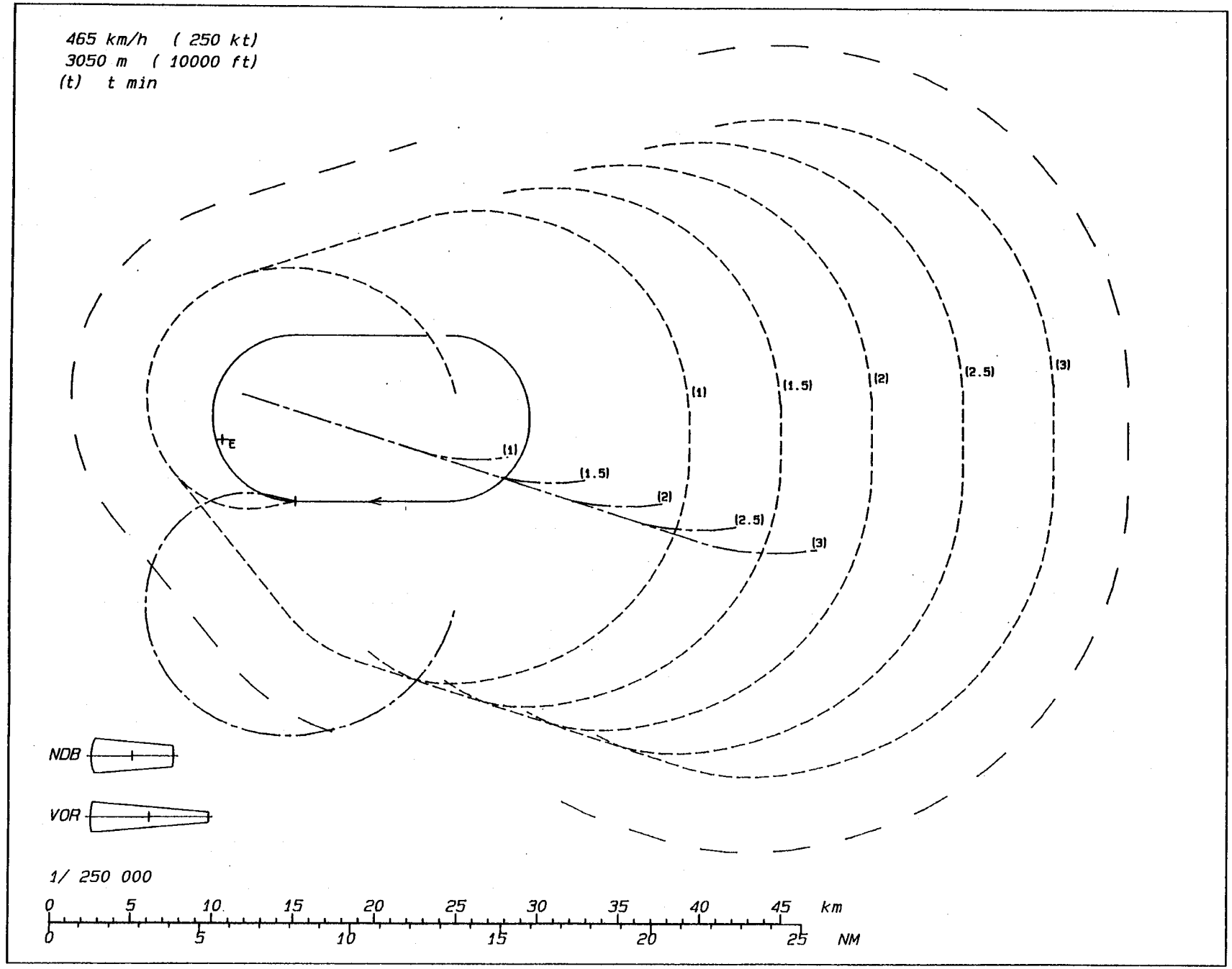
1/ 250 000

0 5 10 15 20 25 30 35 40 45 km

0 5 10 15 20 25 NM

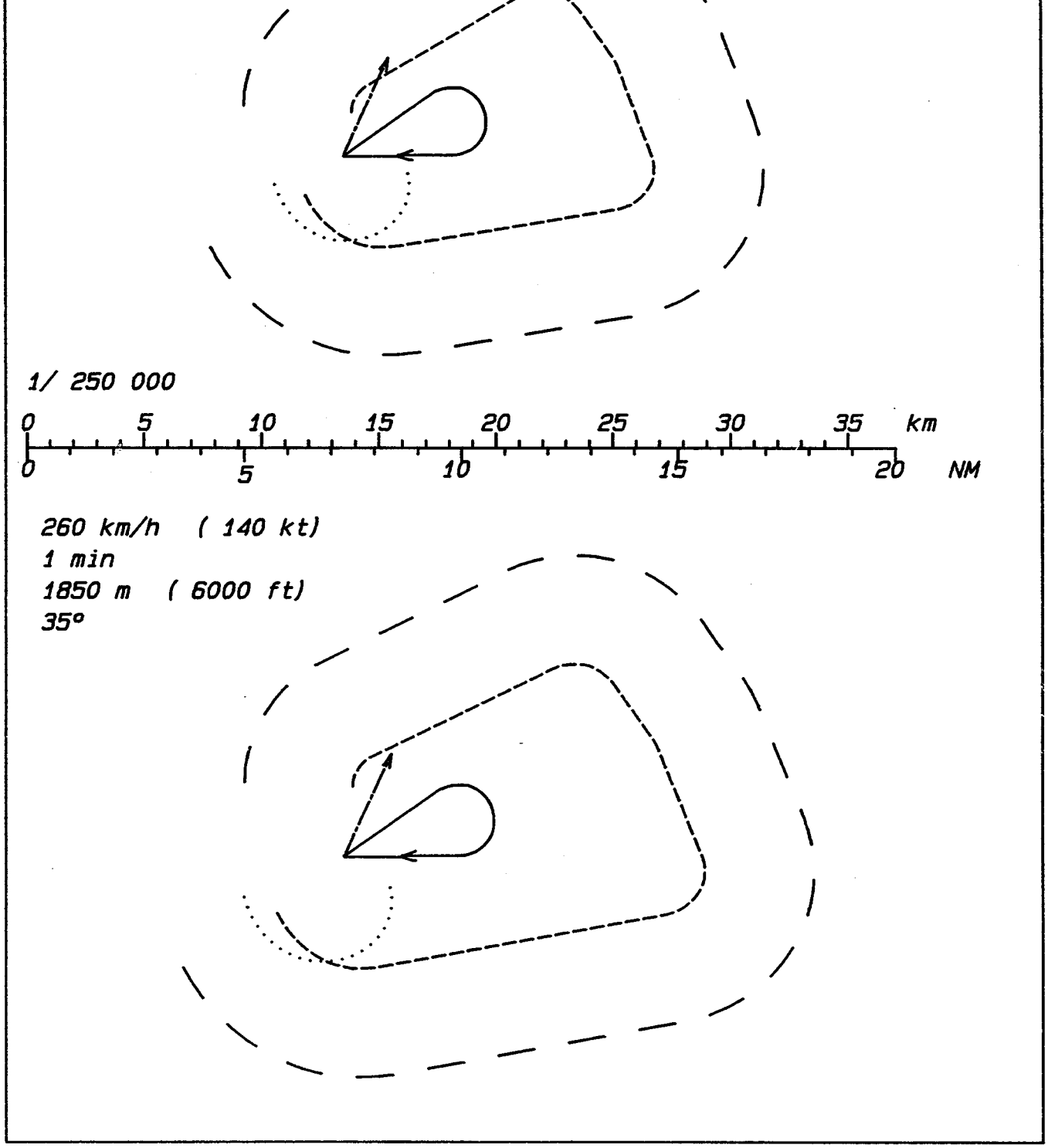

465 km/h (250 kt)
1850 m (6000 ft)
(t) t min
E
(1)
(1.5)
(2)
(2.5)
(3)
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM

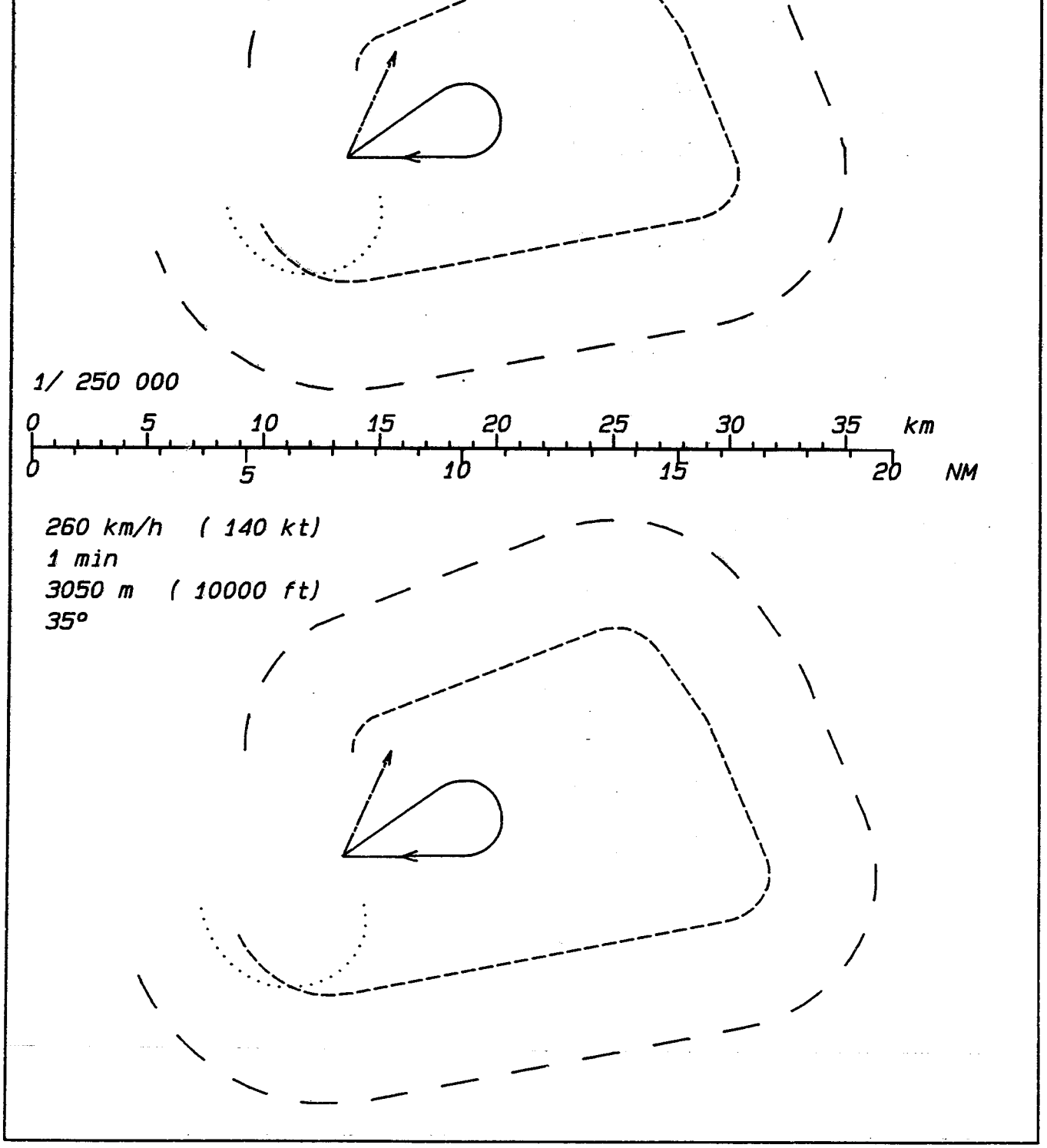

465 km/h (250 kt)
2450 m (8000 ft)
(t) t min
E
(1)
(1.5)
(2)
(2.5)
(3)
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


465 km/h (250 kt)
3050 m (10000 ft)
(t) t min
E
(1)
(1.5)
(2)
(2.5)
(3)
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM

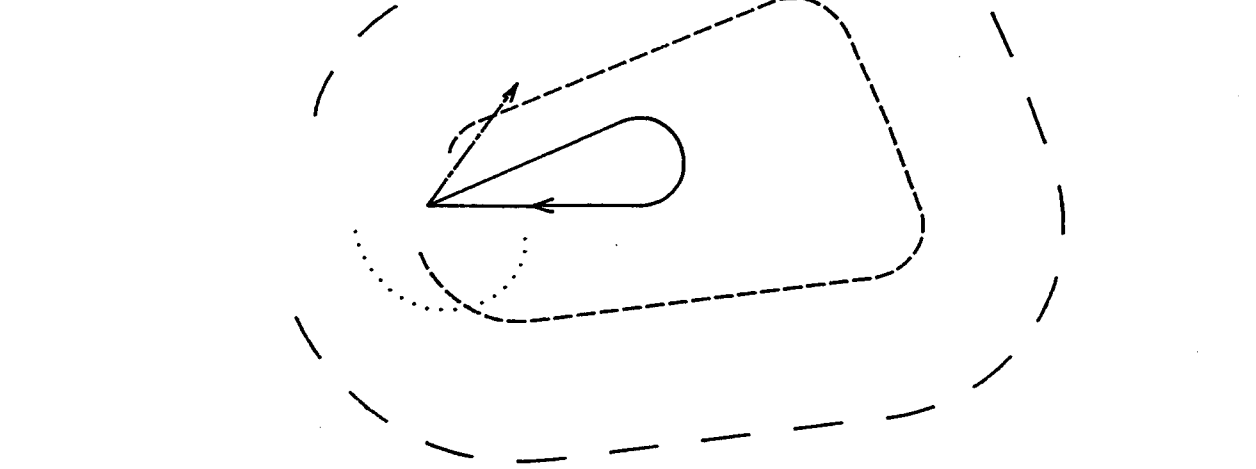
BASE TURN TEMPLATES

BT 1 - BT 65

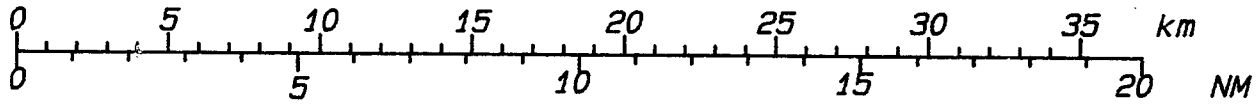

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
1 min
1850 m (6000 ft)
35°


1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
1 min
3050 m (10000 ft)
35°

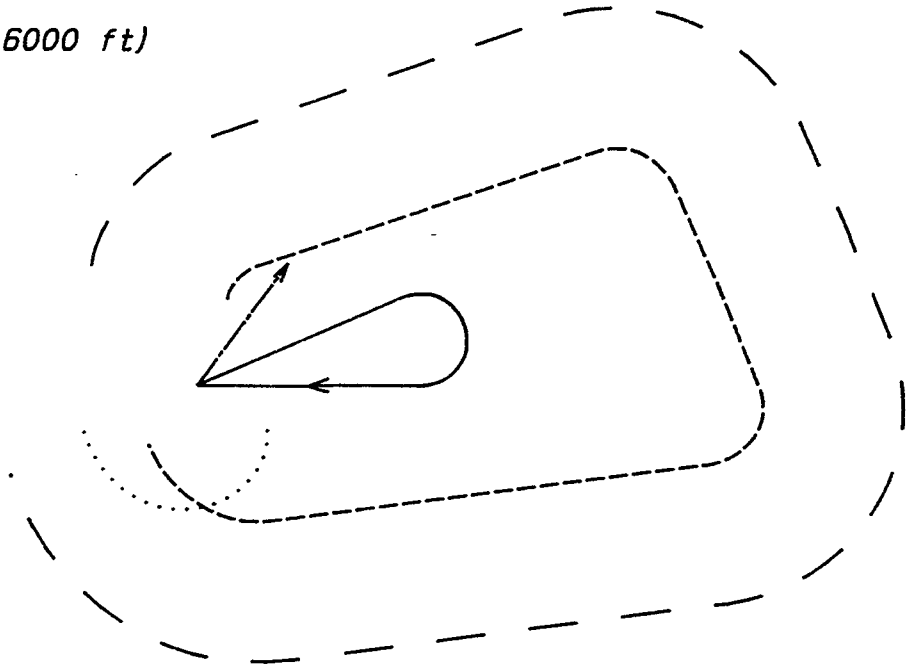
BT 2 1986/06

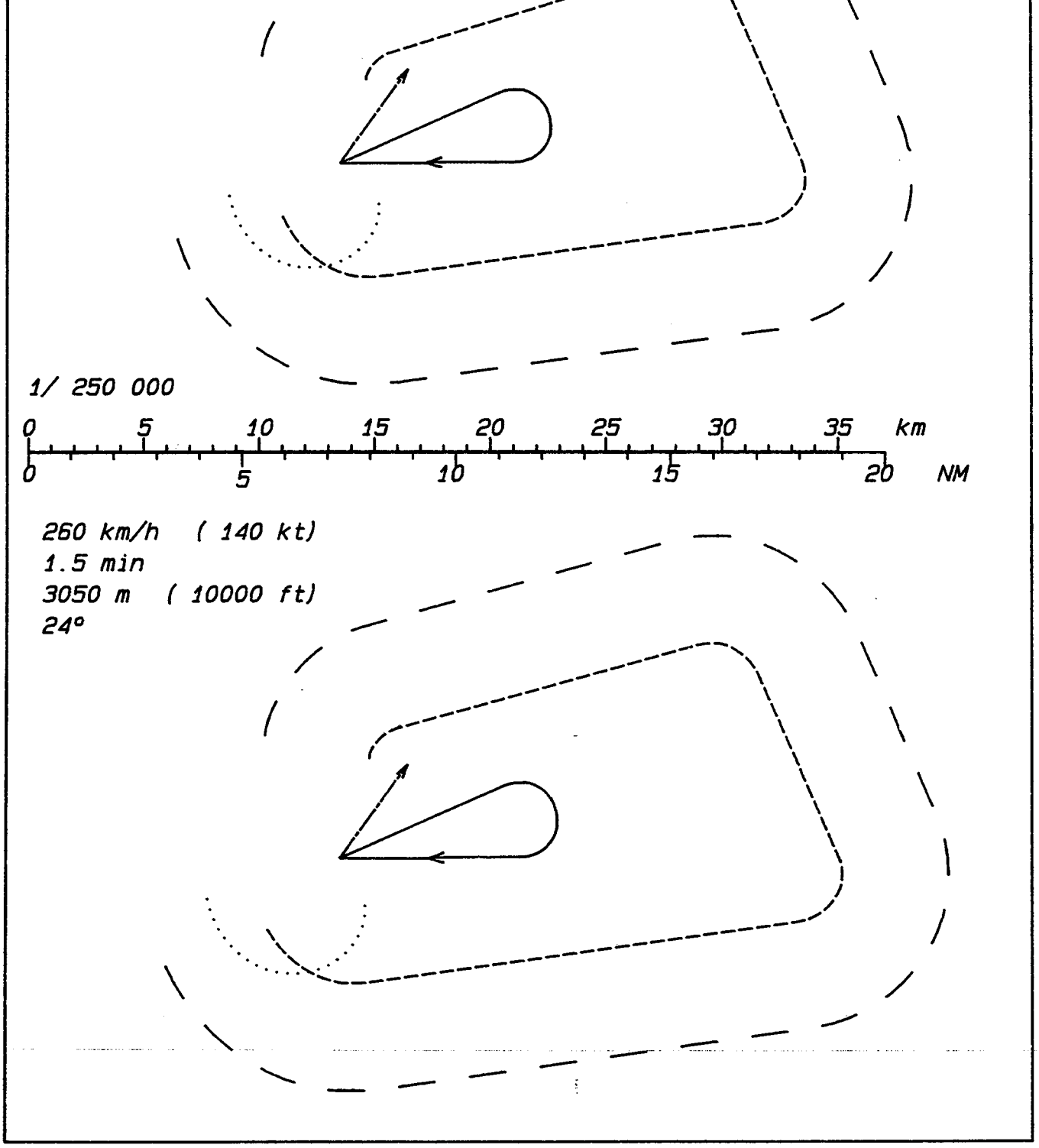


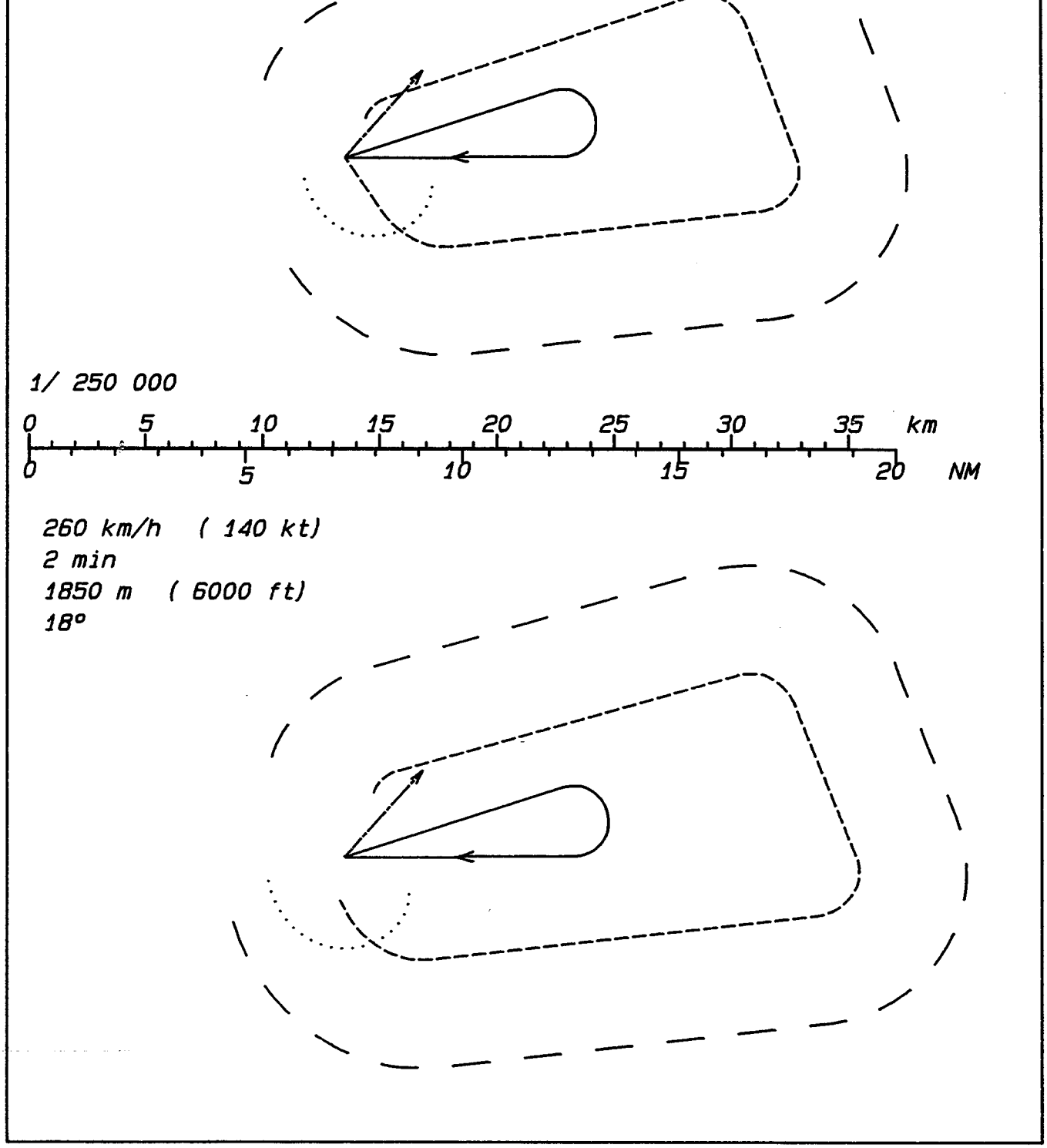
1/ 250 000

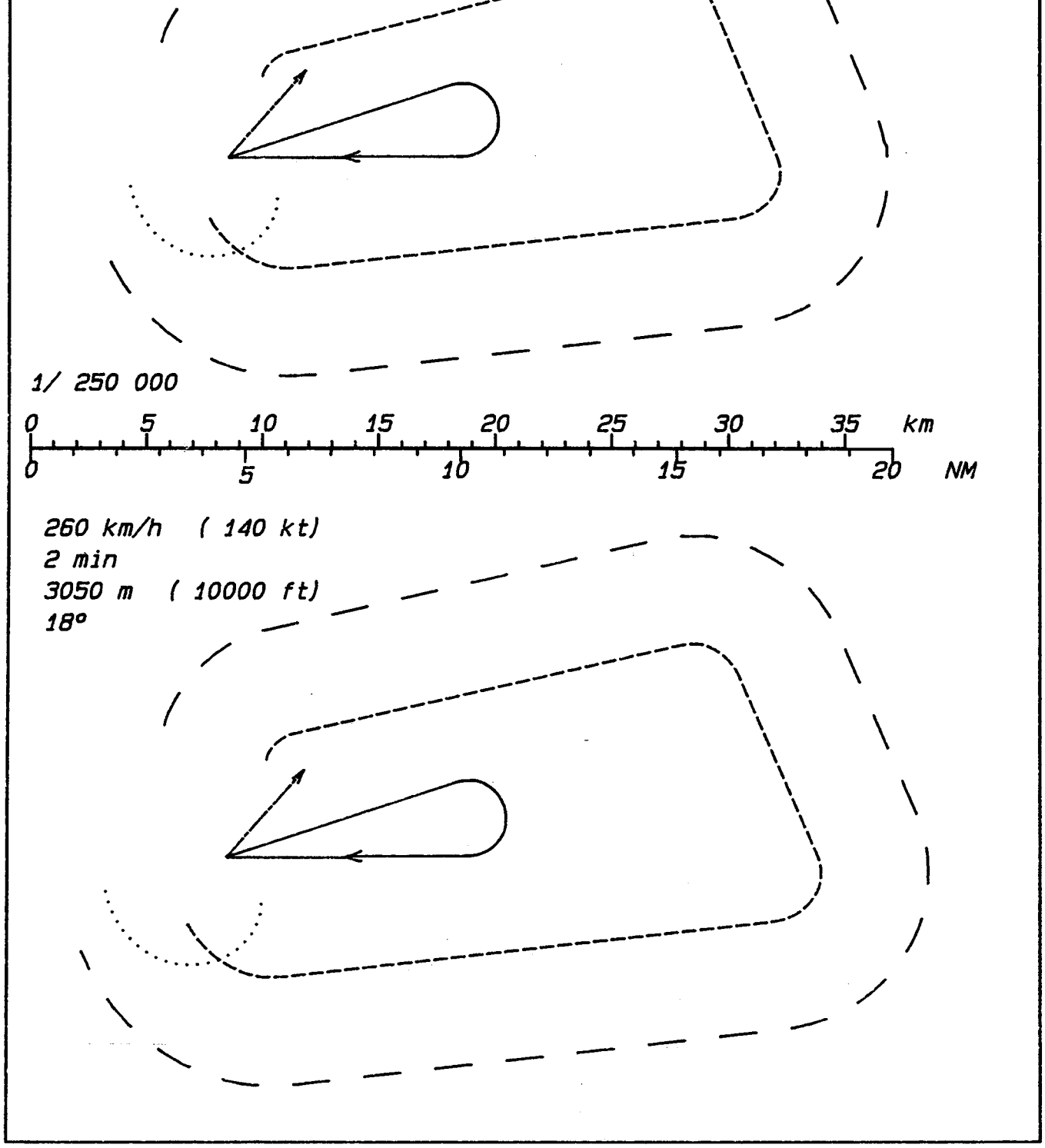


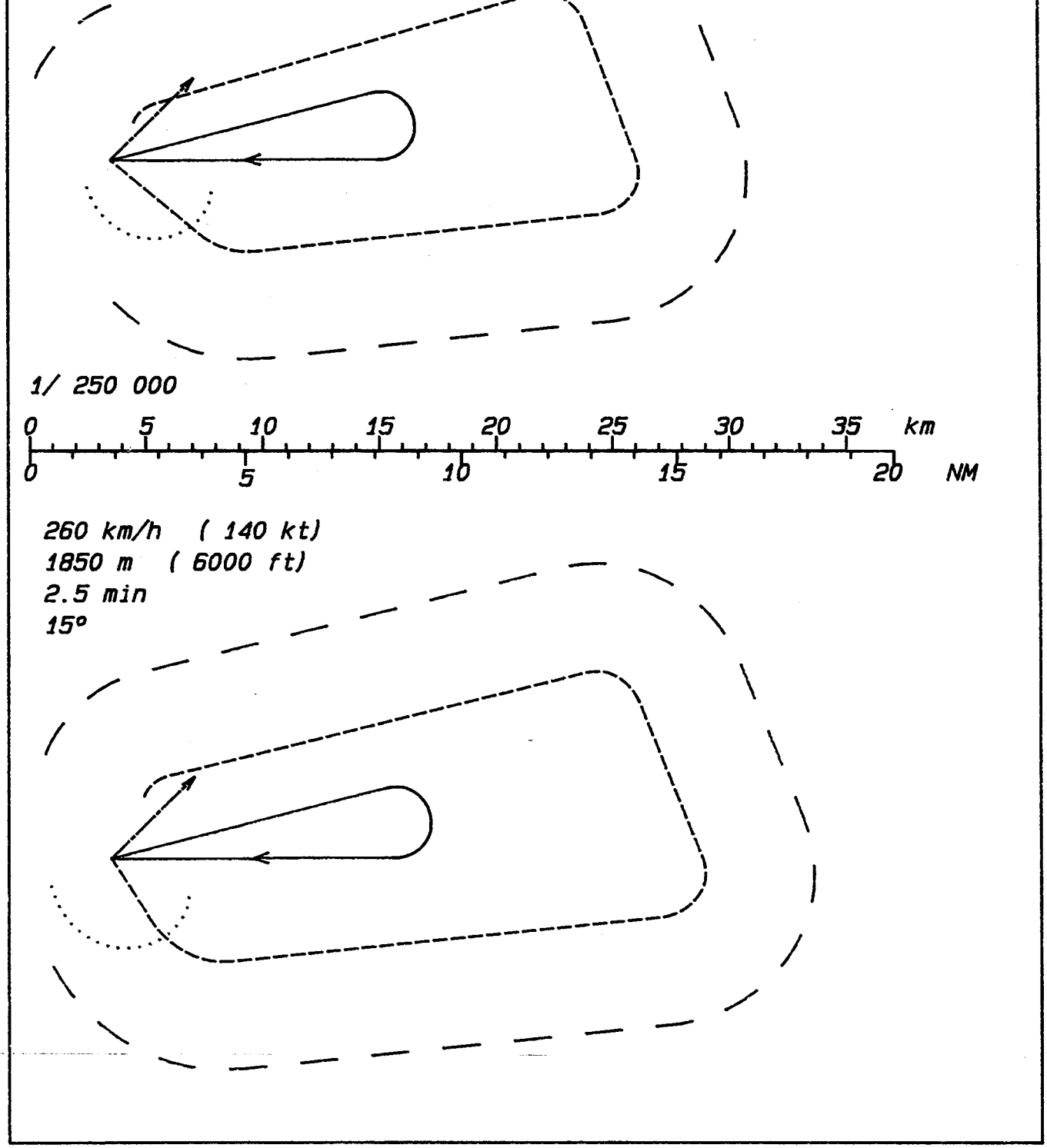
260 km/h (140 kt)
1.5 min
1850 m (6000 ft)
24°

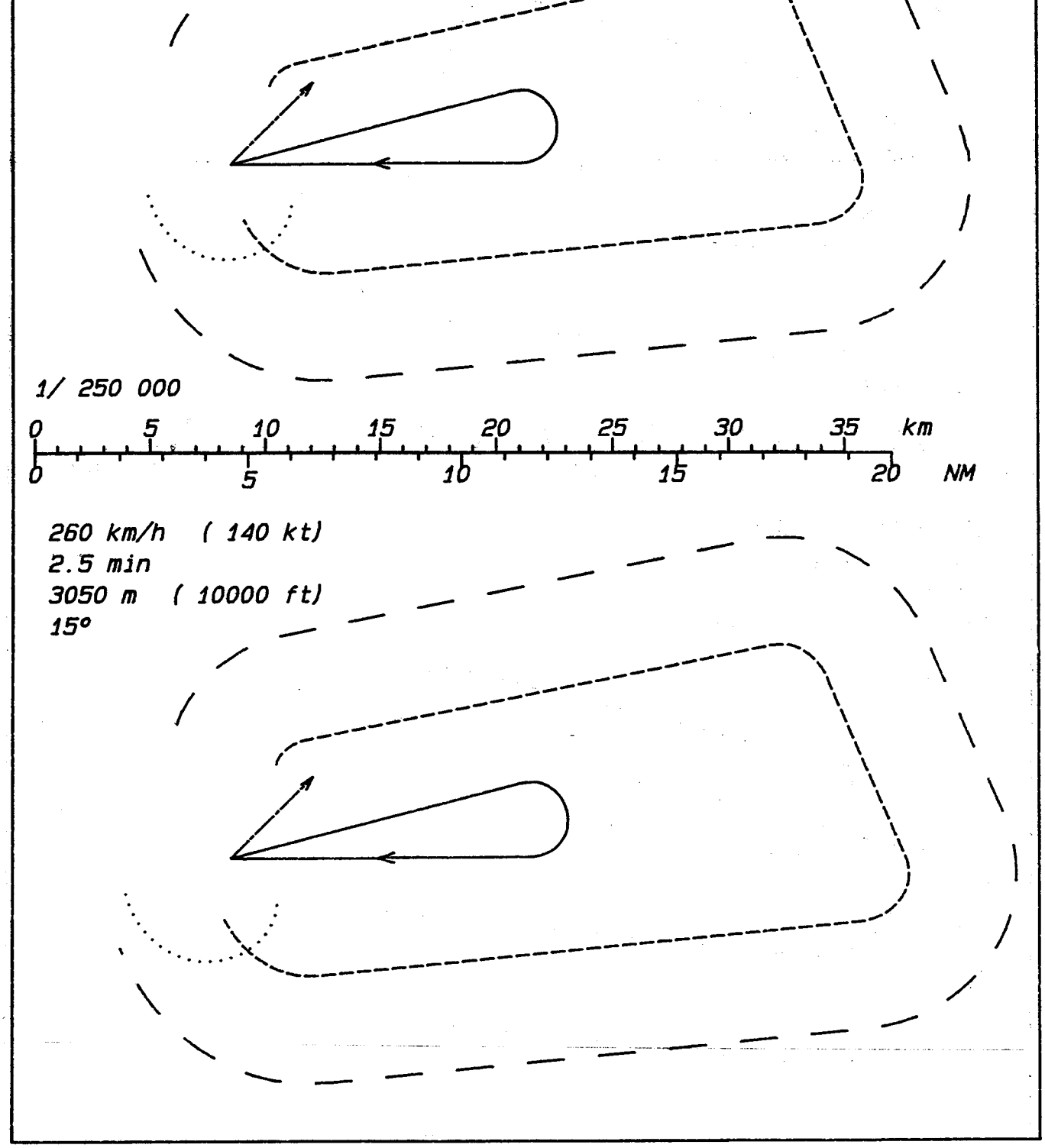


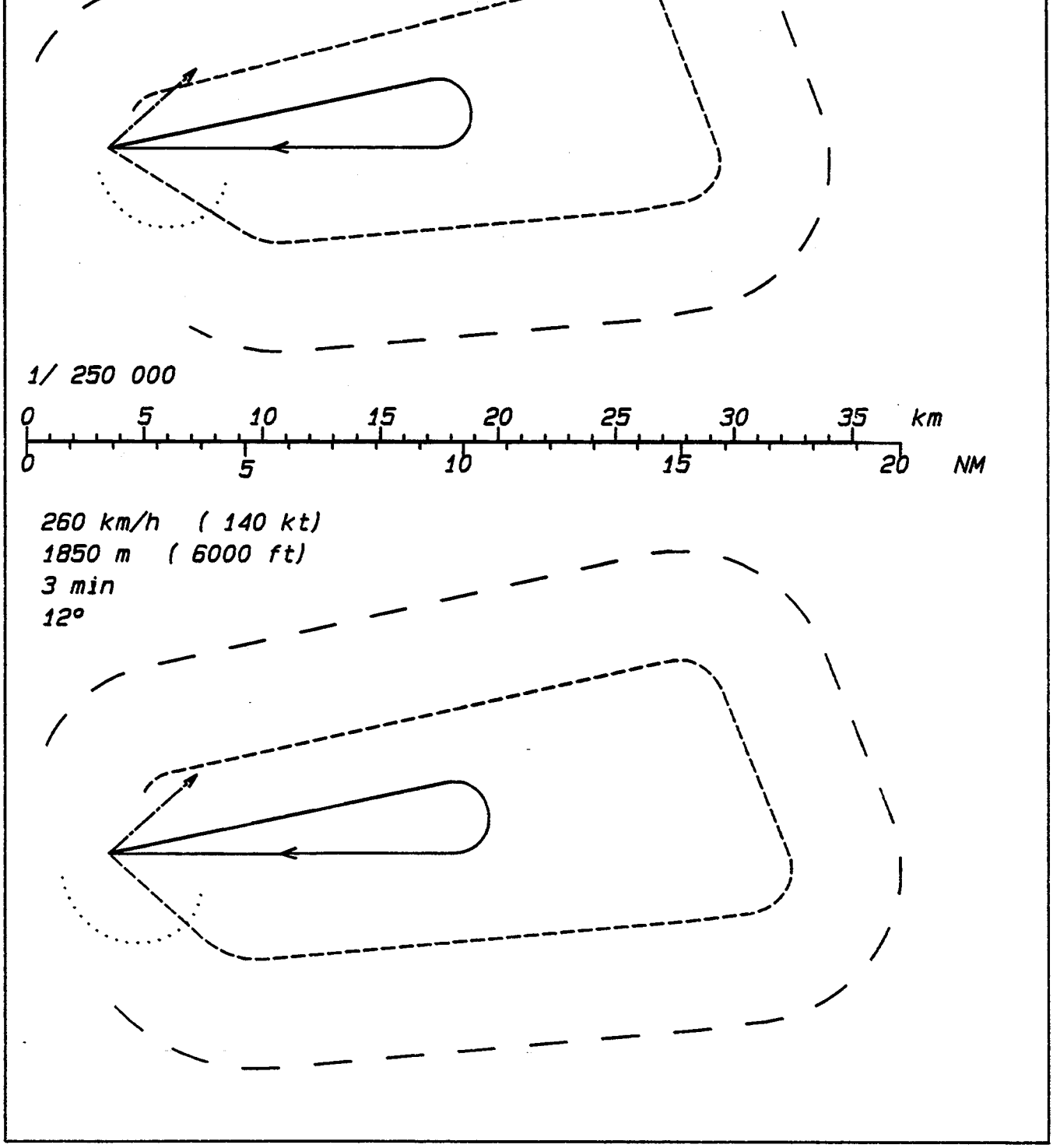

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
1.5 min
3050 m (10000 ft)
24°

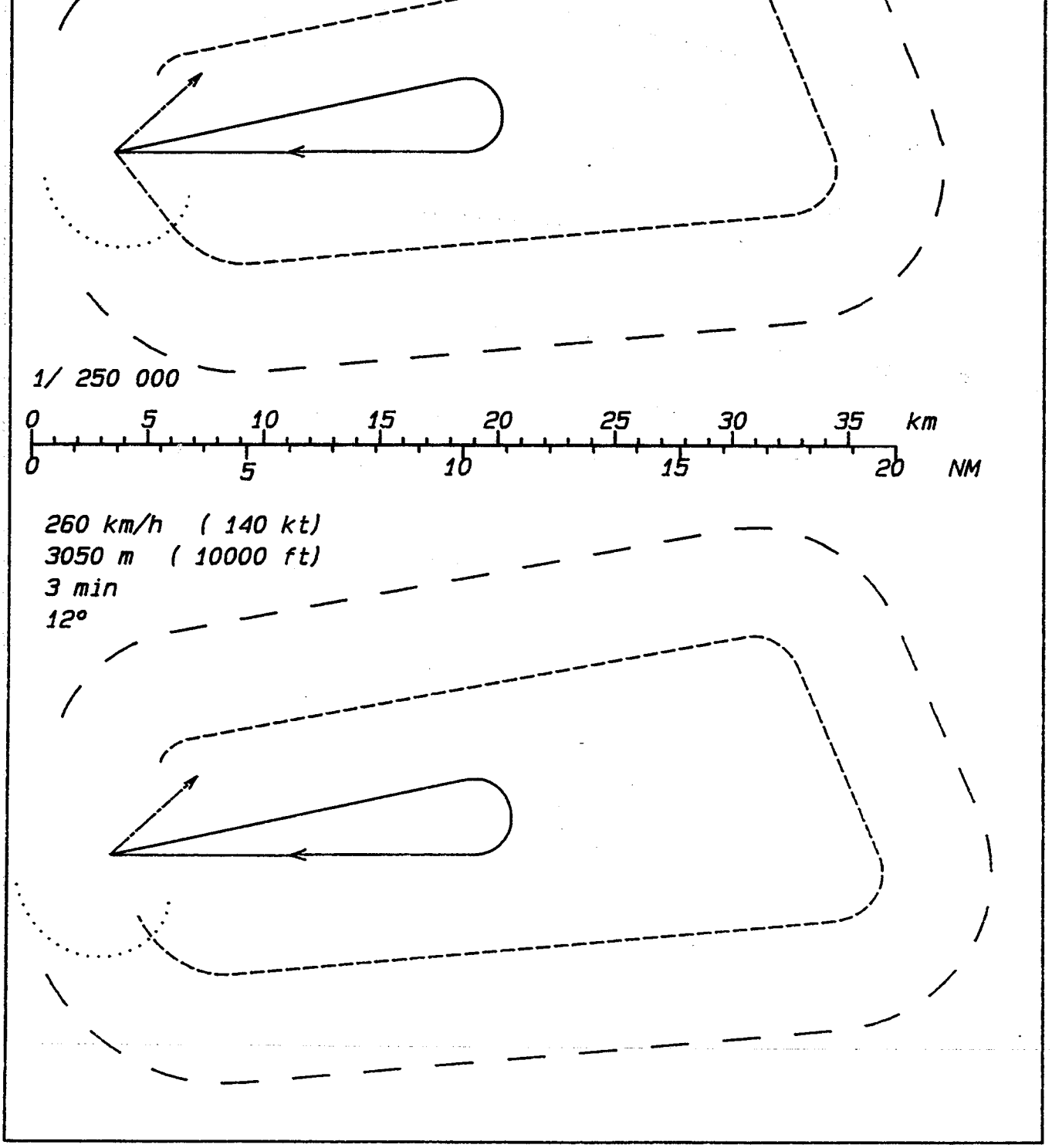

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
2 min
1850 m (6000 ft)
18°

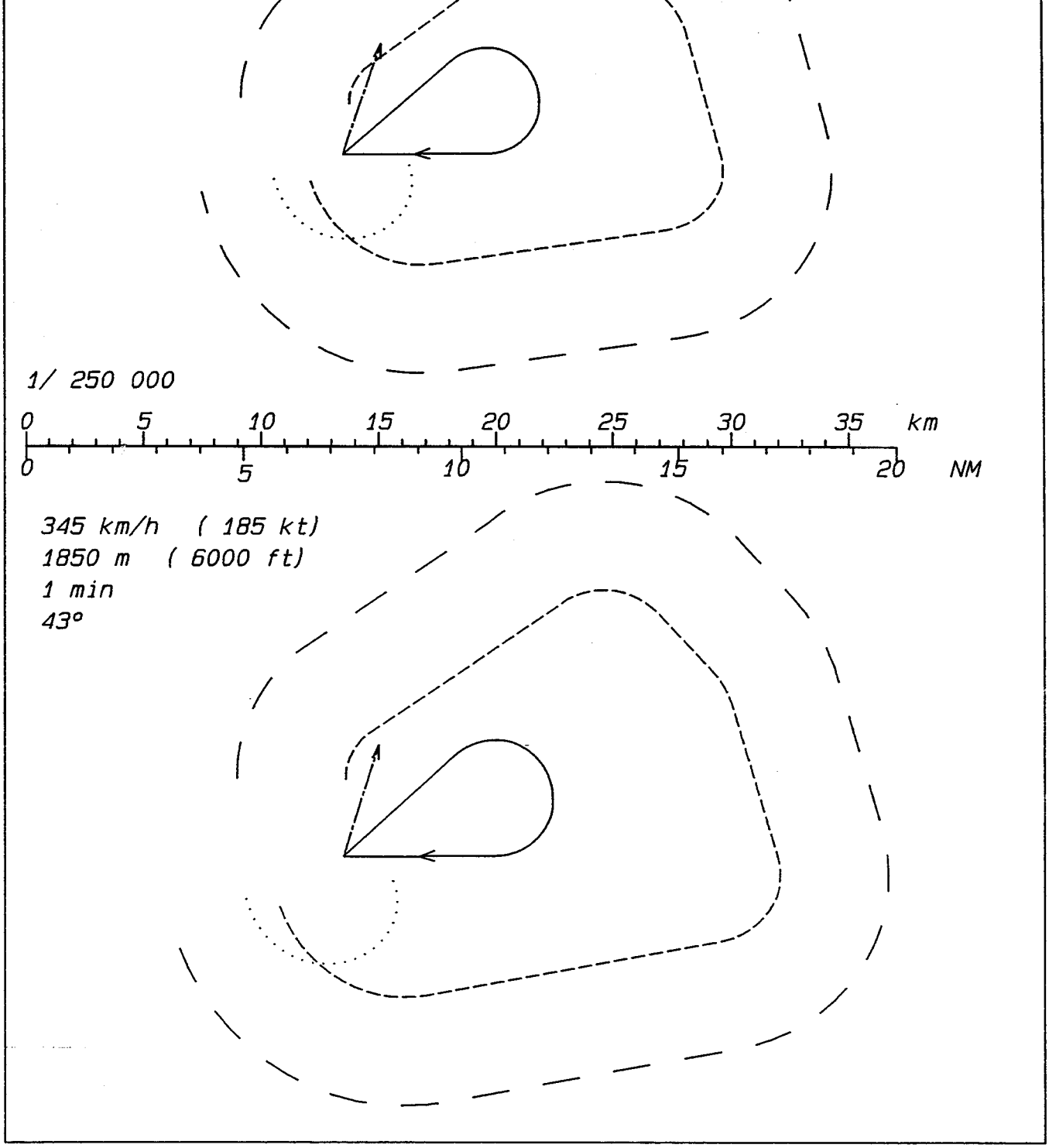

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
2 min
3050 m (10000 ft)
18°

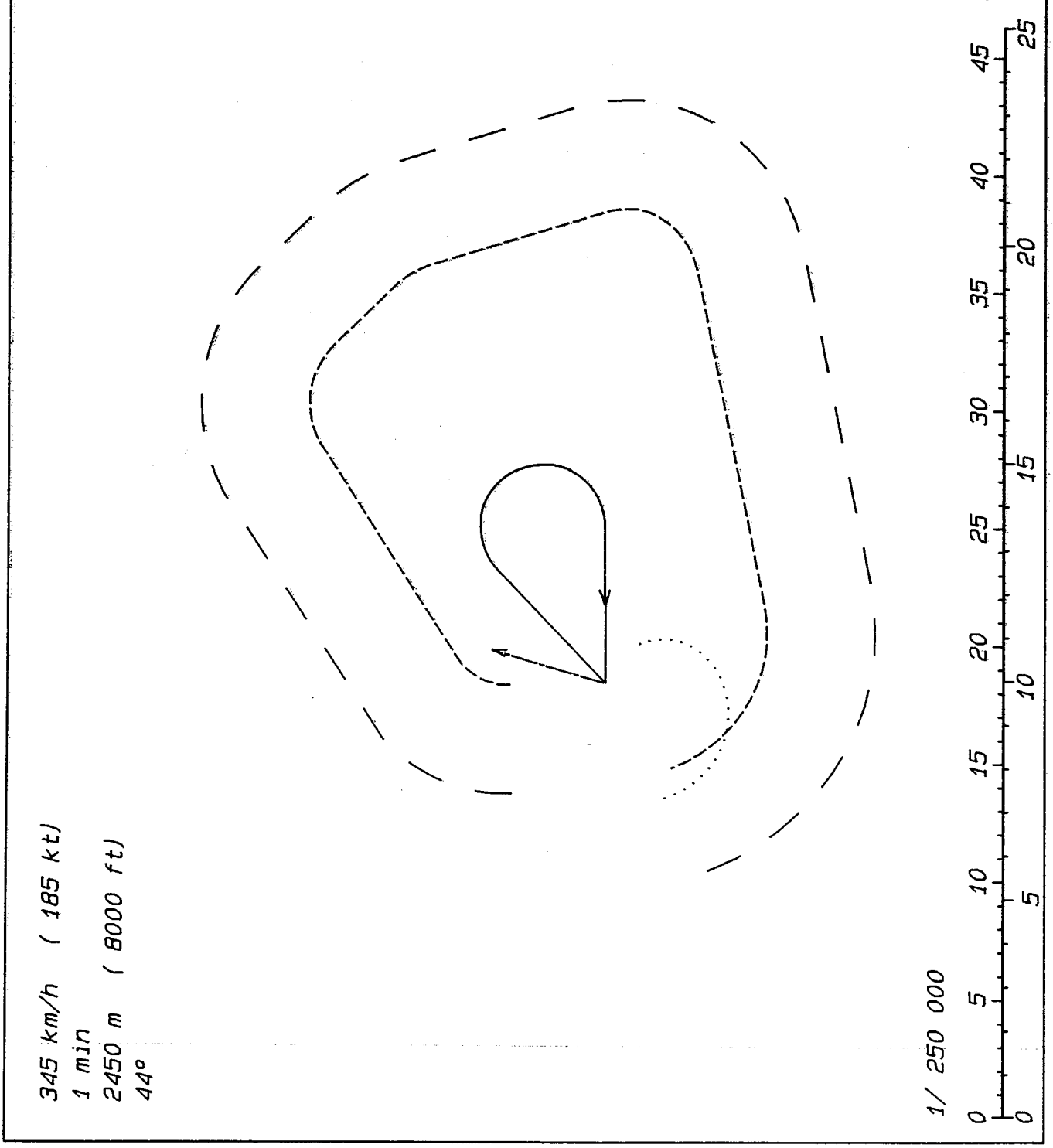

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
1850 m (6000 ft)
2.5 min
15°

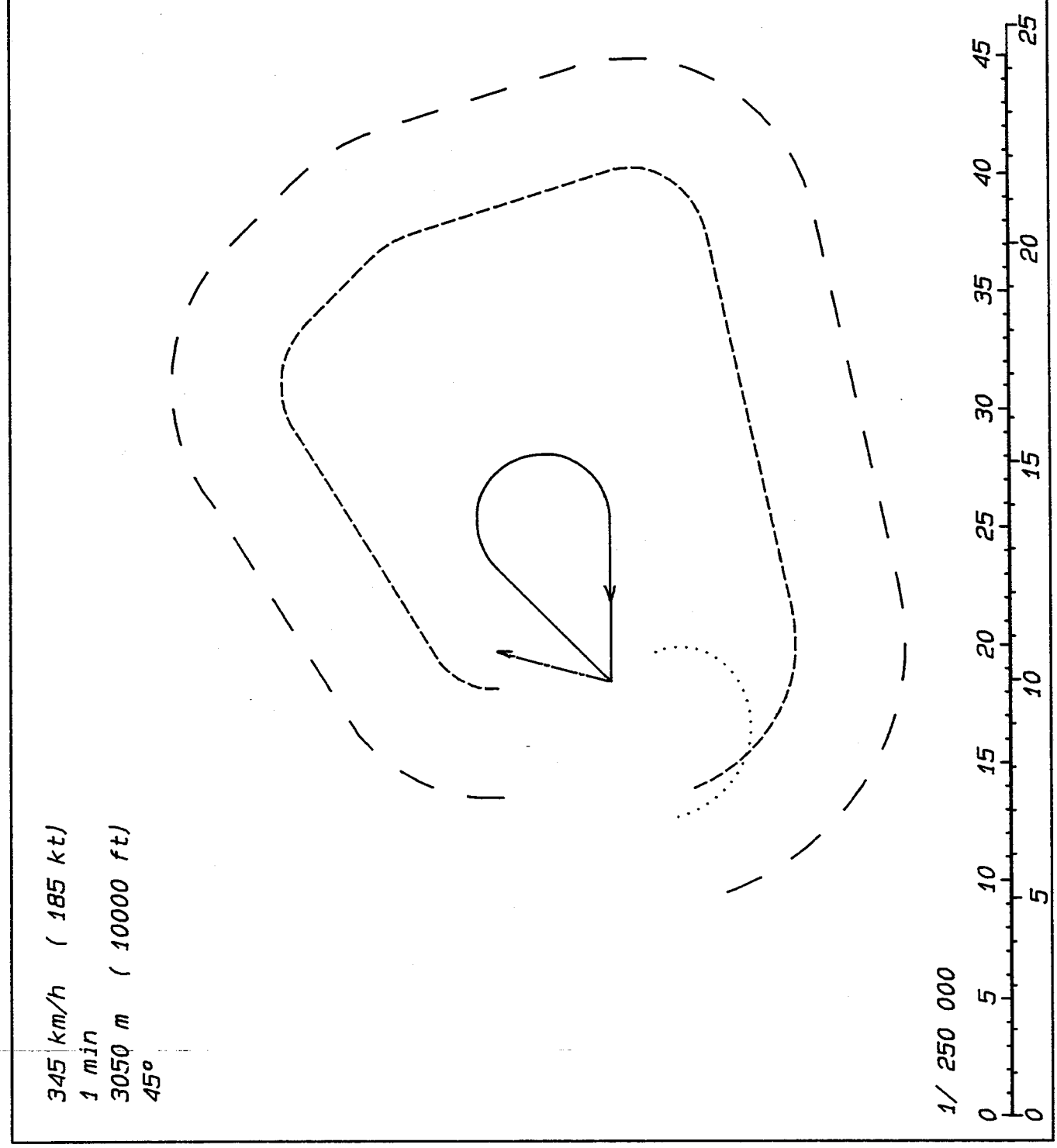

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
2.5 min
3050 m (10000 ft)
15°

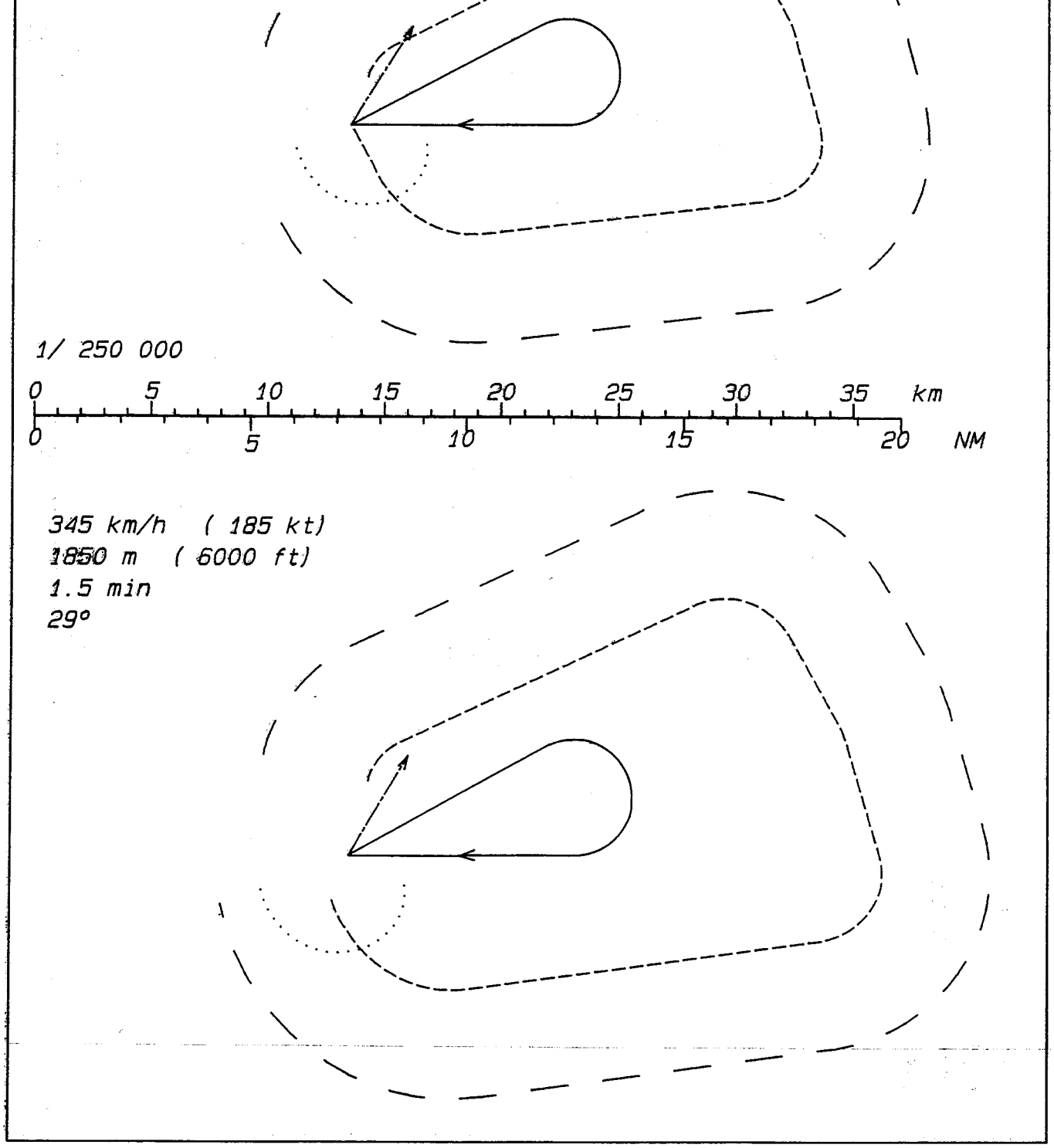

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
1850 m (6000 ft)
3 min
12°

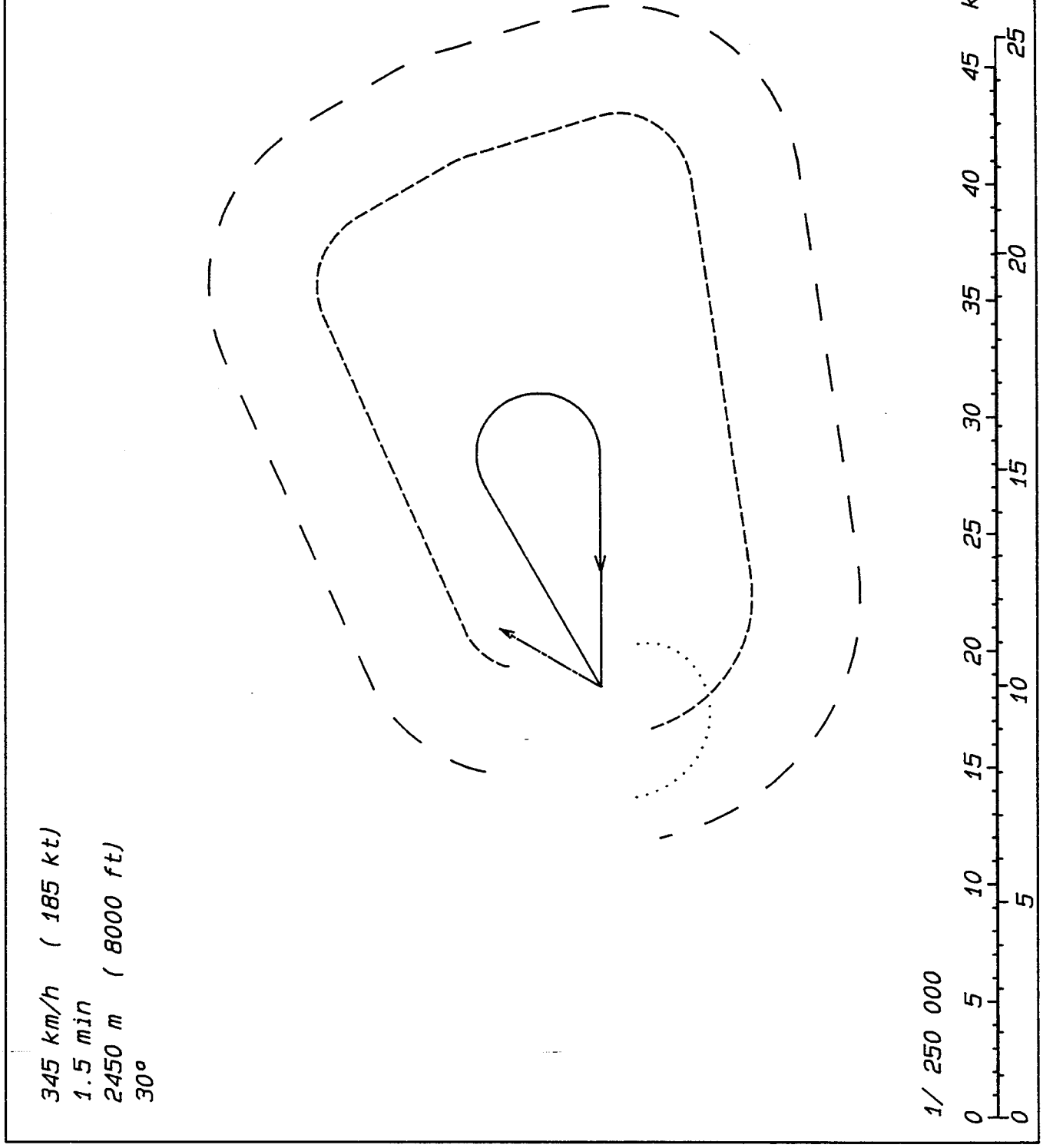

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
3050 m (10000 ft)
3 min
12°

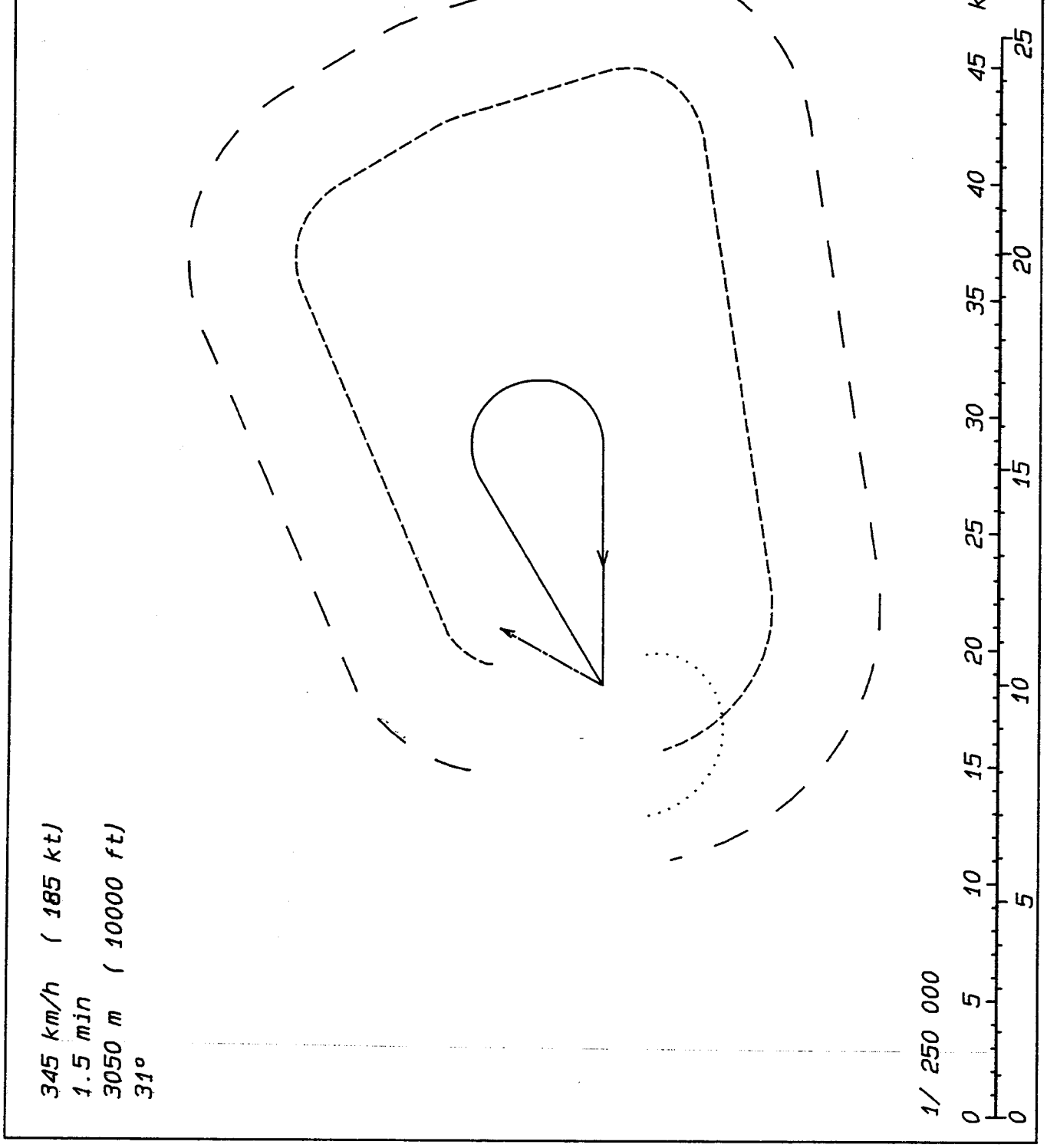

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
1850 m (6000 ft)
1 min
43°

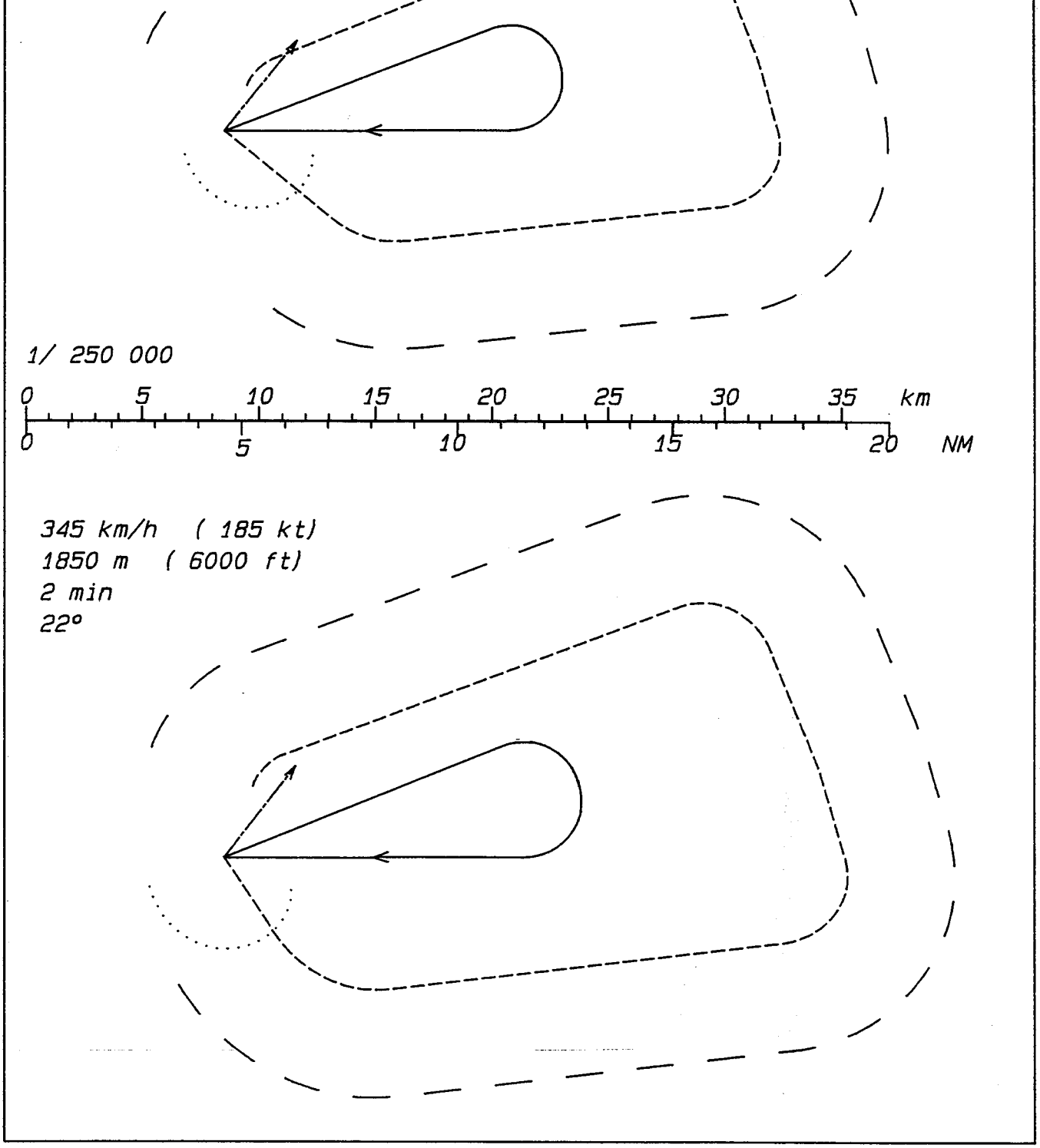

345 km/h (185 kt)
1 min
2450 m (8000 ft)
44°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

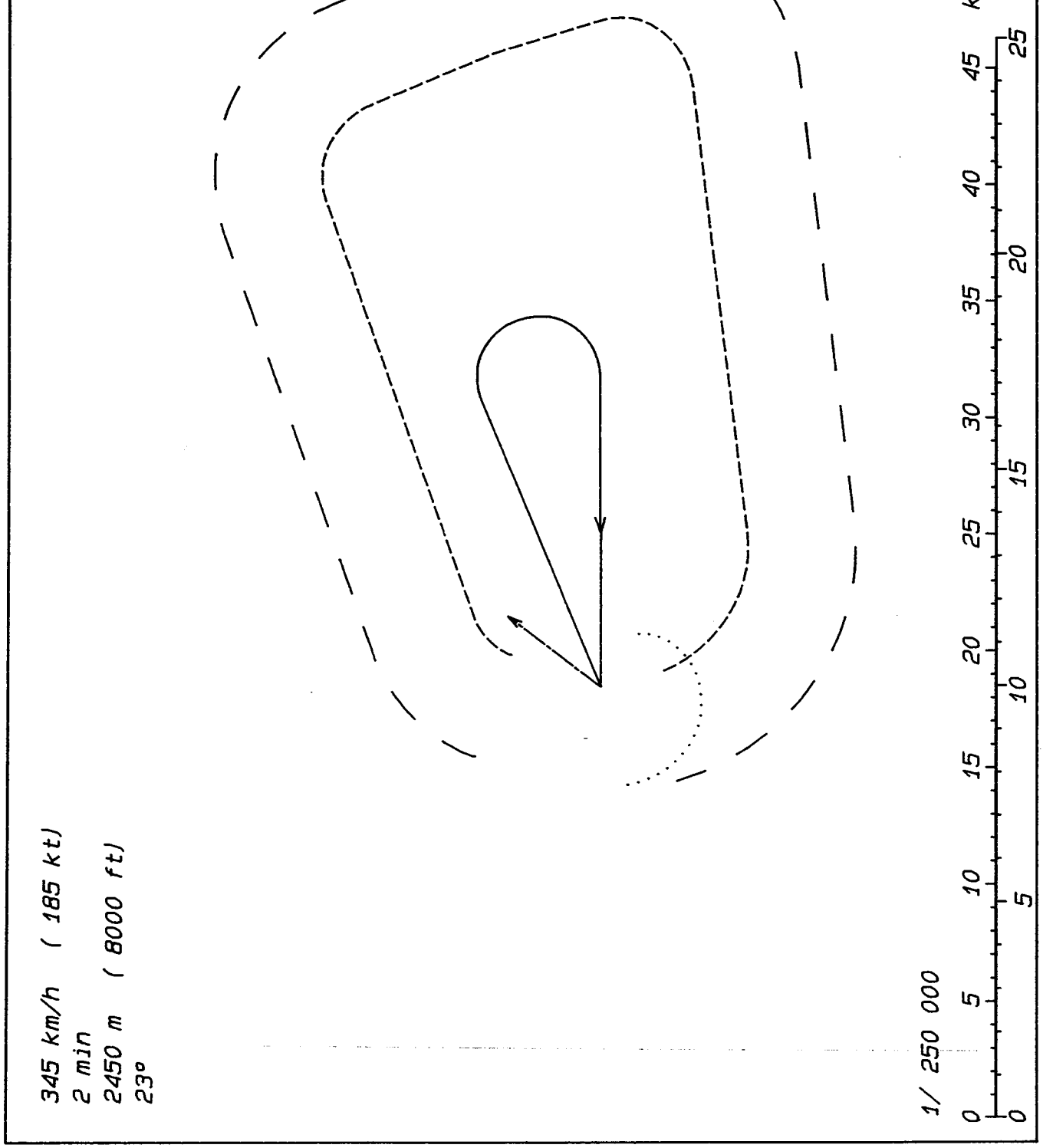

345 km/h (185 kt)
1 min
3050 m (10000 ft)
45°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25

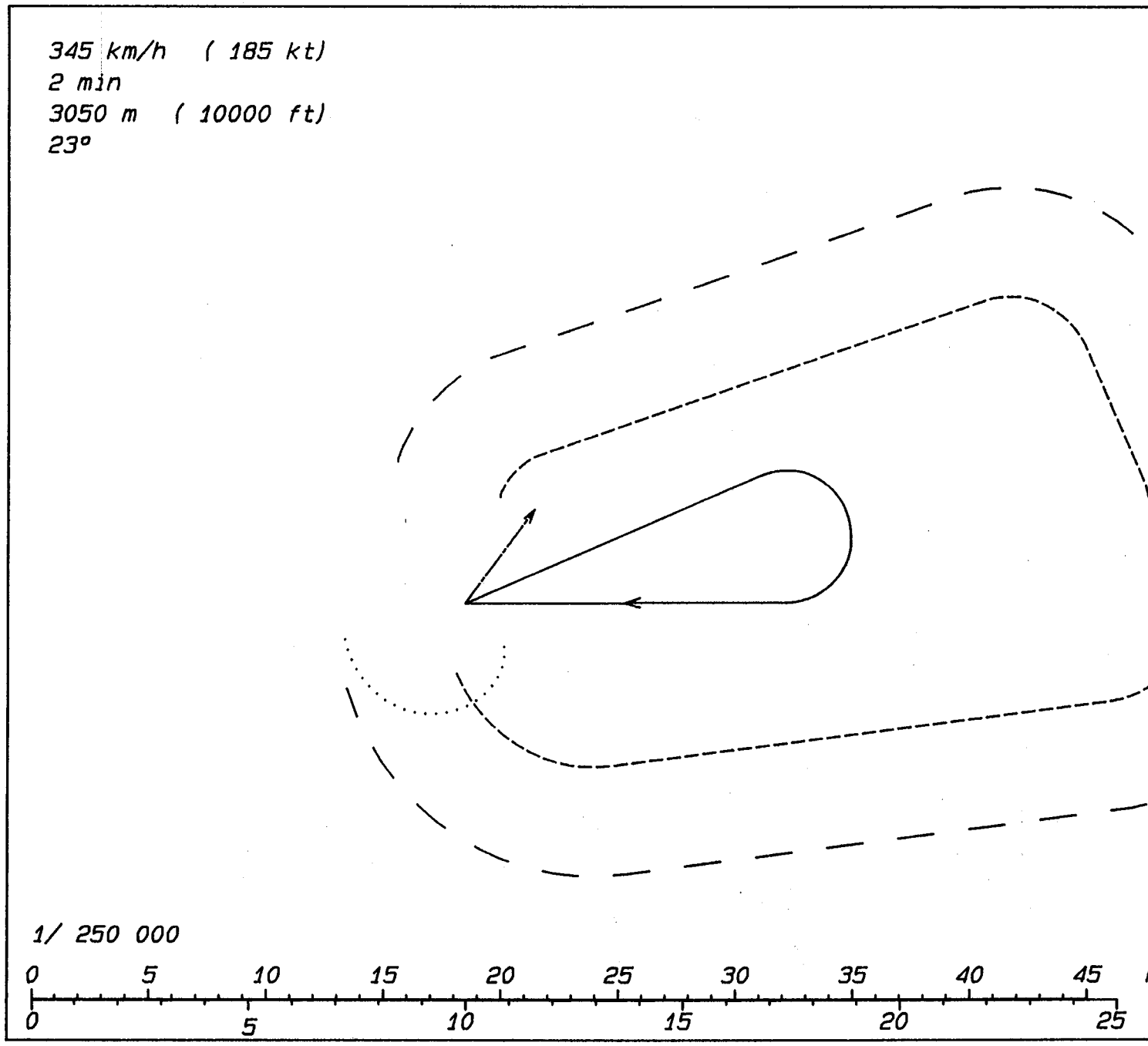

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
1850 m (6000 ft)
1.5 min
29°


345 km/h (185 kt)
1.5 min
2450 m (8000 ft)
30°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


345 km/h (185 kt)
1.5 min
3050 m (10000 ft)
31°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

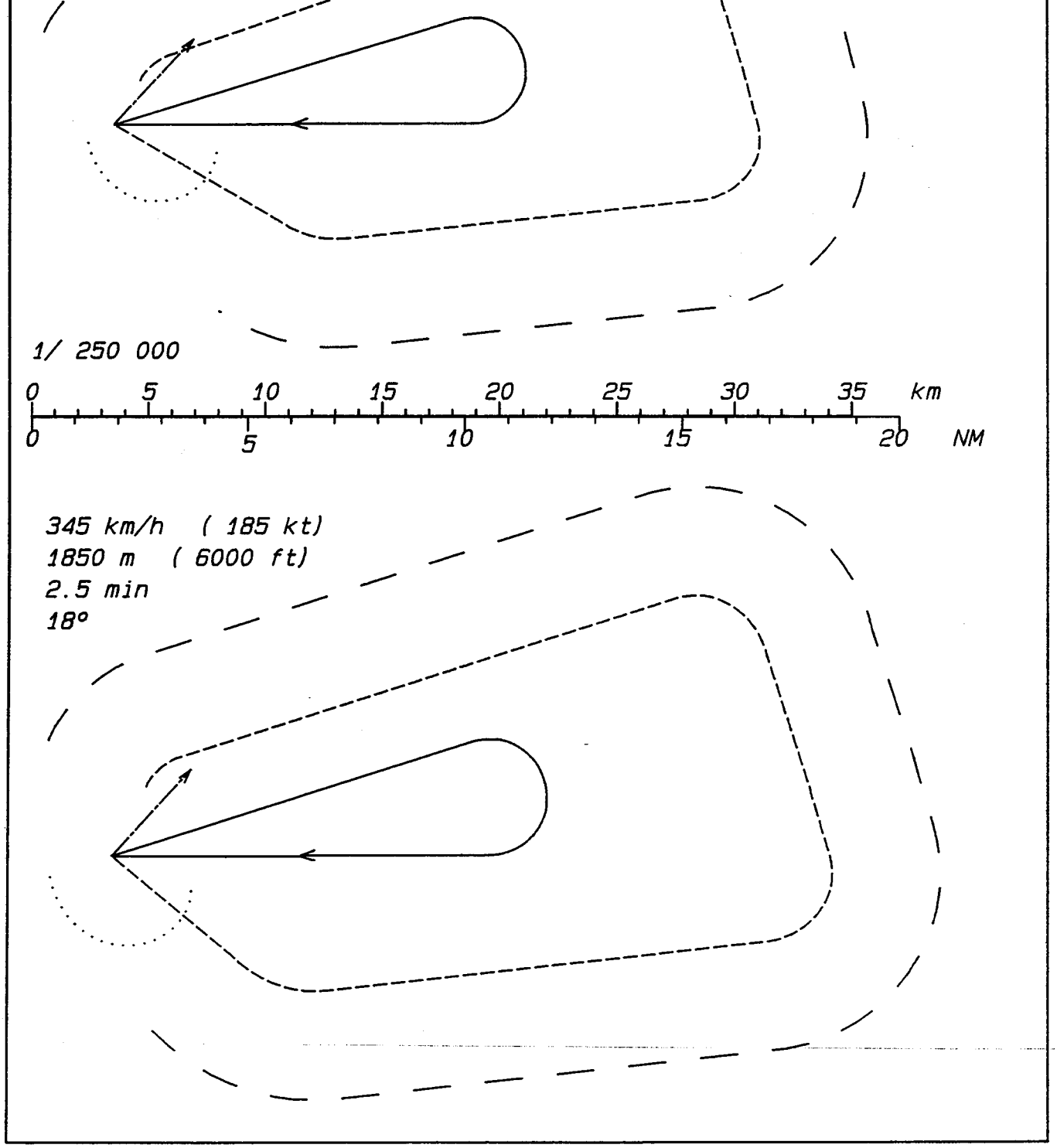

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
1850 m (6000 ft)
2 min
22°

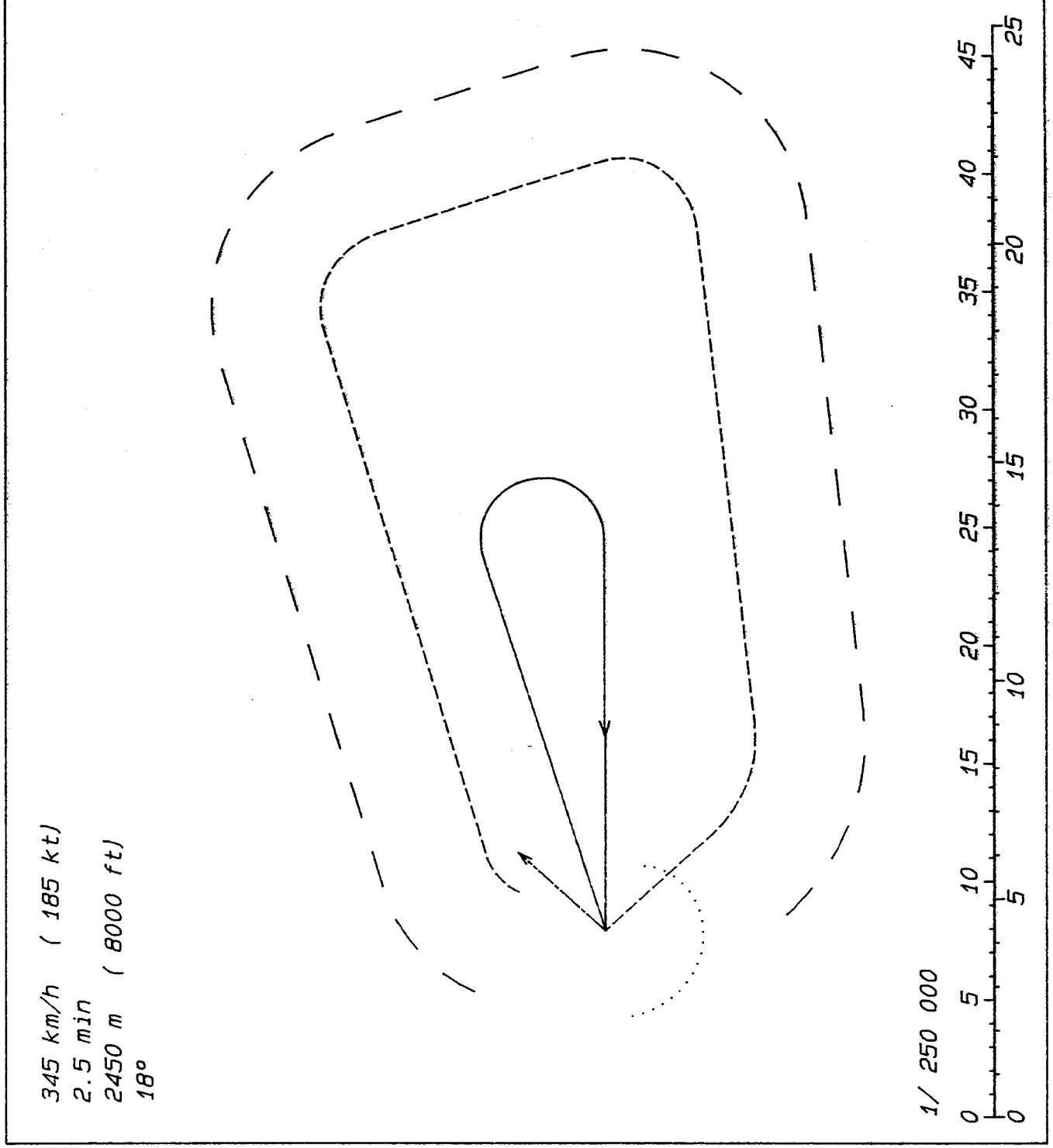

345 km/h (185 kt)
2 min
2450 m (8000 ft)
23°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

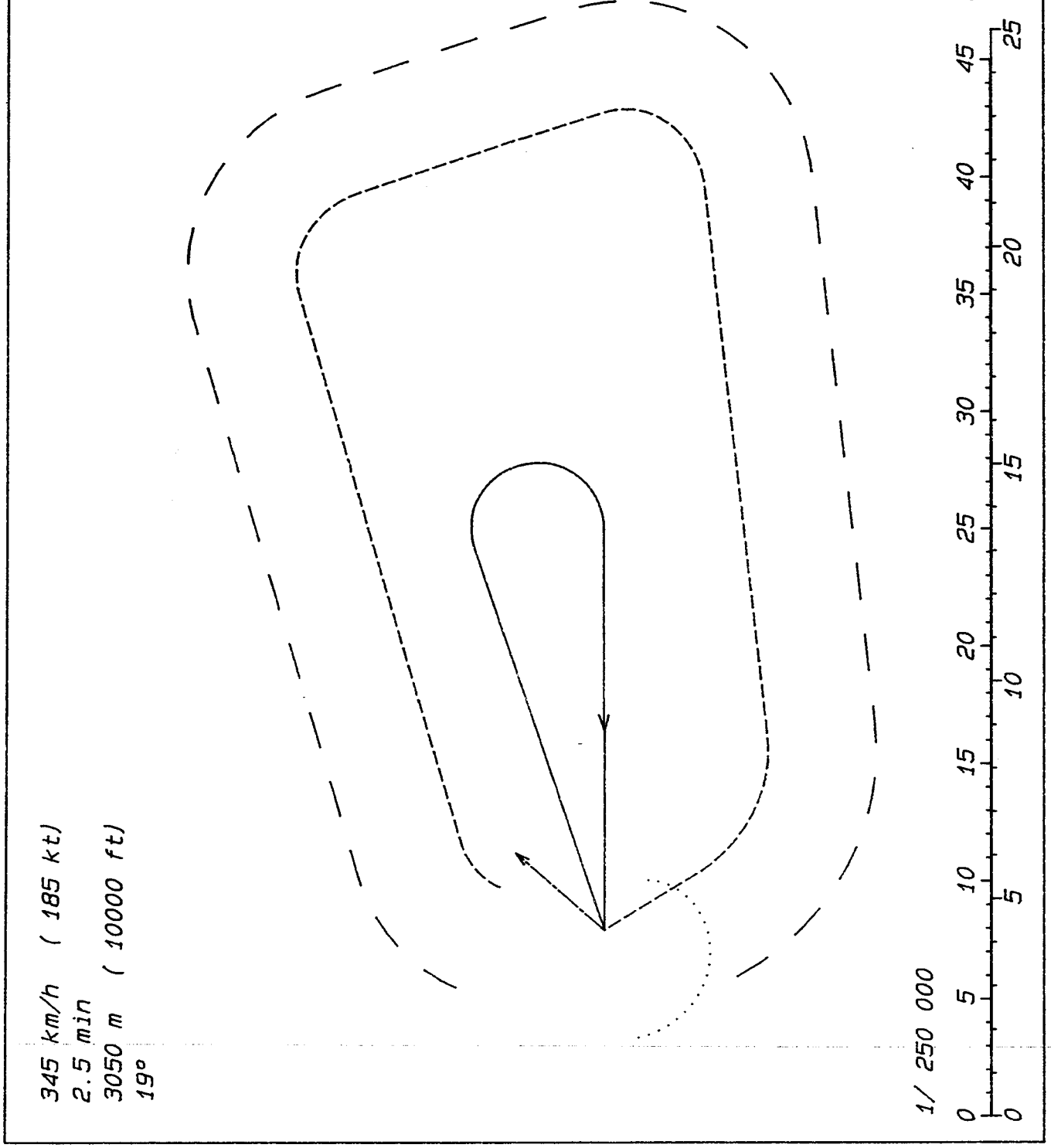

345 km/h (185 kt)
2 min
3050 m (10000 ft)
23°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25

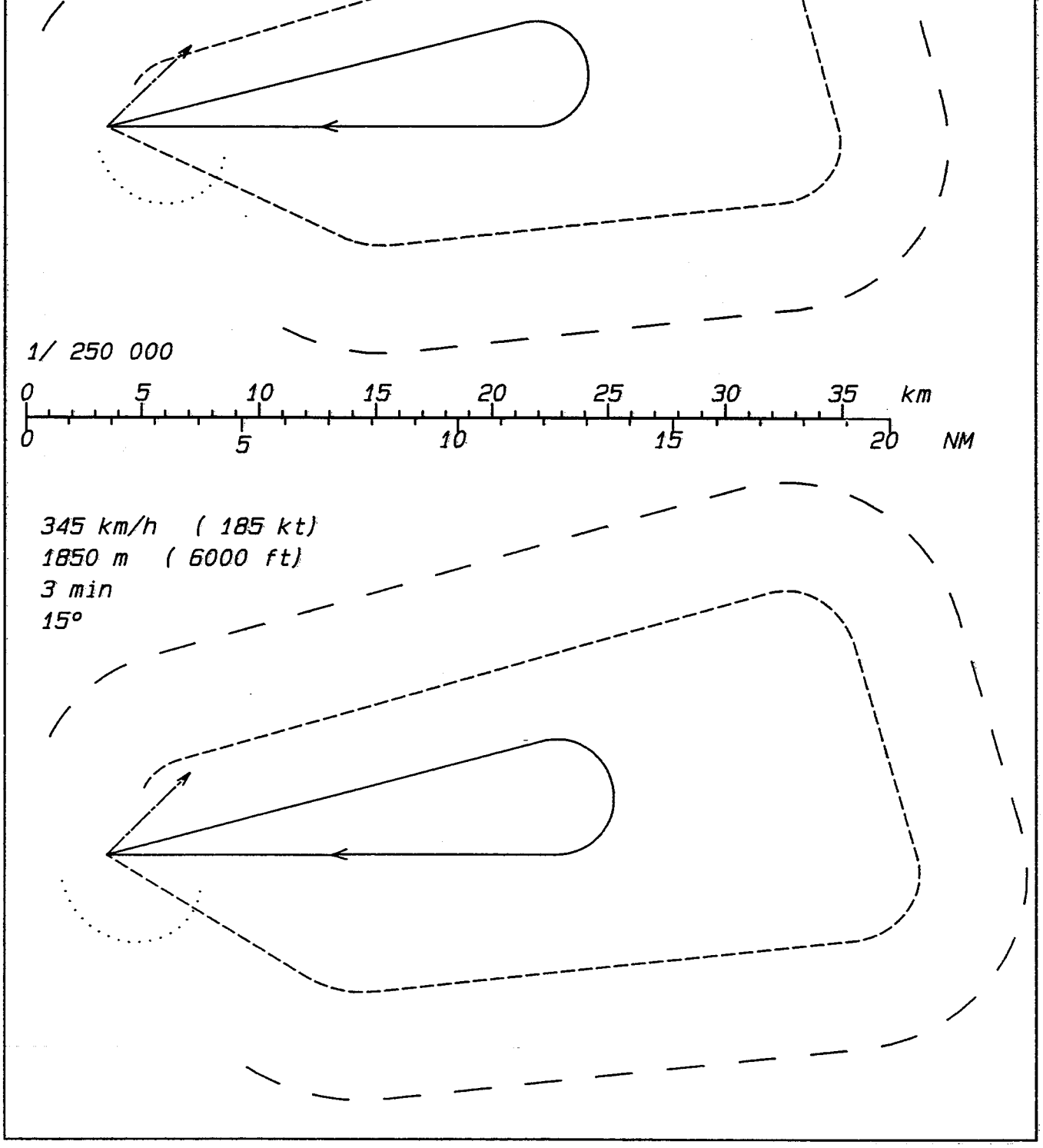
BT 19

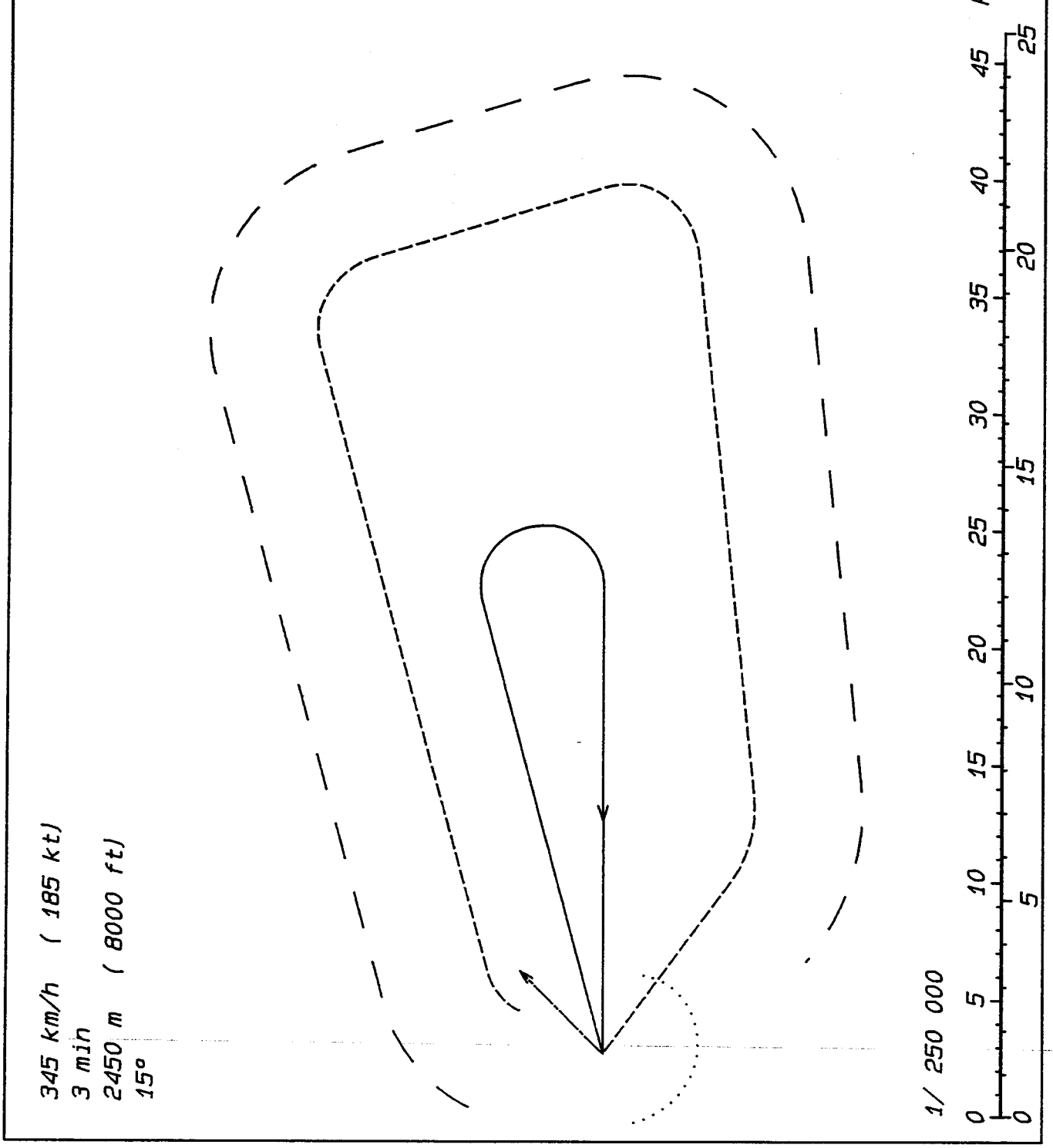
1986/06

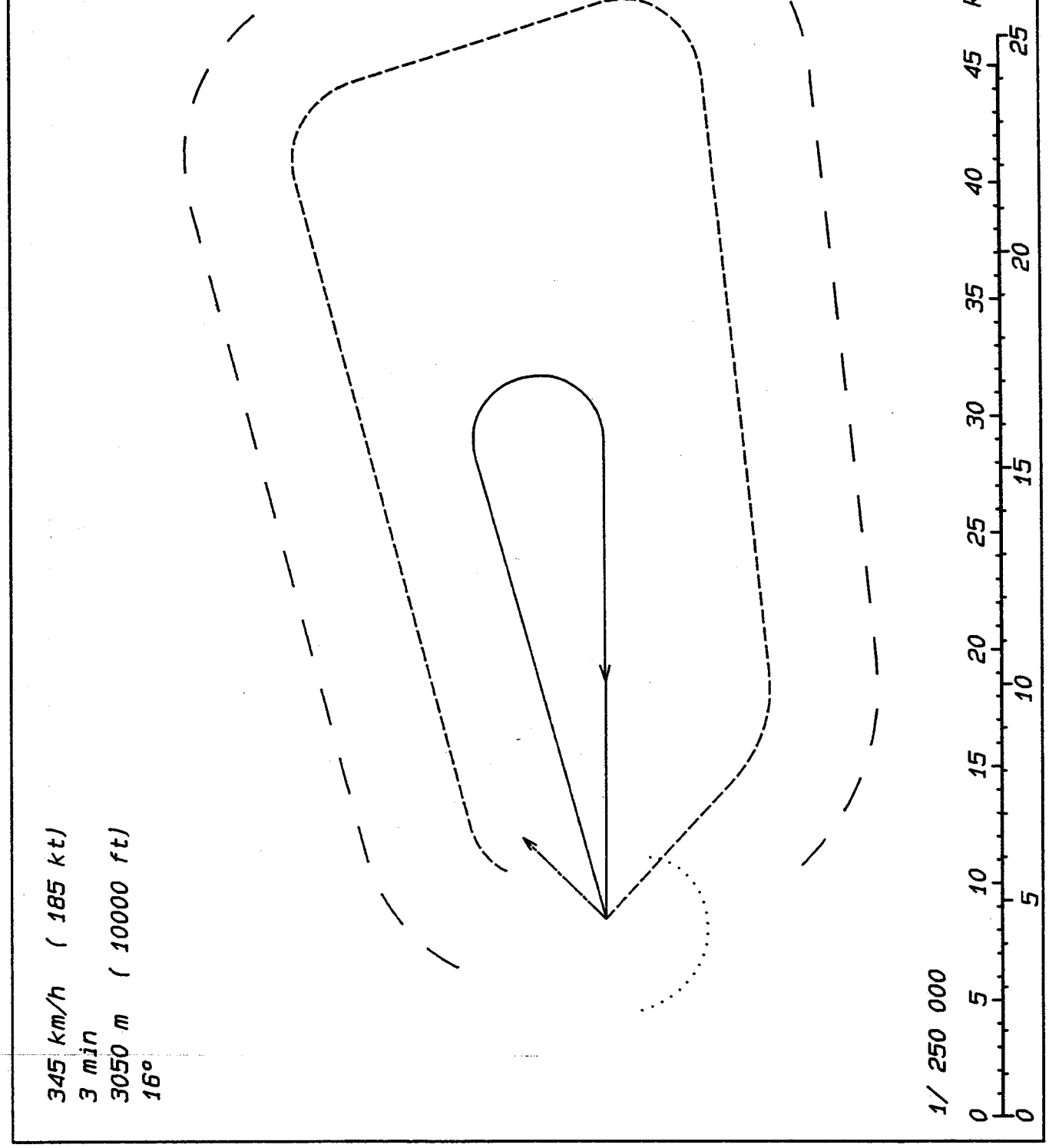

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
1850 m (6000 ft)
2.5 min
18°


345 km/h (185 kt)
2.5 min
2450 m (8000 ft)
18°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


345 km/h (185 kt)
2.5 min
3050 m (10000 ft)
19°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

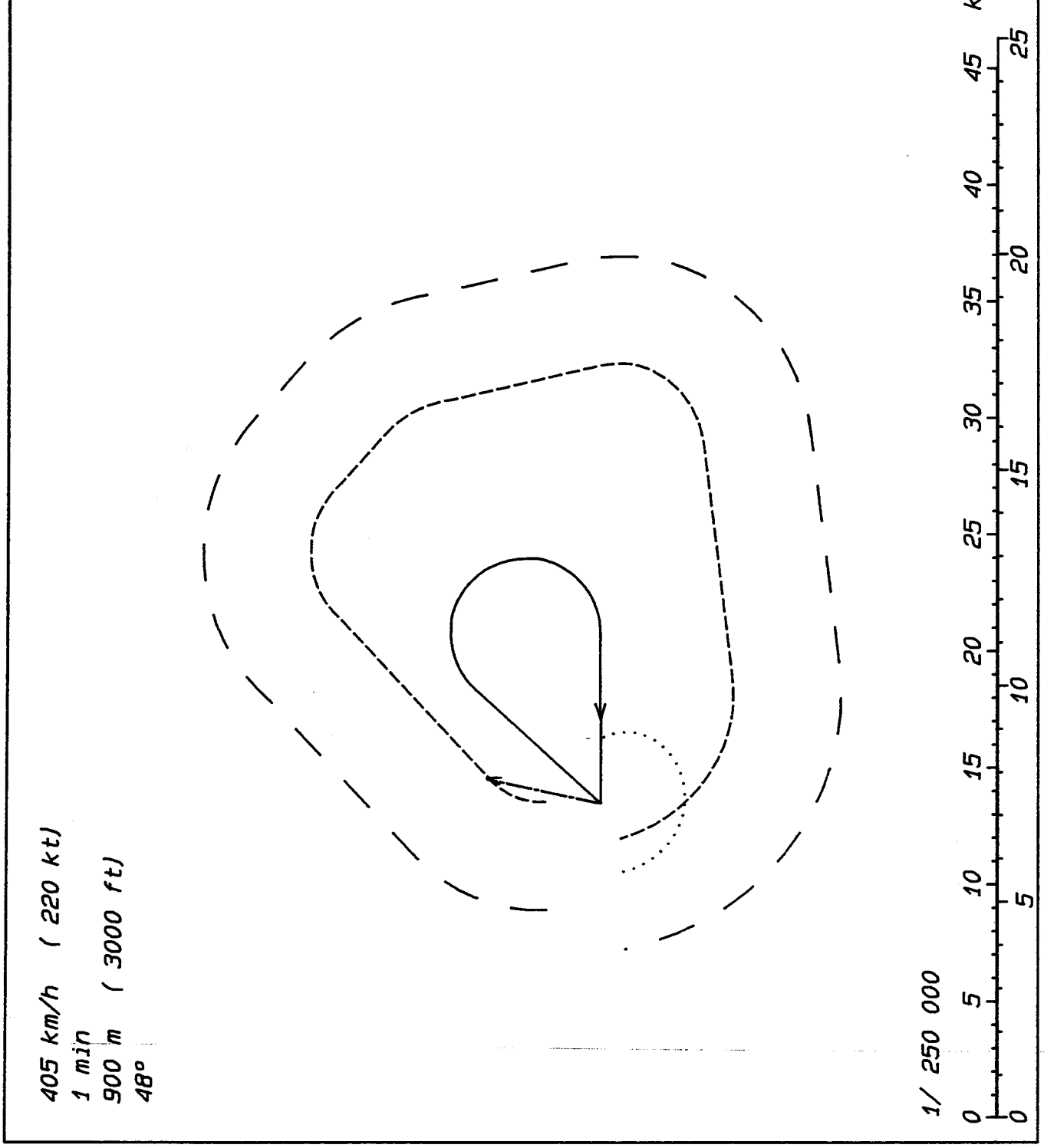

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
1850 m (6000 ft)
3 min
15°


345 km/h (185 kt)
3 min
2450 m (8000 ft)
15°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


345 km/h (185 kt)
3 min
3050 m (10000 ft)
16°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

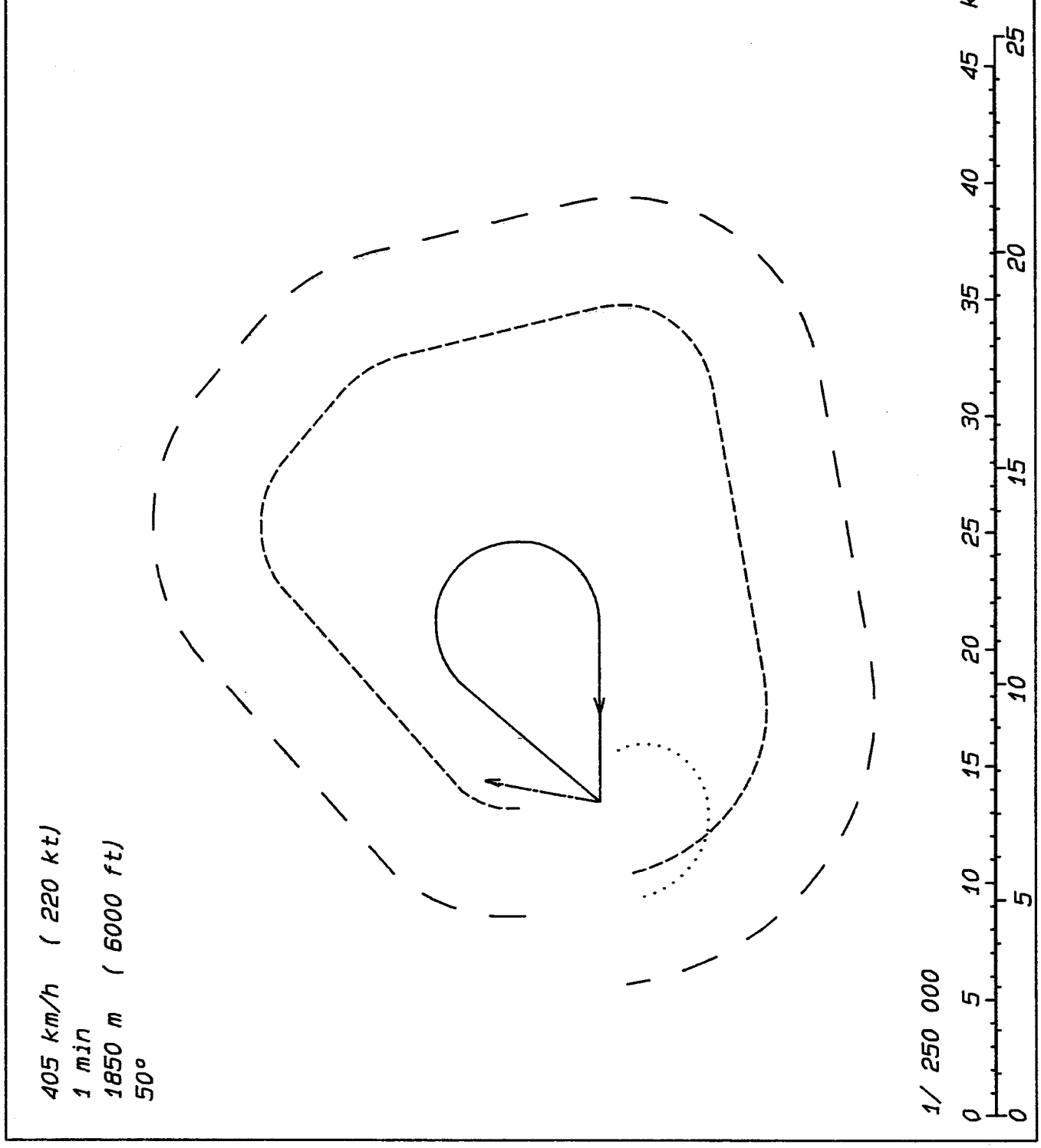
BT 25

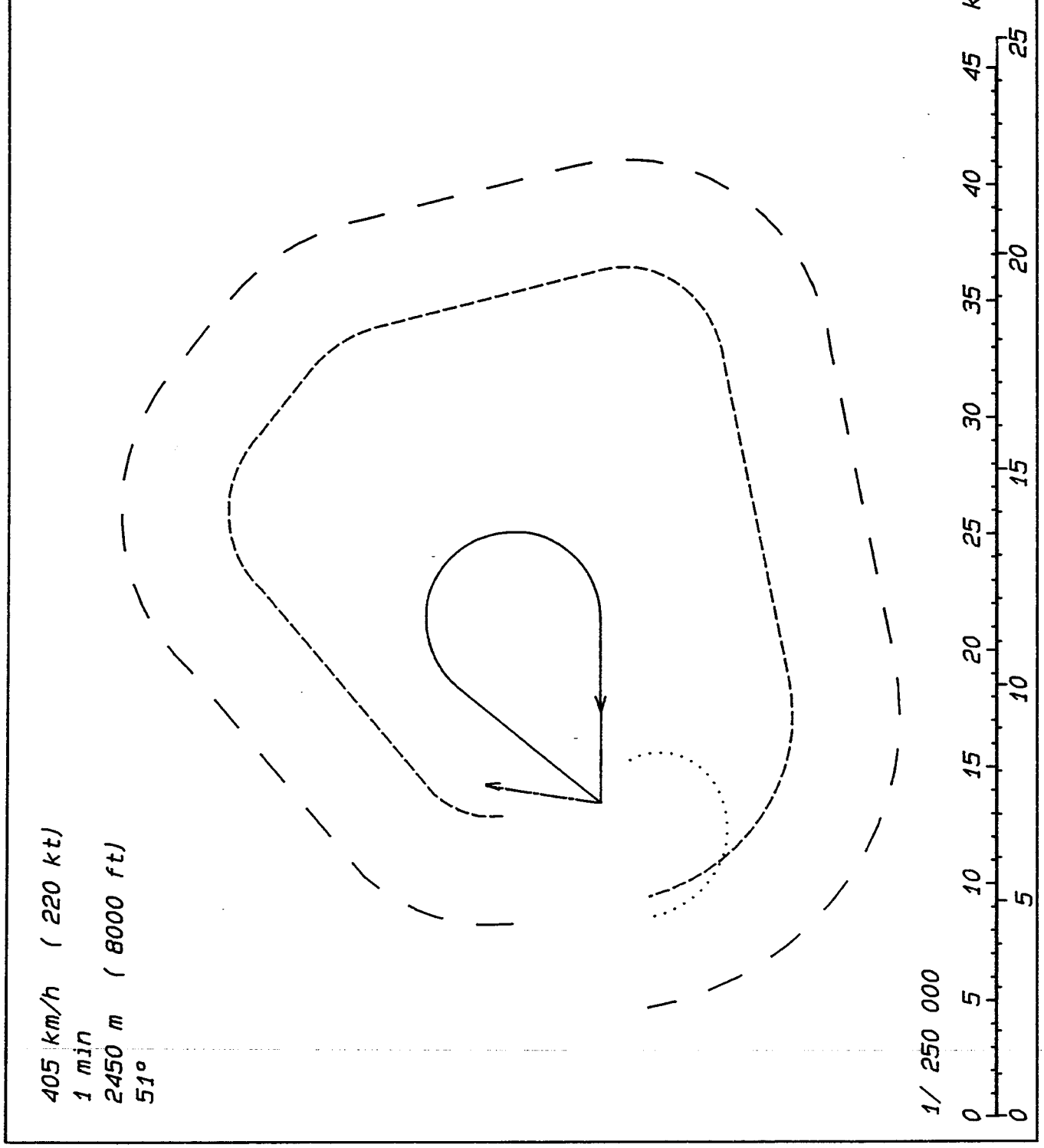
1986/06

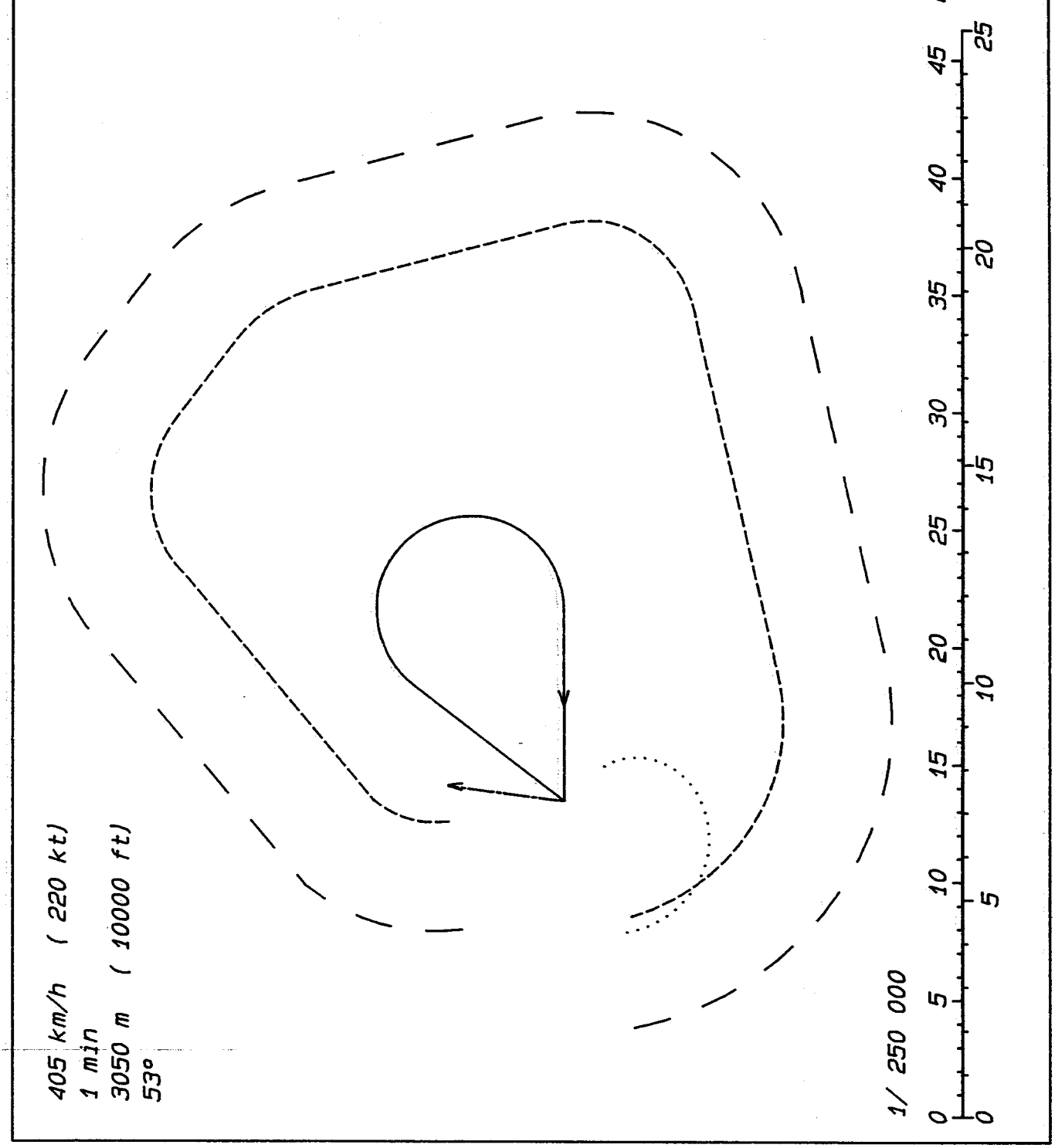

405 km/h (220 kt)
1 min
900 m (3000 ft)
48°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

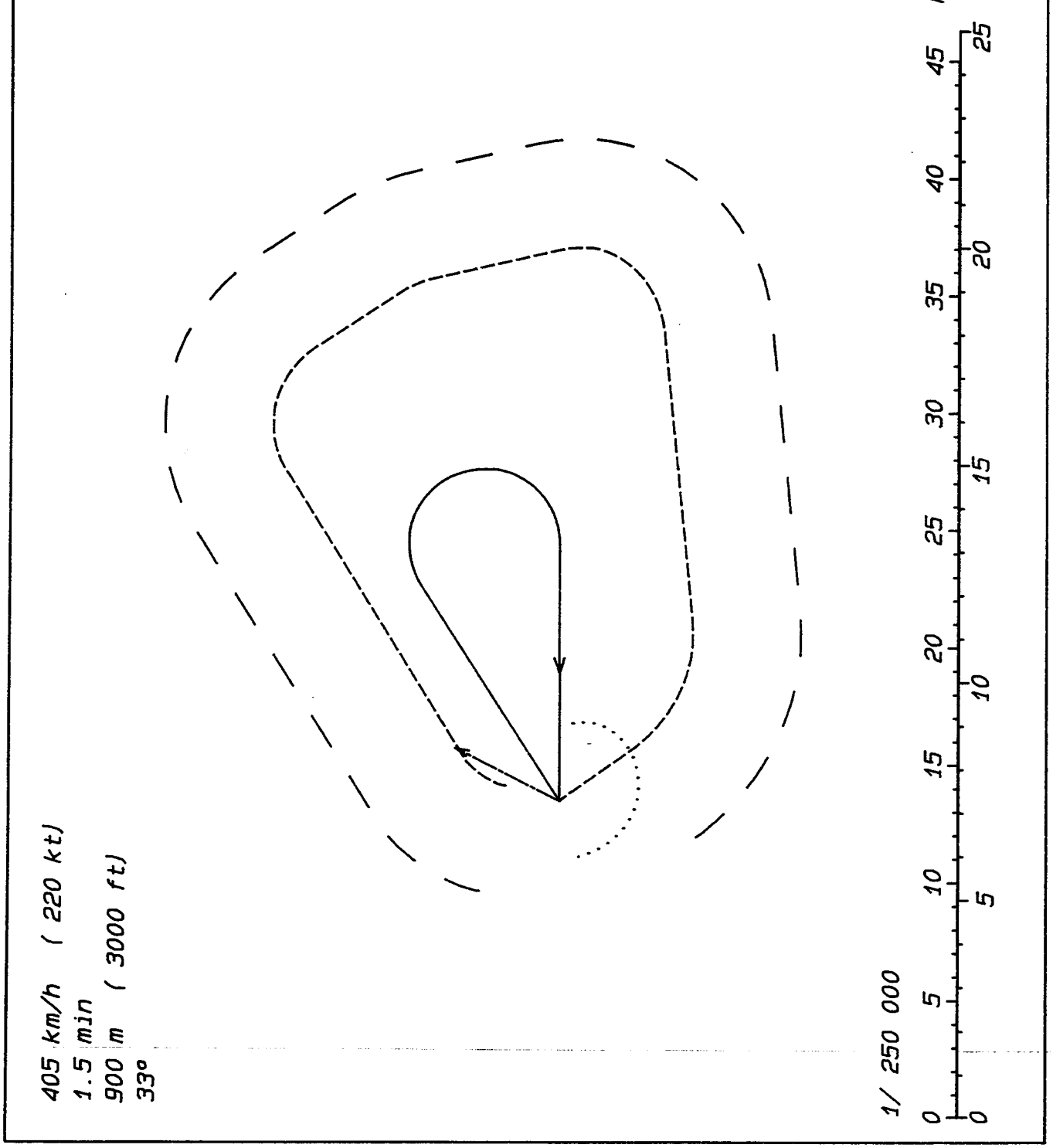
BT 26

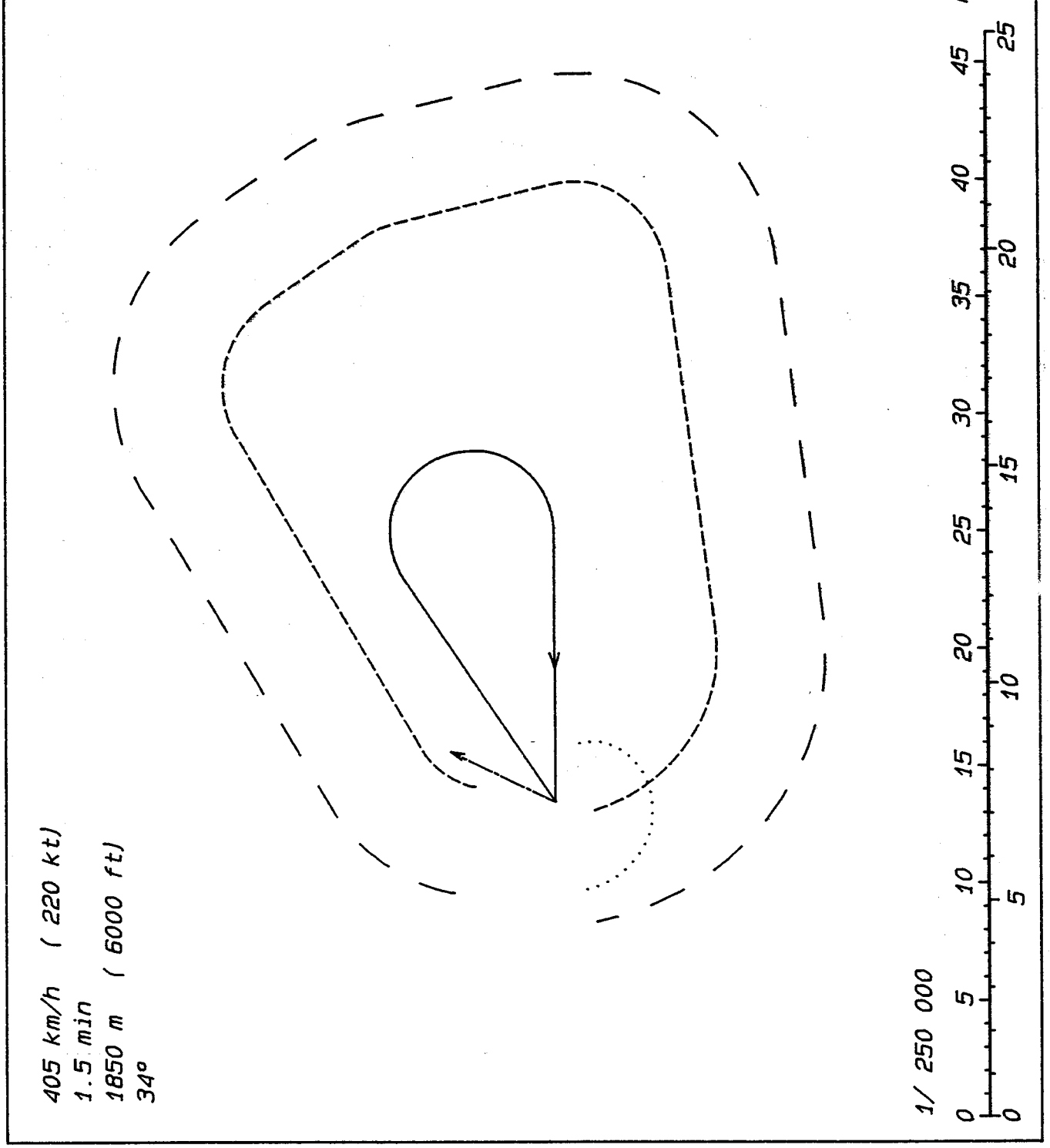
1986/06


405 km/h (220 kt)
1 min
1850 m (6000 ft)
50°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25


405 km/h (220 kt)
1 min
2450 m (8000 ft)
51°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25


405 km/h (220 kt)
1 min
3050 m (10000 ft)
53°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


405 km/h (220 kt)
1.5 min
900 m (3000 ft)
33°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


405 km/h (220 kt)
1.5 min
1850 m (6000 ft)
34°
1/ 250 000
0
5
10
15
20
25
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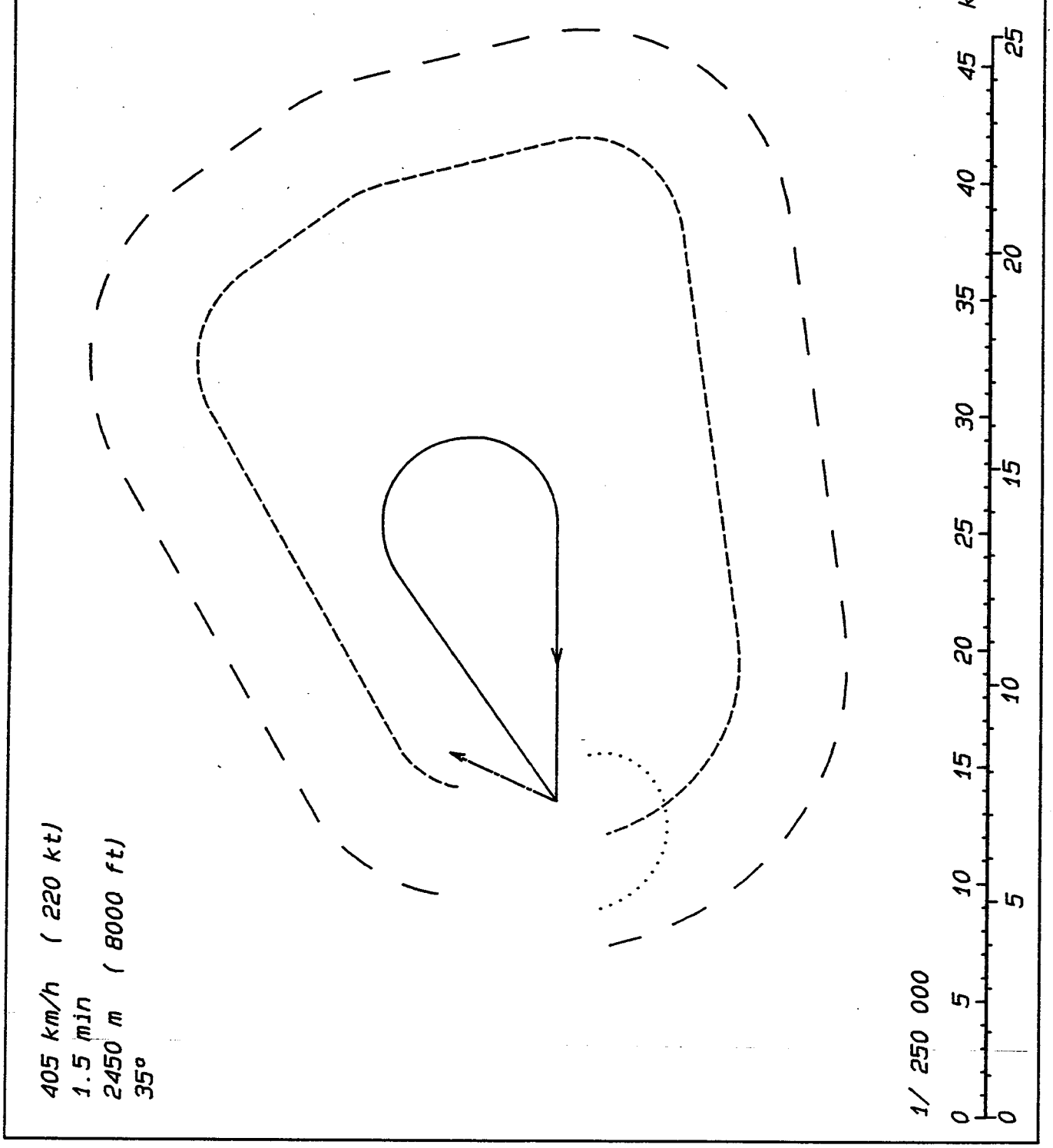
35
40
45
0
5
10
15
20
25


405 km/h (220 kt)
1.5 min
2450 m (8000 ft)
35°
1/ 250 000
0
5
10
15
20
25
30
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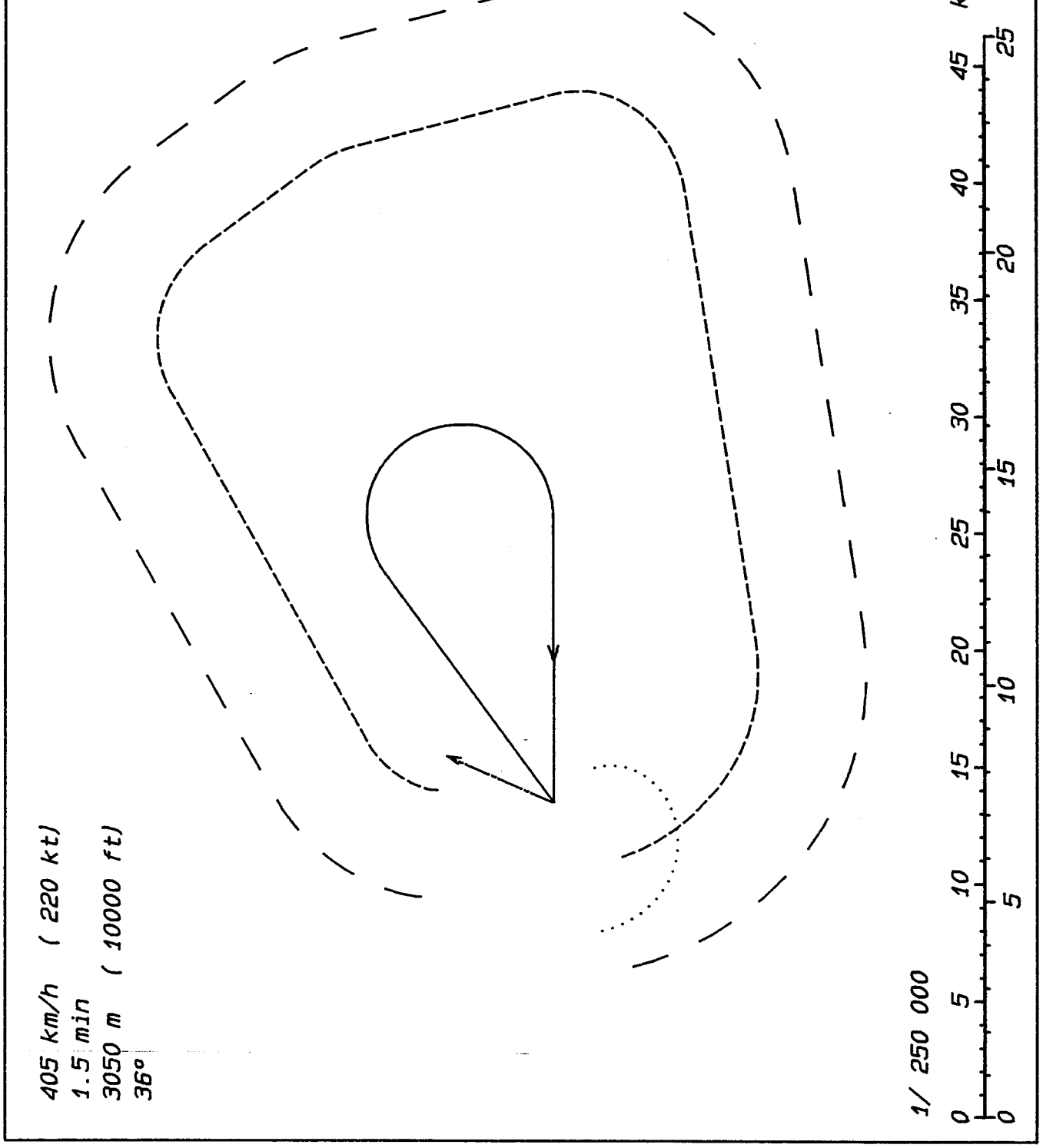
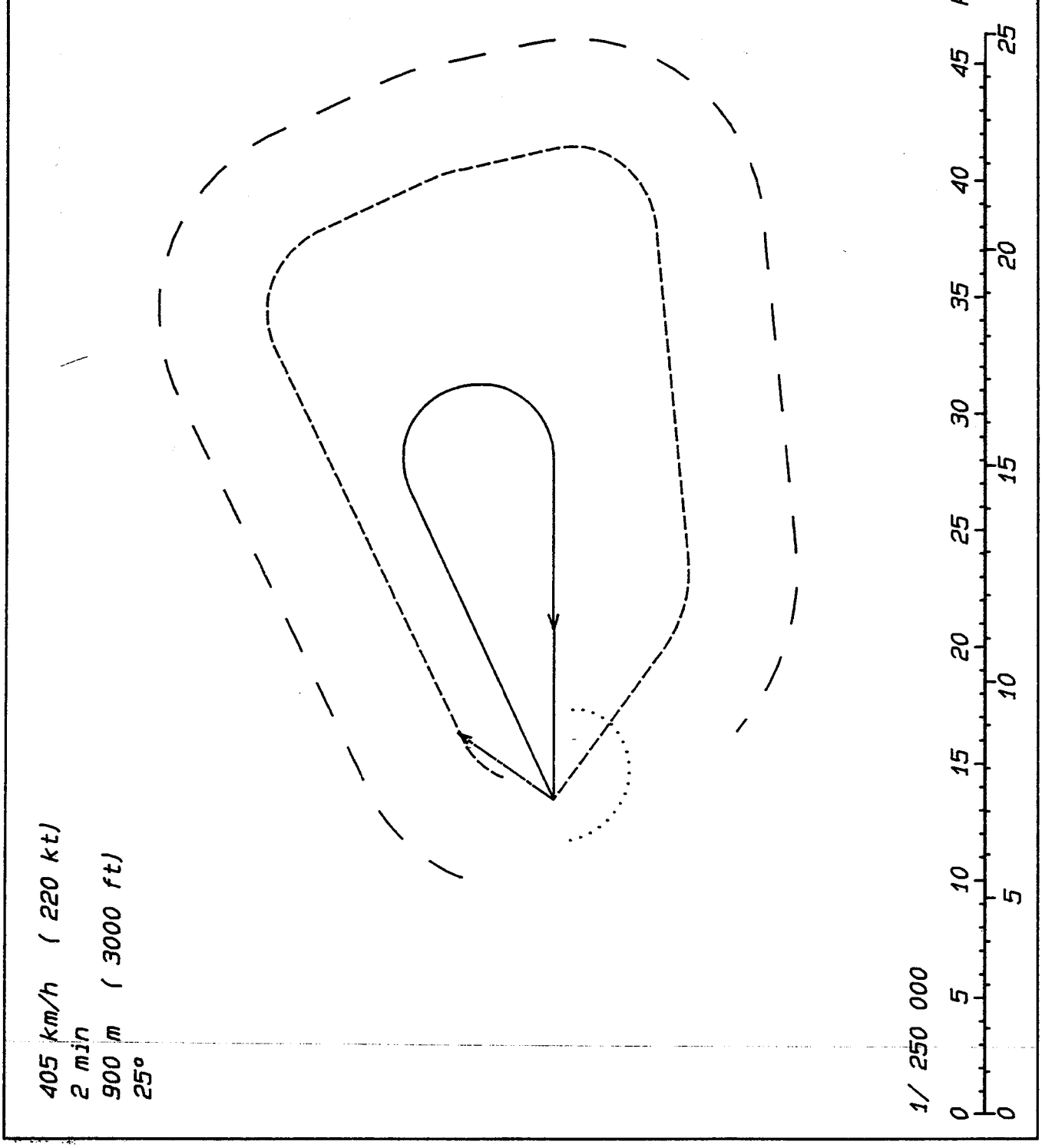
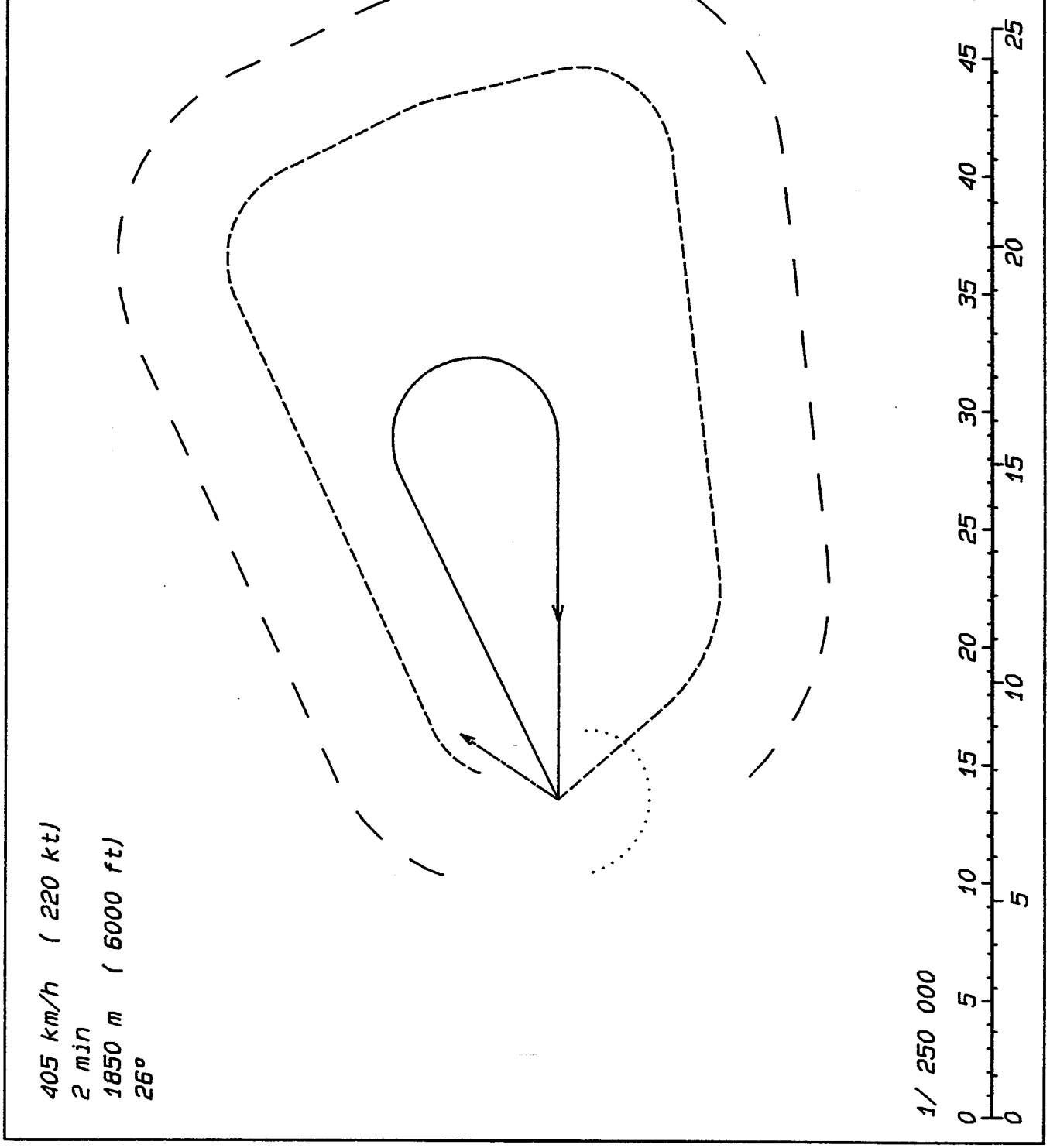
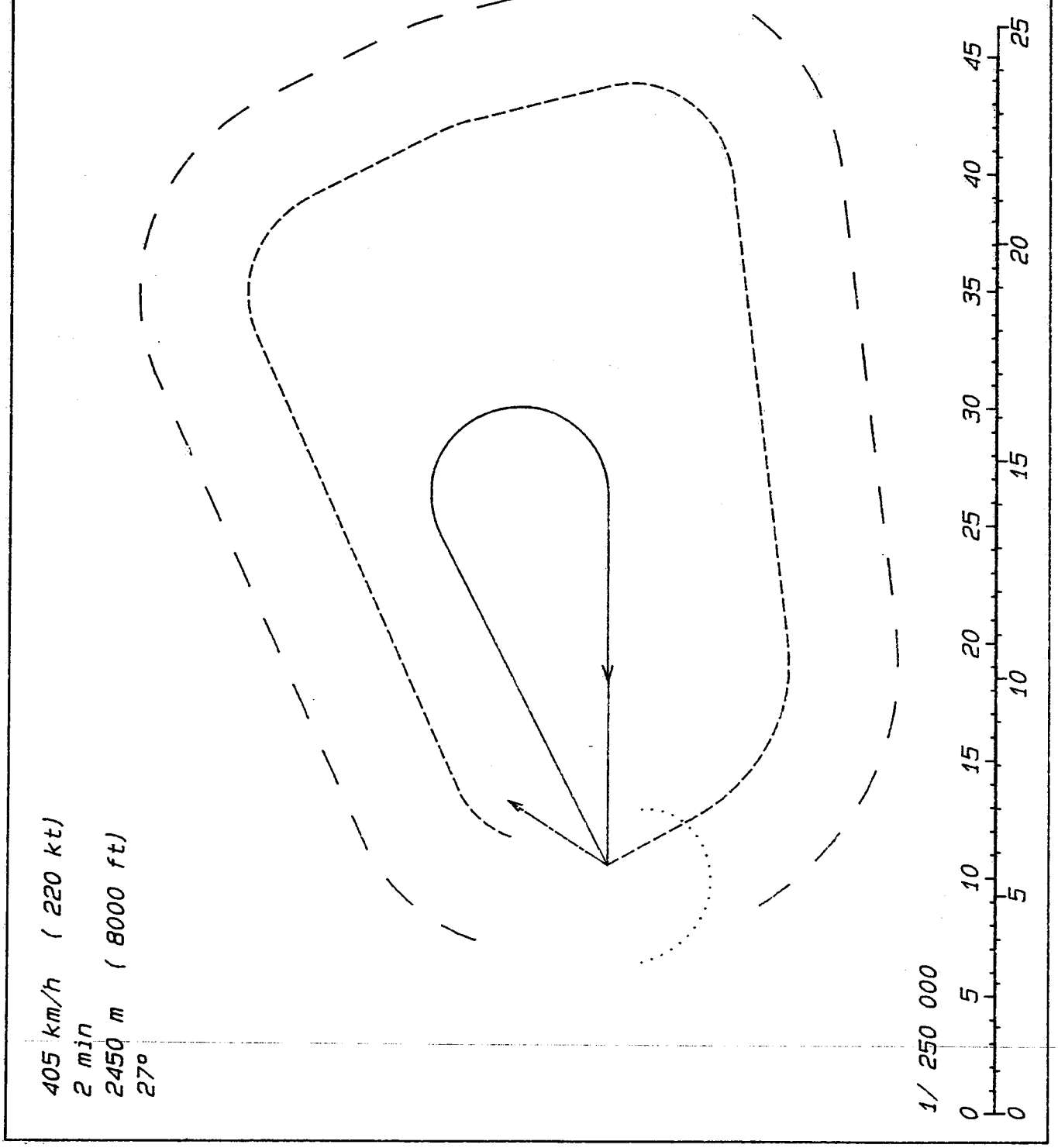
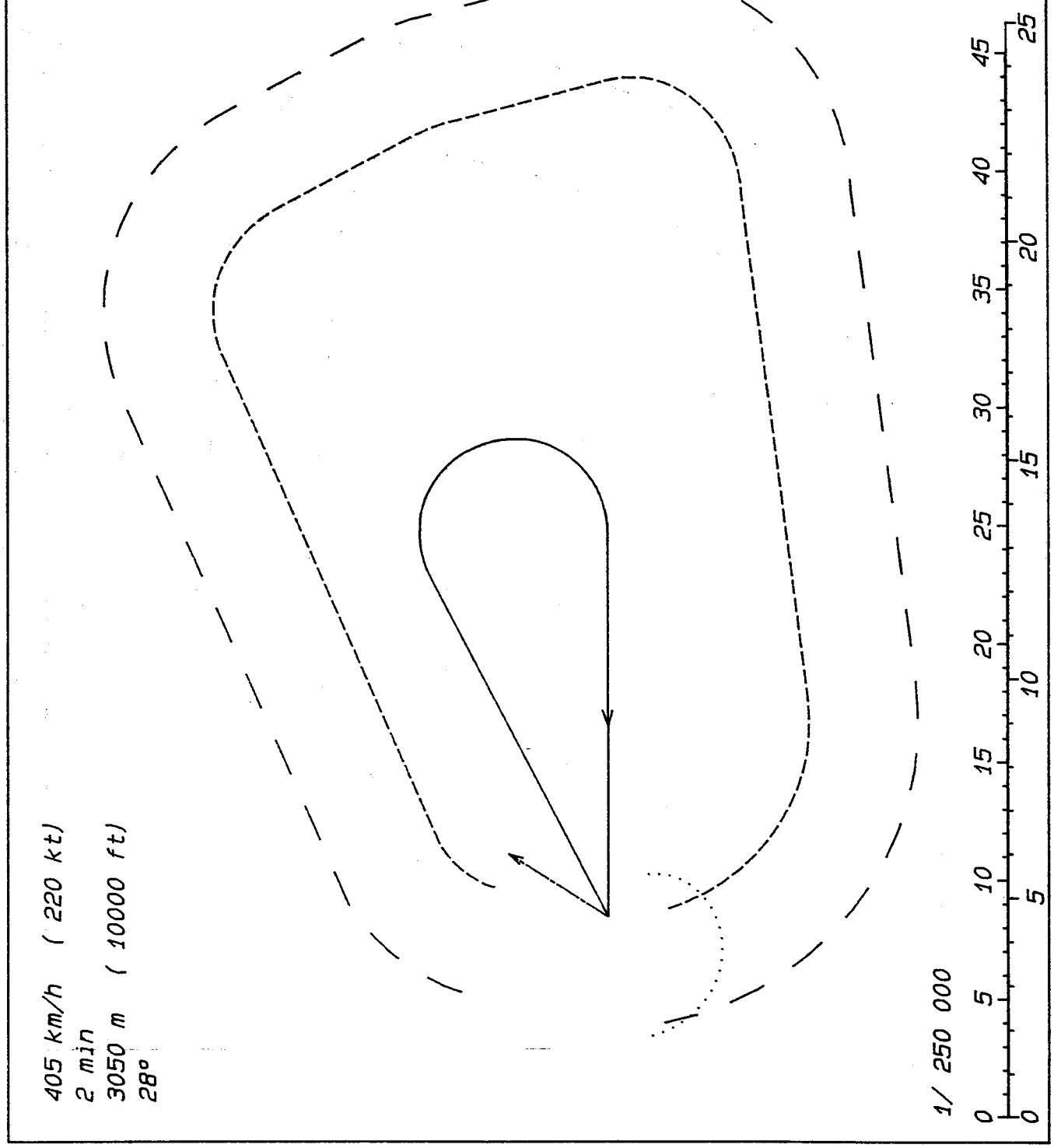
40
45
0
5
10
15
20
25

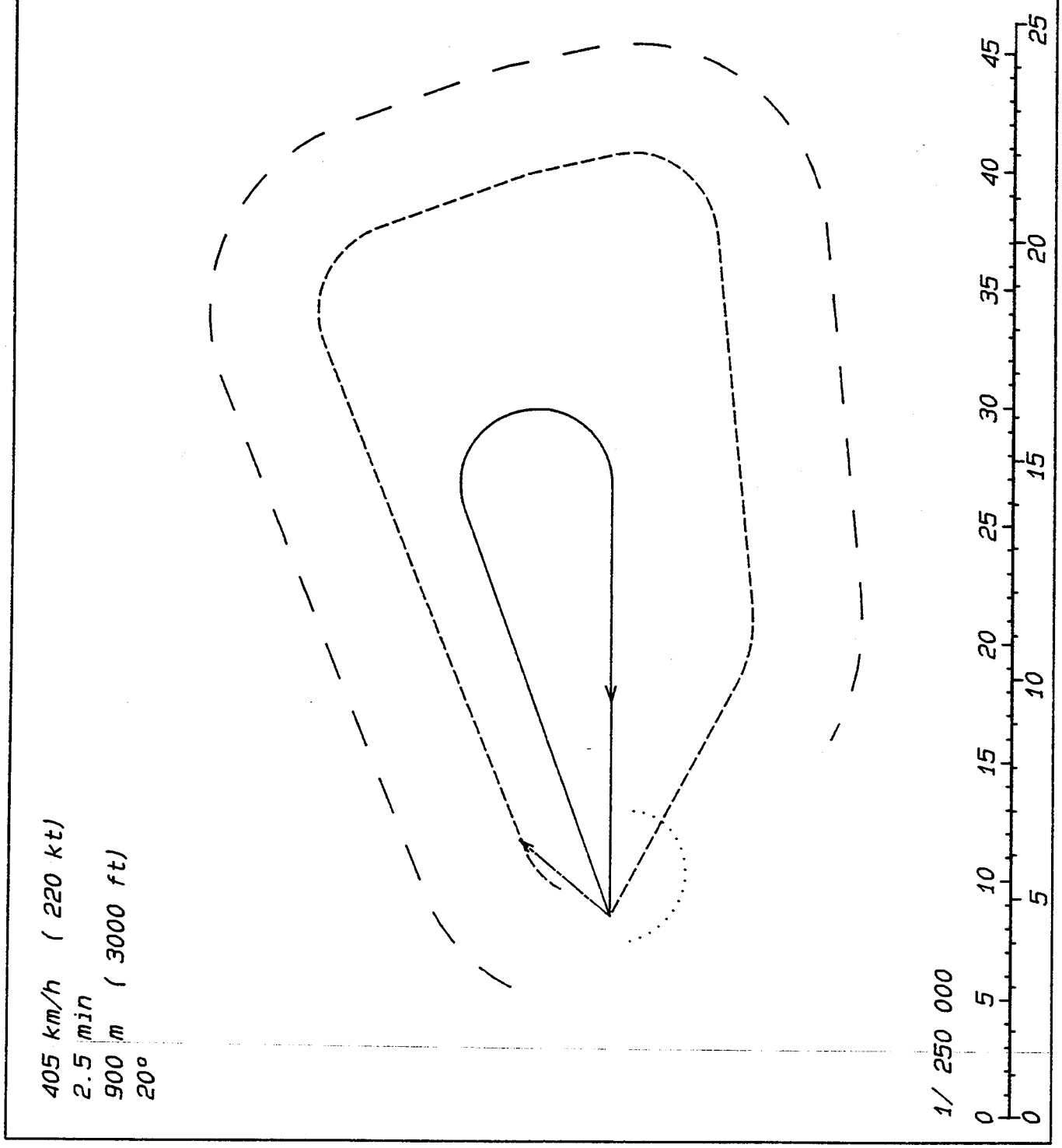

405 km/h (220 kt)
1.5 min
3050 m (10000 ft)
36°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

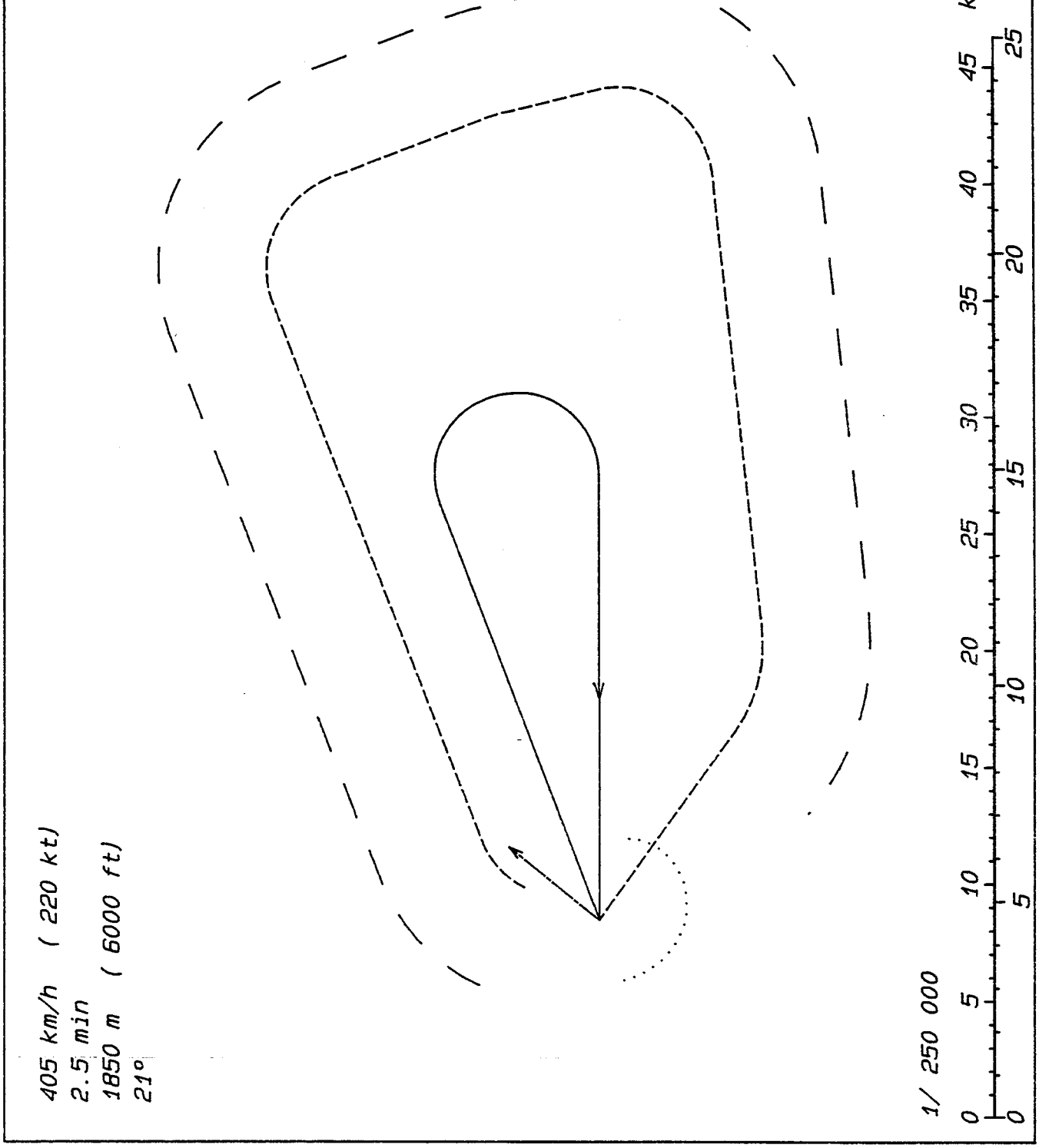

405 km/h (220 kt)
2 min
900 m (3000 ft)
25°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

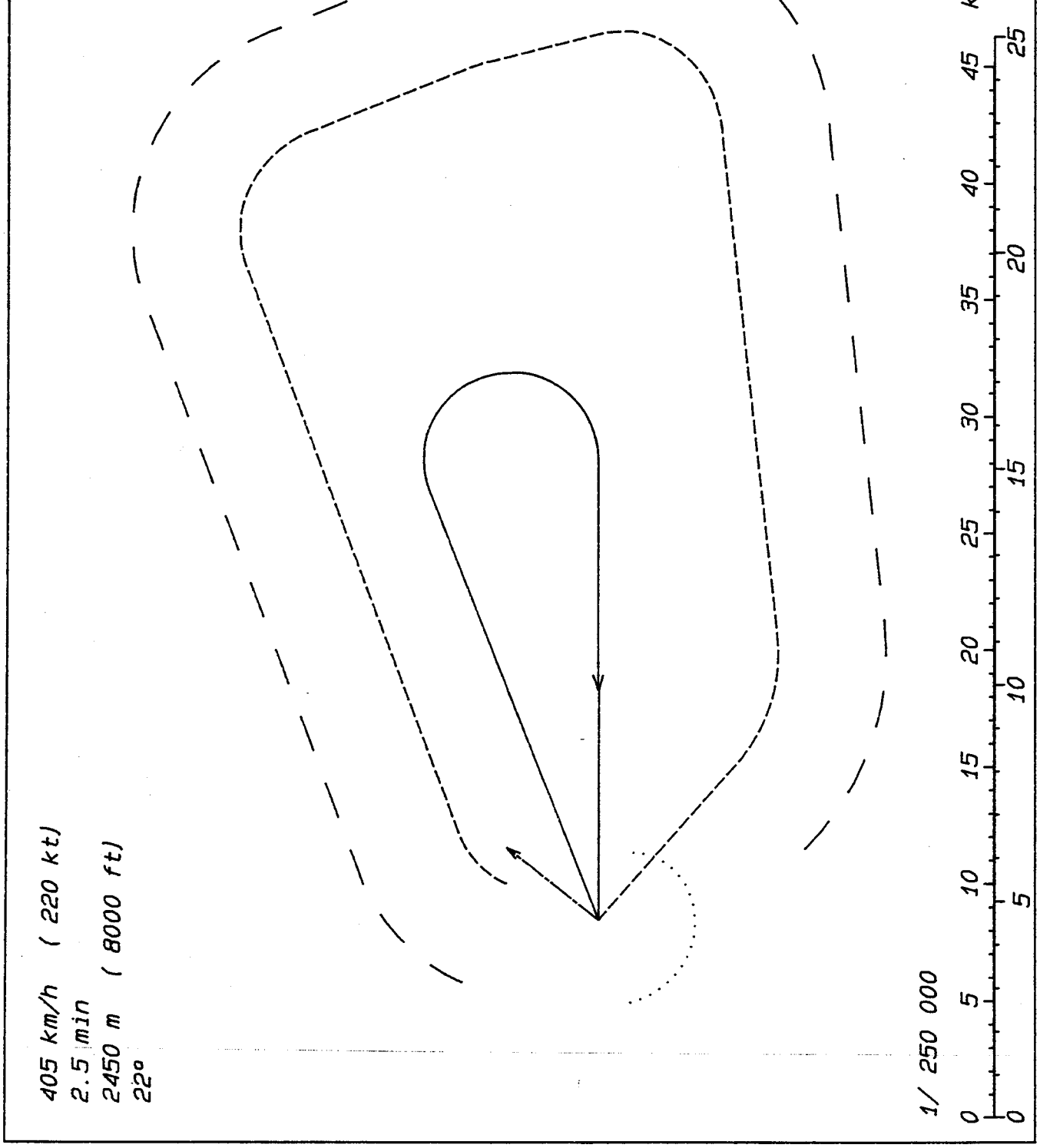

405 km/h (220 kt)
2 min
1850 m (6000 ft)
26°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

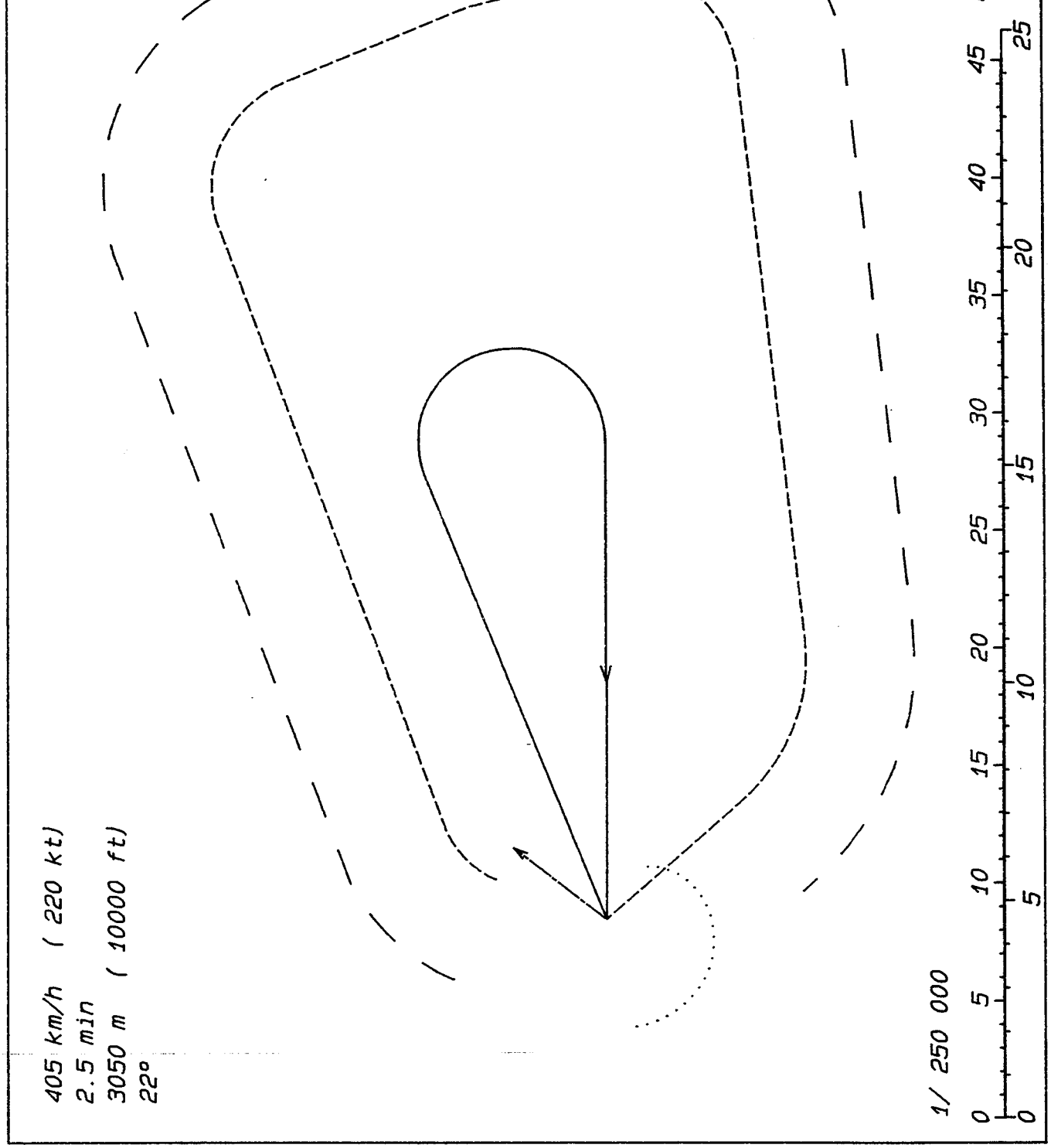

405 km/h (220 kt)
2 min
2450 m (8000 ft)
27°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

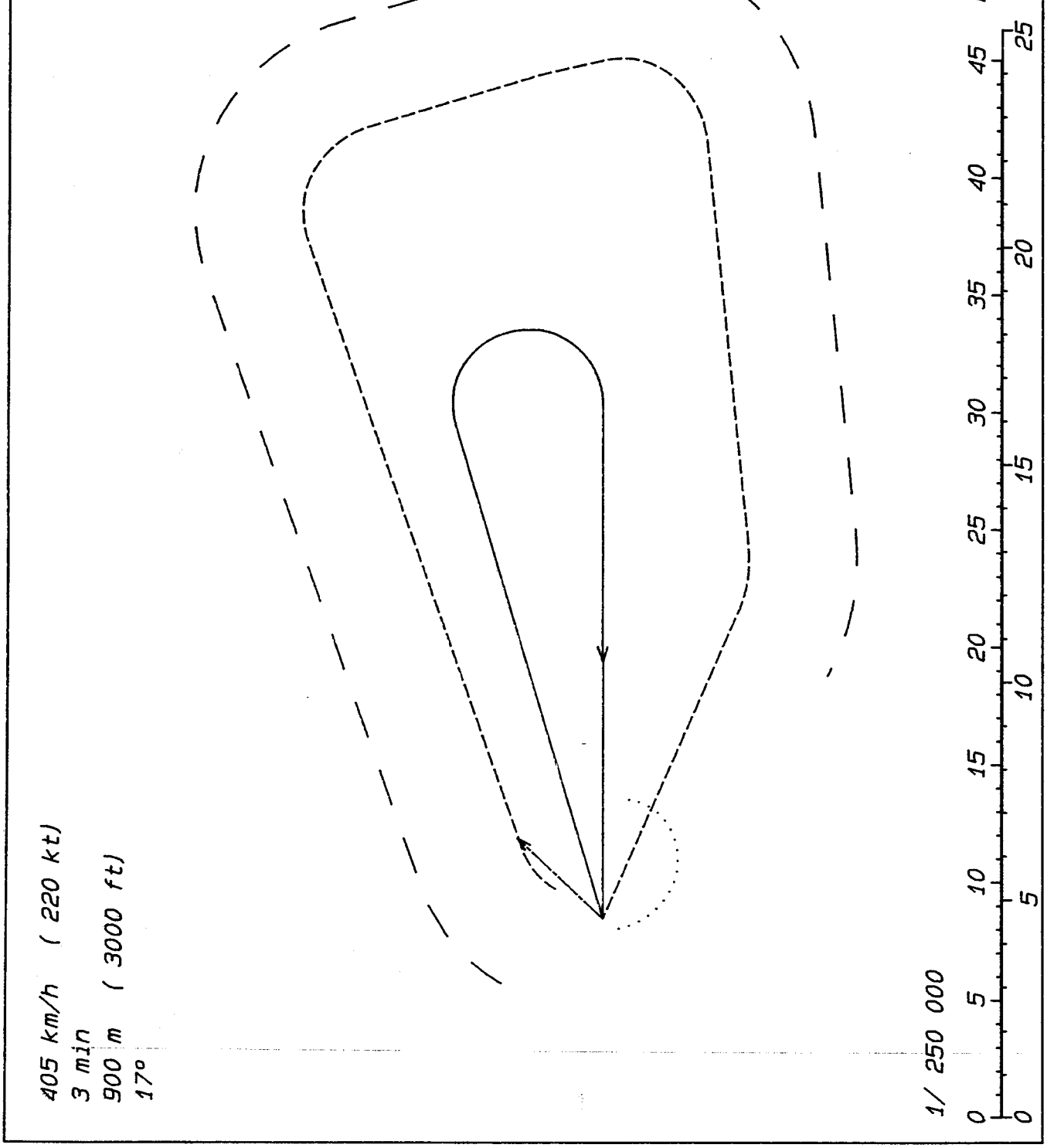

405 km/h (220 kt)
2 min
3050 m (10000 ft)
28°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


405 km/h (220 kt)
2.5 min
900 m (3000 ft)
20°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25


405 km/h (220 kt)
2.5 min
1850 m (6000 ft)
21°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

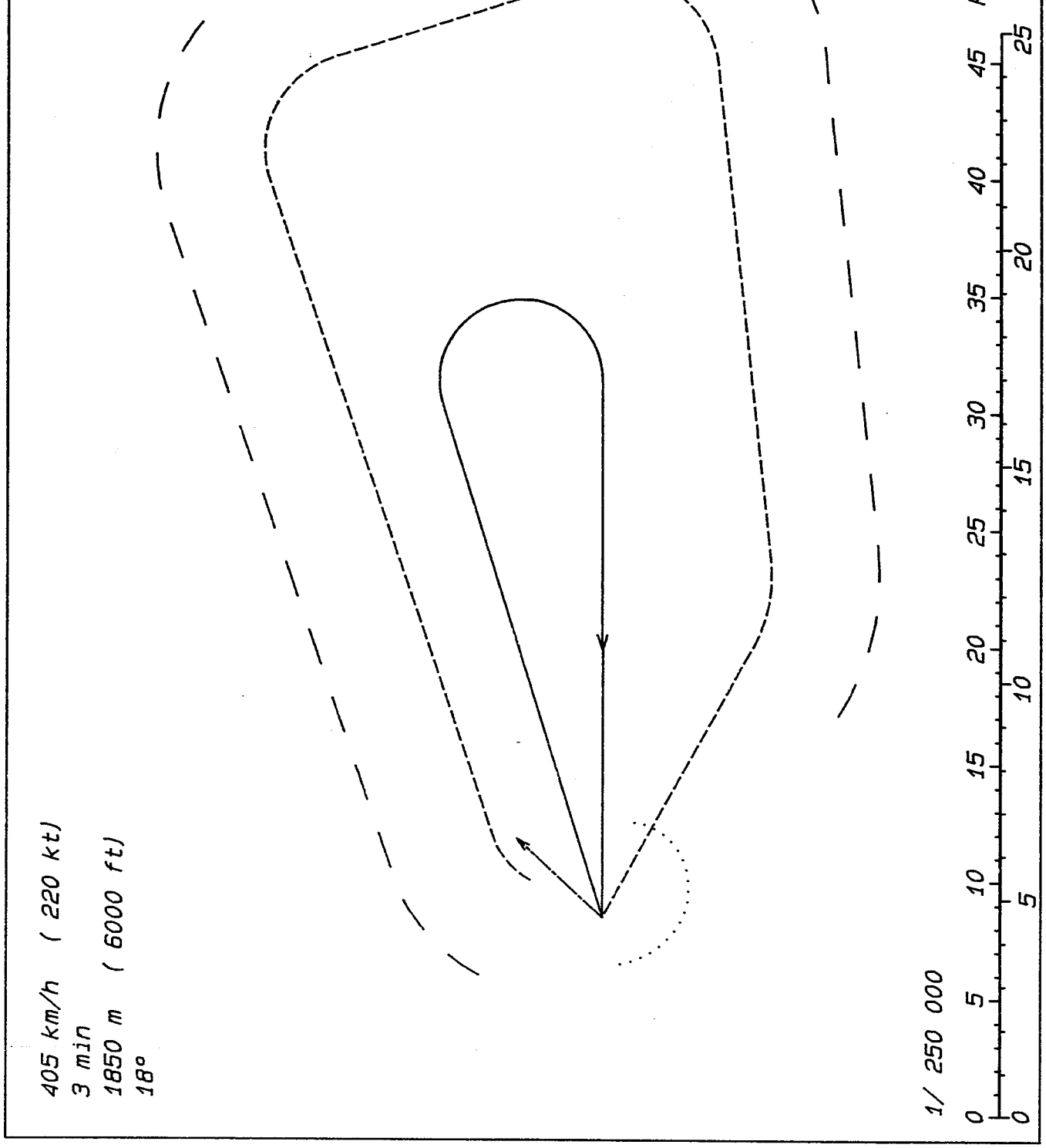

405 km/h (220 kt)
2.5 min
2450 m (8000 ft)
22°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25


405 km/h (220 kt)
2.5 min
3050 m (10000 ft)
22°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


405 km/h (220 kt)
3 min
900 m (3000 ft)
17°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

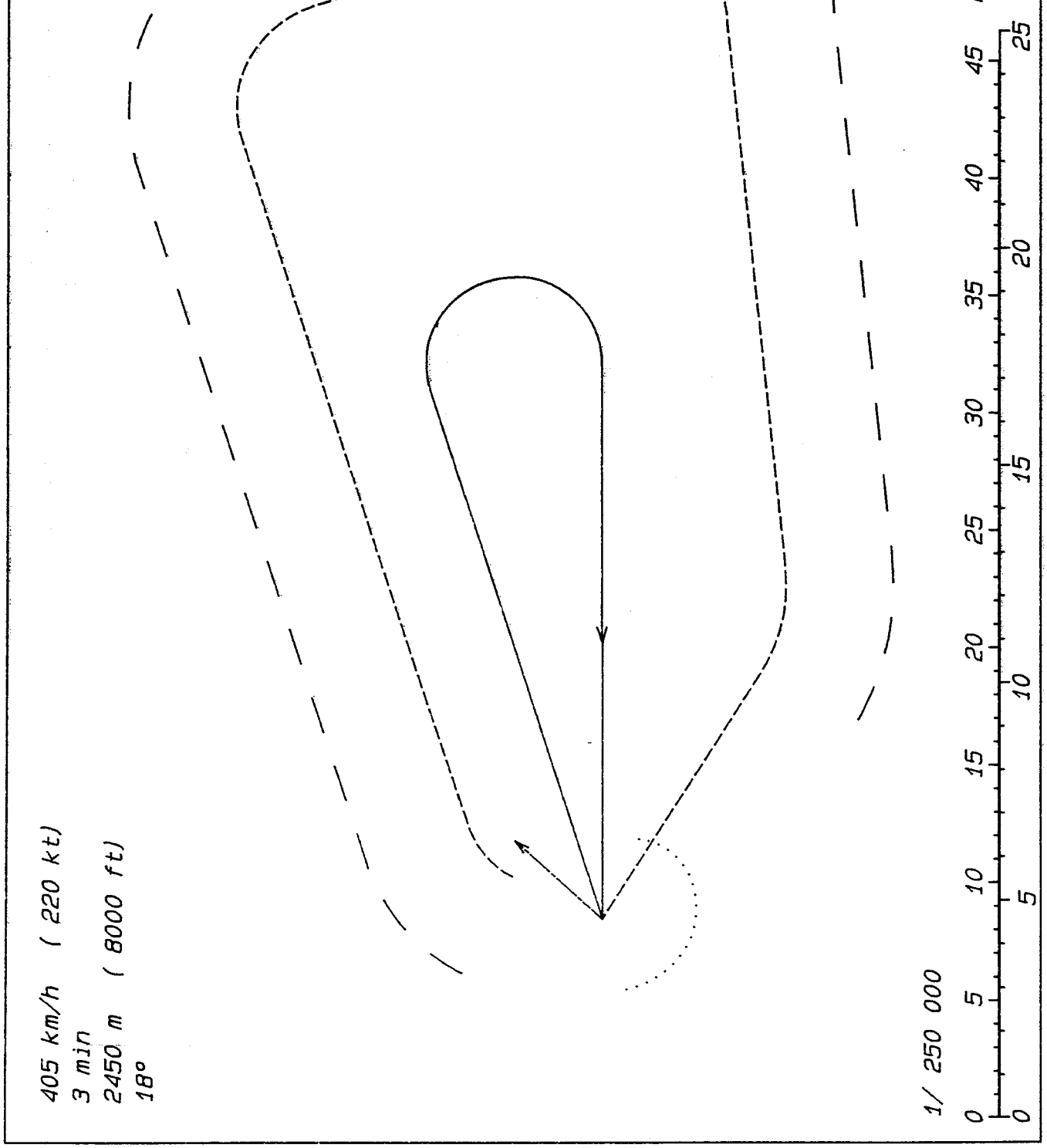
BT 42

1986/06


405 km/h (220 kt)
3 min
1850 m (6000 ft)
18°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25

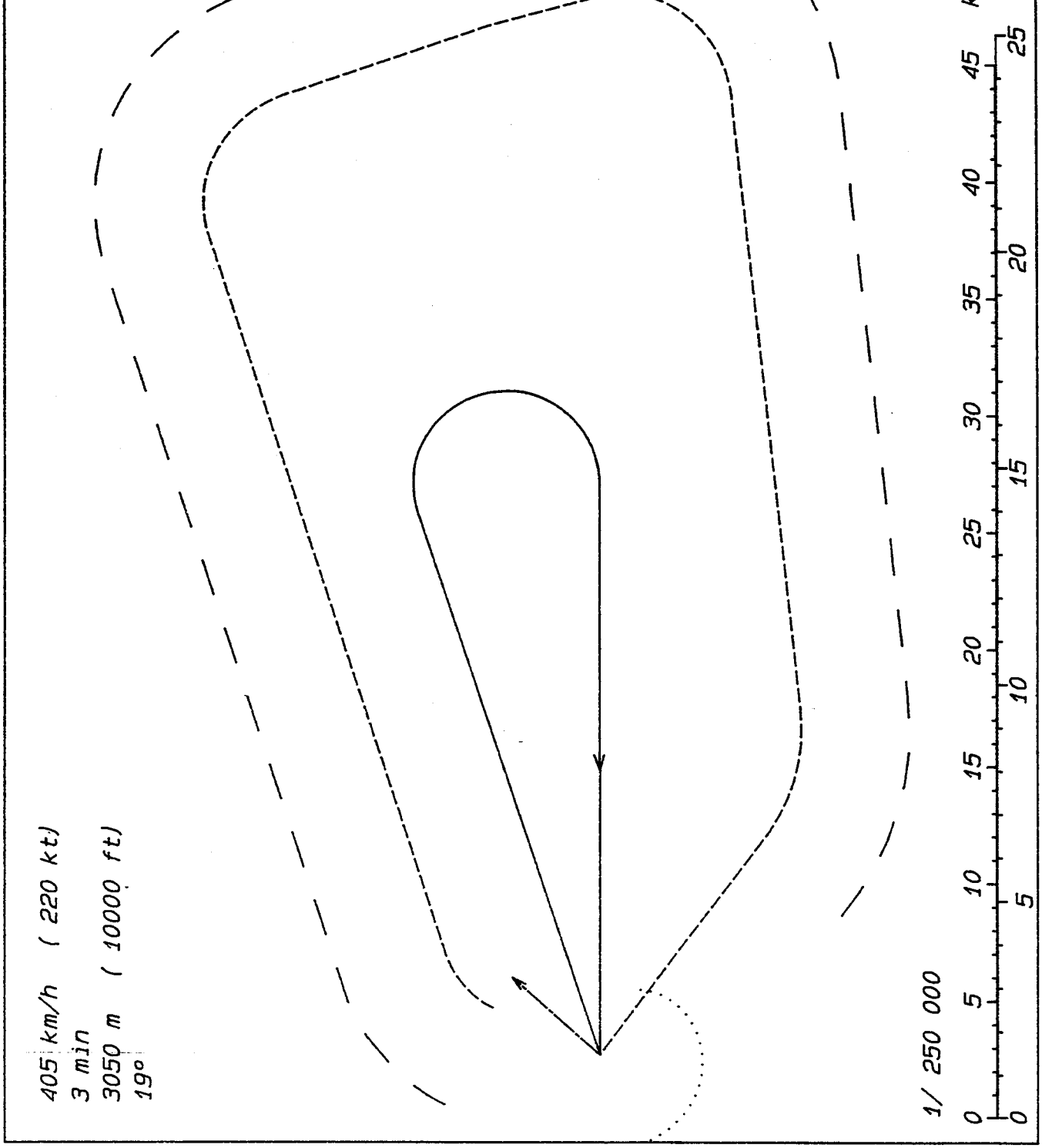
BT 43

1986/06


405 km/h (220 kt)
3 min
2450 m (8000 ft)
18°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

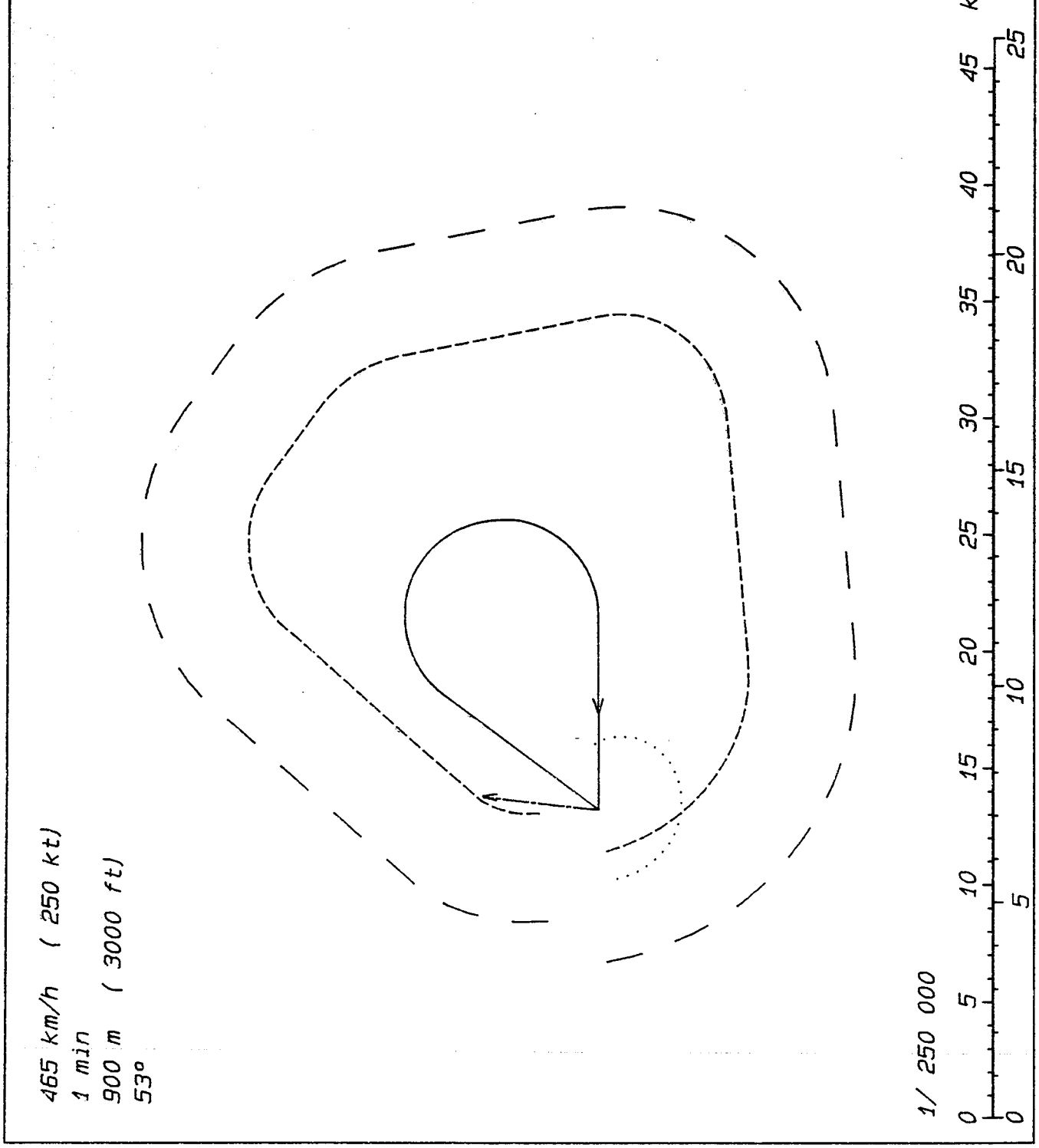
BT 44

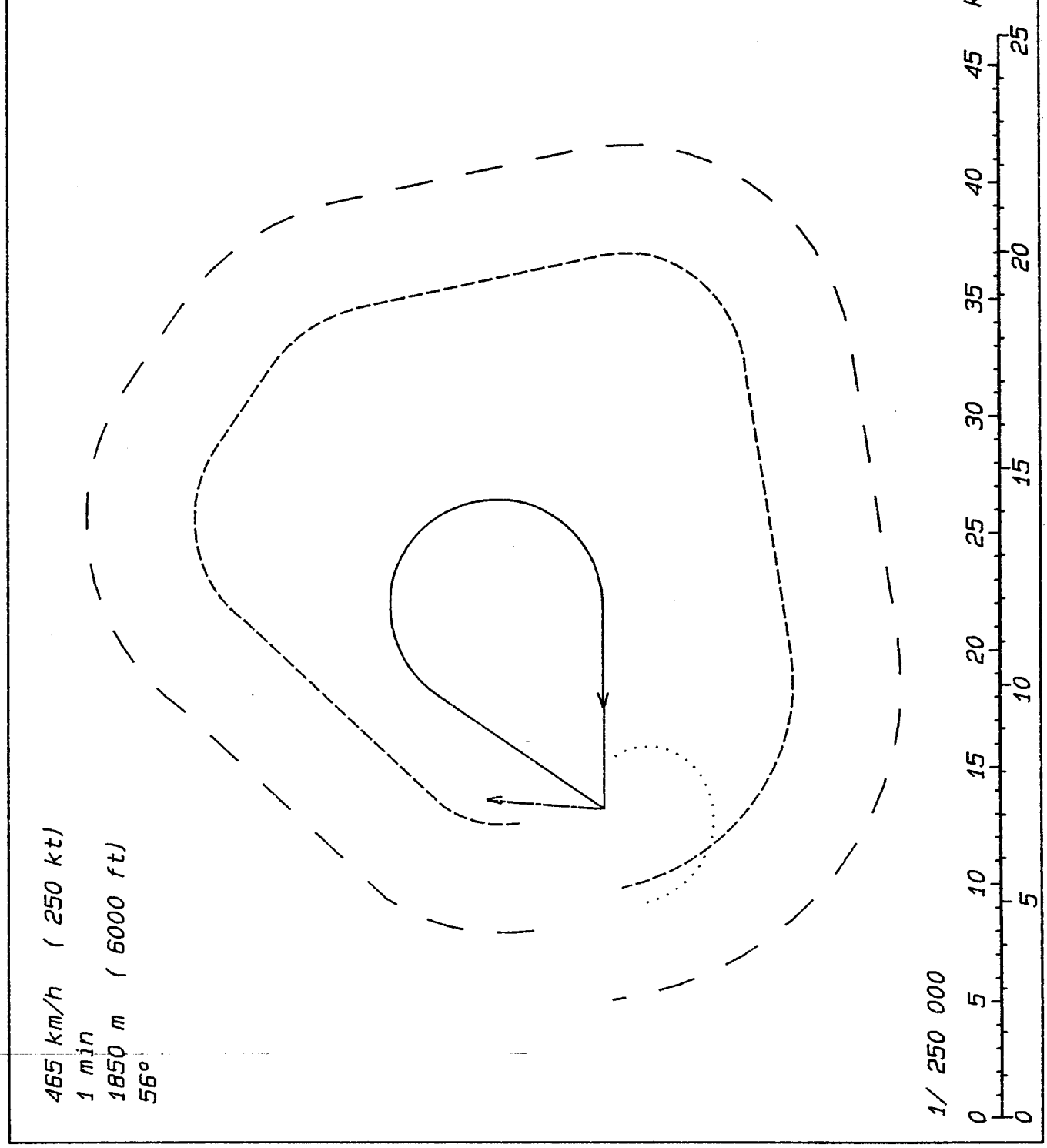
1986/06

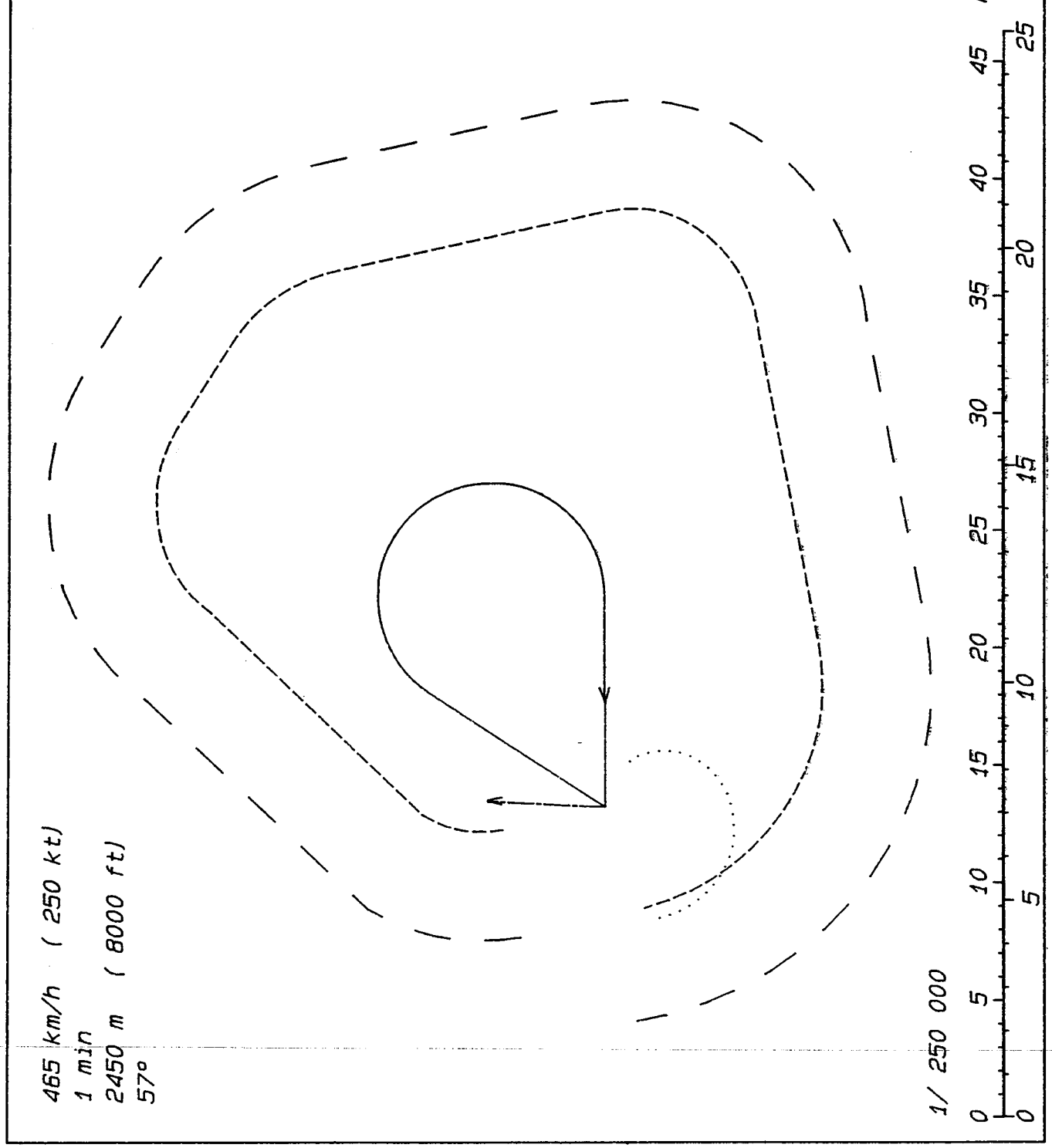

405 km/h (220 kt)
3 min
3050 m (10000 ft)
19°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

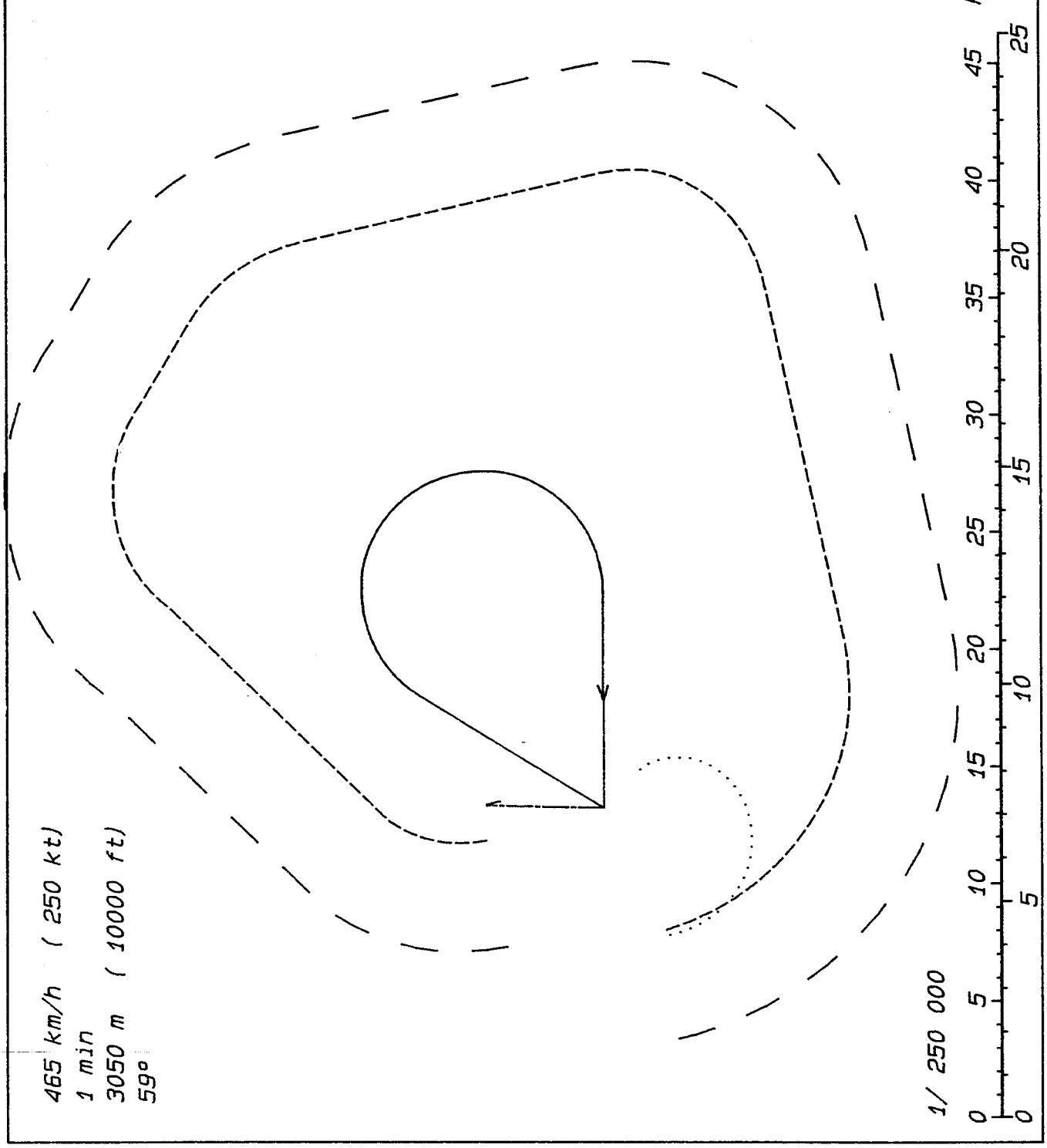
BT 45

1986/06


465 km/h (250 kt)
1 min
900 m (3000 ft)
53°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

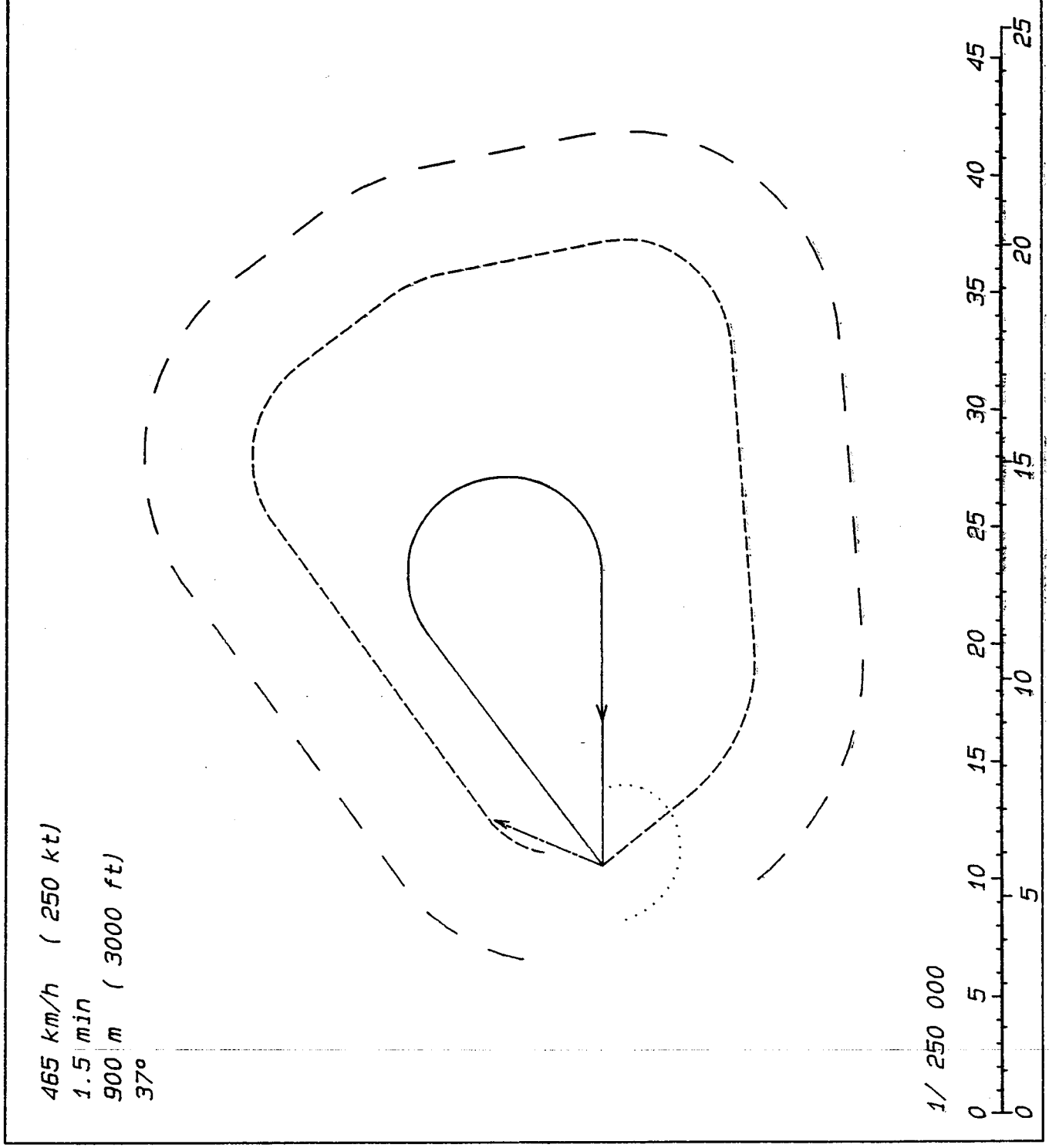

465 km/h (250 kt)
1 min
1850 m (6000 ft)
56°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25


465 km/h (250 kt)
1 min
2450 m (8000 ft)
57°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

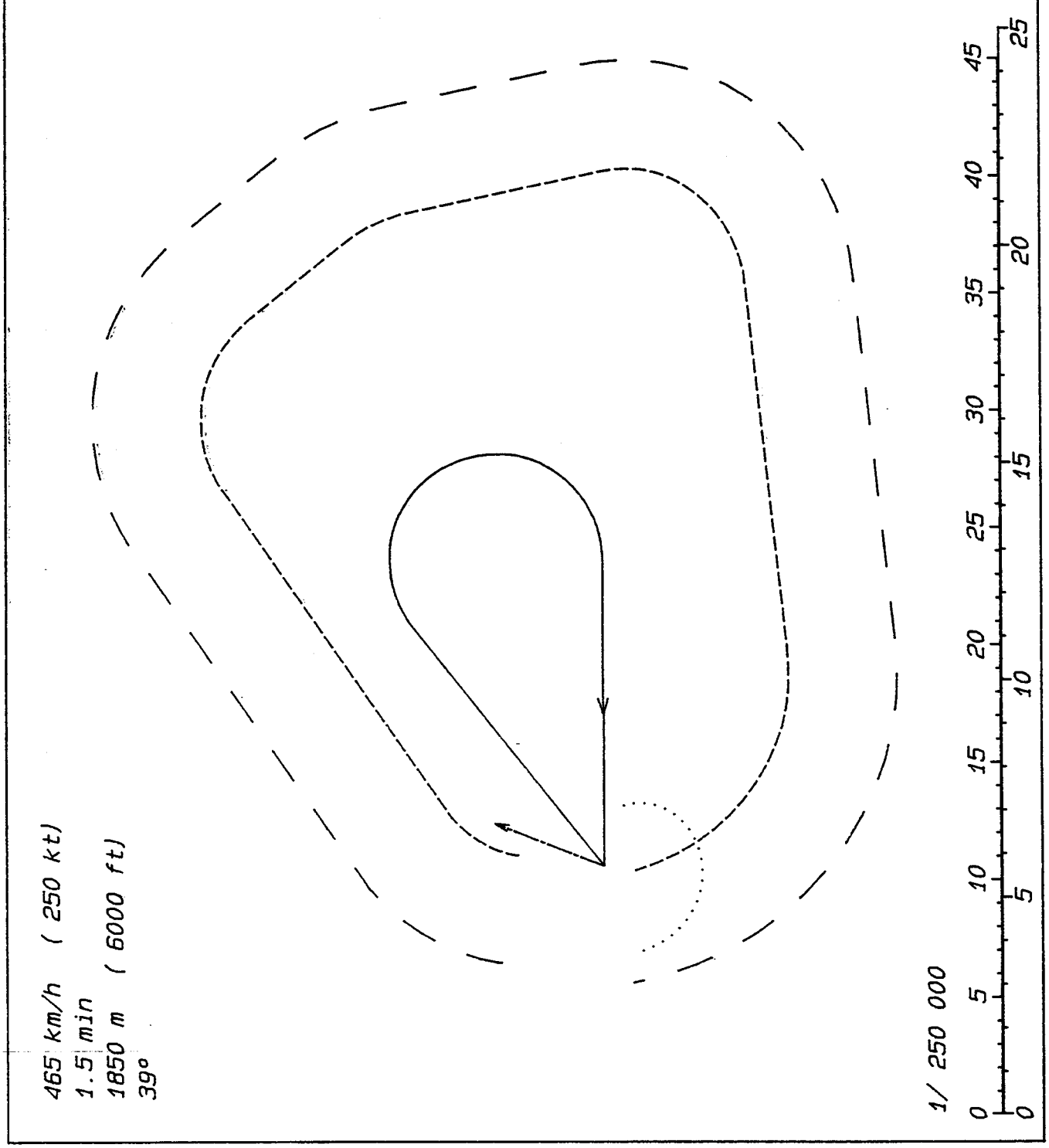

465 km/h (250 kt)
1 min
3050 m (10000 ft)
59°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

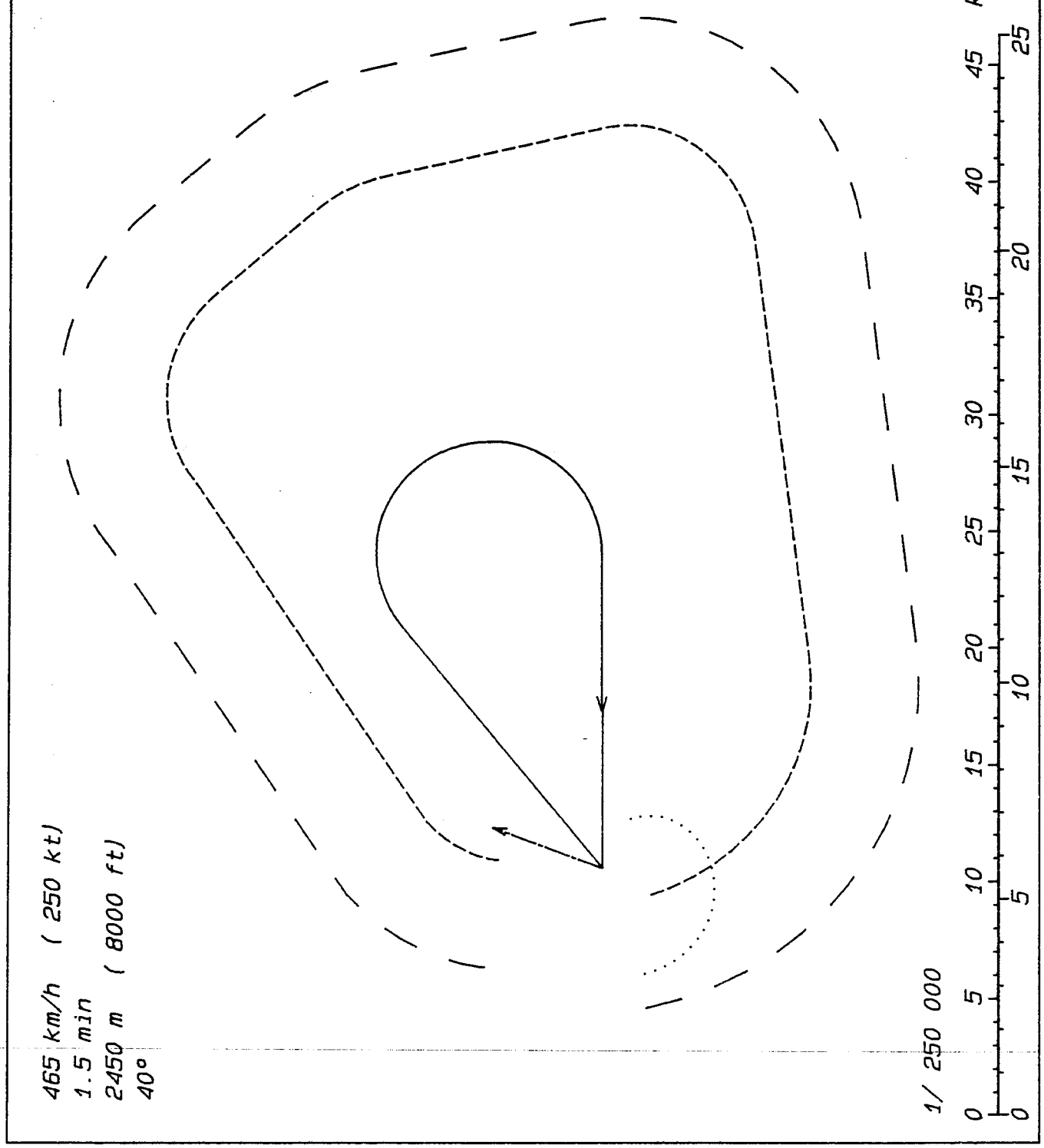
BT 49

1986/06


465 km/h (250 kt)
1.5 min
900 m (3000 ft)
37°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25

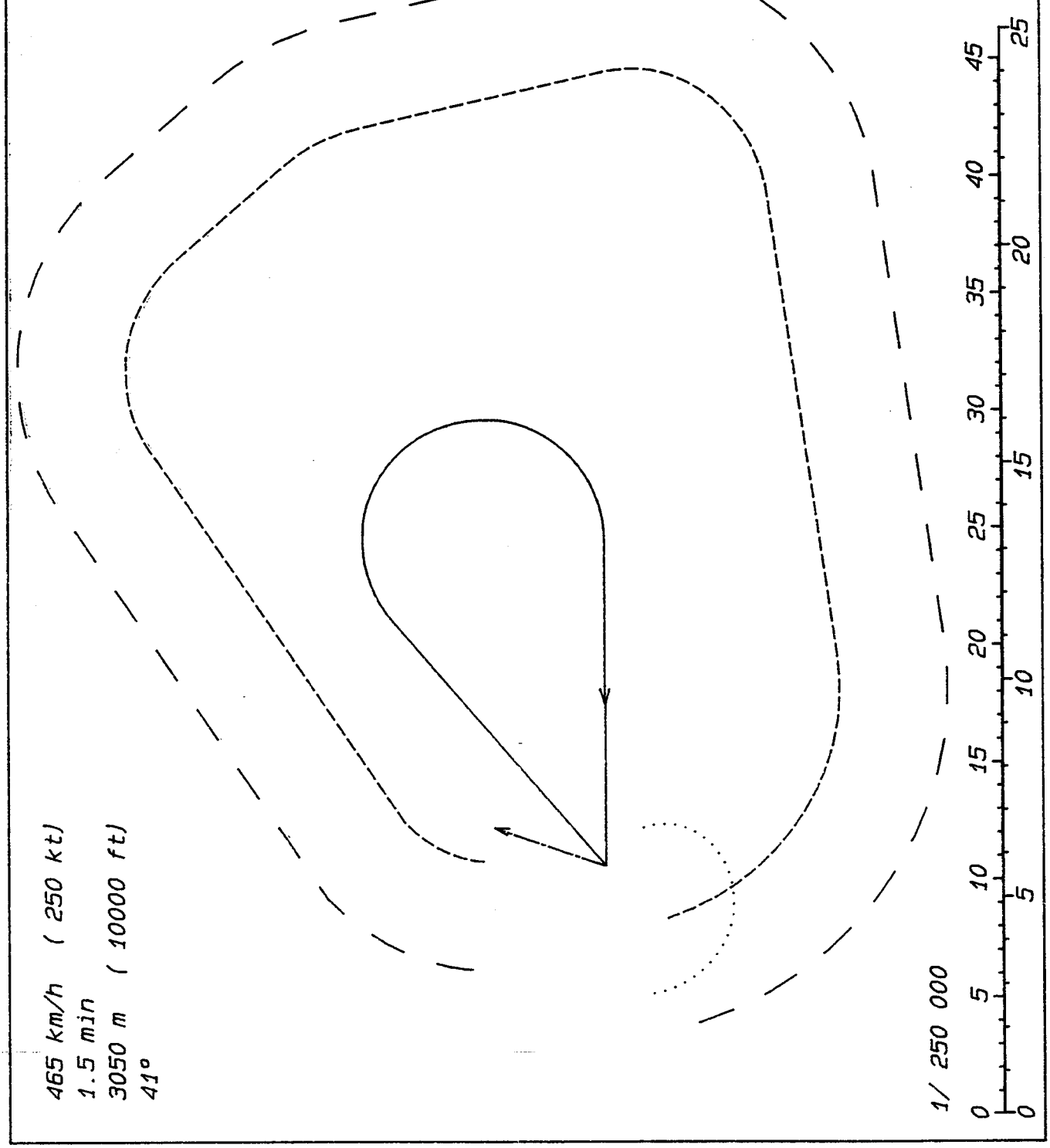
BT 50 1986/06


465 km/h (250 kt)
1.5 min
1850 m (6000 ft)
39°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25


465 km/h (250 kt)
1.5 min
2450 m (8000 ft)
40°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

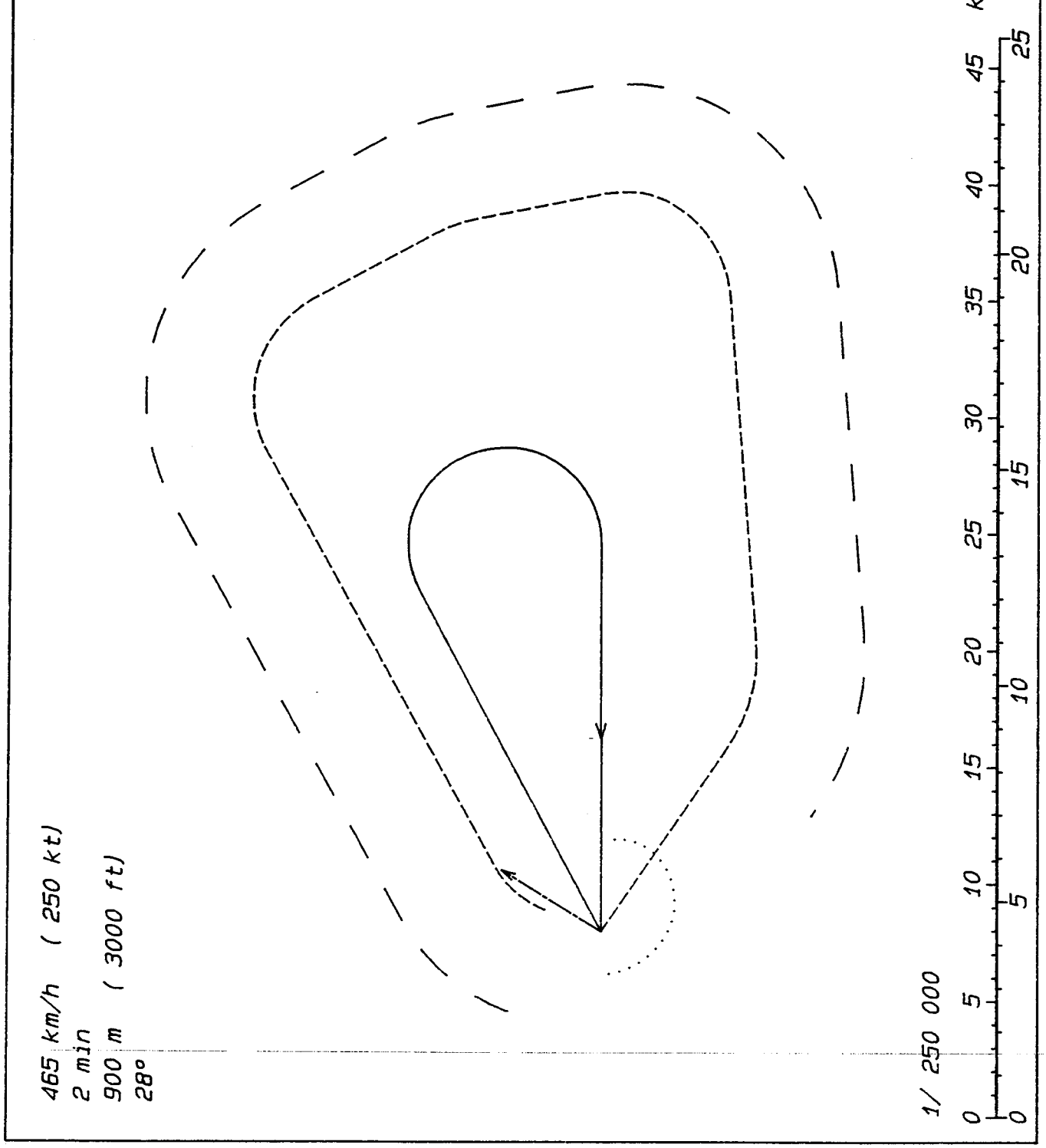
BT 52

1986/06

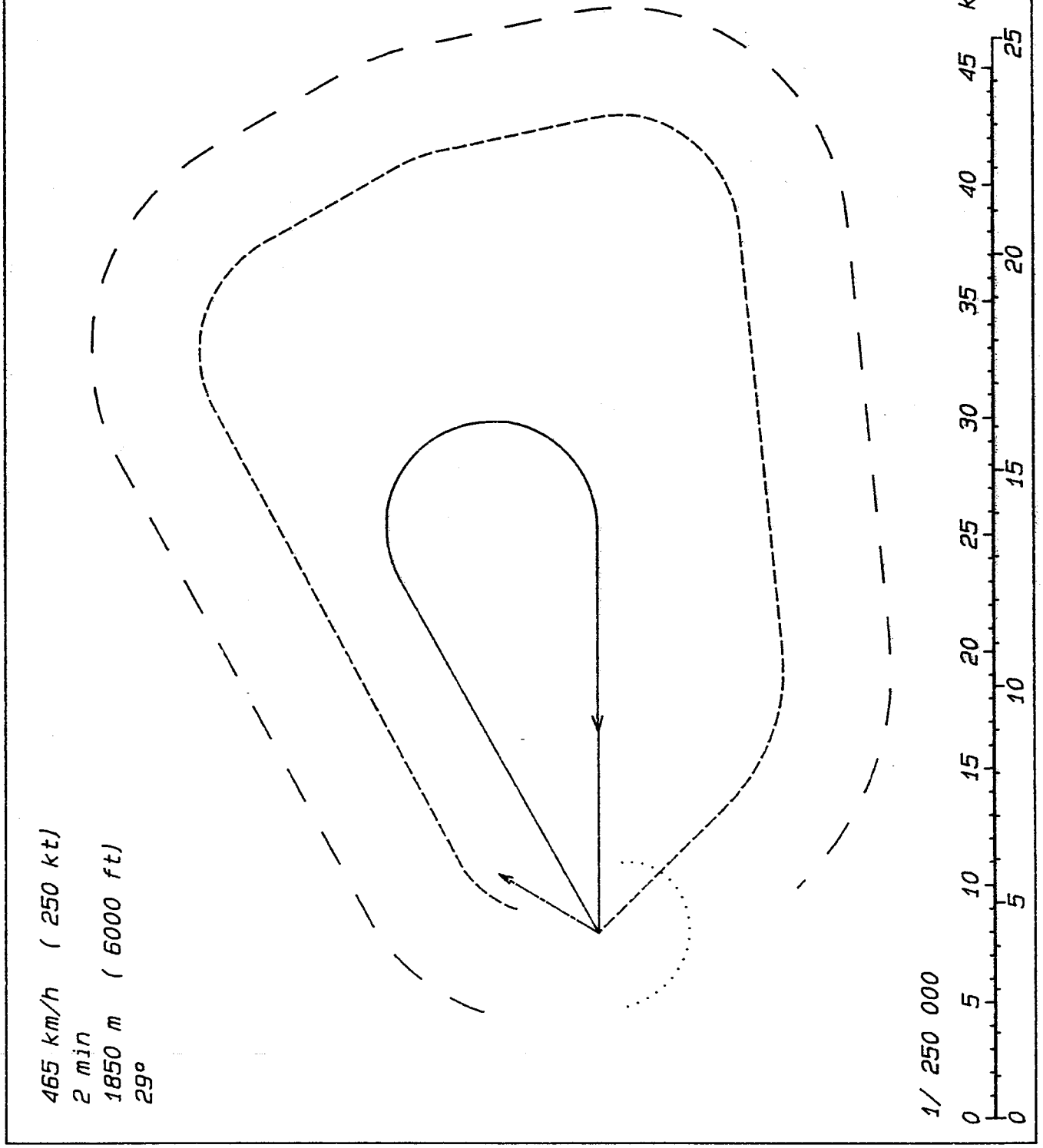

465 km/h (250 kt)
1.5 min
3050 m (10000 ft)
41°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

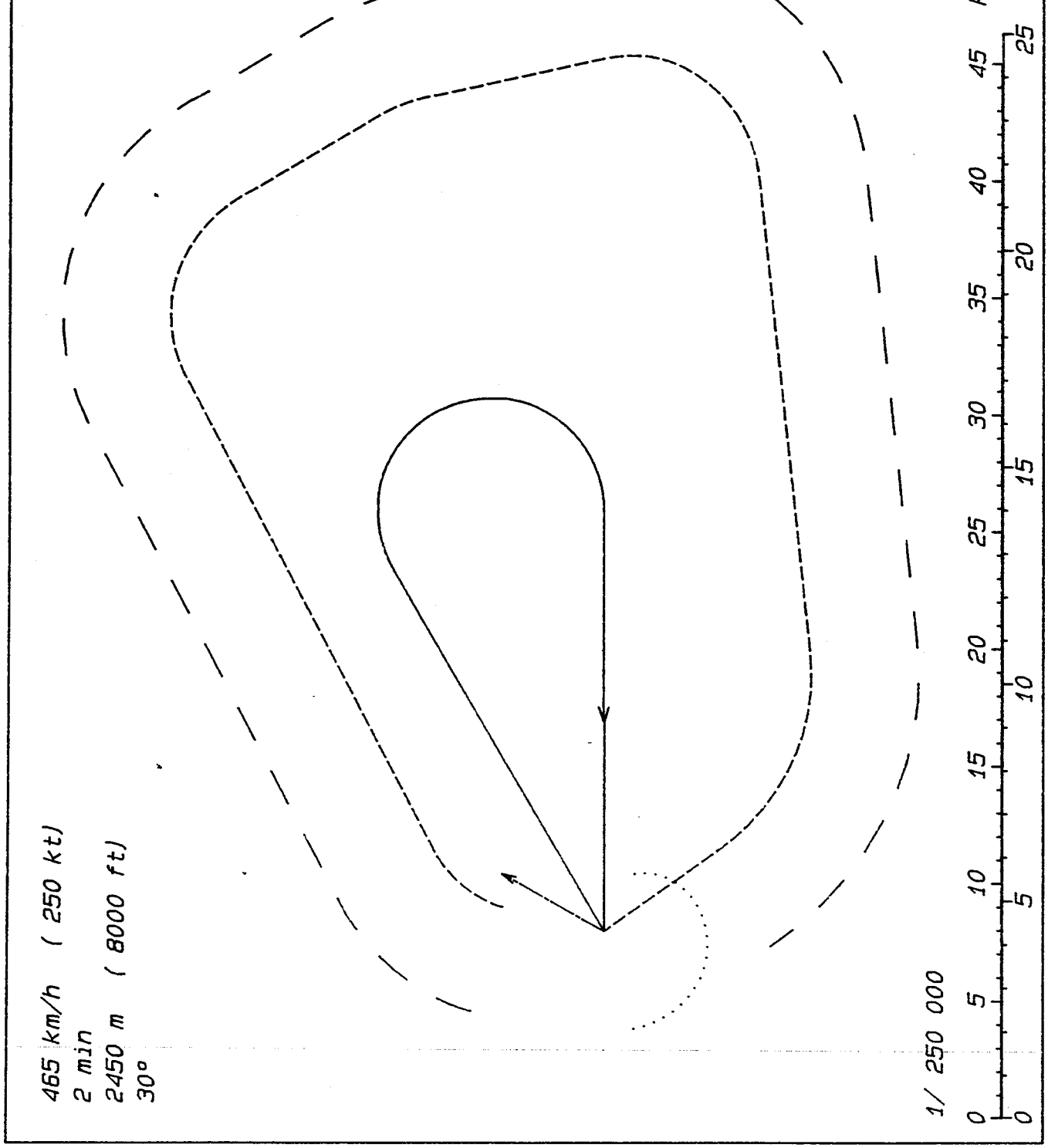
BT 53

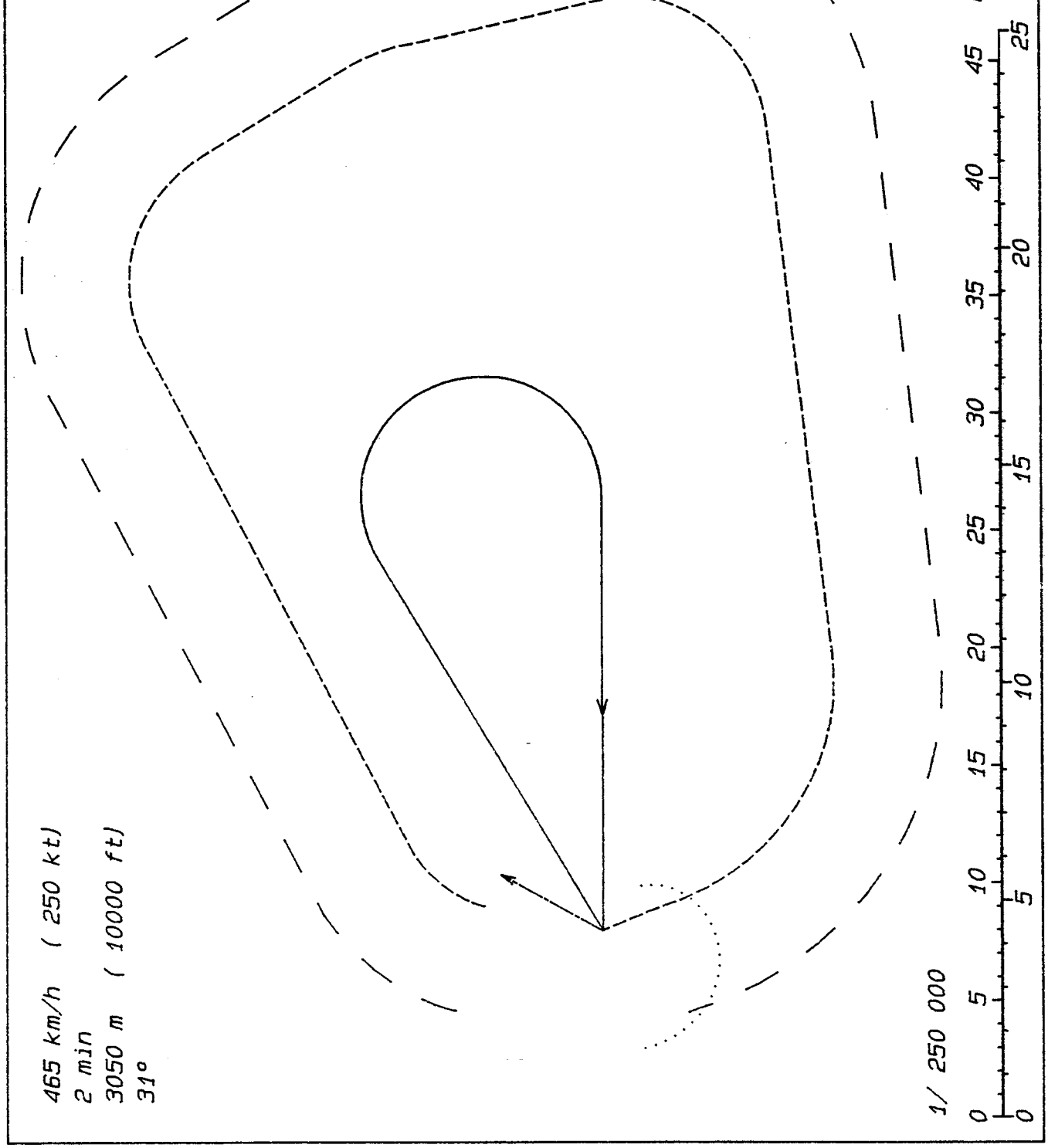
1986/06

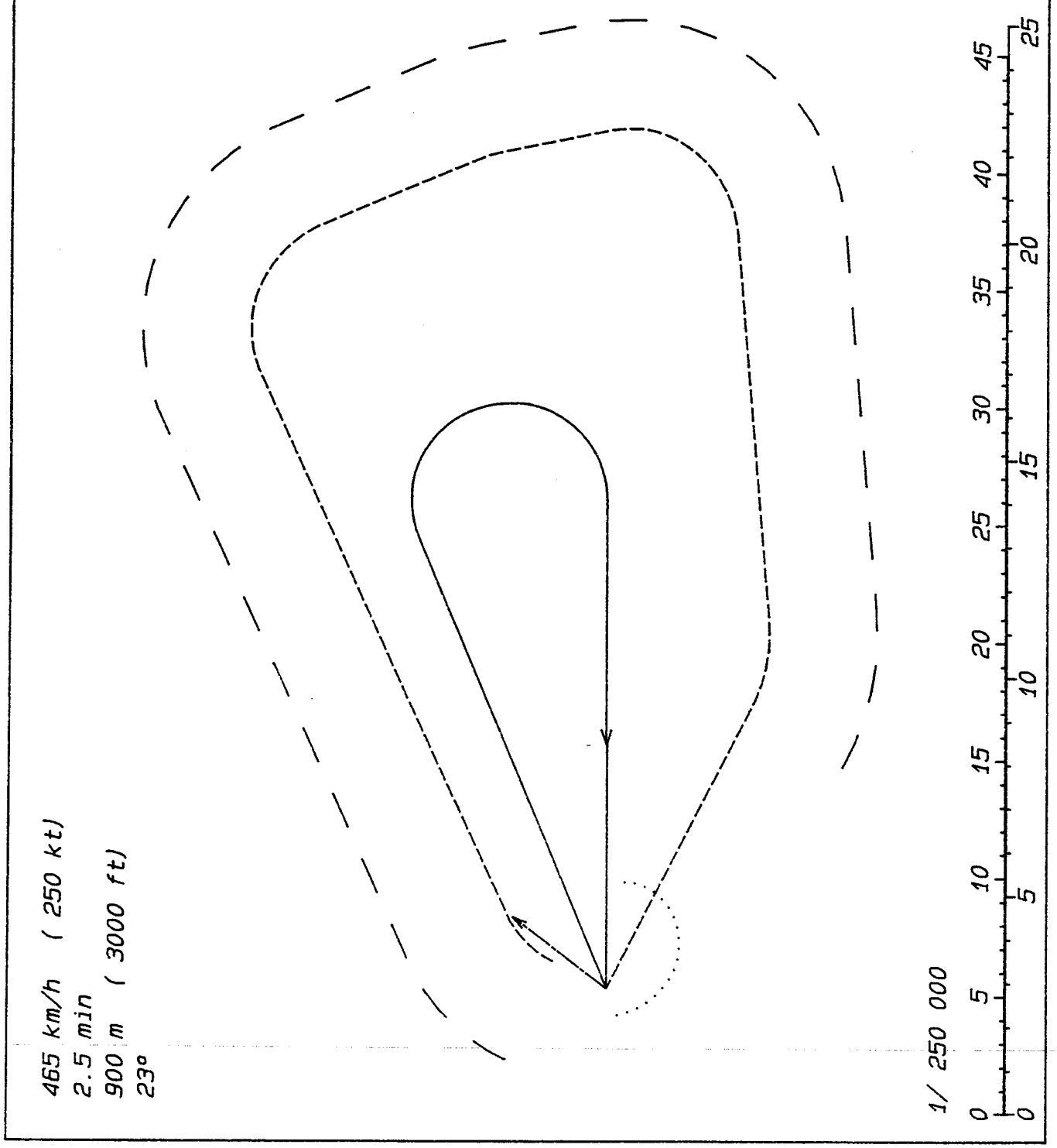

465 km/h (250 kt)
2 min
900 m (3000 ft)
28°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

BT 54 1986/06


465 km/h (250 kt)
2 min
1850 m (6000 ft)
29°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

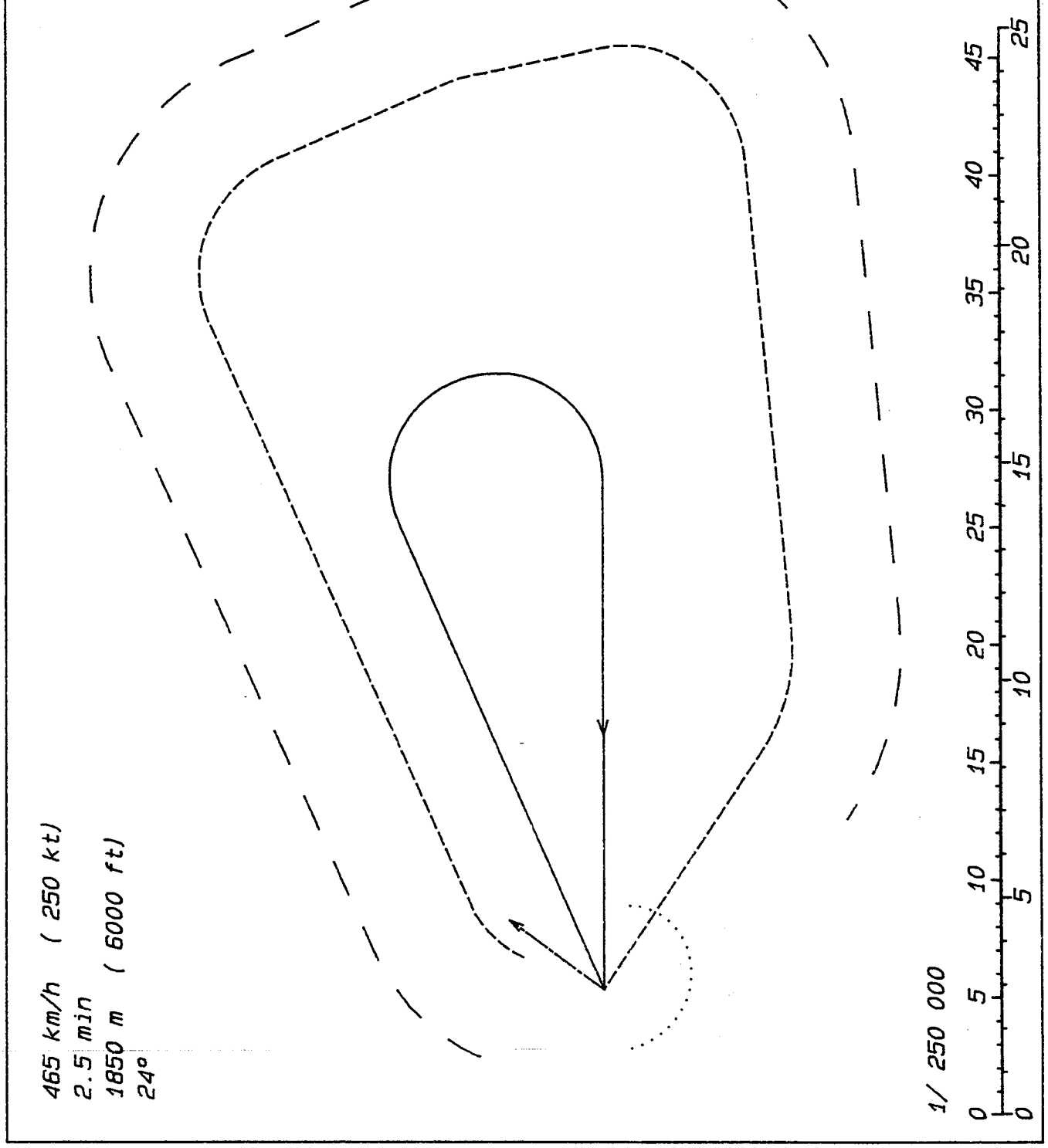

465 km/h (250 kt)
2 min
2450 m (8000 ft)
30°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

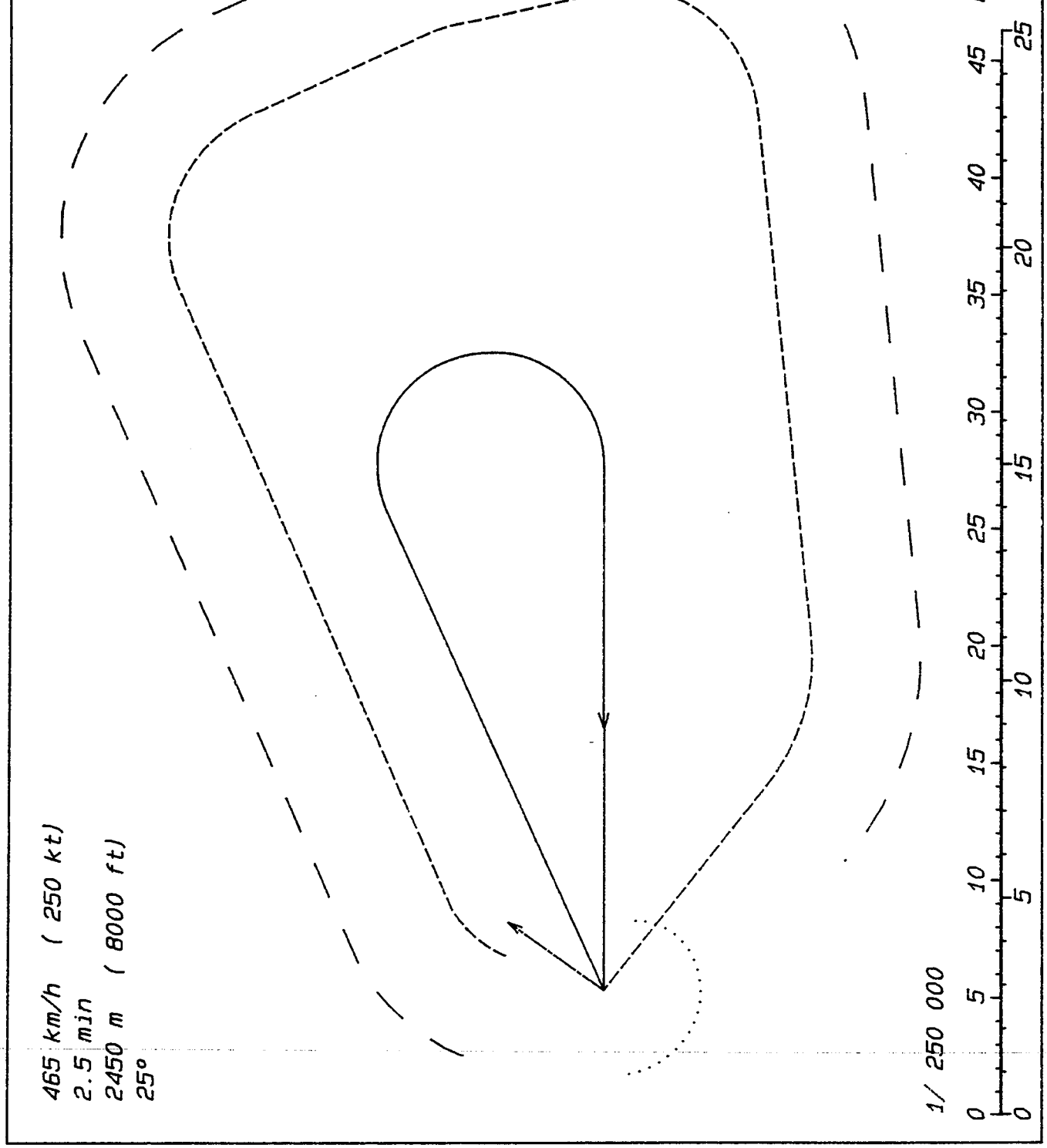

465 km/h (250 kt)
2 min
3050 m (10000 ft)
31°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


465 km/h (250 kt)
2.5 min
900 m (3000 ft)
23°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25

BT 58

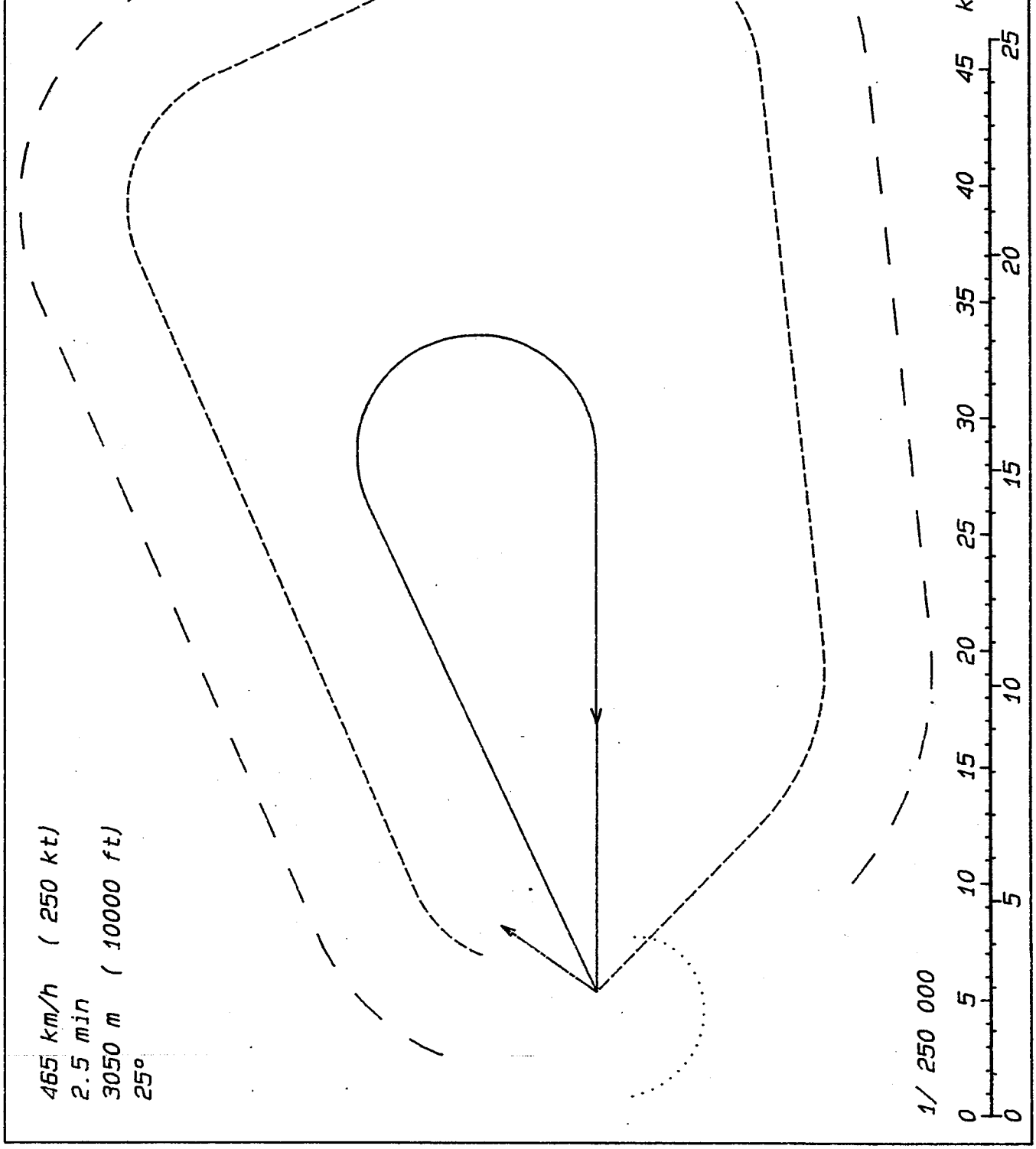
1986/06

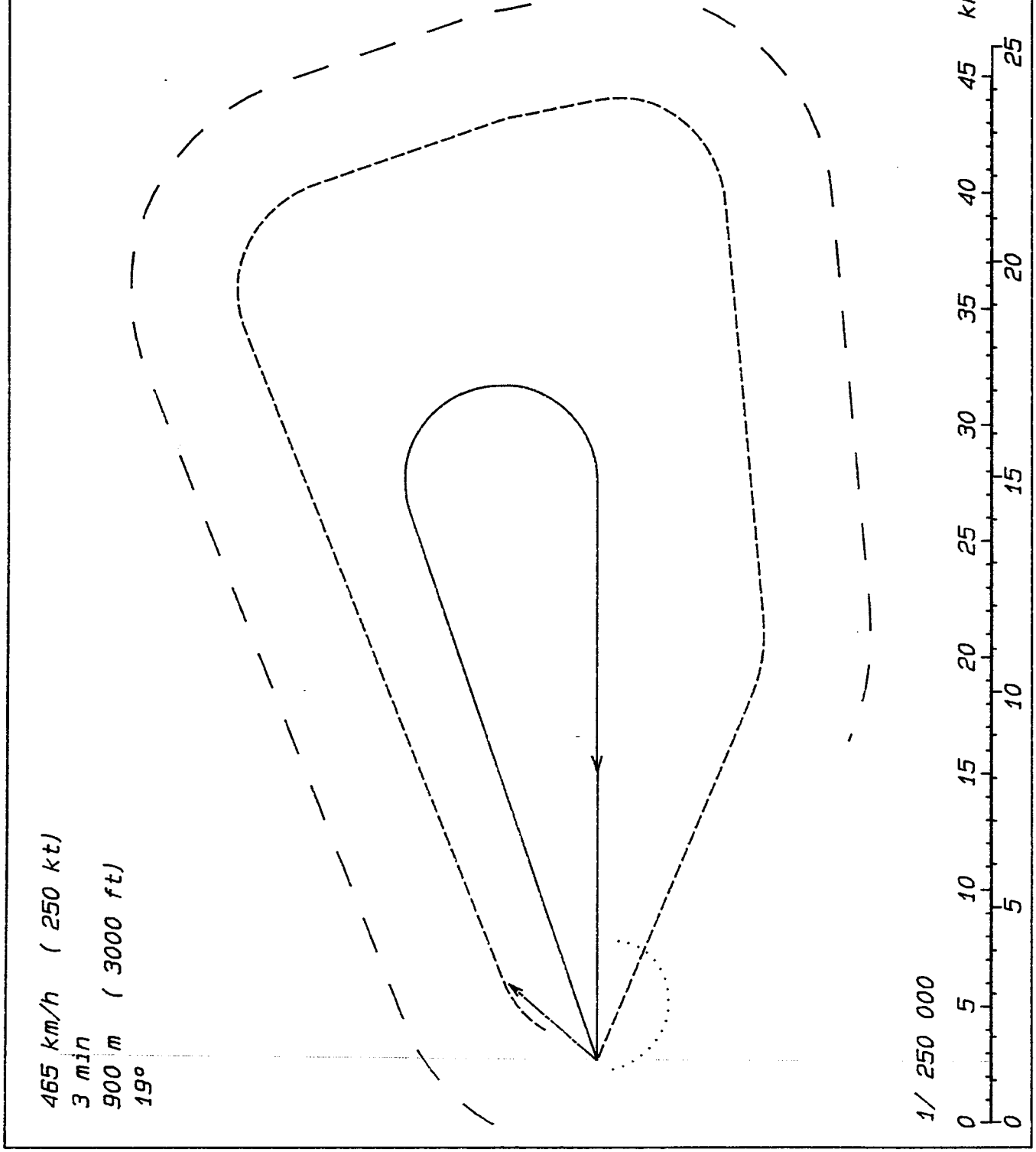

465 km/h (250 kt)
2.5 min
1850 m (6000 ft)
24°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

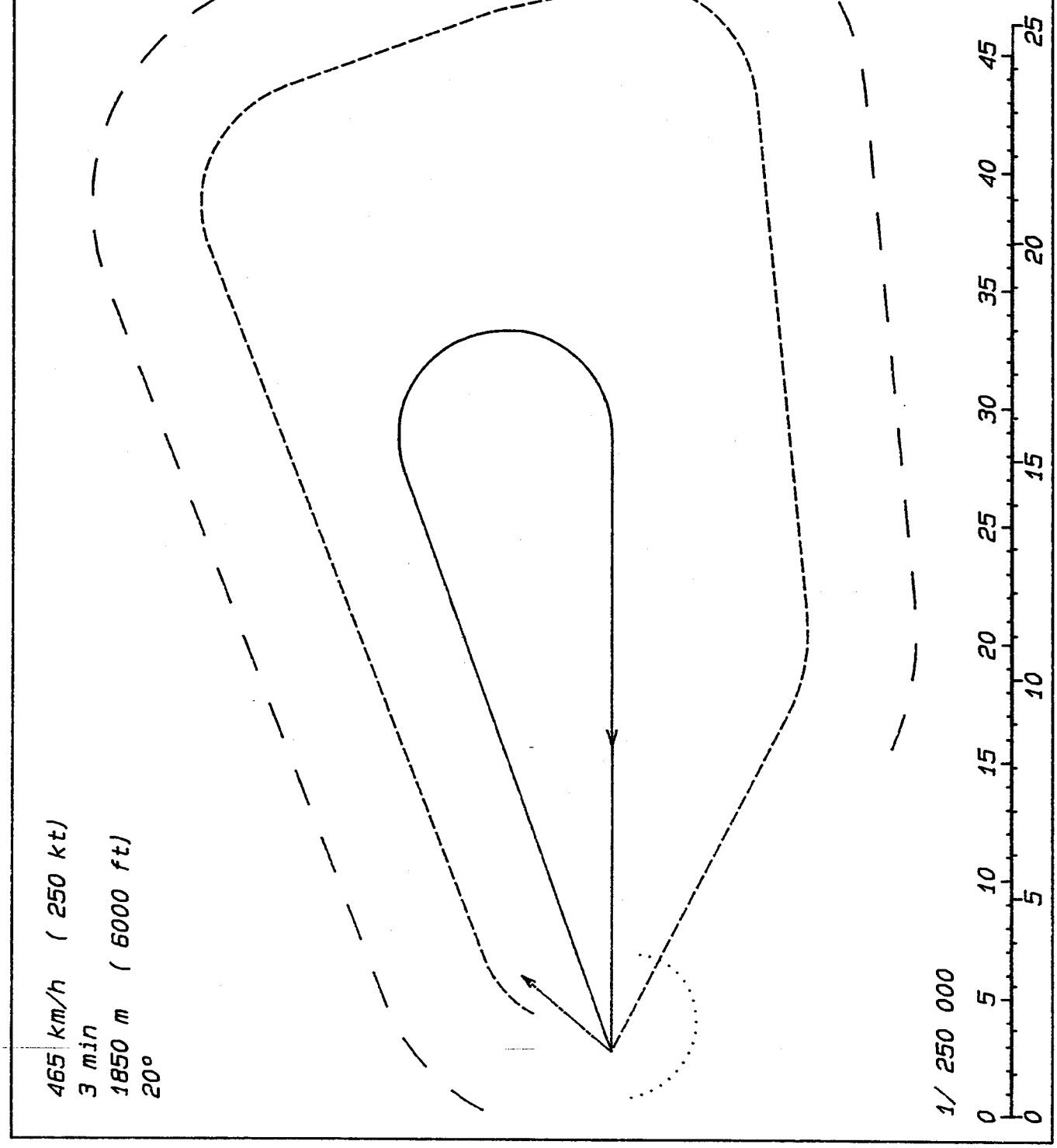

465 km/h (250 kt)
2.5 min
2450 m (8000 ft)
25°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

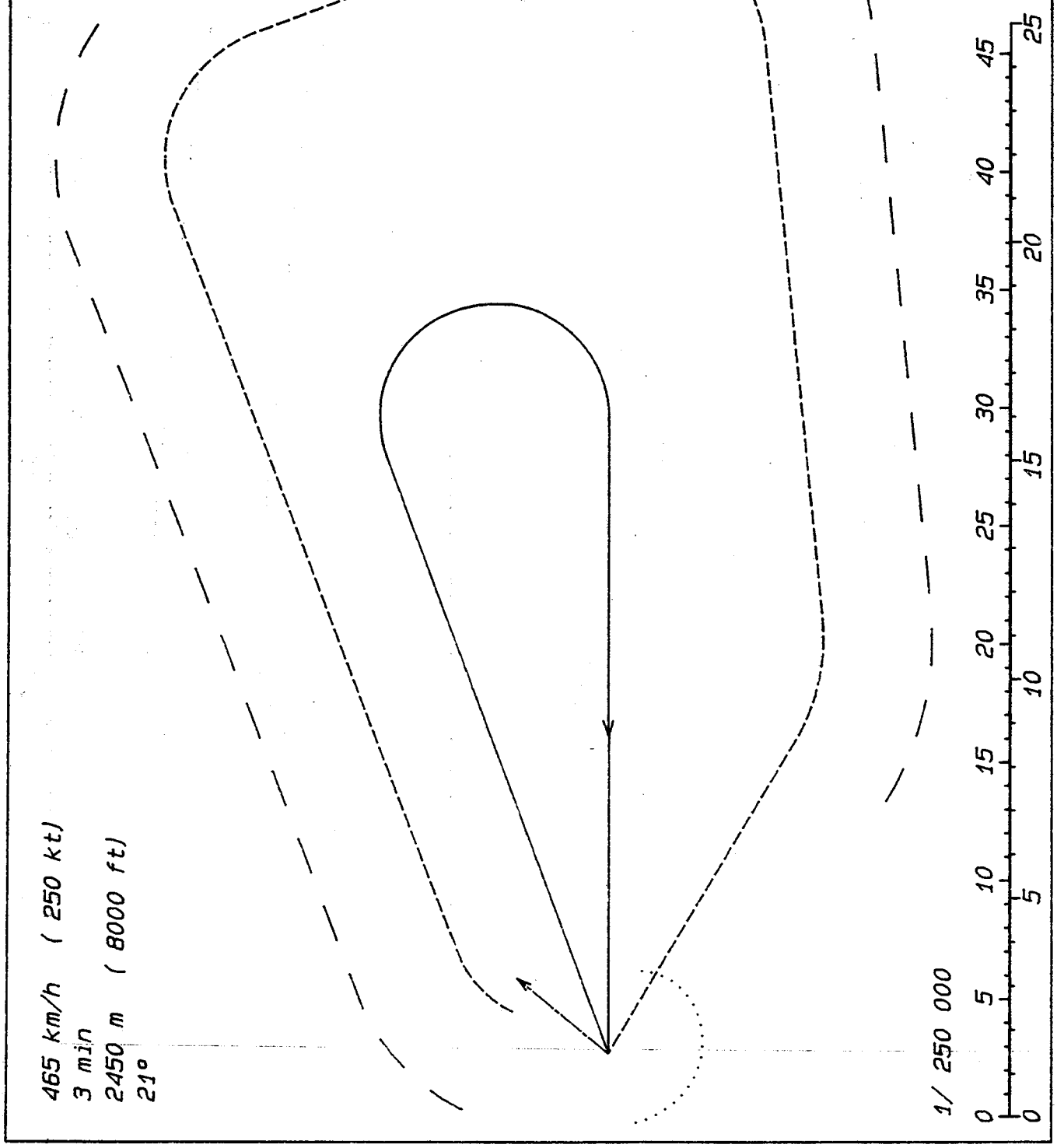
BT 60

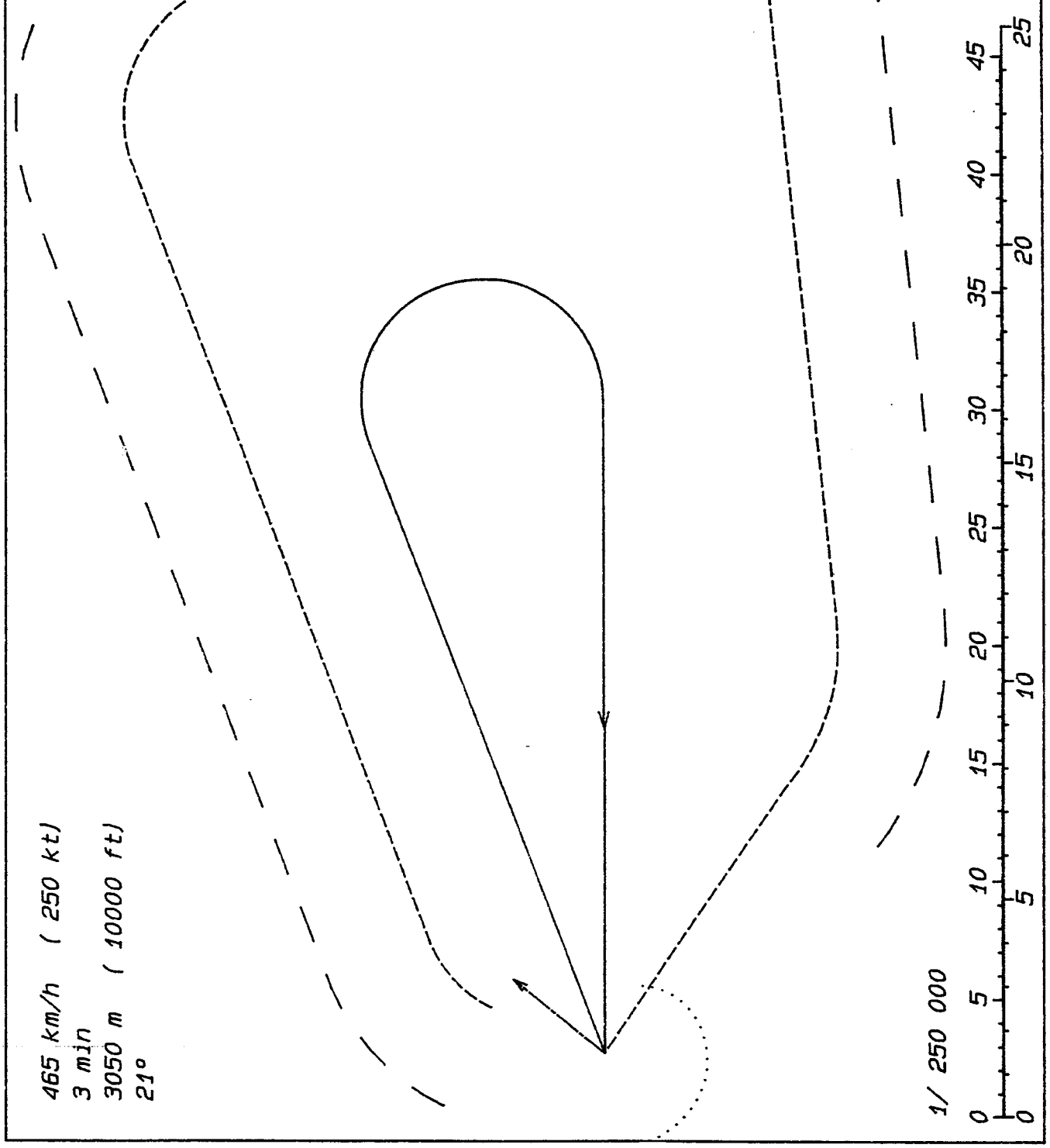
1986/06


465 km/h (250 kt)
2.5 min
3050 m (10000 ft)
25°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25


465 km/h (250 kt)
3 min
900 m (3000 ft)
19°
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25

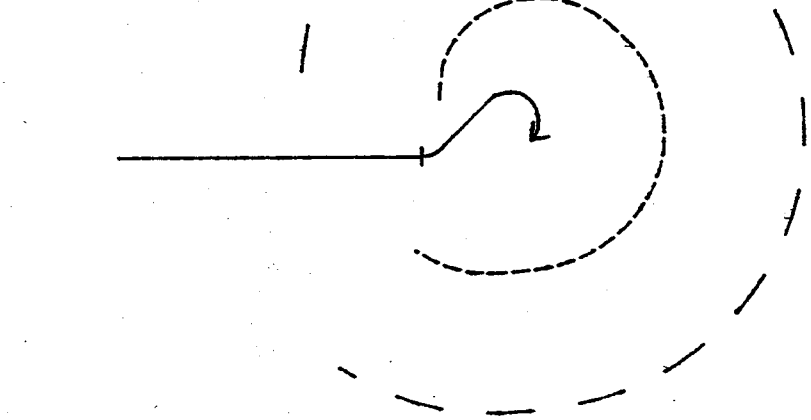

465 km/h (250 kt)
3 min
1850 m (6000 ft)
20°
1/ 250 000
0 5 10 15 20 25 30 35 40 45
0 5 10 15 20 25


465 km/h (250 kt)
3 min
2450 m (8000 ft)
21°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

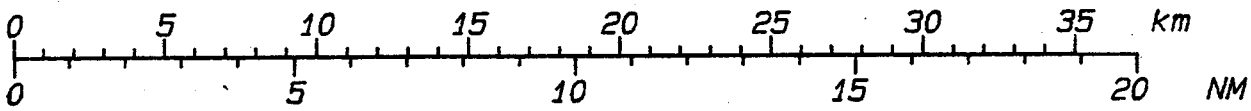

465 km/h (250 kt)
3 min
3050 m (10000 ft)
21°
1/ 250 000
0
5
10
15
20
25
30
35
40
45
0
5
10
15
20
25

PROCEDURE TURN TEMPLATES

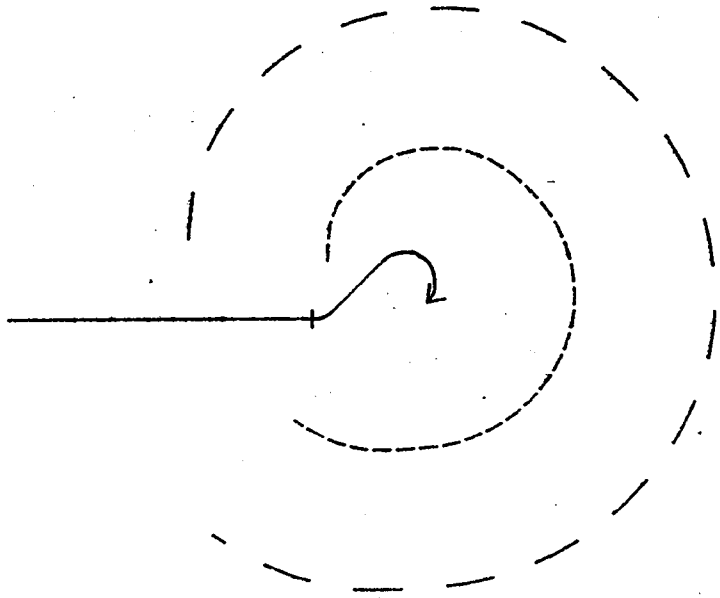
PT 1 - PT 27

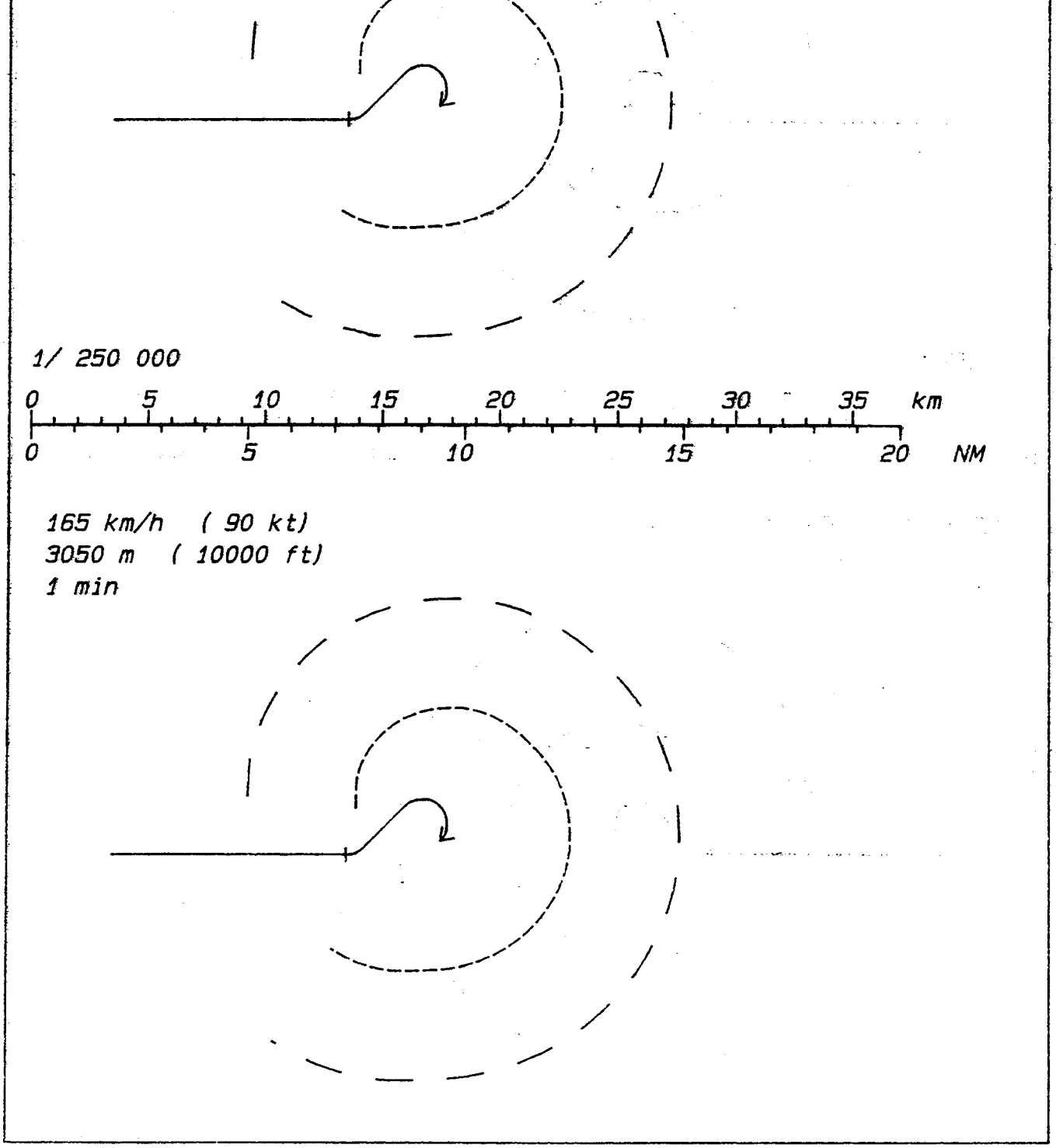


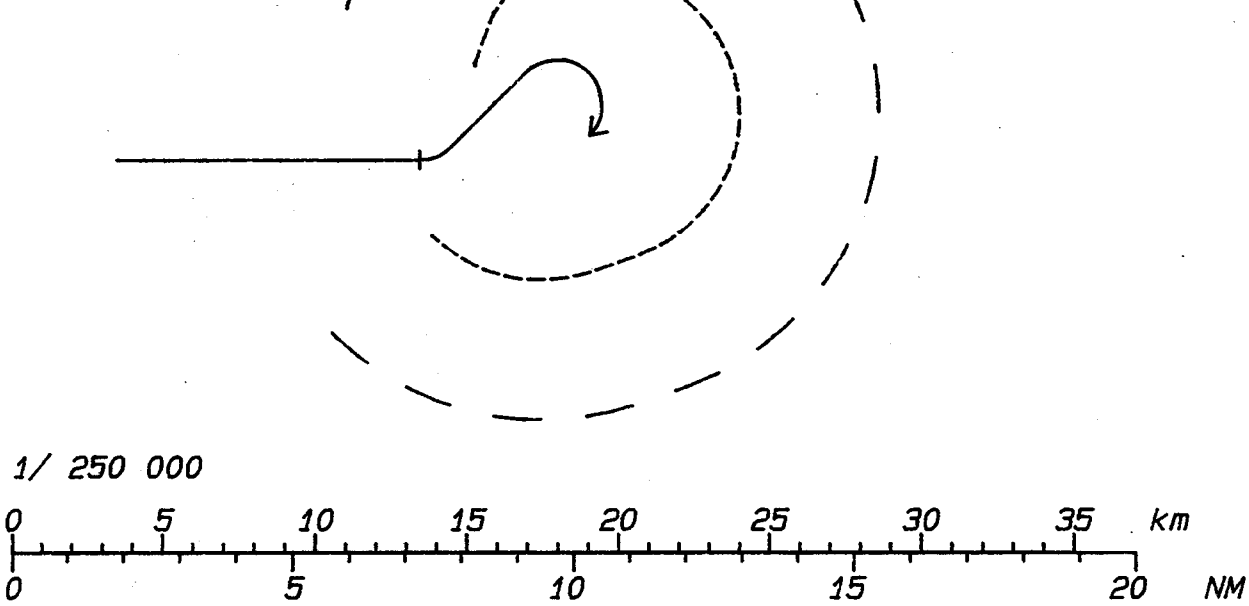
1/ 250 000



165 km/h (90 kt)
1850 m (6000 ft)
1 min

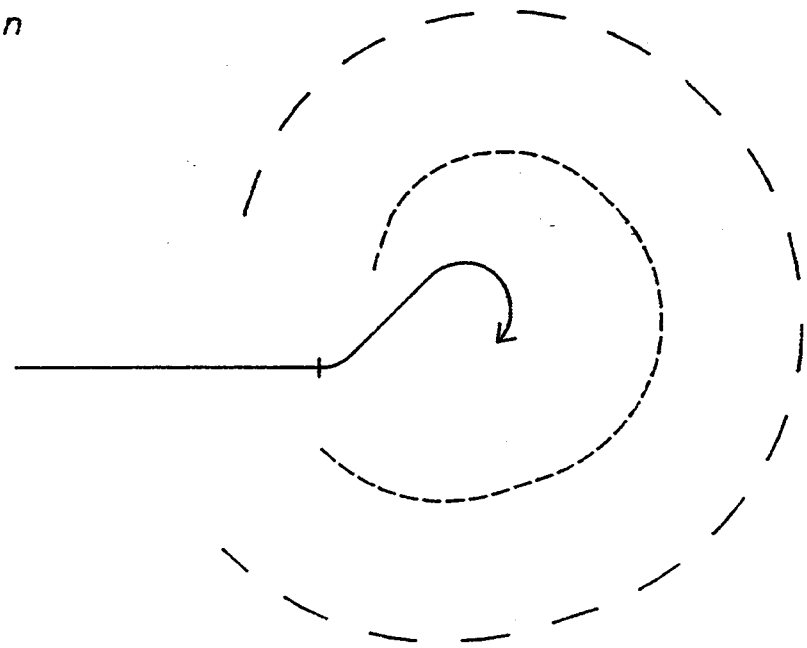


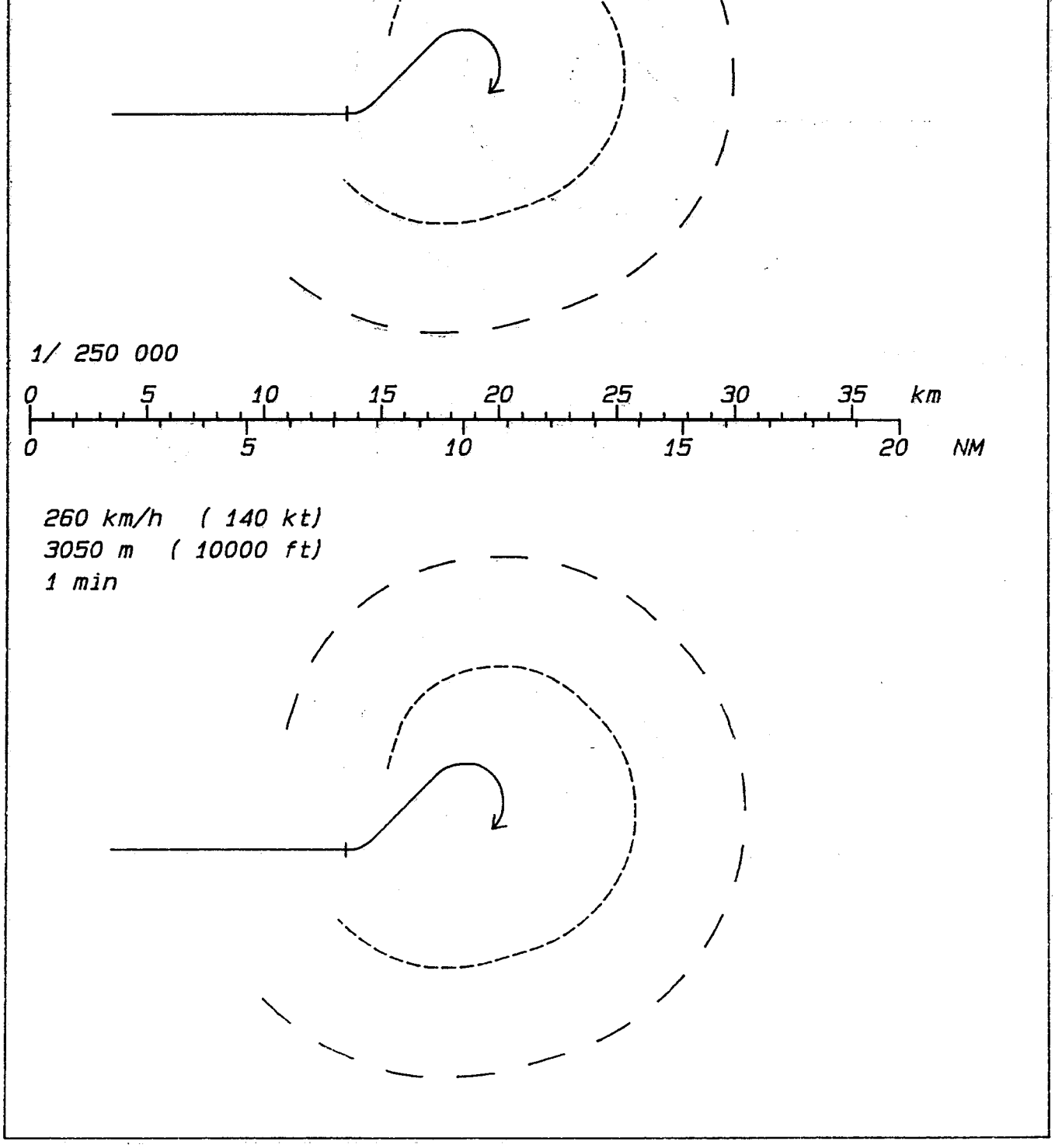

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
165 km/h (90 kt)
3050 m (10000 ft)
1 min

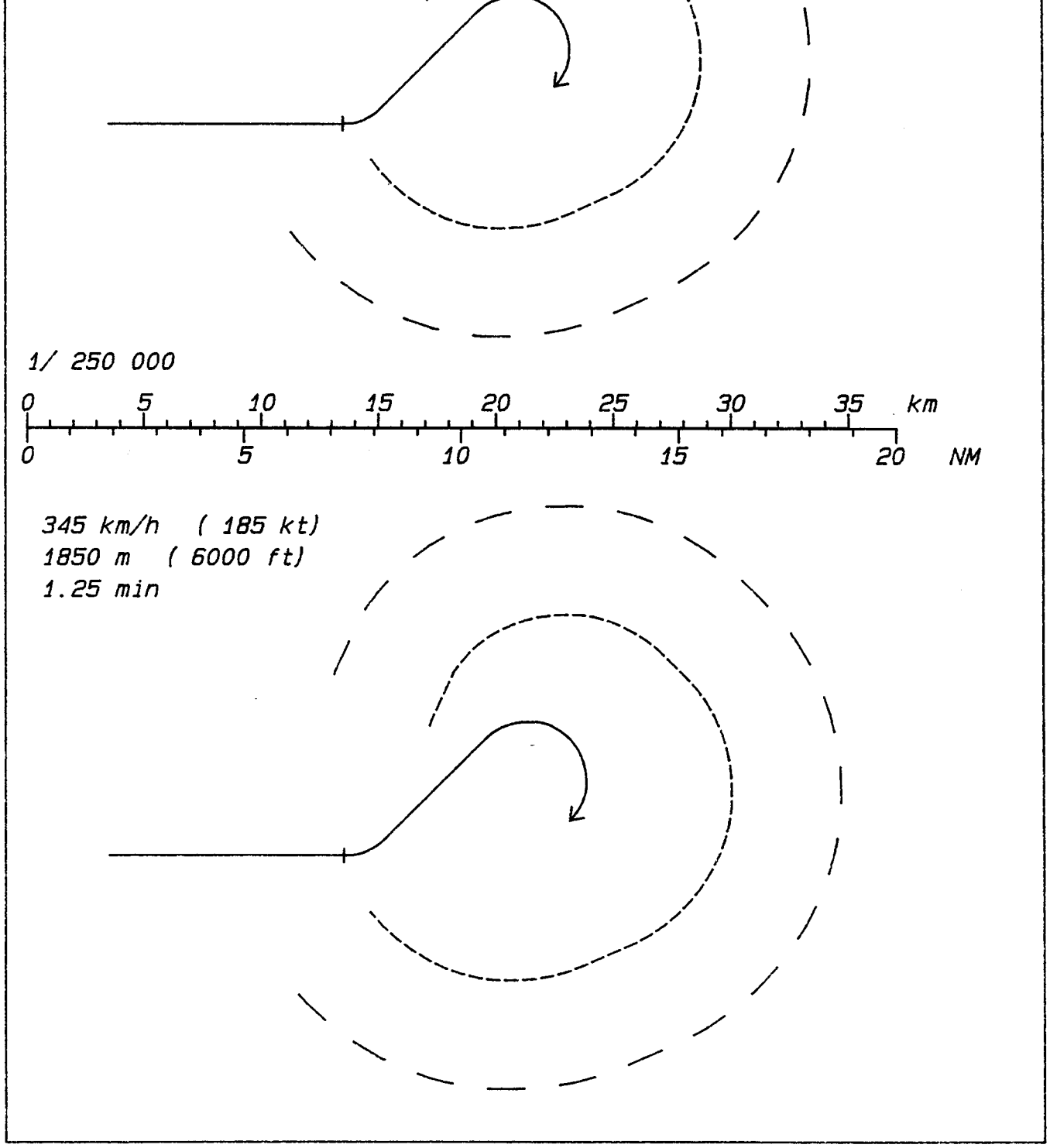


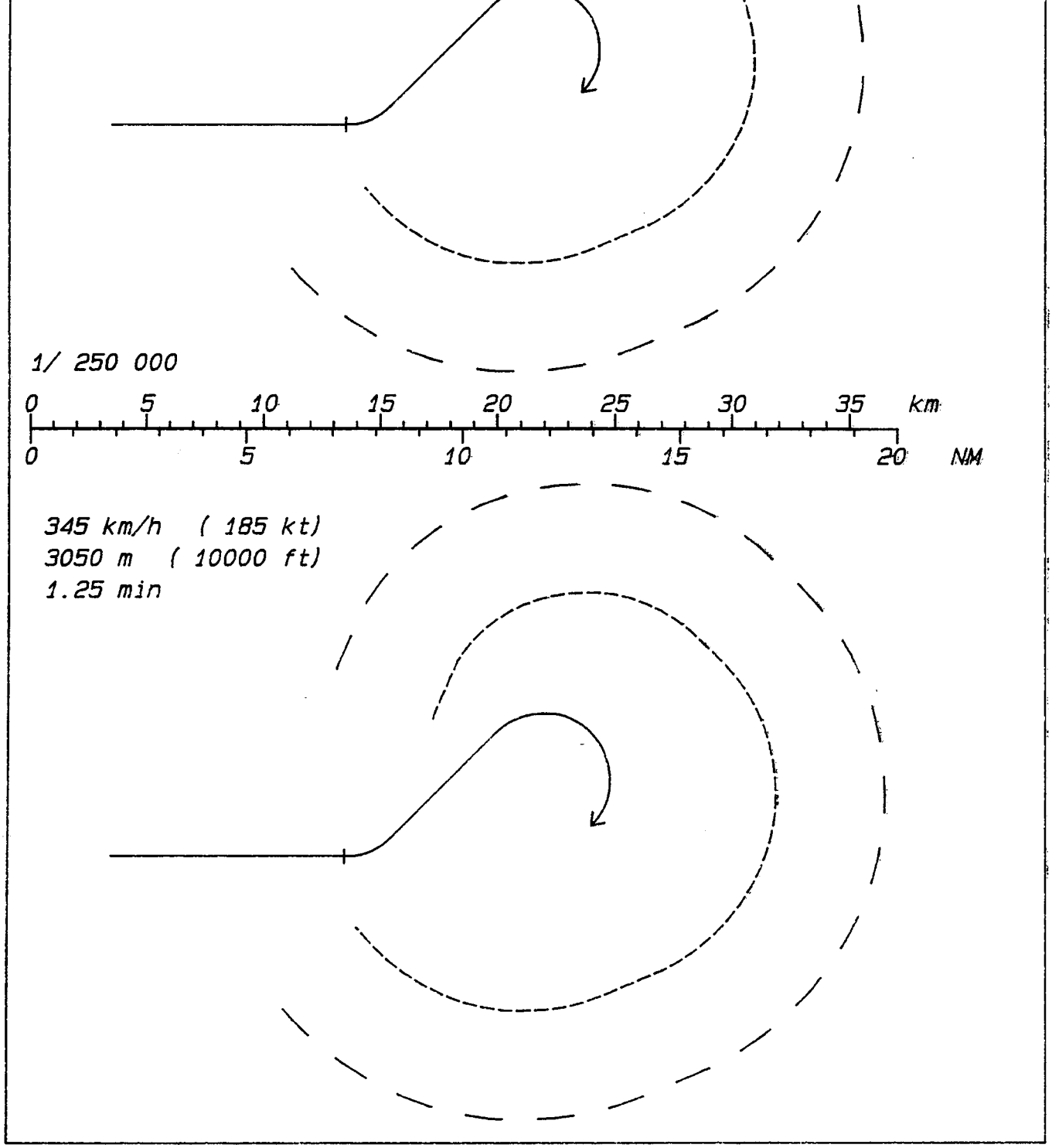
1/ 250 000

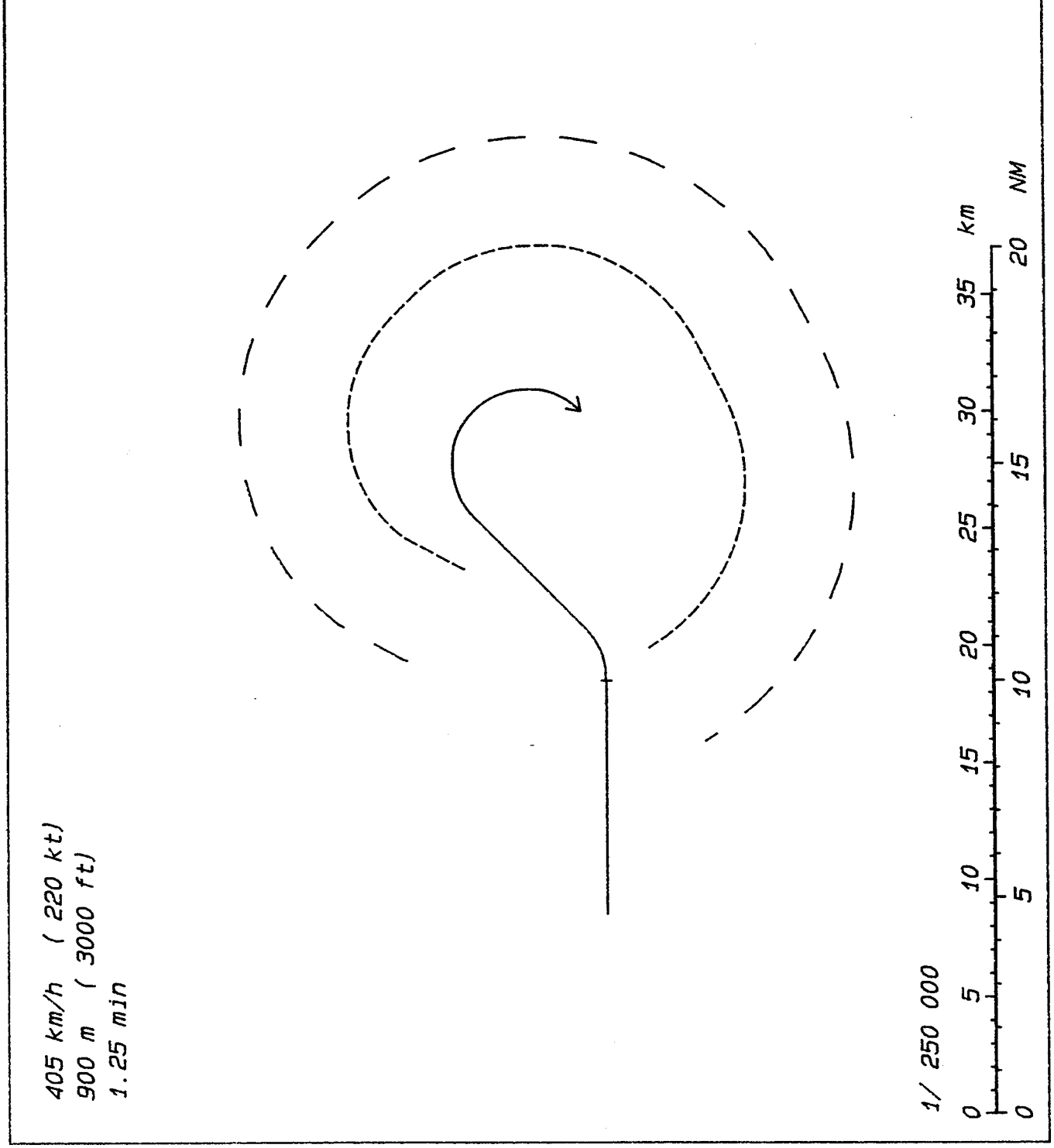
260 km/h (140 kt)
1850 m (6000 ft)
1 min

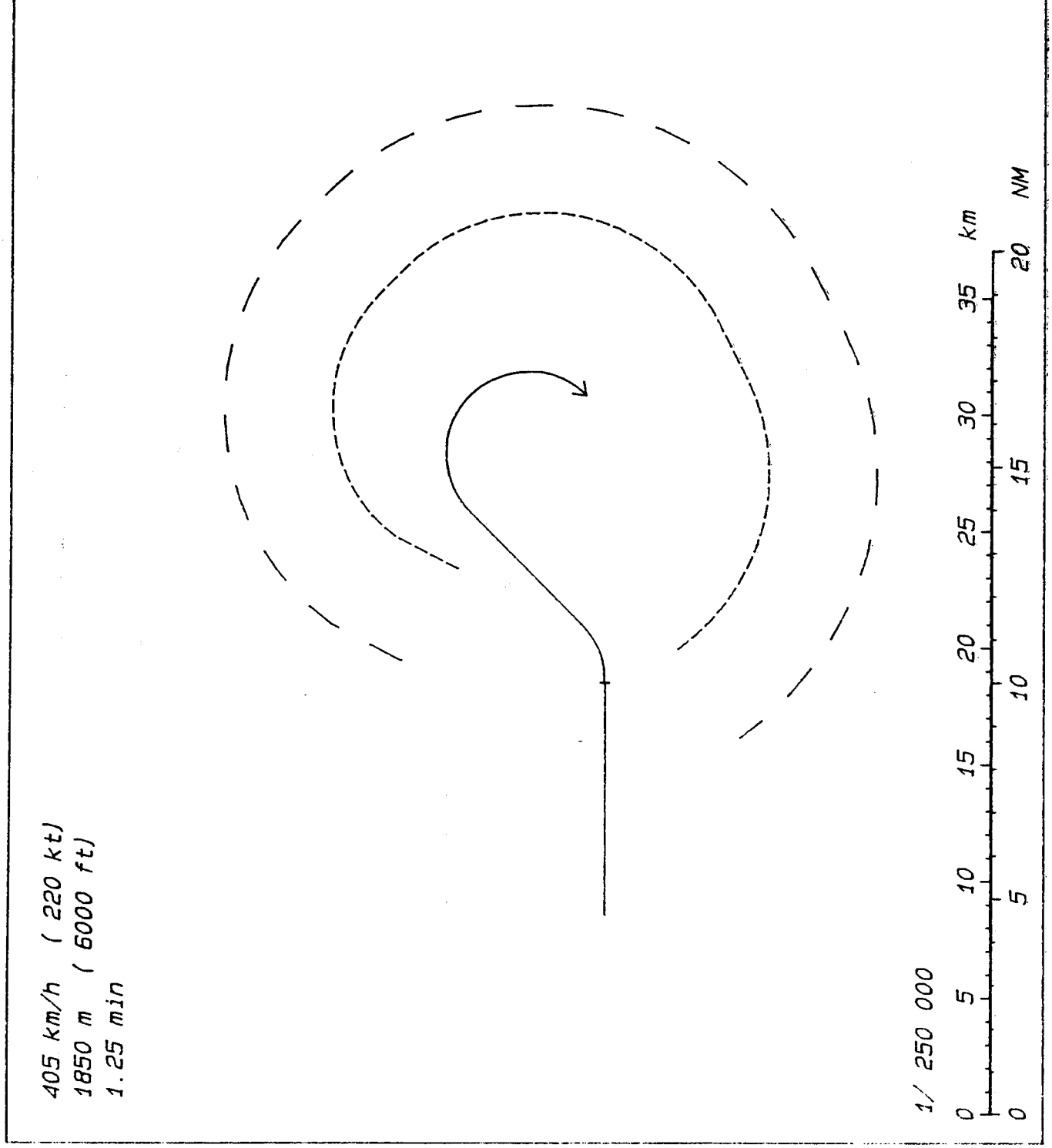


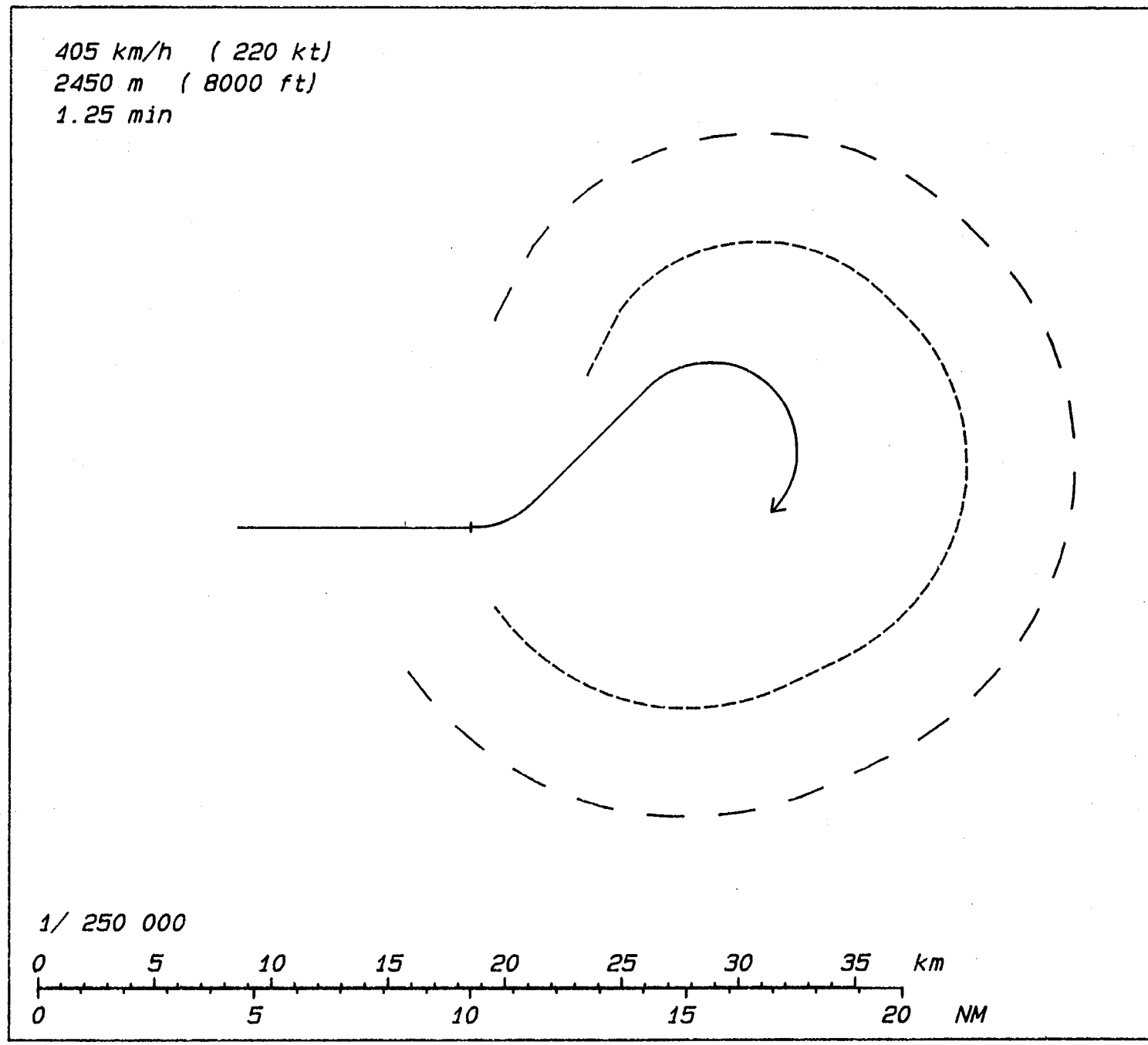

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
260 km/h (140 kt)
3050 m (10000 ft)
1 min

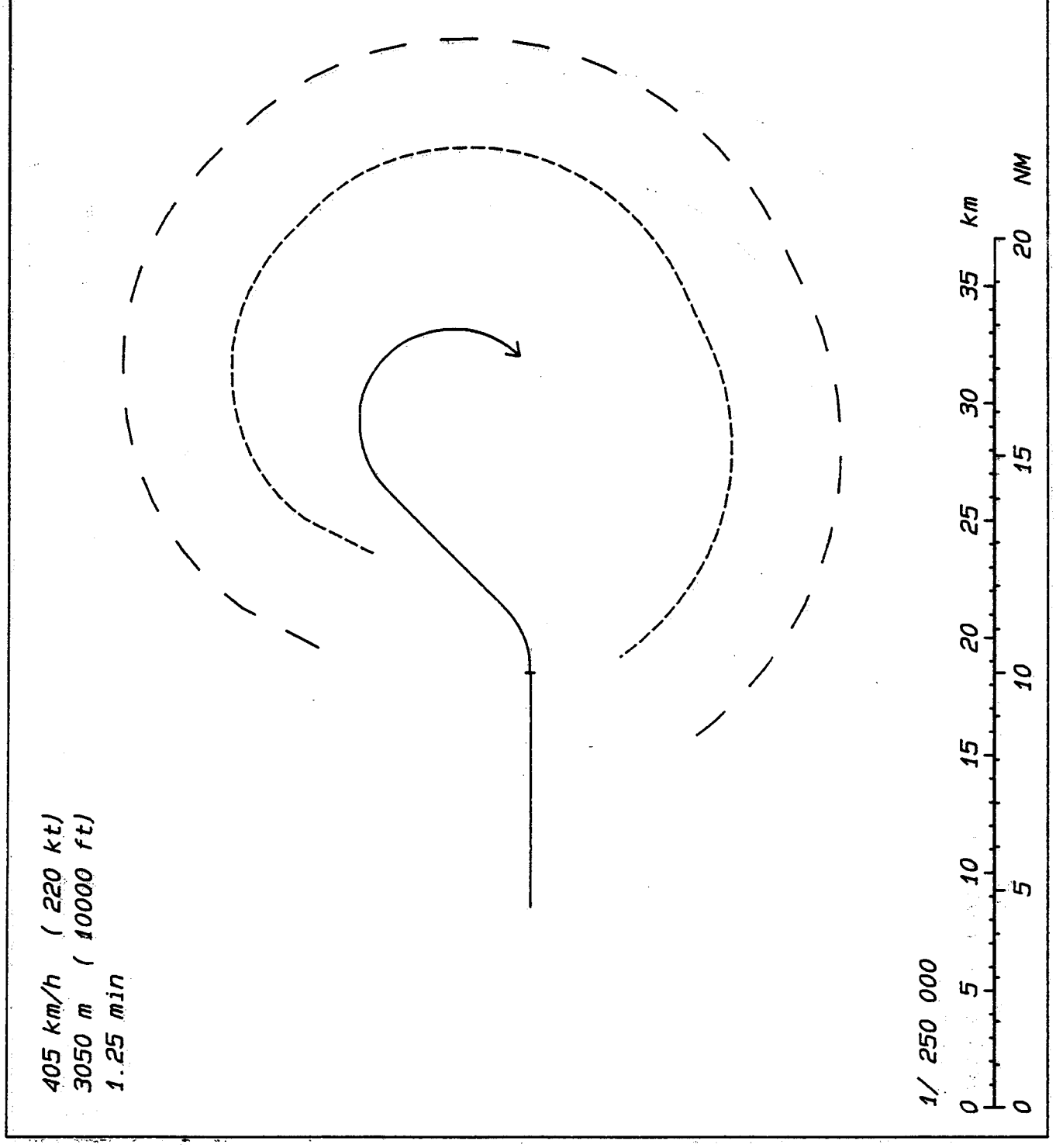

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
1850 m (6000 ft)
1.25 min

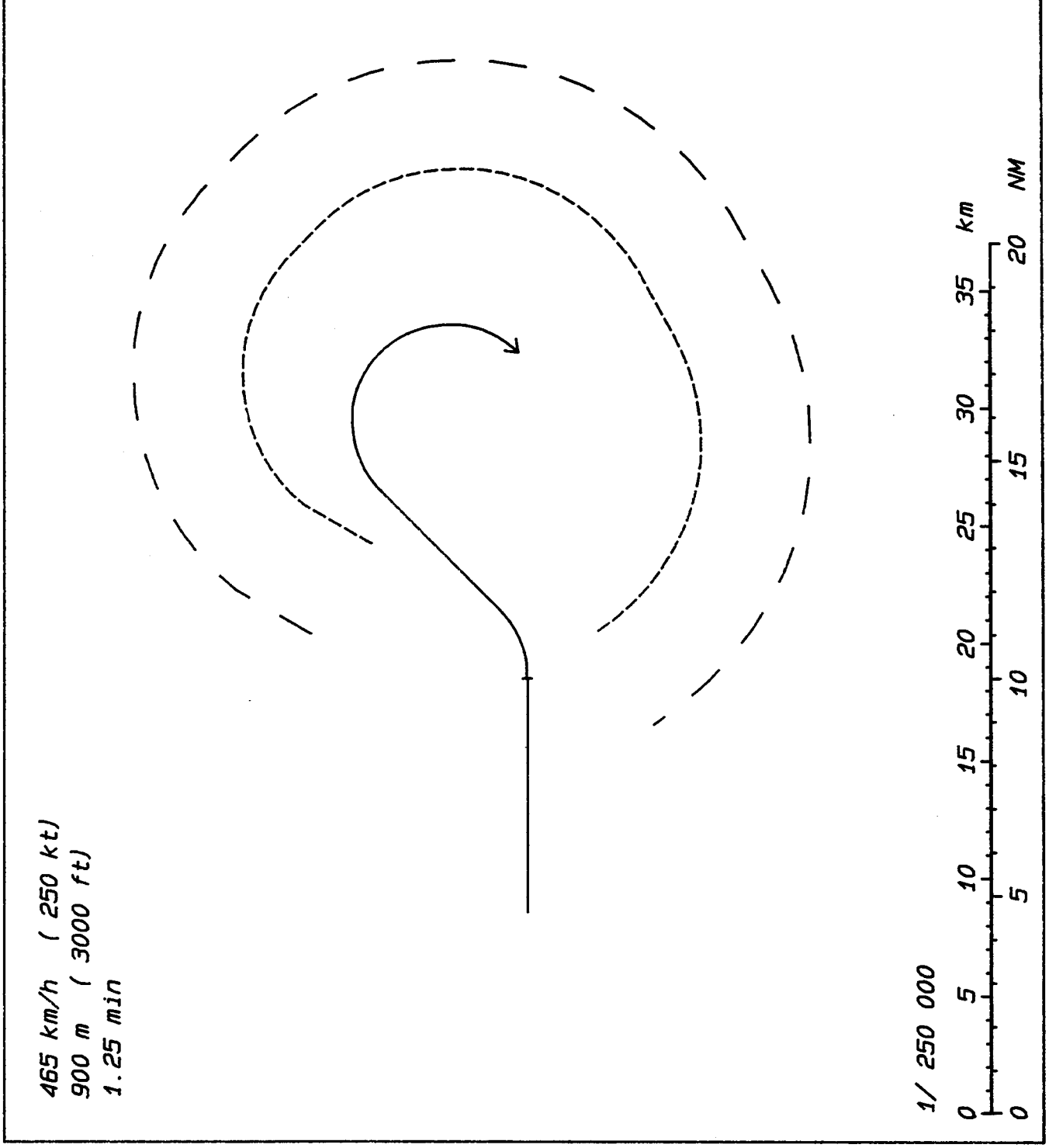

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
3050 m (10000 ft)
1.25 min

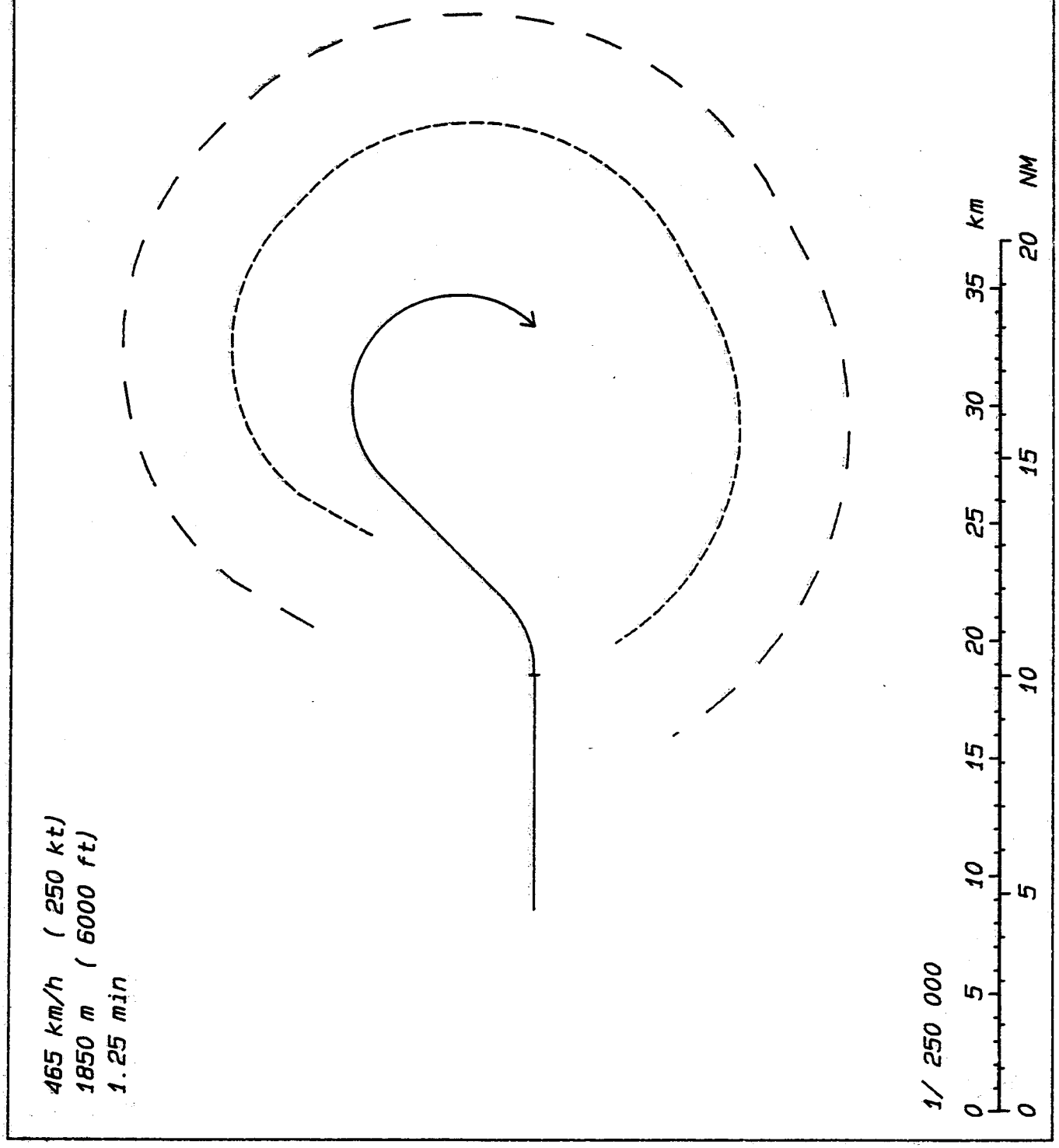

405 km/h (220 kt)
900 m (3000 ft)
1.25 min
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM

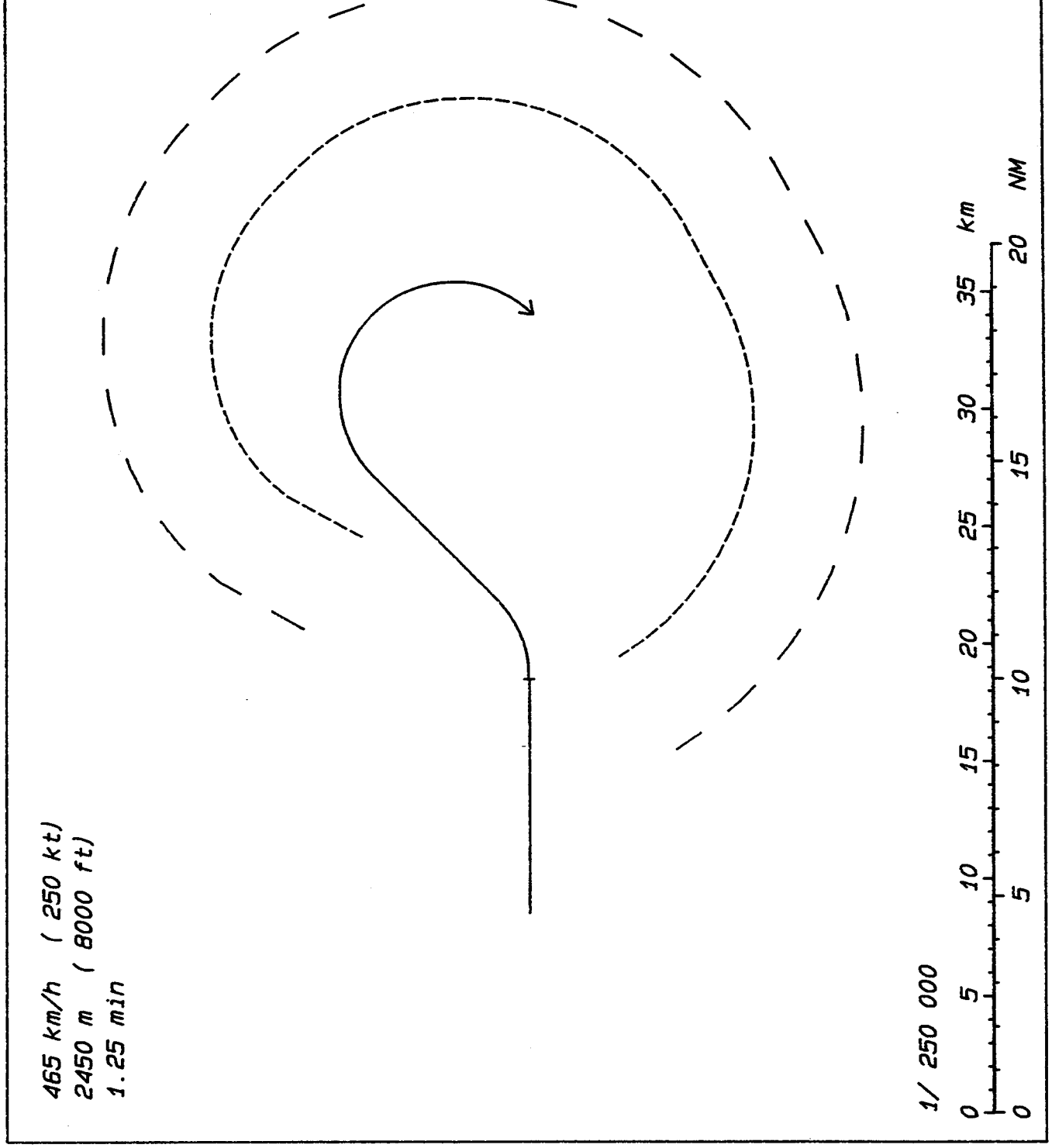

405 km/h (220 kt)
1850 m (6000 ft)
1.25 min
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM

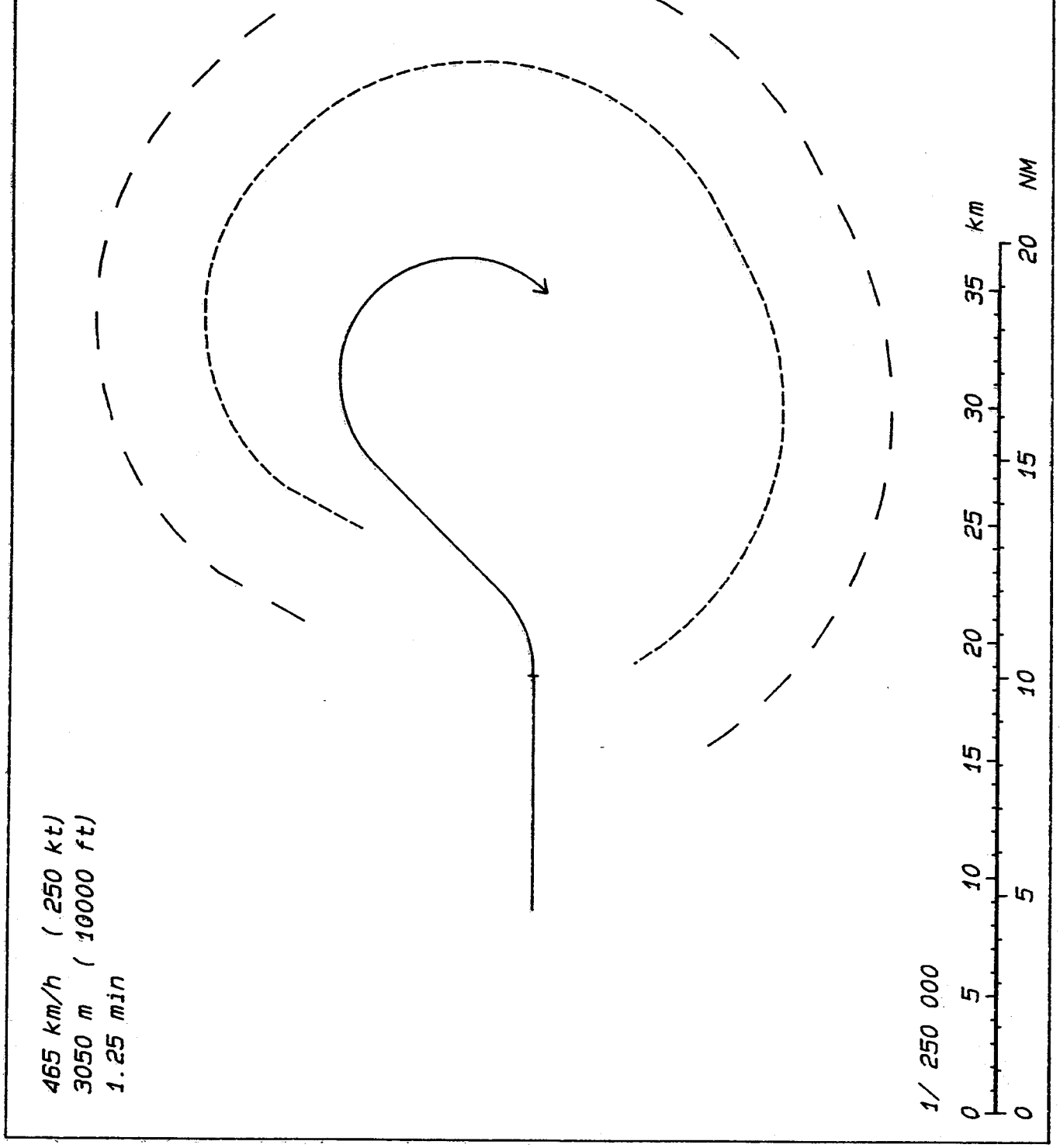

405 km/h (220 kt)
2450 m (8000 ft)
1.25 min
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM

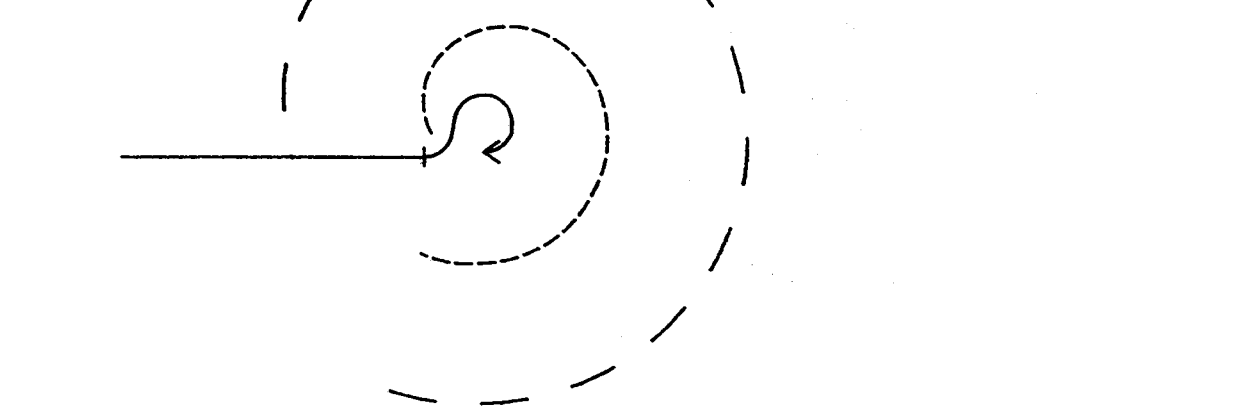

405 km/h (220 kt)
3050 m (10000 ft)
1.25 min
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM


465 km/h (250 kt)
900 m (3000 ft)
1.25 min
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM

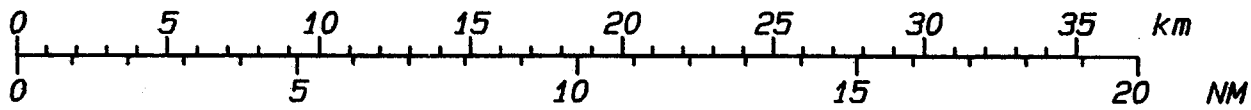

465 km/h (250 kt)
1850 m (6000 ft)
1.25 min
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM


465 km/h (250 kt)
2450 m (8000 ft)
1.25 min
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM

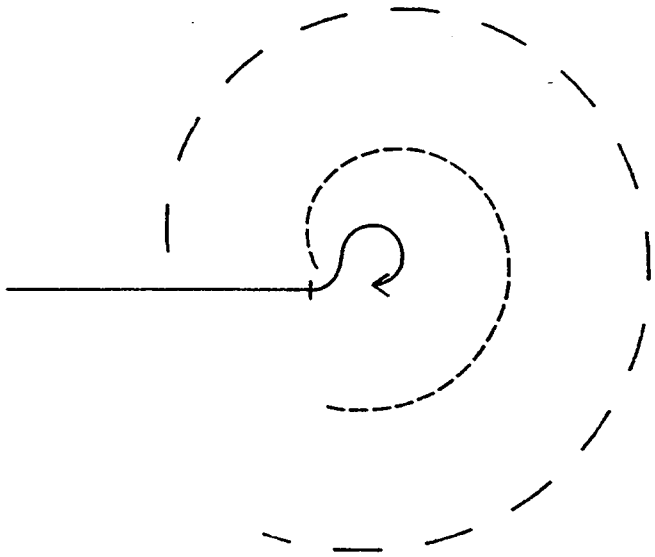

465 km/h (250 kt)
3050 m (10000 ft)
1.25 min
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM

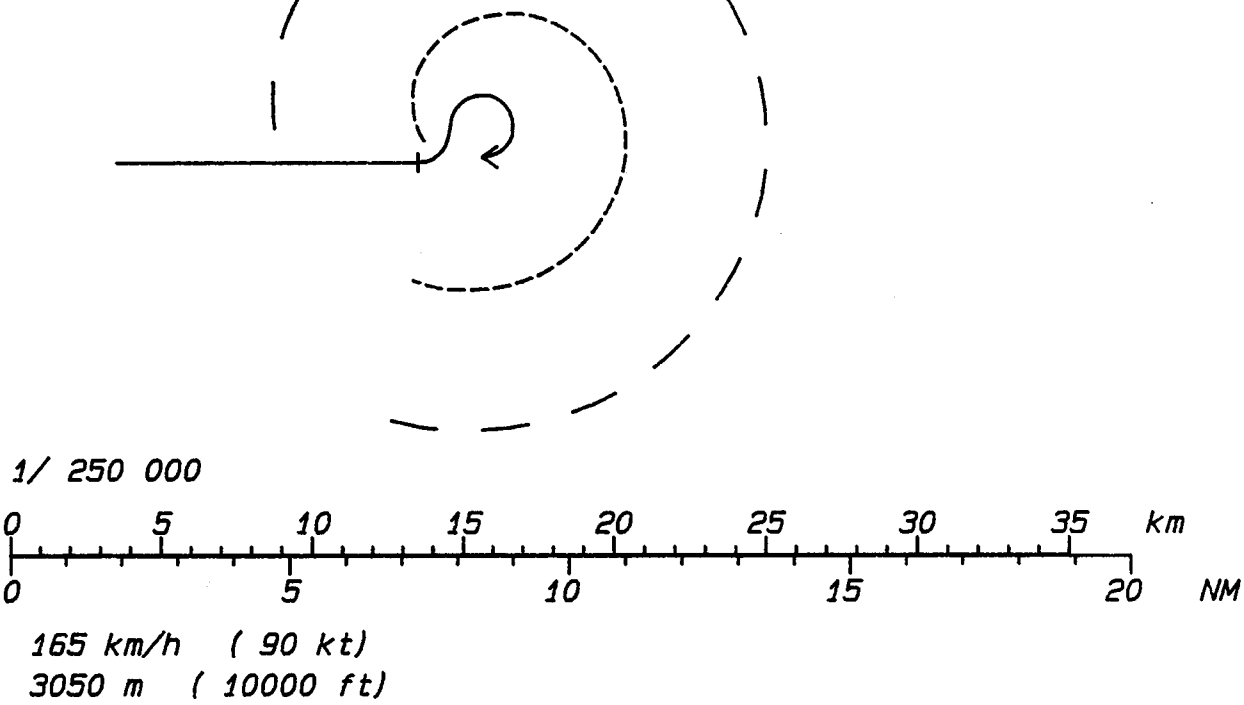


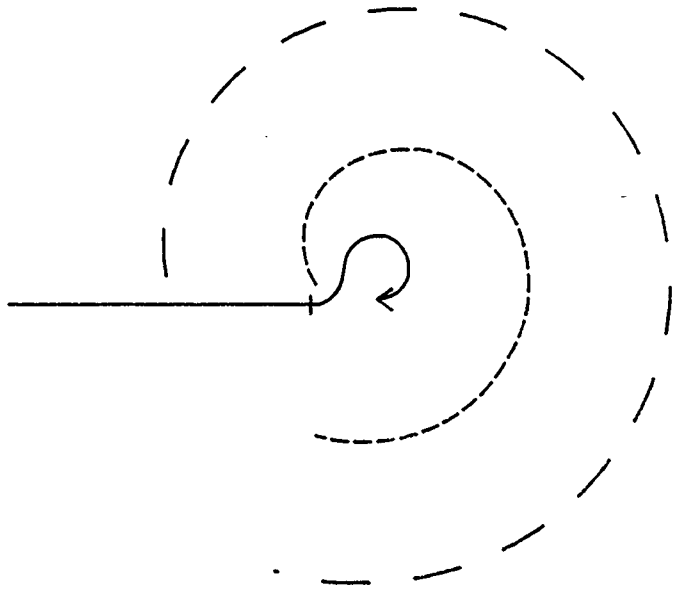
1/ 250 000

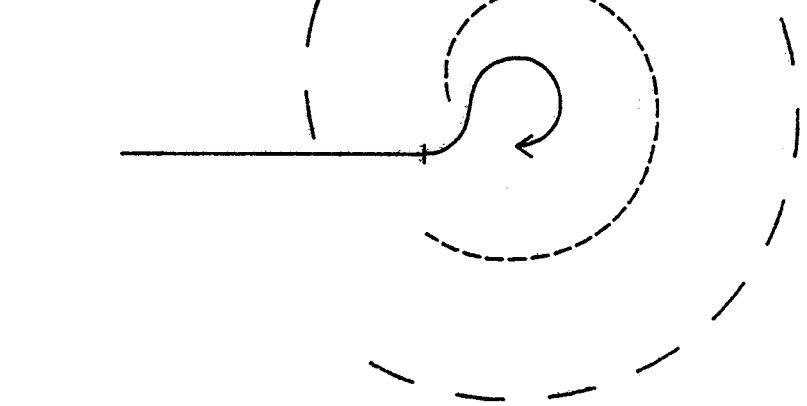


165 km/h (90 kt)
1850 m (6000 ft)

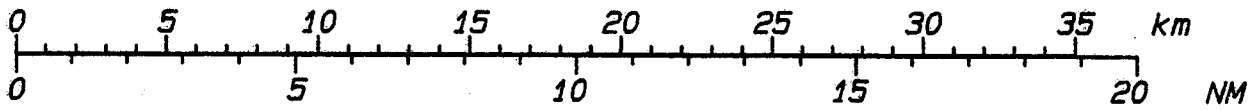



1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
165 km/h (90 kt)
3050 m (10000 ft)

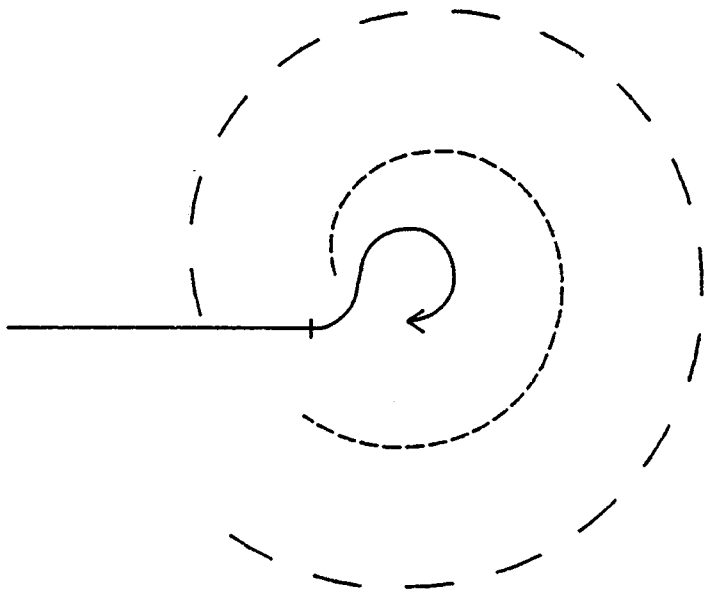


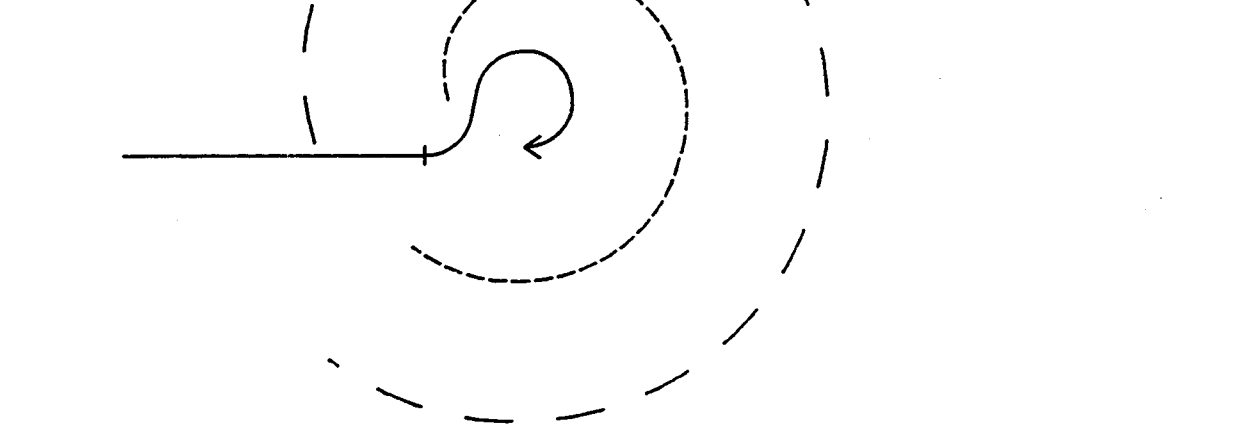


1/ 250 000



260 km/h (140 kt)
1850 m (6000 ft)





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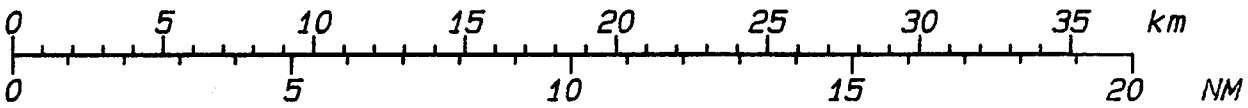
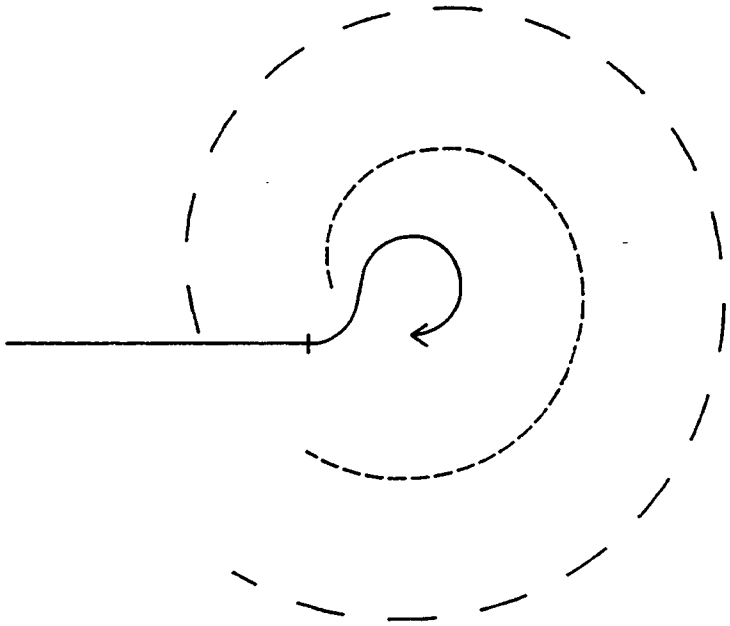
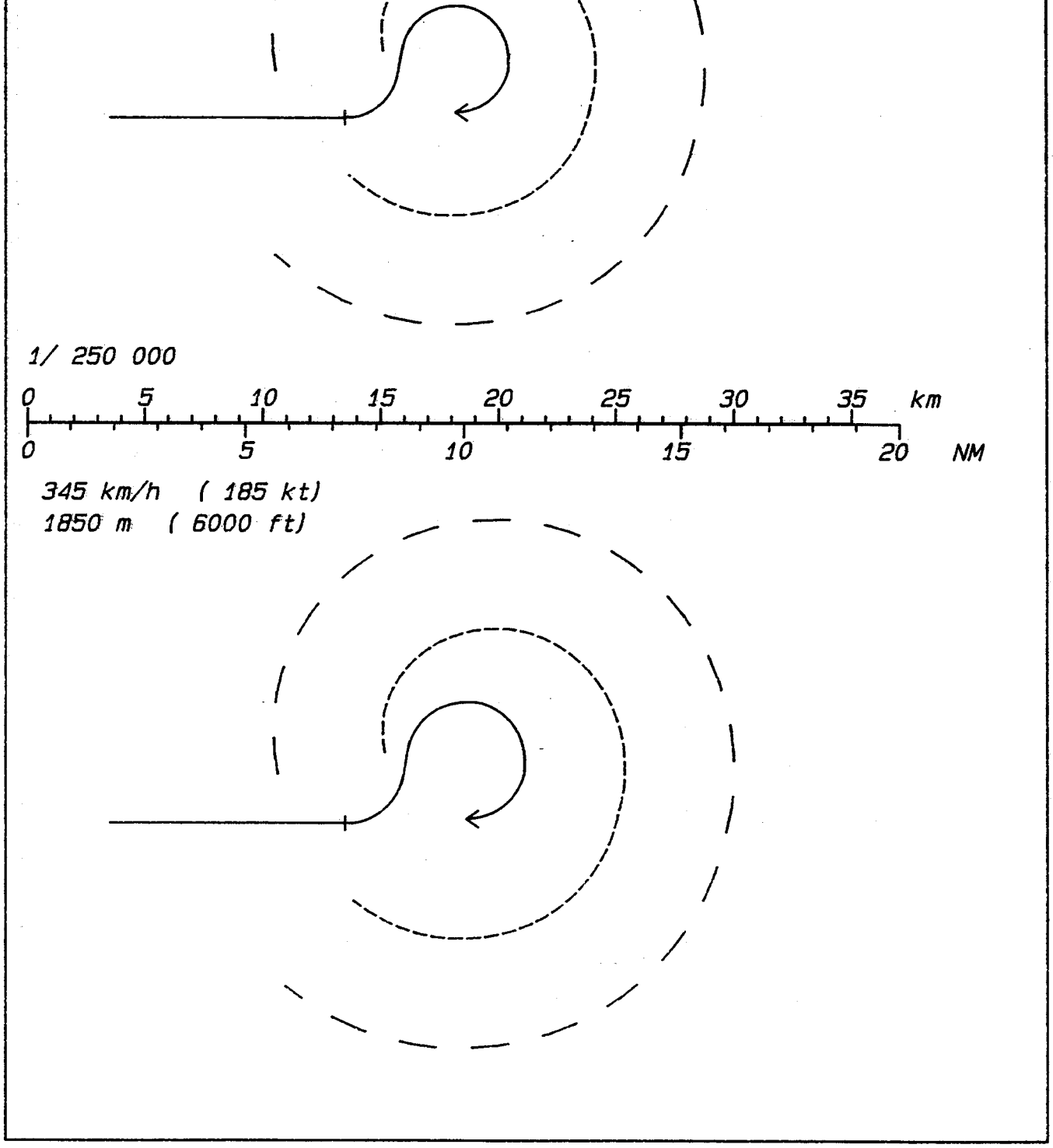
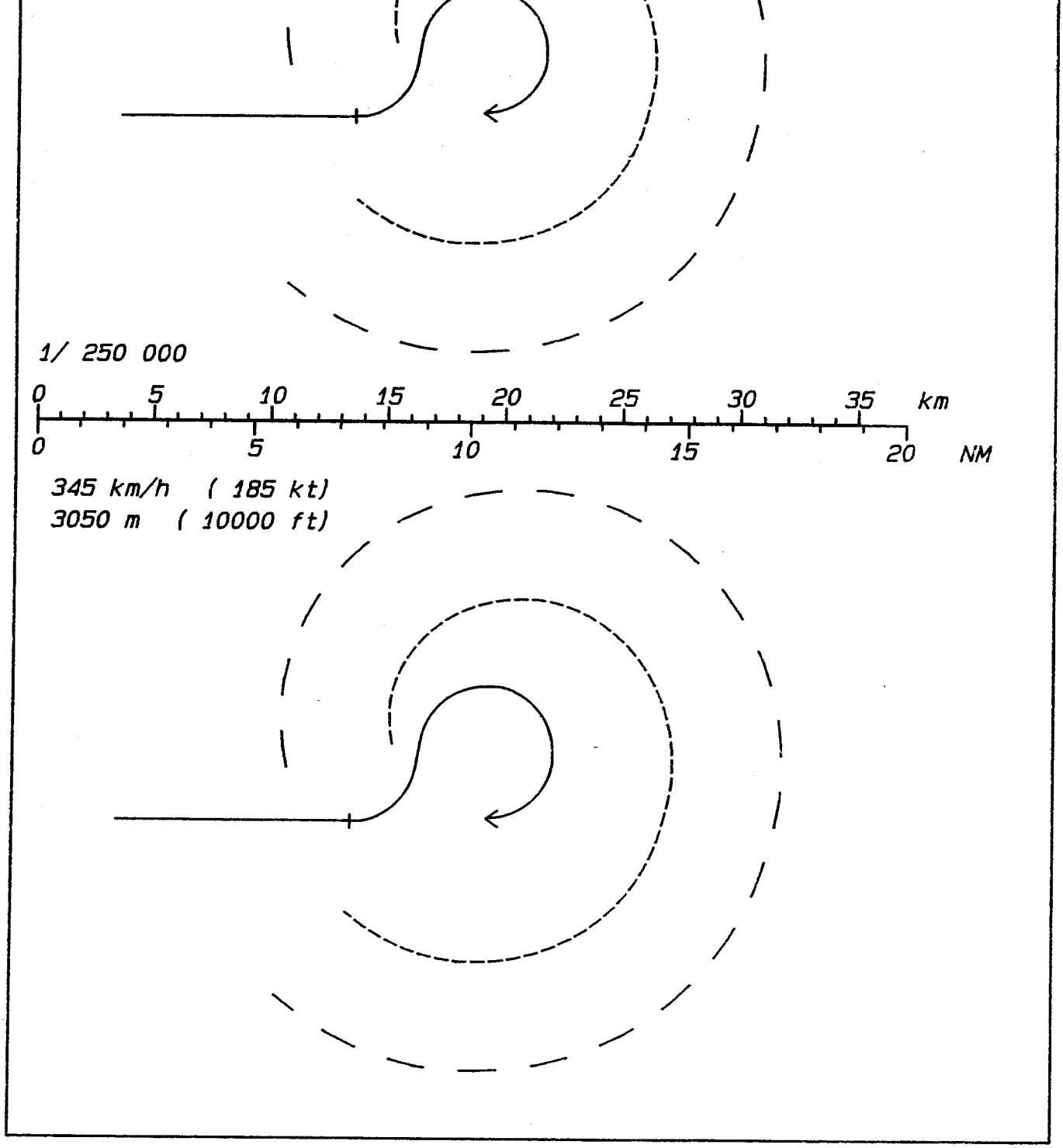
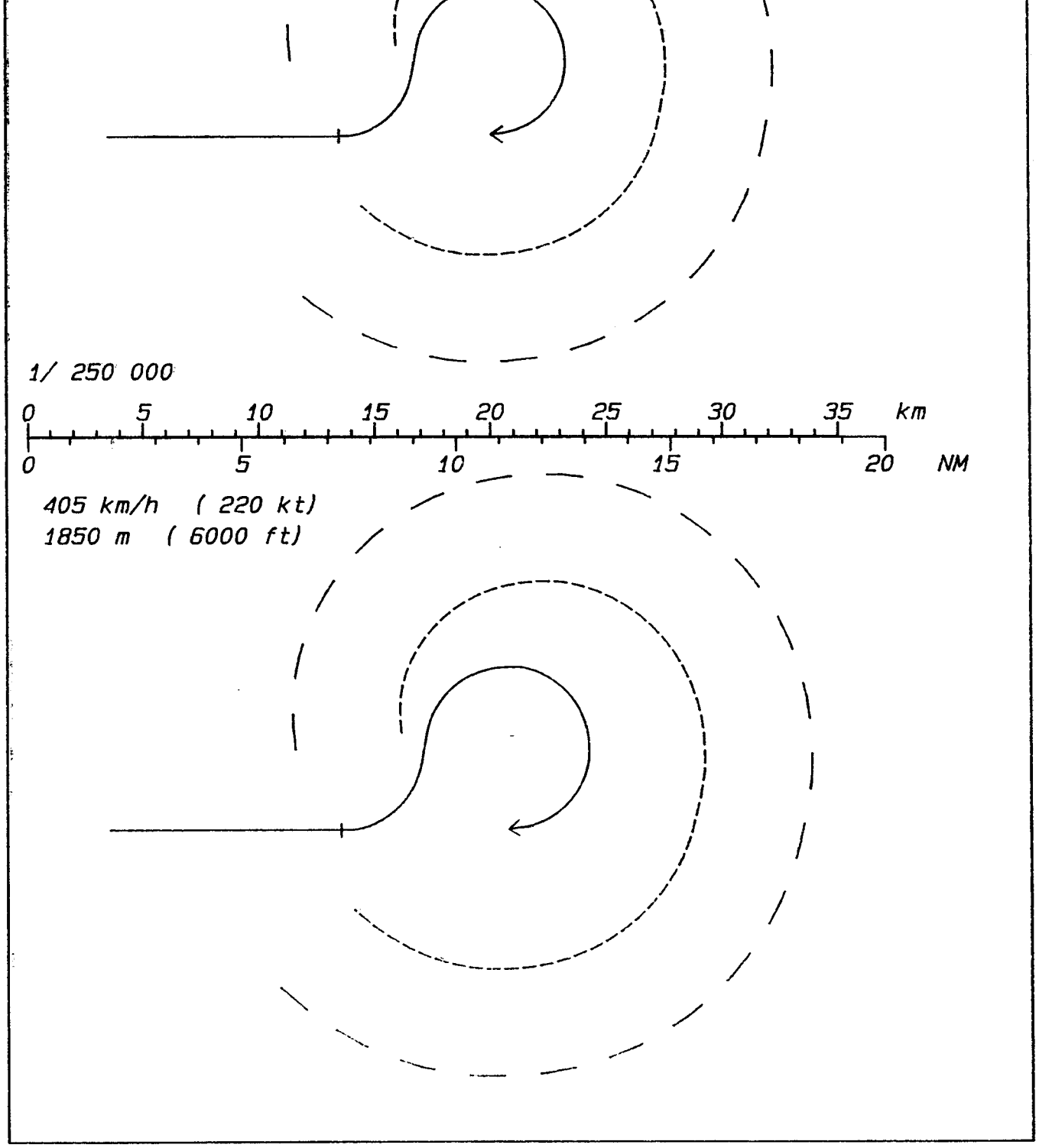


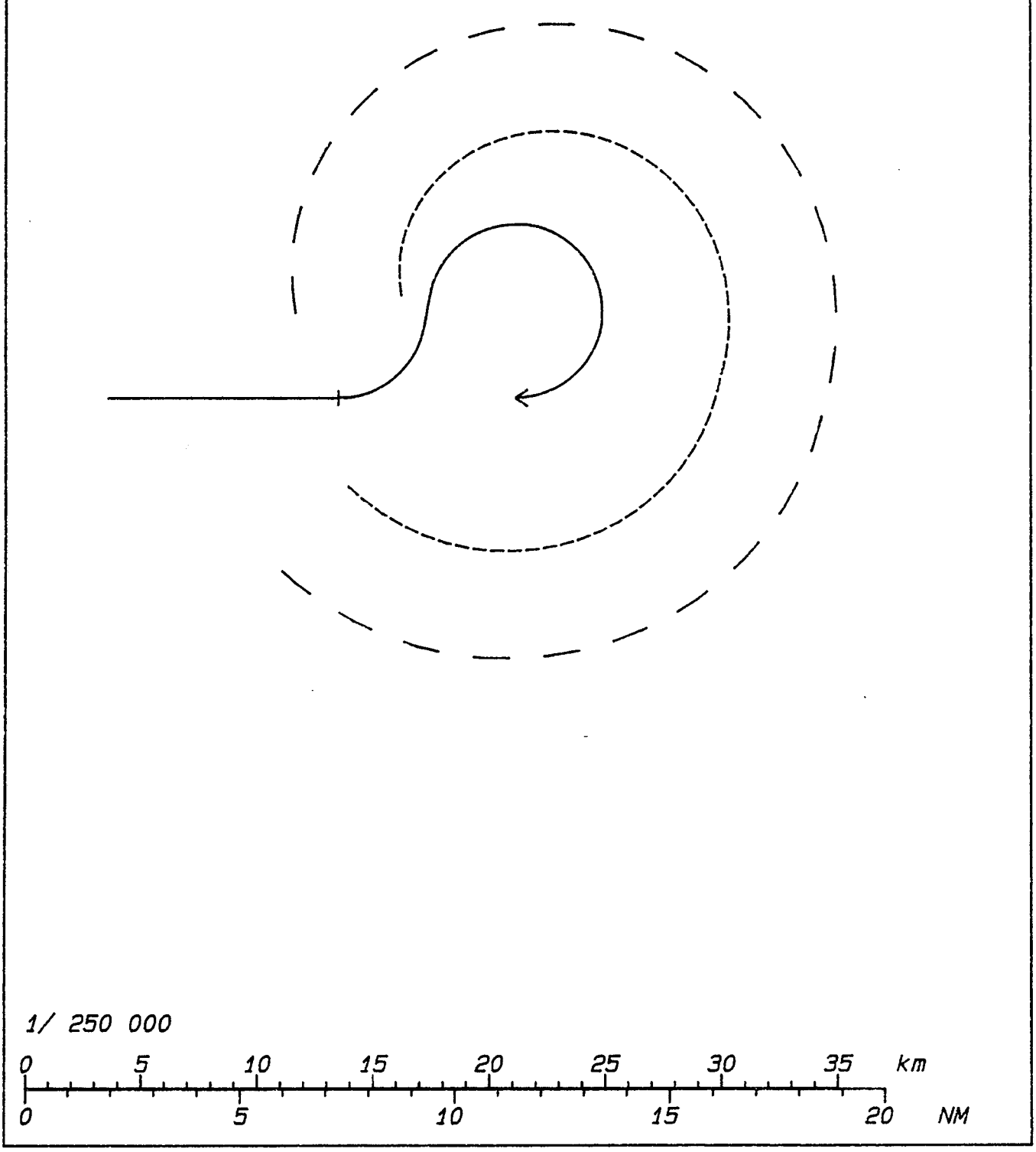
260 km/h (140 kt)
3050 m (10000 ft)

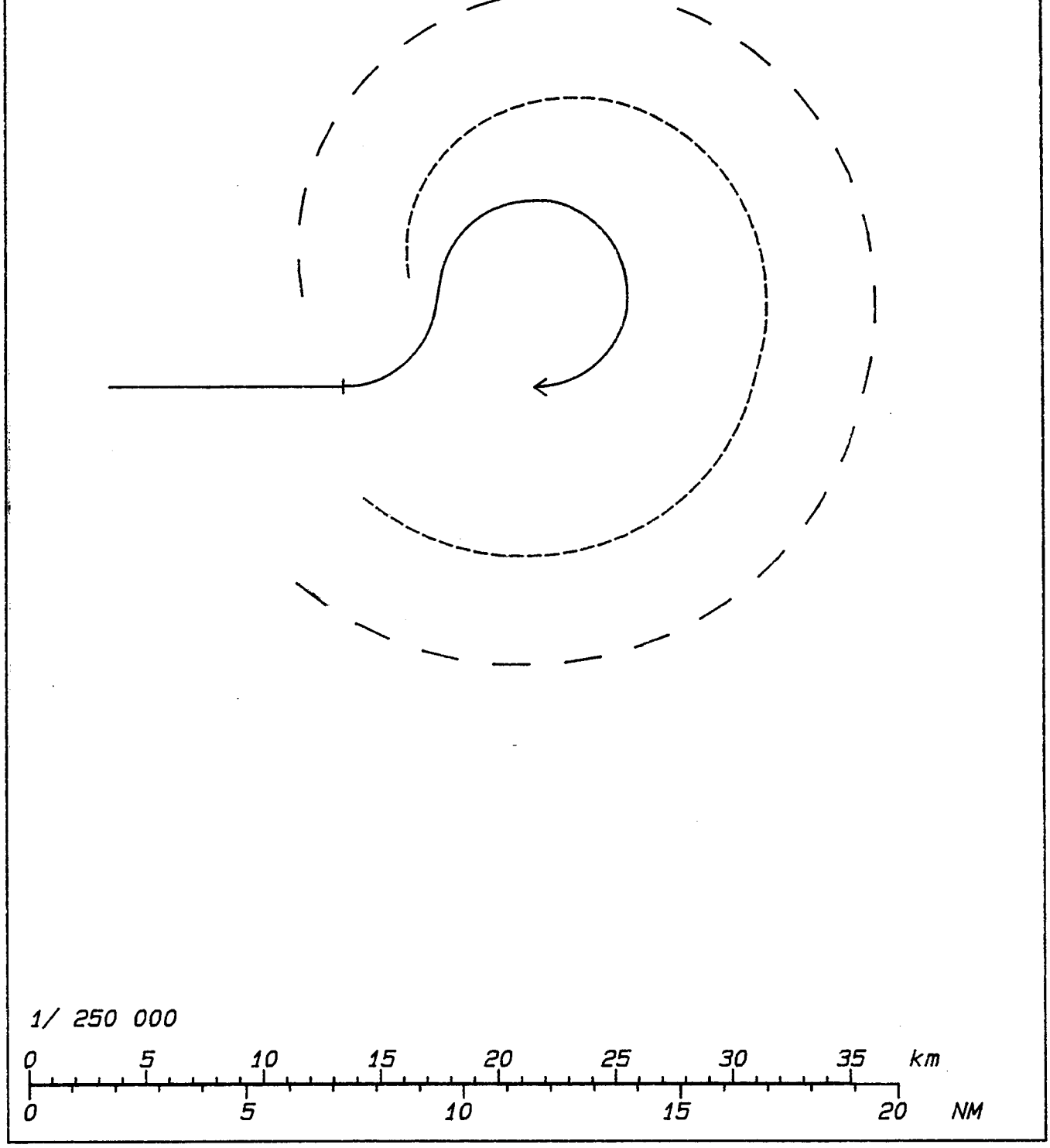


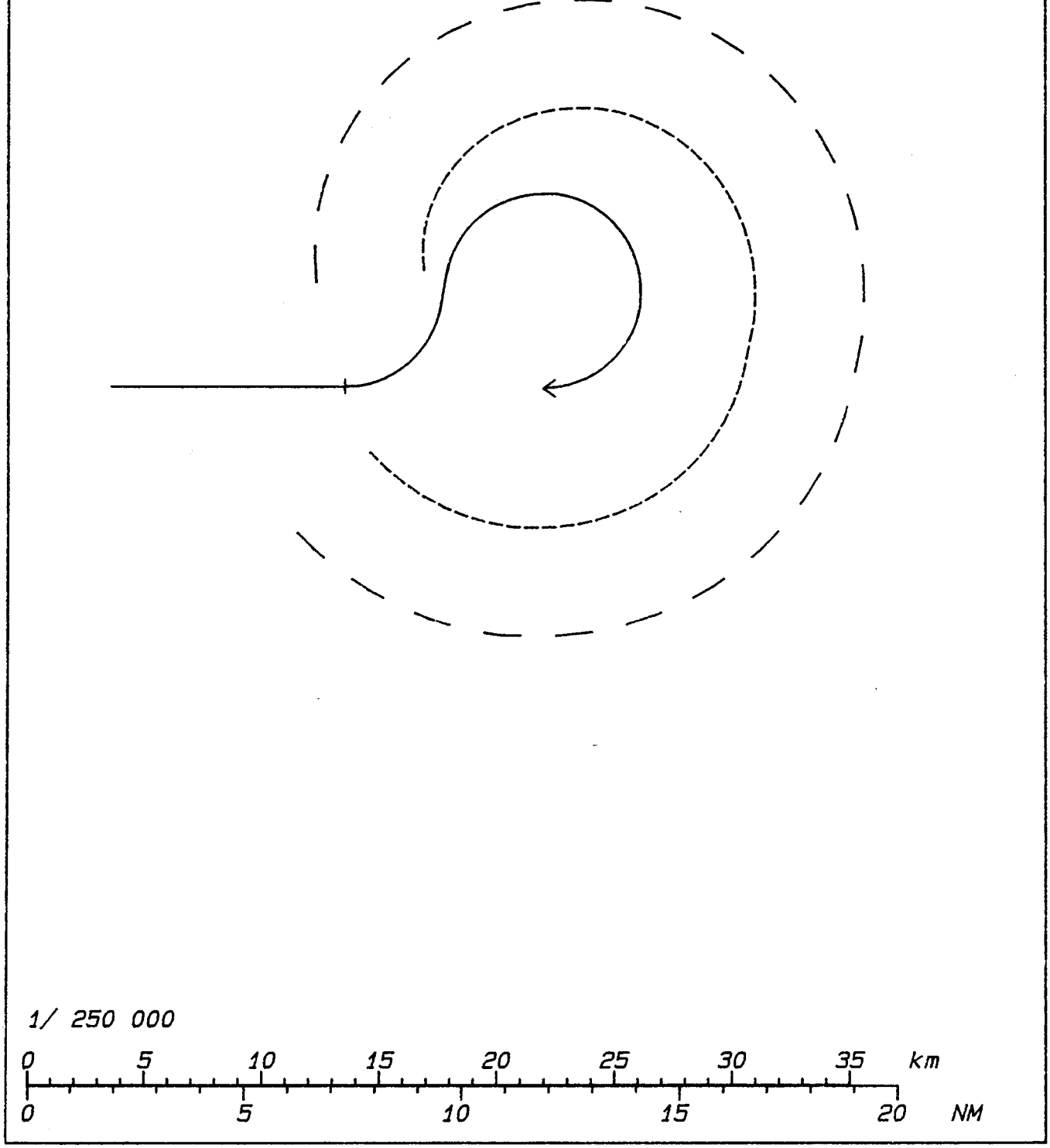

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
1850 m (6000 ft)

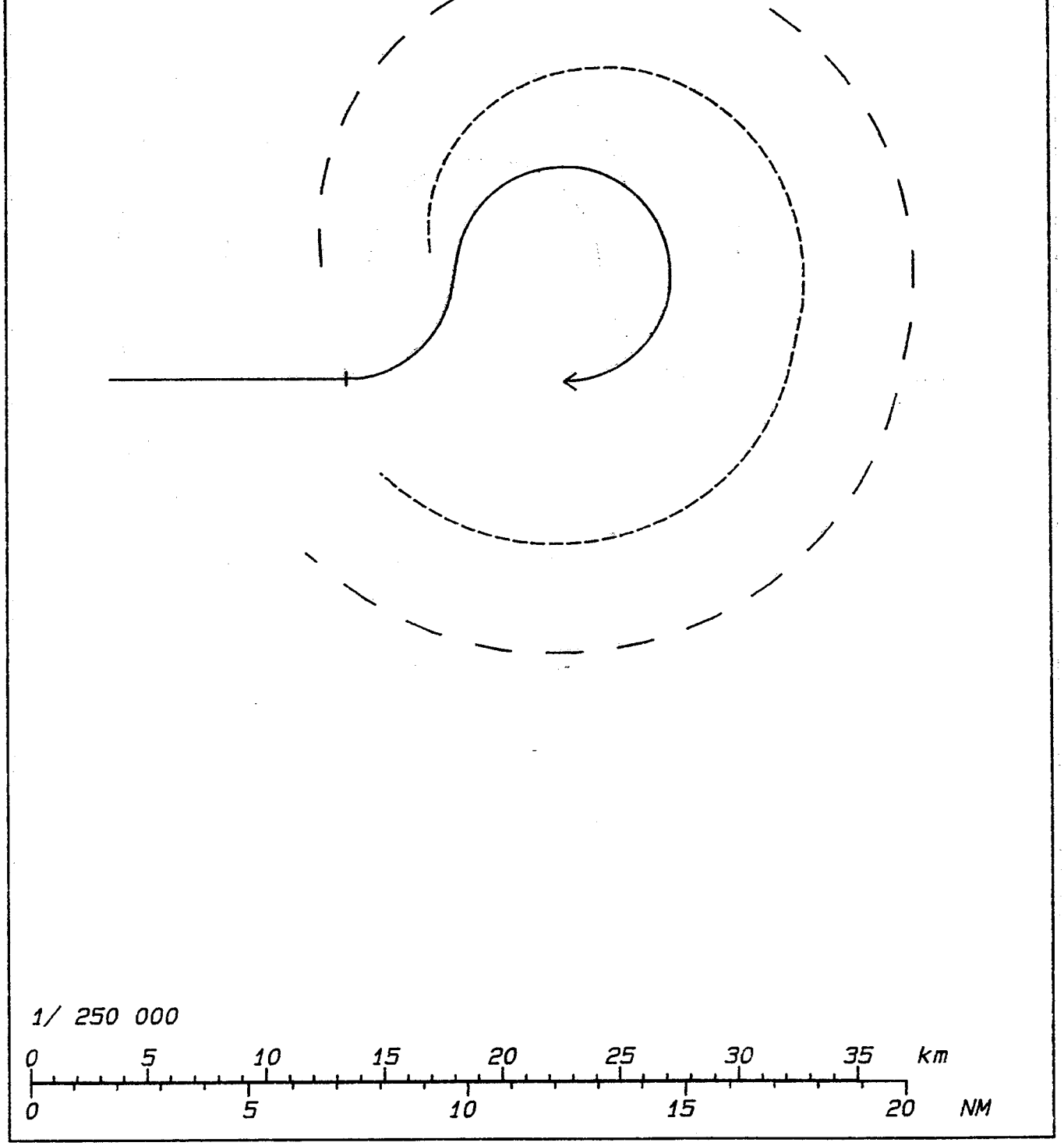

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
345 km/h (185 kt)
3050 m (10000 ft)

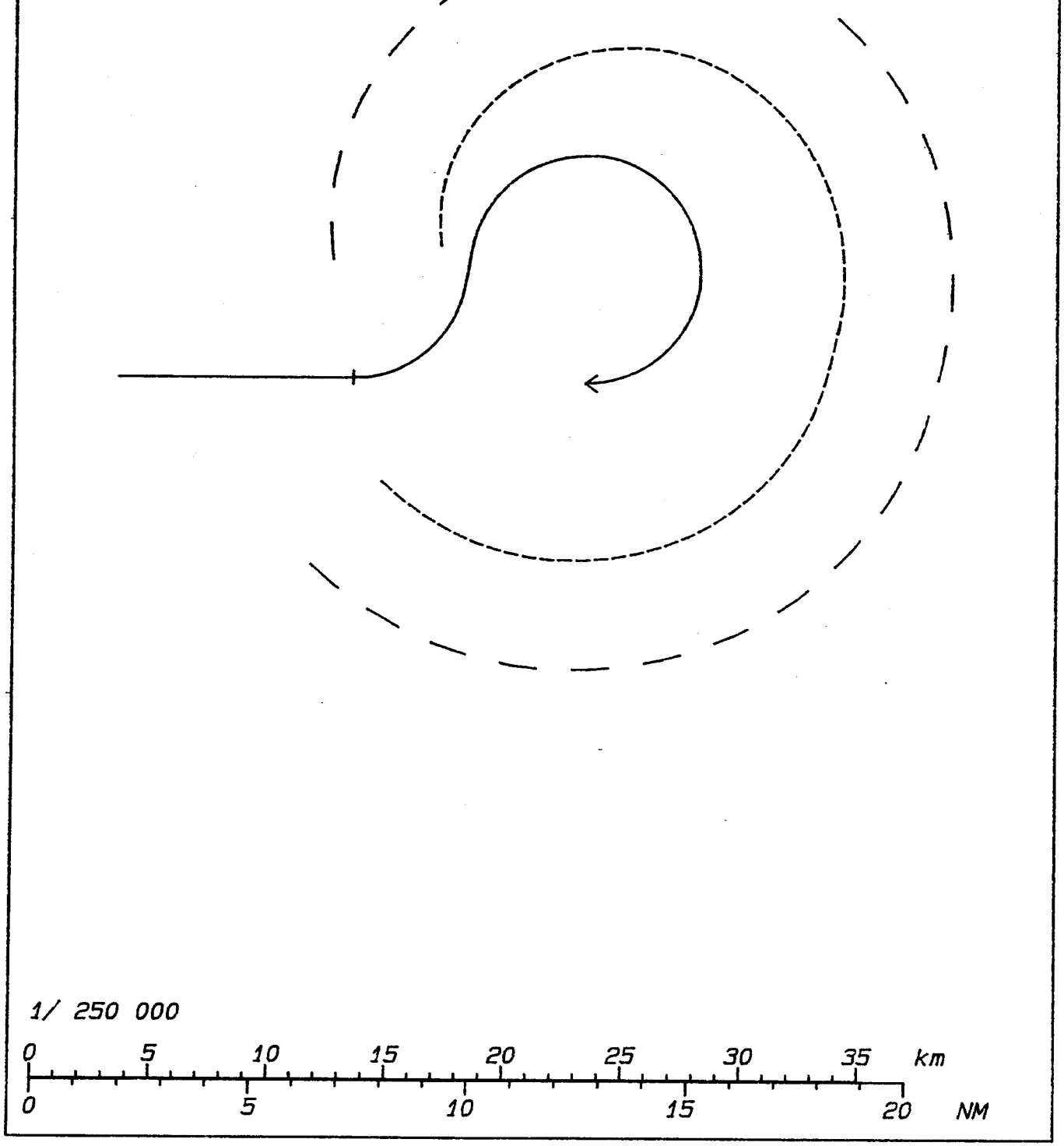

1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
405 km/h (220 kt)
1850 m (6000 ft)

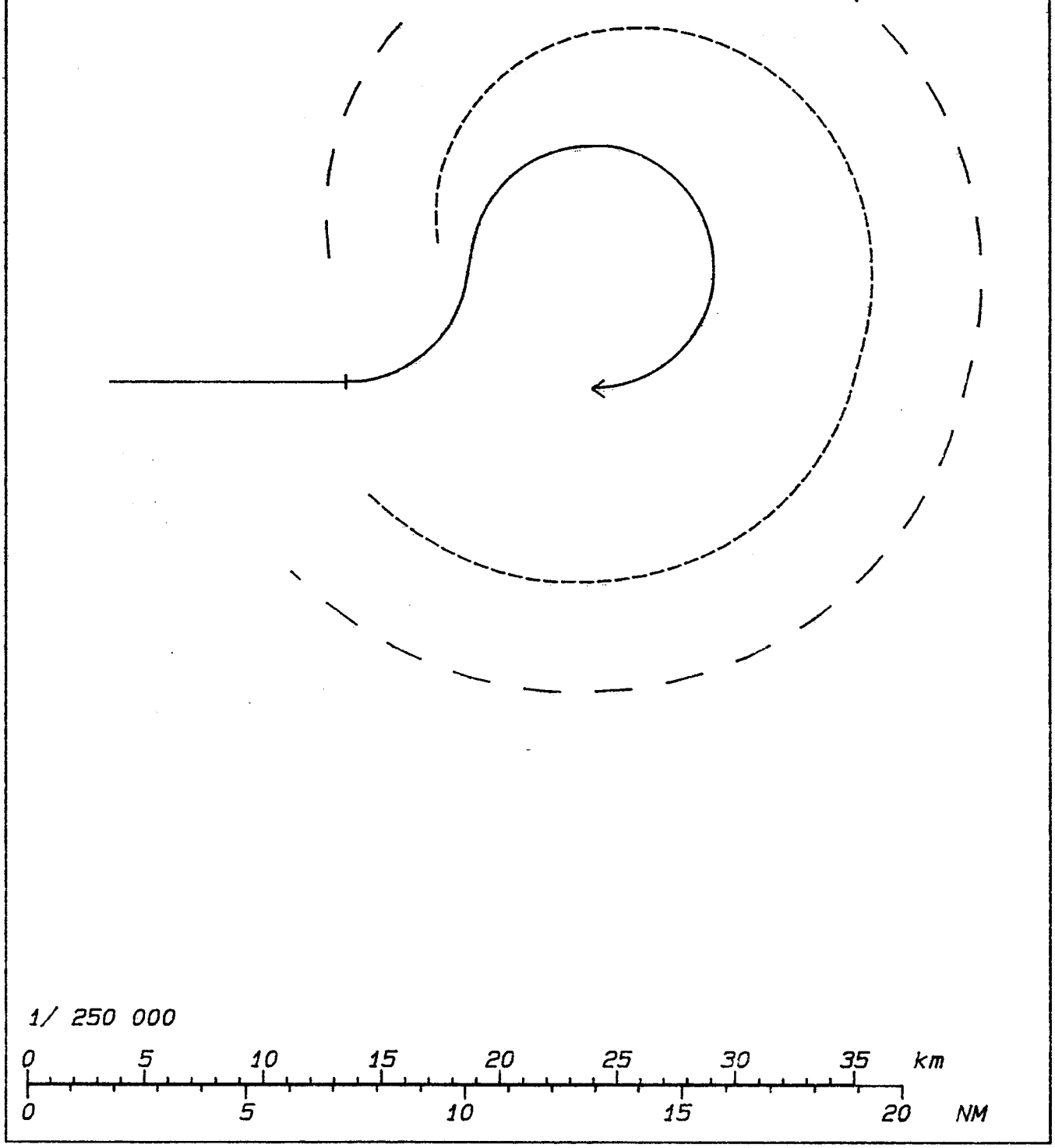

1/ 250 000
0
5
10
15
20
25
30
35
km
0
5
10
15
20
NM


1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM


1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM


1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM

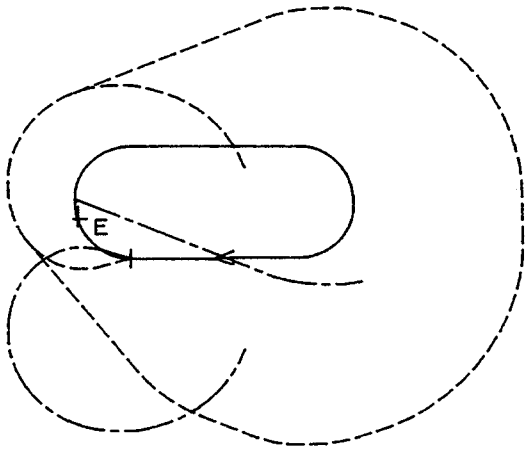

1/ 250 000
0
5
10
15
20
25
30
35
km
0
5
10
15
20
NM


1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM

HOLDING TEMPLATES

H 1 - H 40

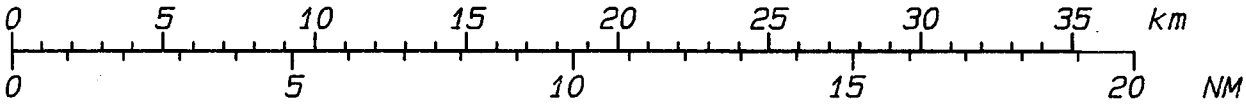
315 km/h (170 kt)
600 m (2000 ft)
1 min



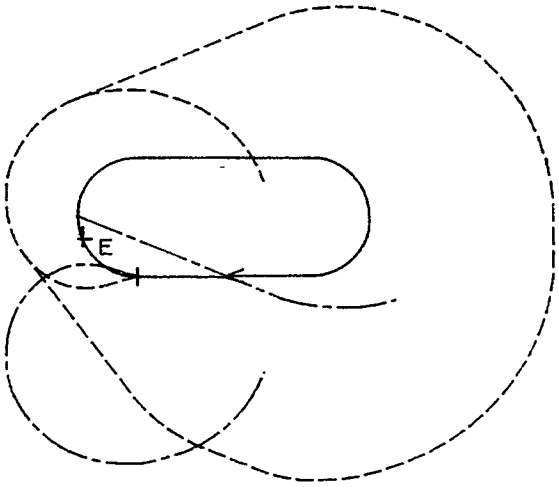
NDB

VOR

1/ 250 000



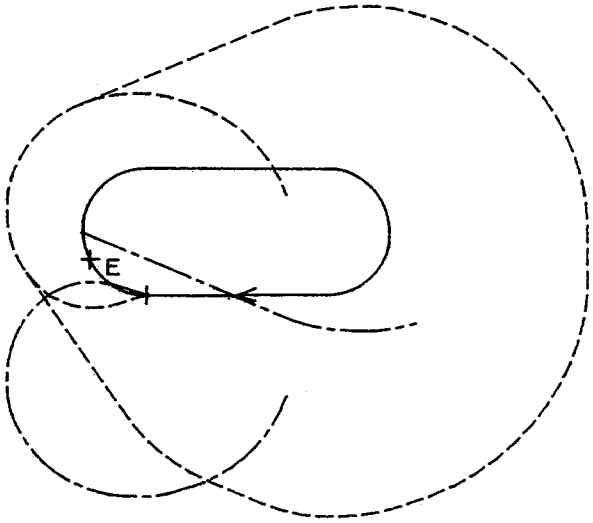
315 km/h (170 kt)
1200 m (4000 ft)
1 min



NDB

VOR

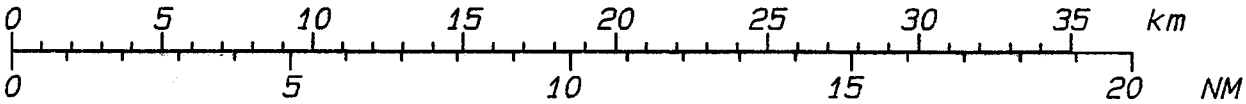
315 km/h (170 kt)
1850 m (6000 ft)
1 min



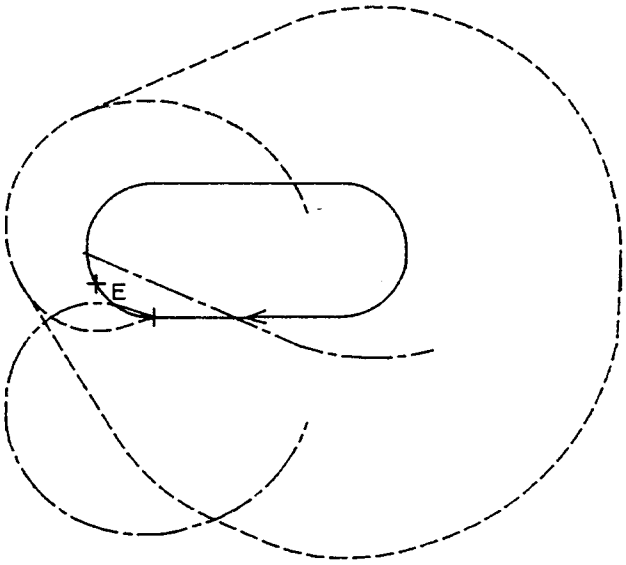
NDB

VOR

1/ 250 000



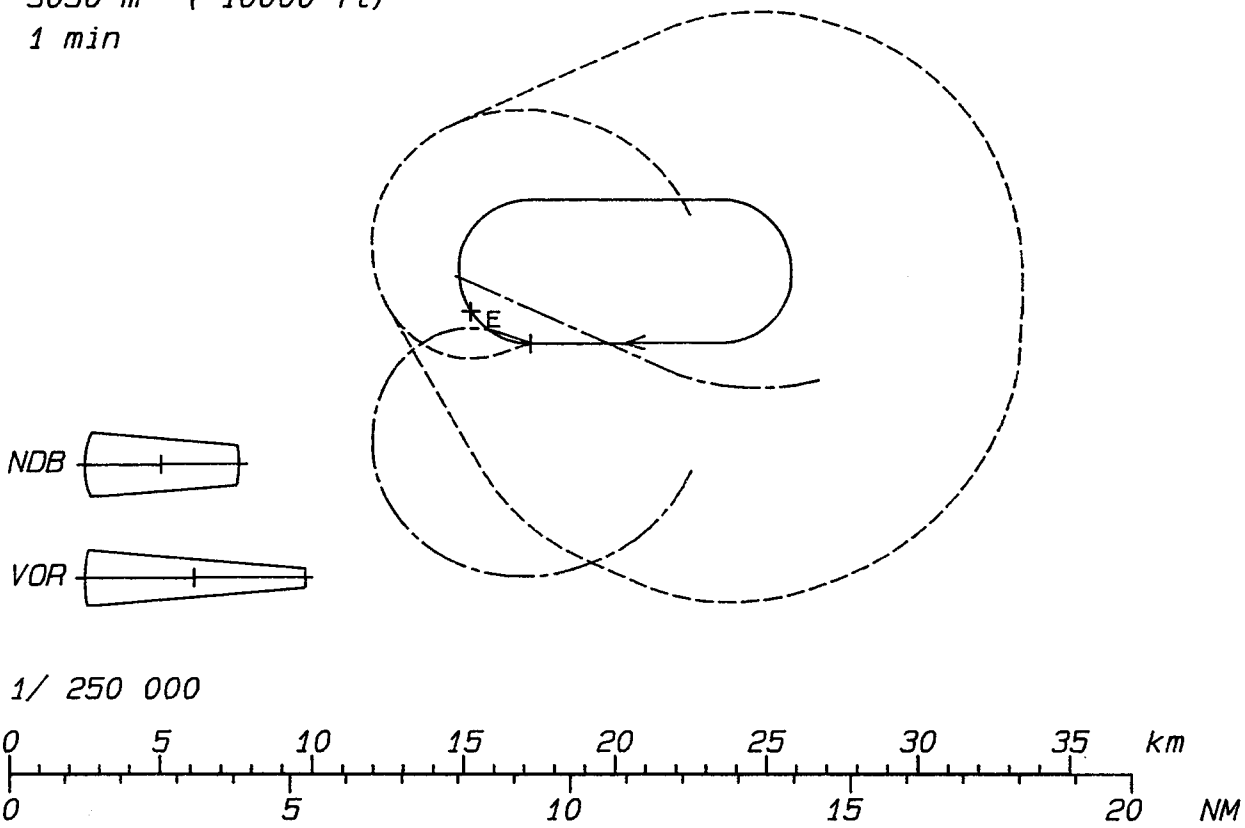
315 km/h (170 kt)
2450 m (8000 ft)
1 min



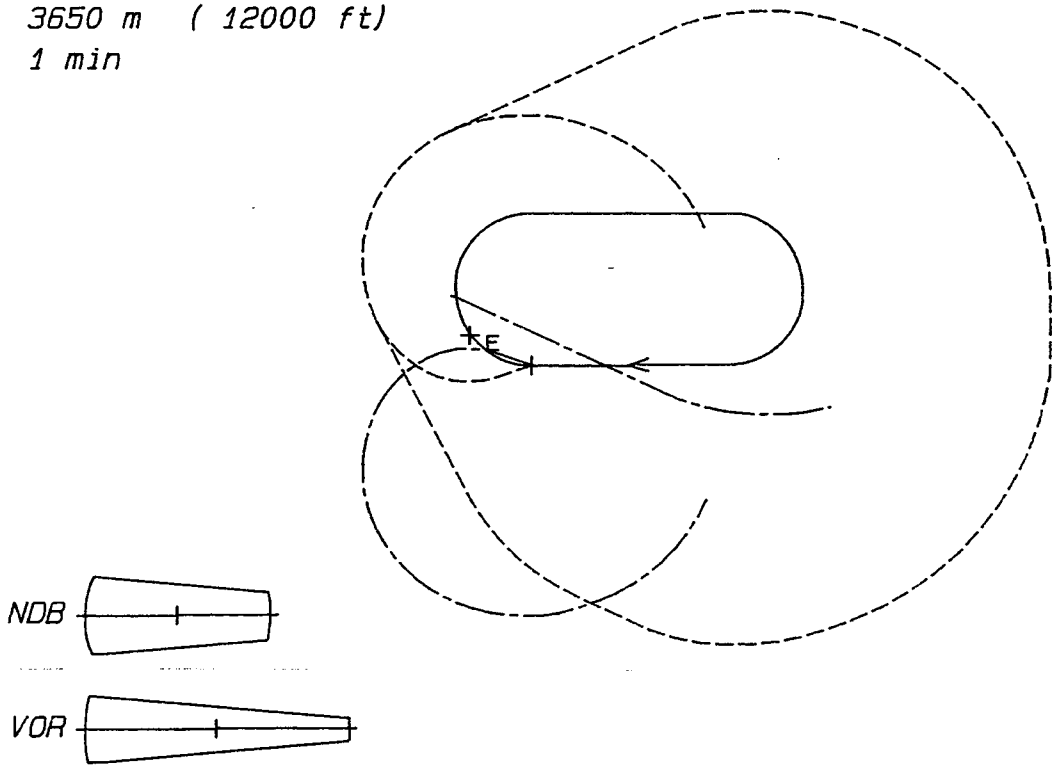
NDB

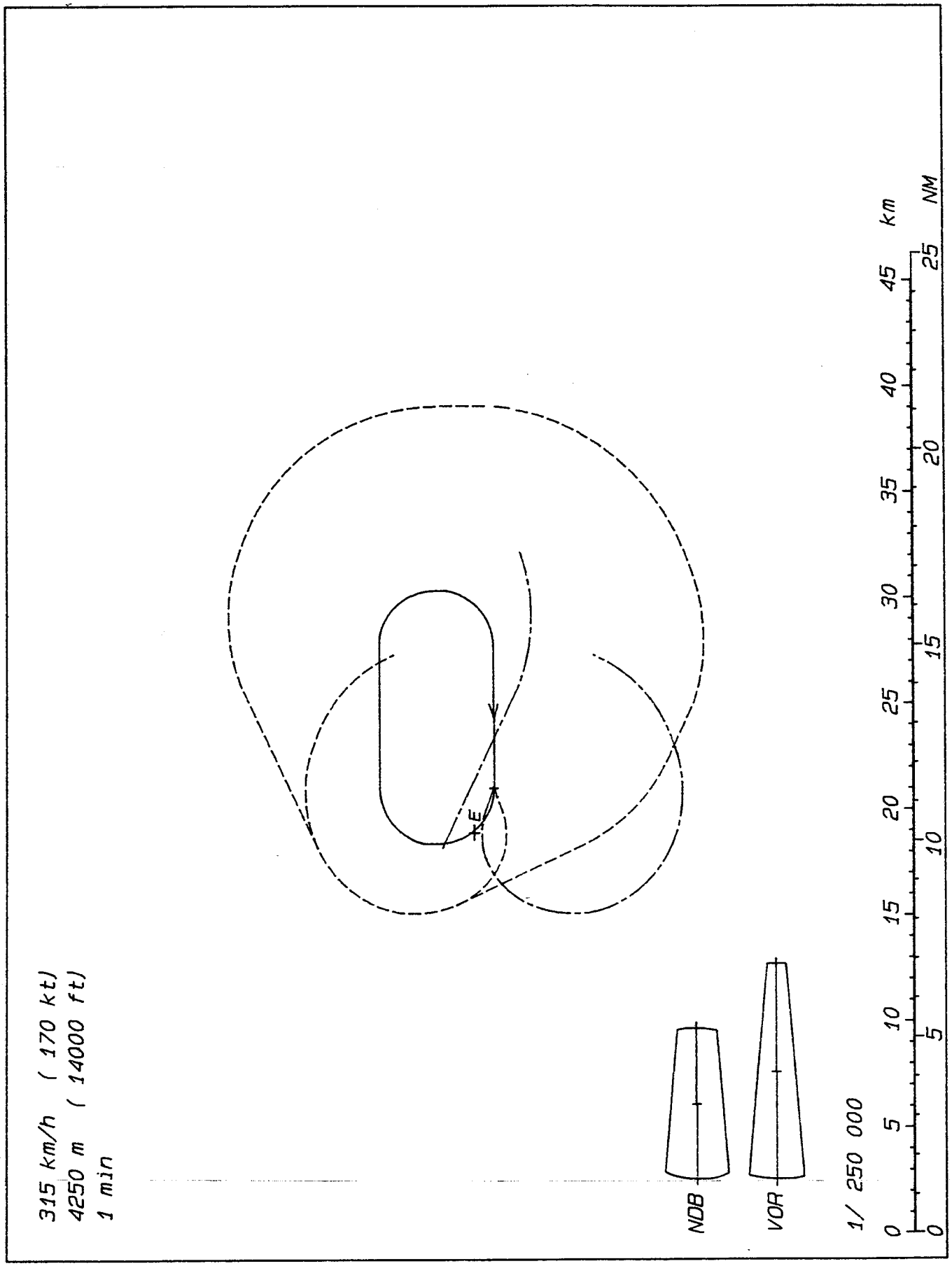
VOR

315 km/h (170 kt)
3050 m (10000 ft)
1 min

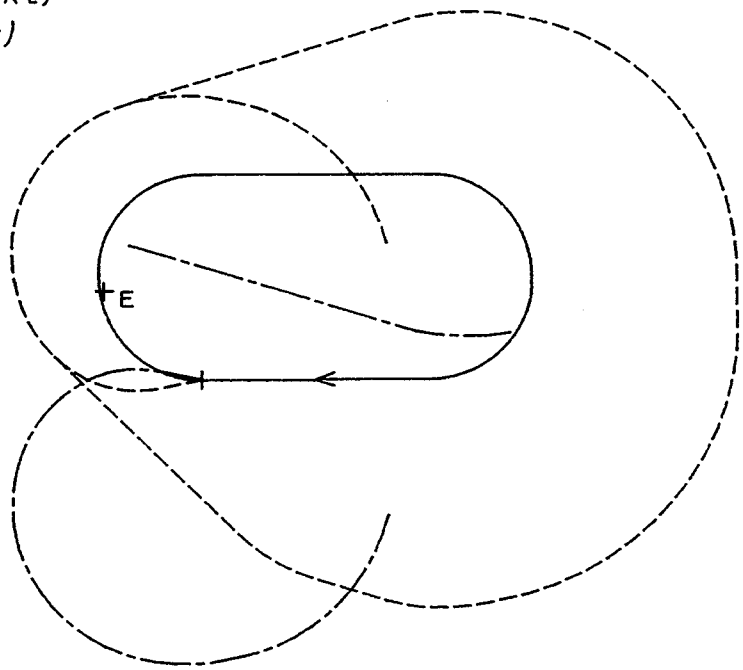


315 km/h (170 kt)
3650 m (12000 ft)
1 min




315 km/h (170 kt)
4250 m (14000 ft)
1 min
E
NDB
VOR
1/ 250 000
0
5
10
15
20
25
30
35
40
45
km
0
5
10
15
20
25
NM

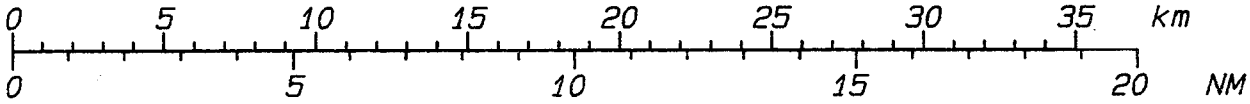
425 km/h (230 kt)
600 m (2000 ft)
1 min



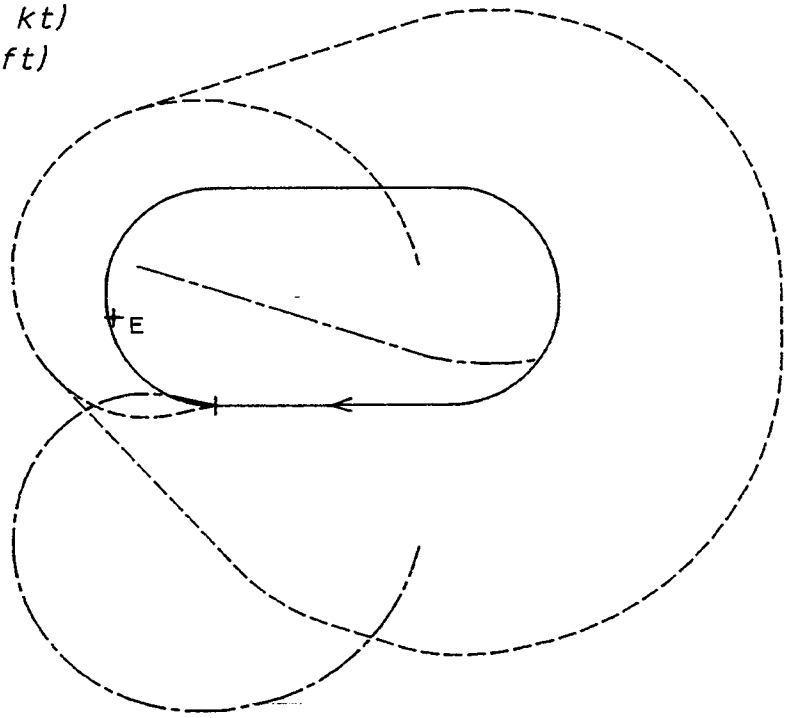
NDB

VOR

1/ 250 000

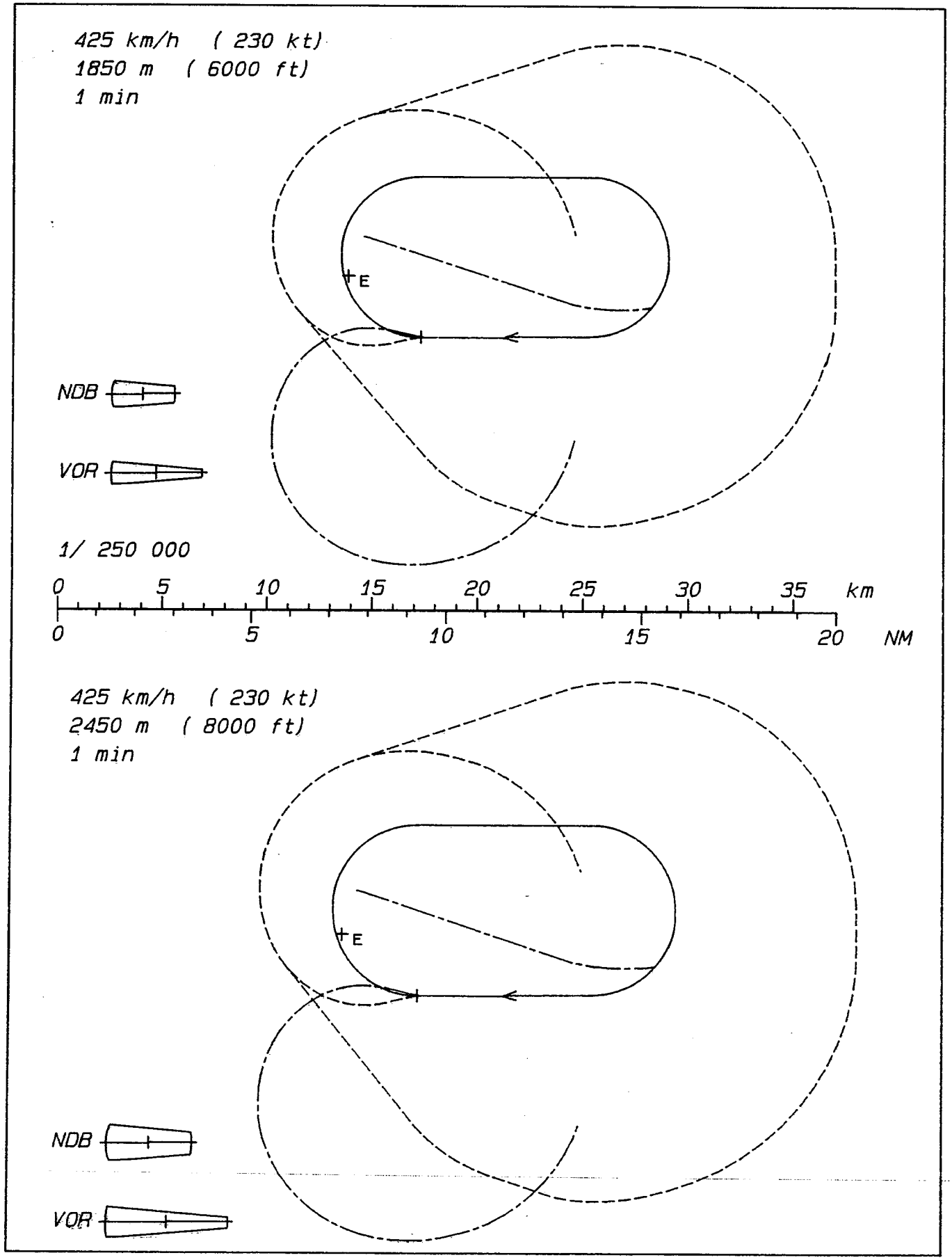


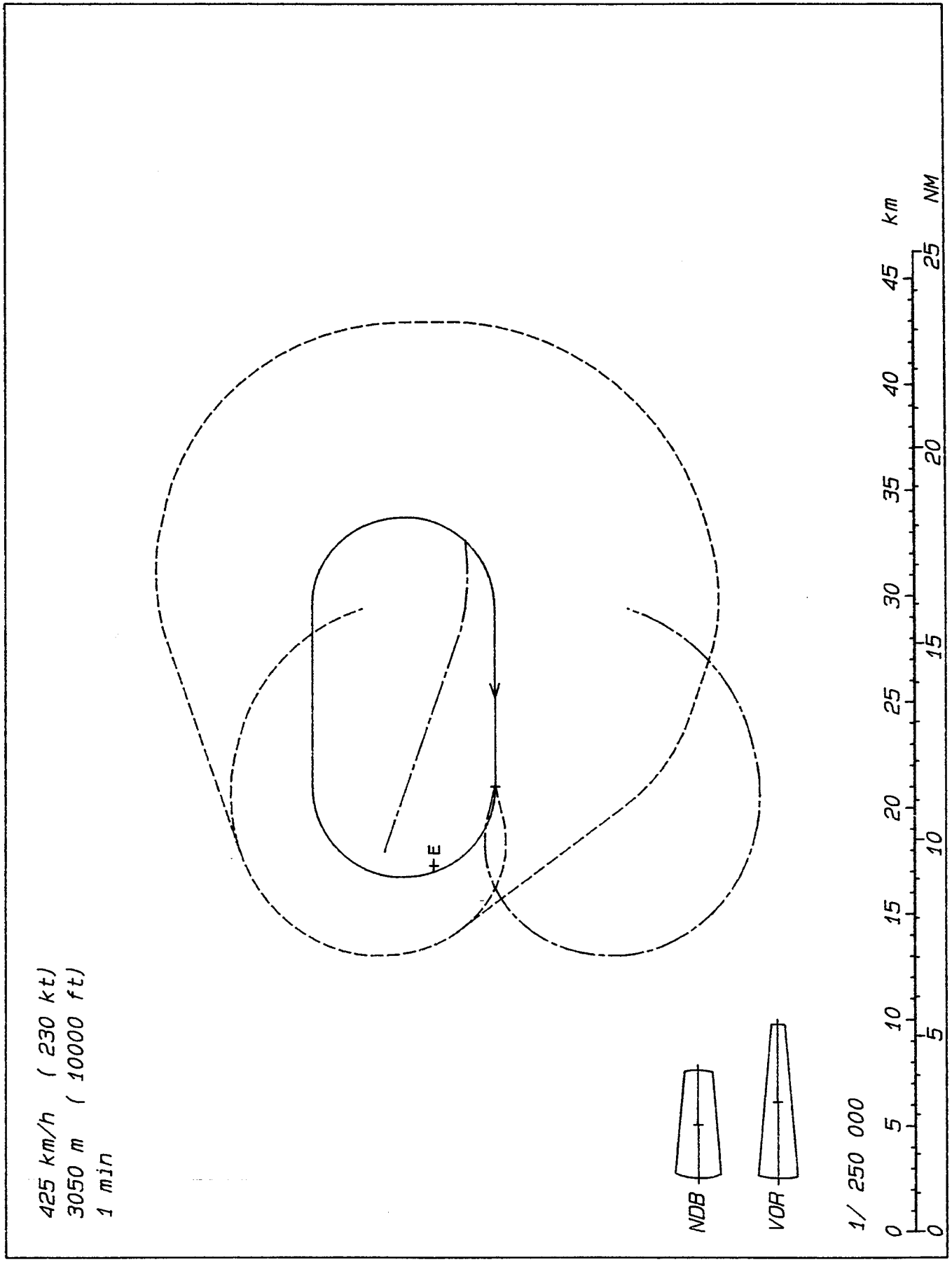
425 km/h (230 kt)
1200 m (4000 ft)
1 min

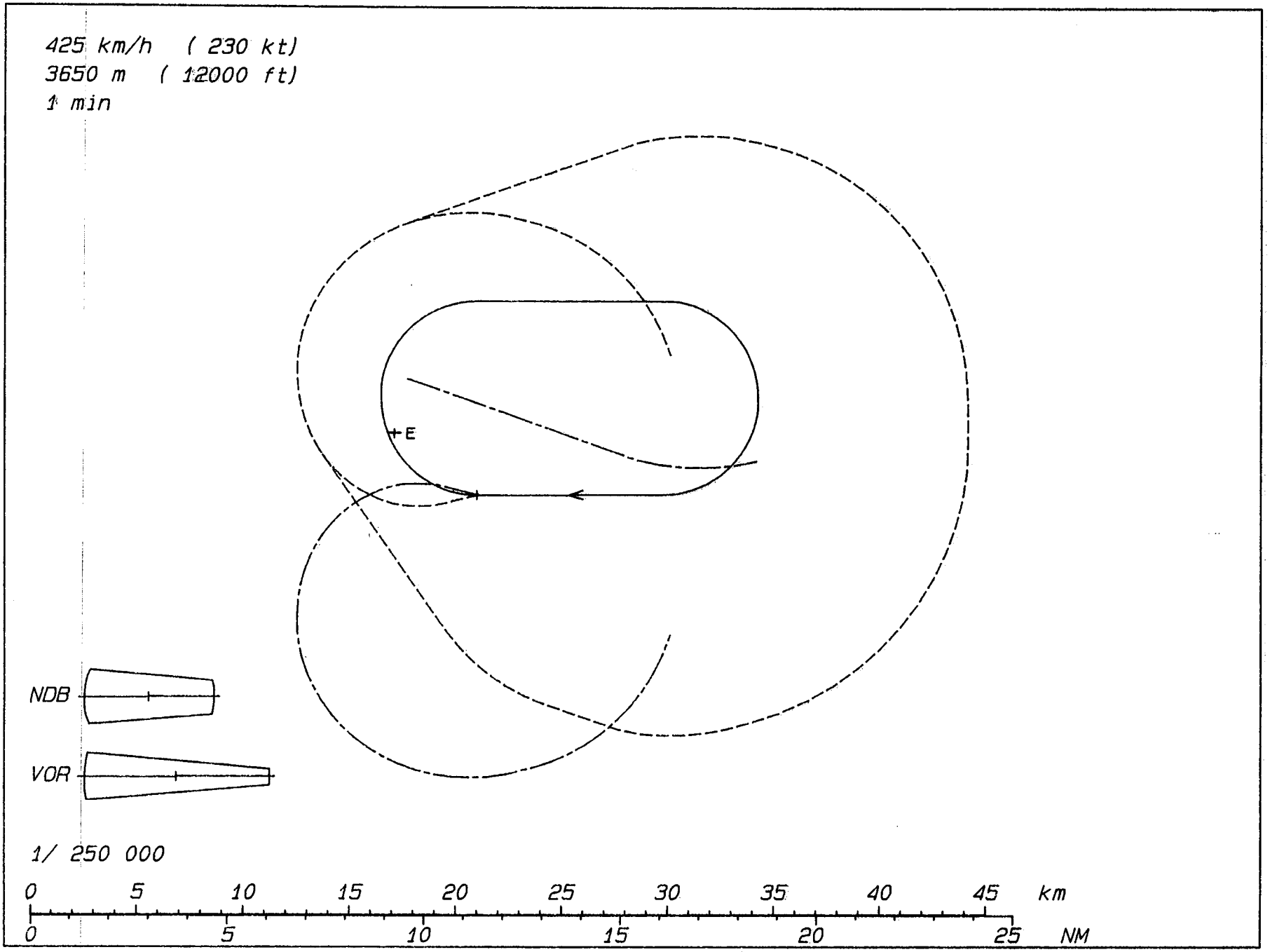


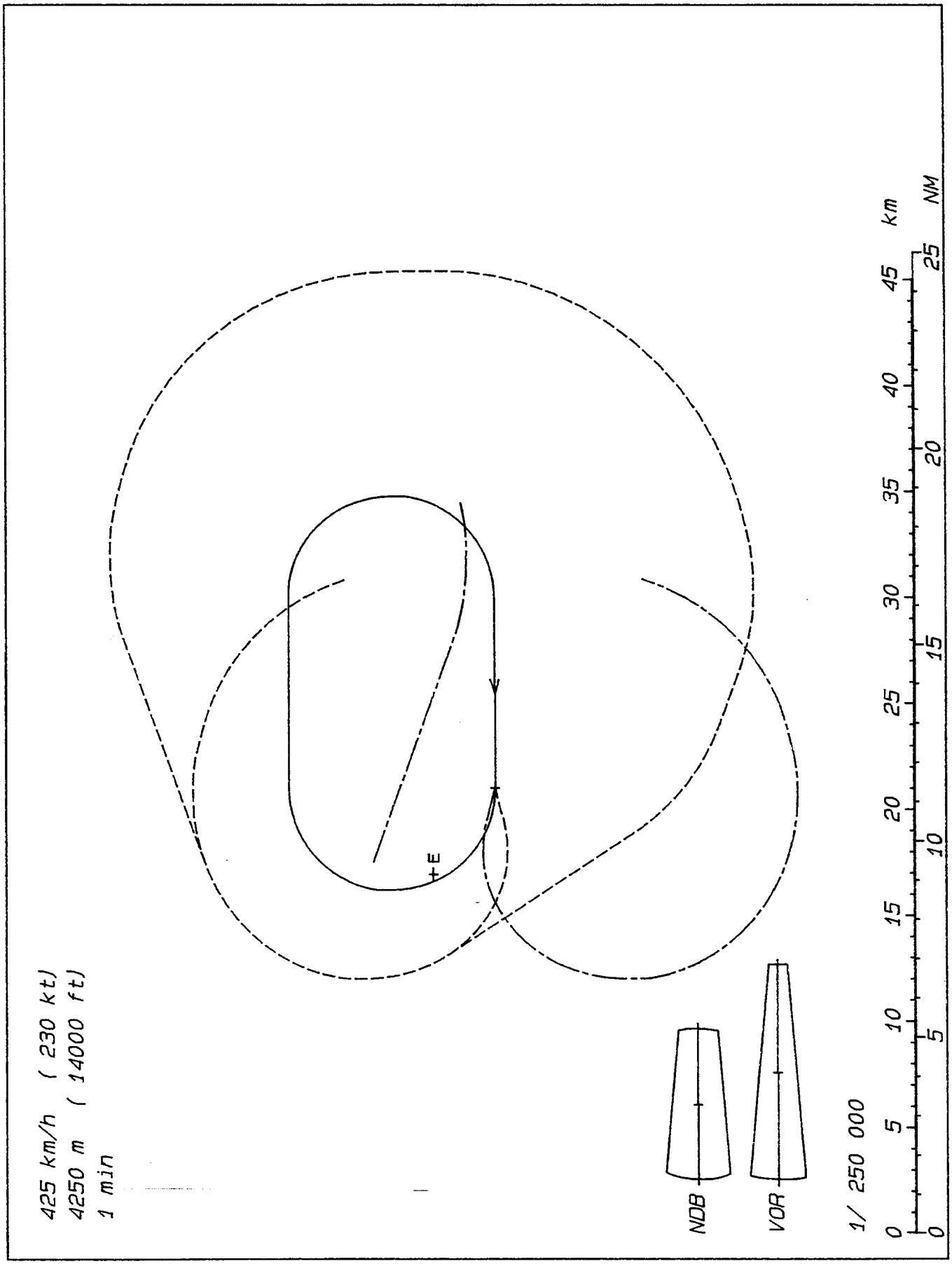
NDB

VOR


425 km/h (230 kt)
1850 m (6000 ft)
1 min
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 km
0 5 10 15 20 NM
425 km/h (230 kt)
2450 m (8000 ft)
1 min
E
NDB
VOR


425 km/h (230 kt)
3050 m (10000 ft)
1 min
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


425 km/h (230 kt)
3650 m (12000 ft)
1 min
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


425 km/h (230 kt)
4250 m (14000 ft)
1 min
E
NDB
VOR
1/ 250 000
0
5
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30
35
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km
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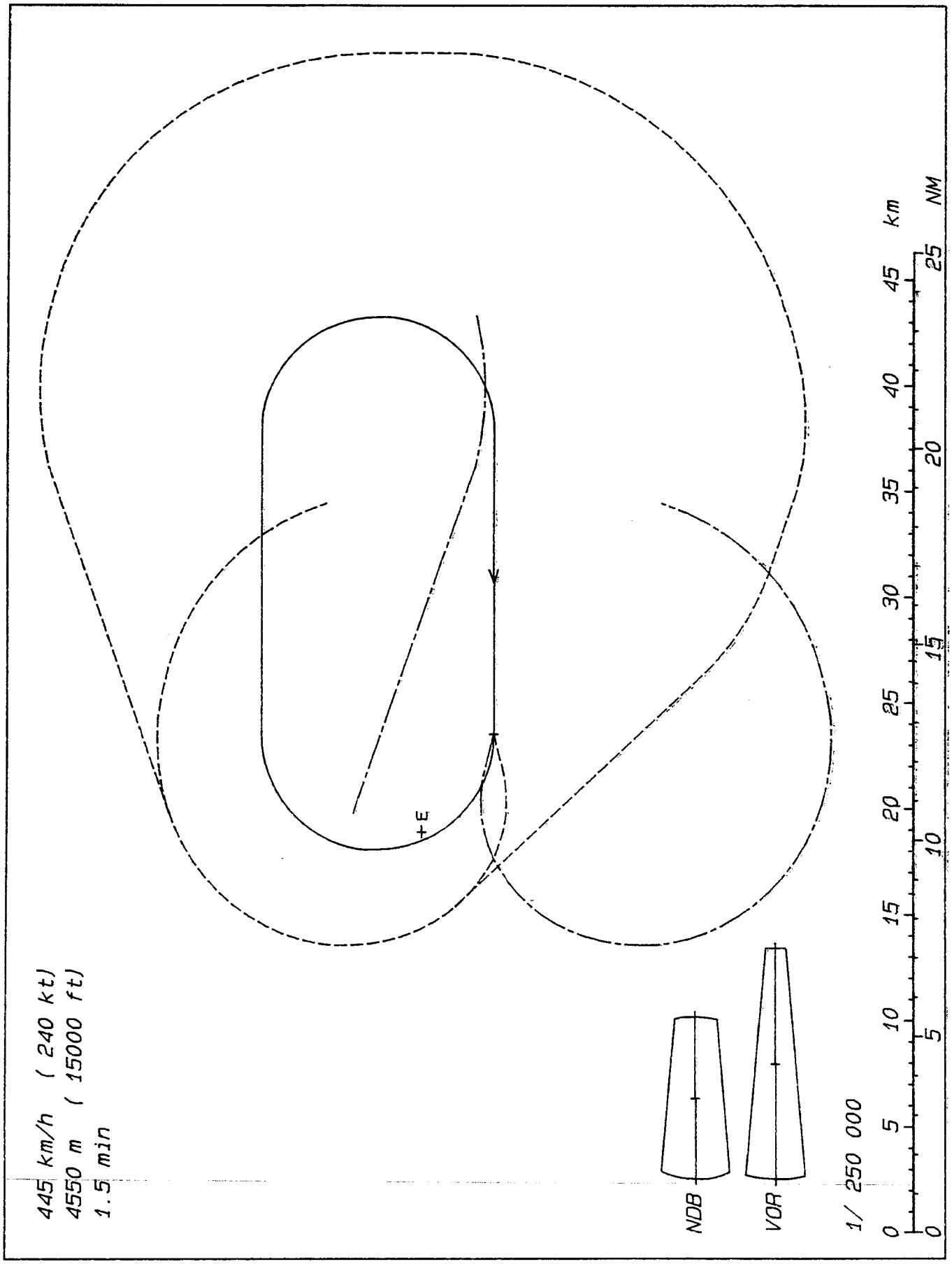
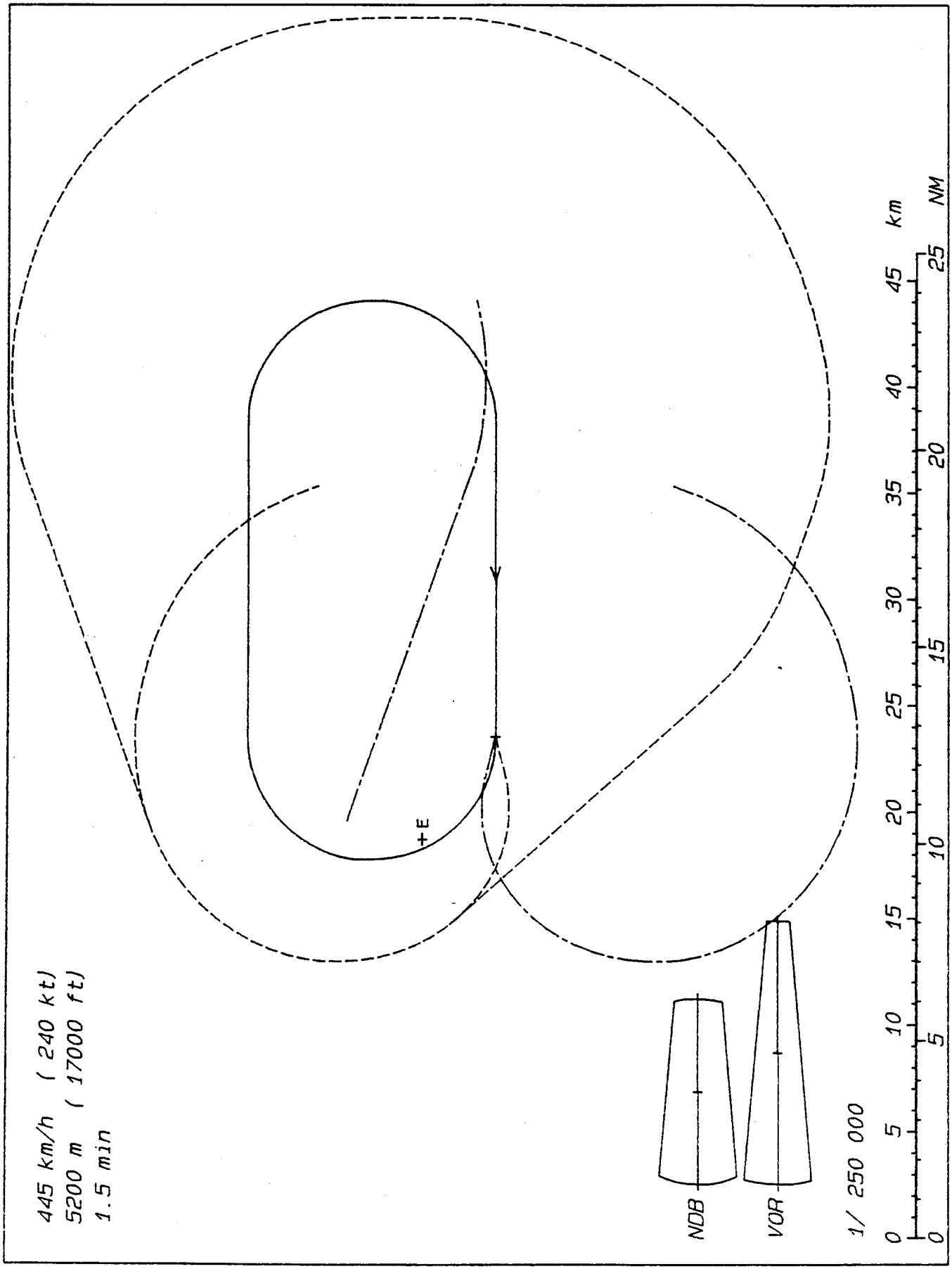
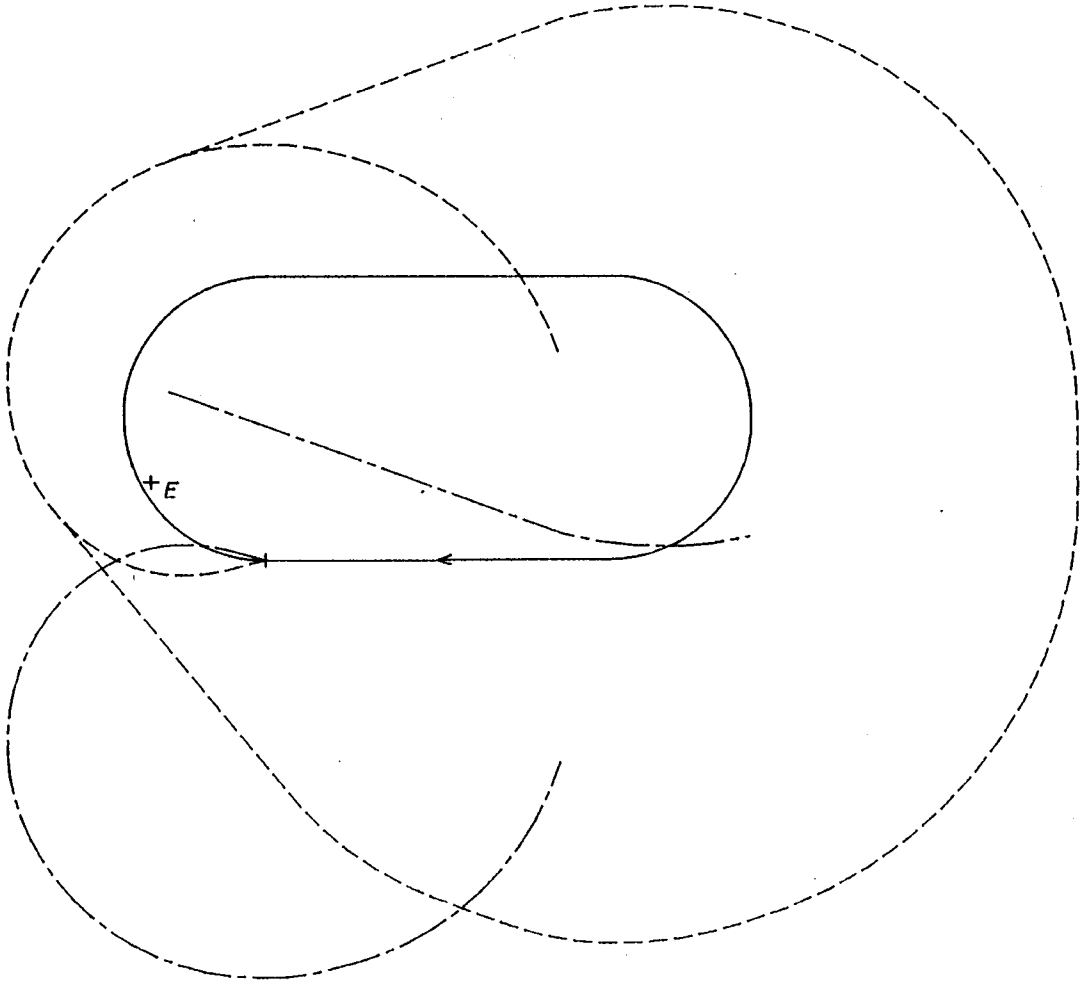
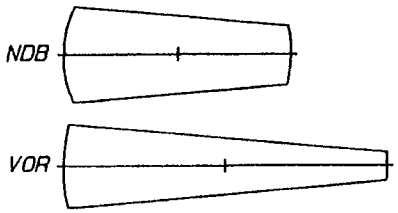
NM


445 km/h (240 kt)
4550 m (15000 ft)
1.5 min
E
NDB
VOR
1/ 250 000
0
5
10
15
20
25
30
35
40
45
km
0
5
10
15
20
25
NM

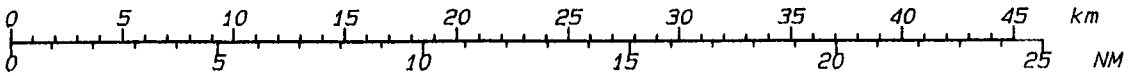

445 km/h (240 kt)
5200 m (17000 ft)
1.5 min
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM

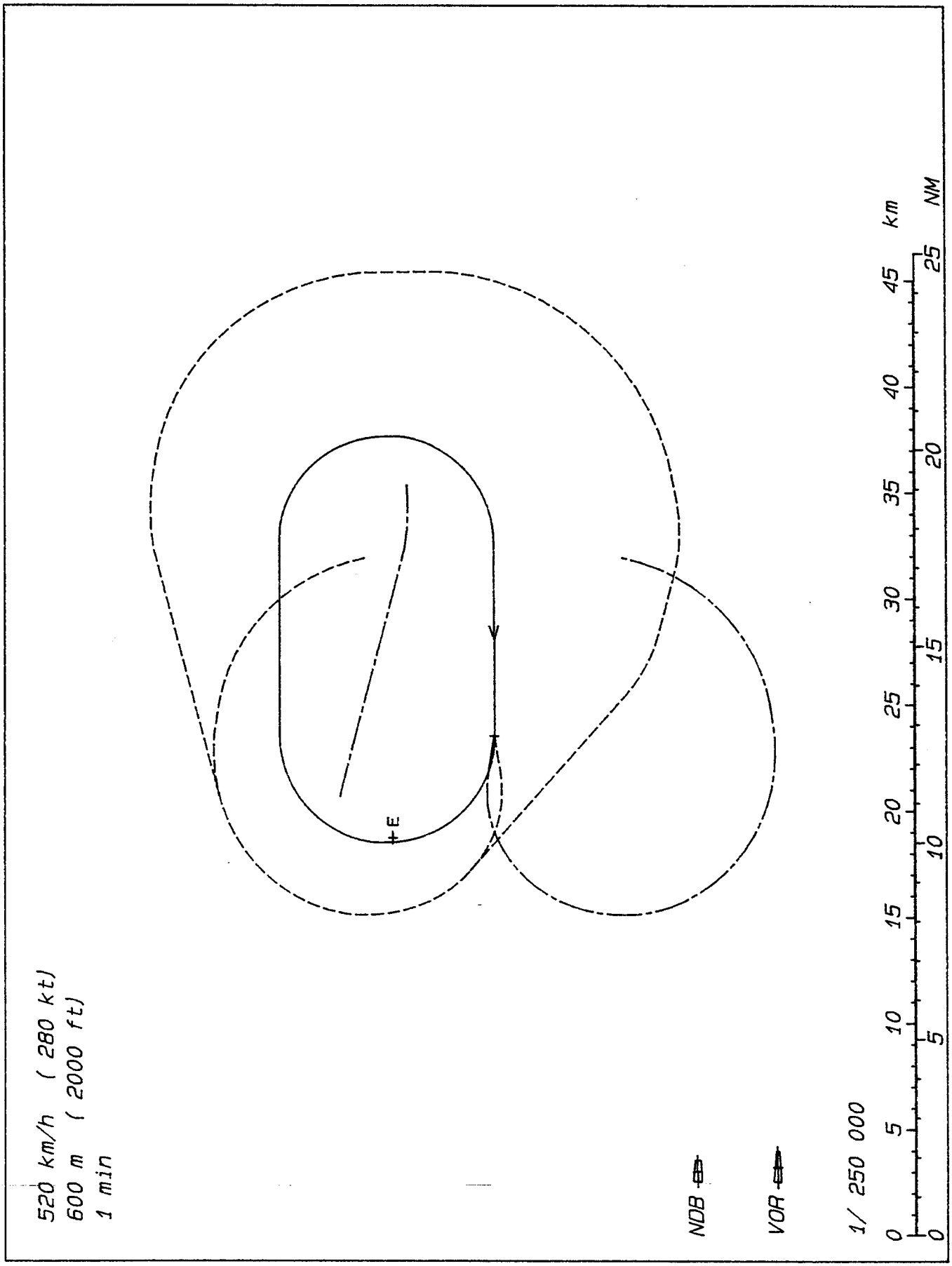
445 km/h (240 kt)
6100 m (20000 ft)
1.5 min

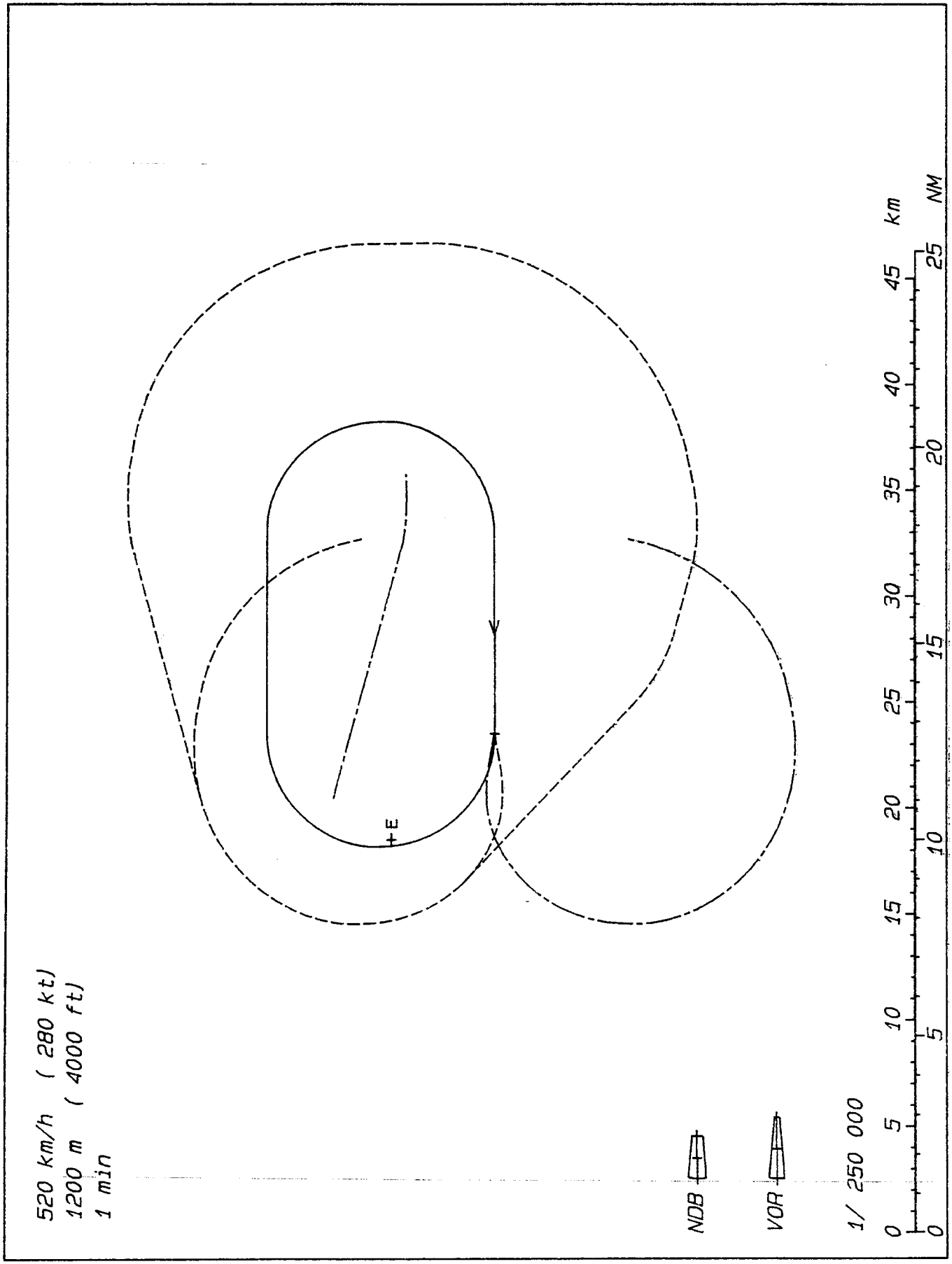


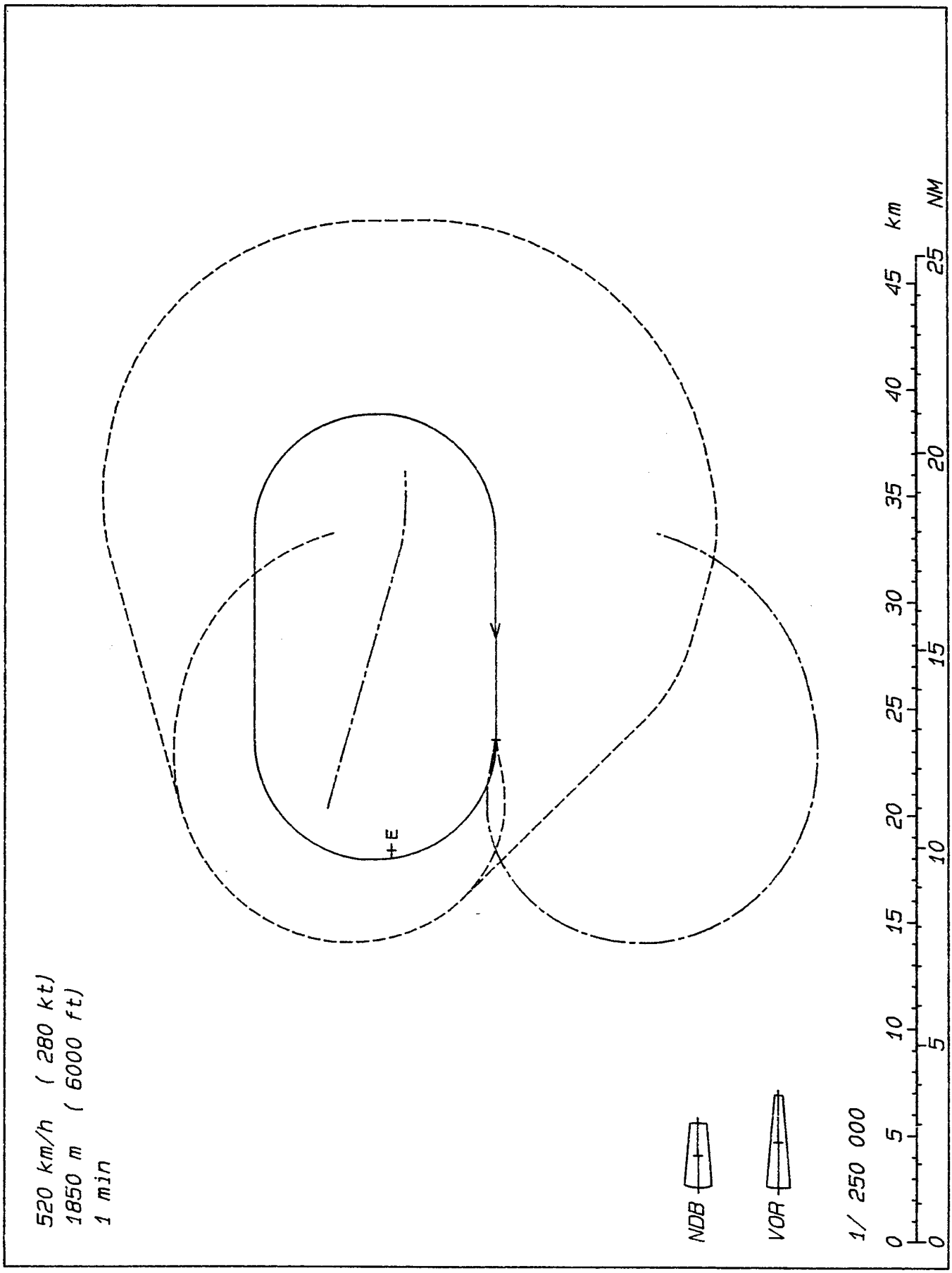


1/ 250 000




520 km/h (280 kt)
600 m (2000 ft)
1 min
E
NDB
VOR
1/ 250 000
0
5
10
15
20
25
30
35
40
45
km
0
5
10
15
20
25
NM


520 km/h (280 kt)
1200 m (4000 ft)
1 min
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


520 km/h (280 kt)
1850 m (6000 ft)
1 min
E
NDB
VOR
1/ 250 000
0
5
10
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30
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km
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5
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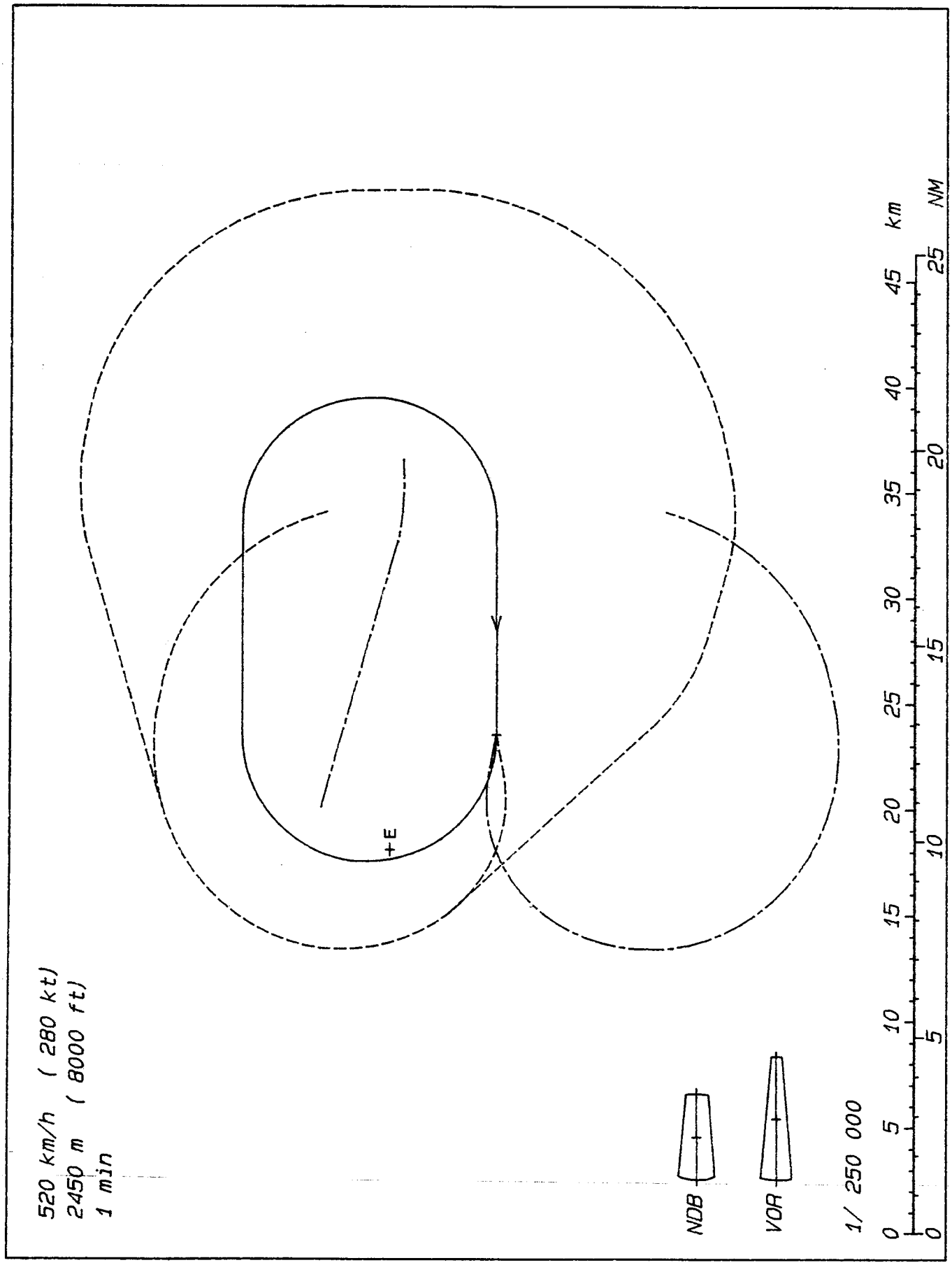
NM


520 km/h (280 kt)
2450 m (8000 ft)
1 min
E
NDB
VOR
1/ 250 000
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km
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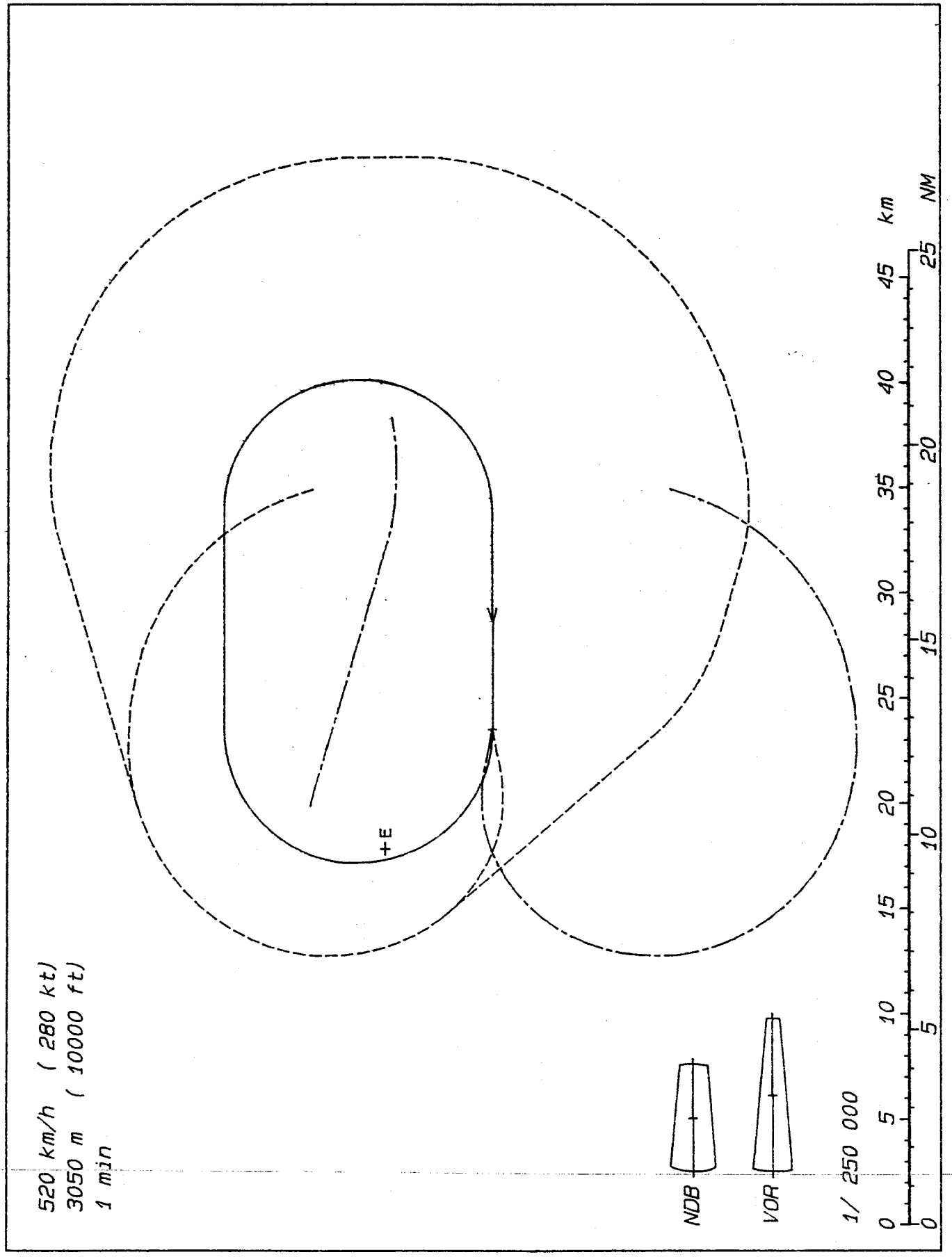
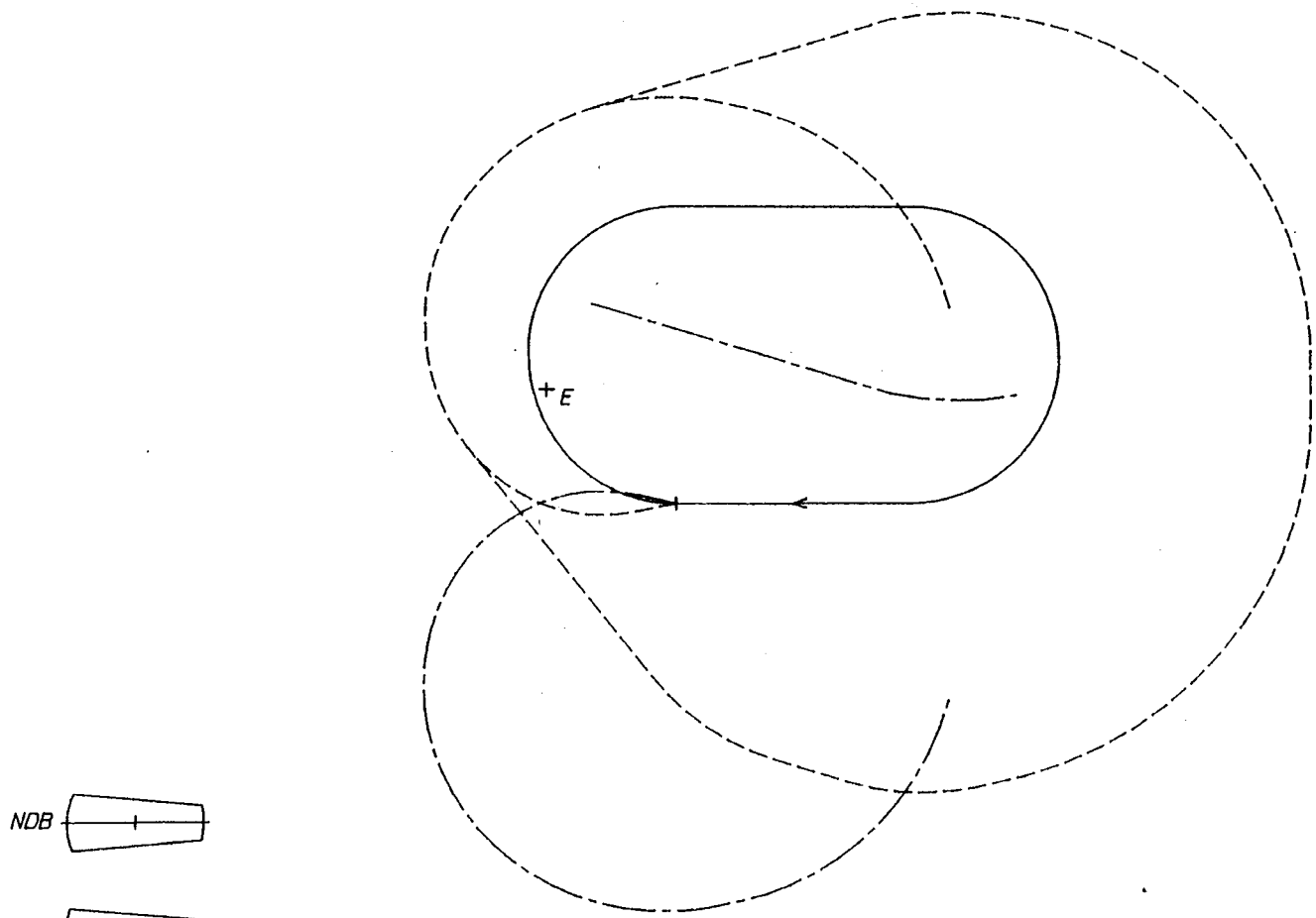
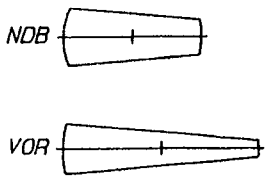
25
NM


520 km/h (280 kt)
3050 m (10000 ft)
1 min
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM

520 km/h (280 kt)
3650 m (12000 ft)
1 min





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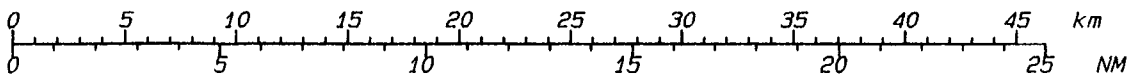
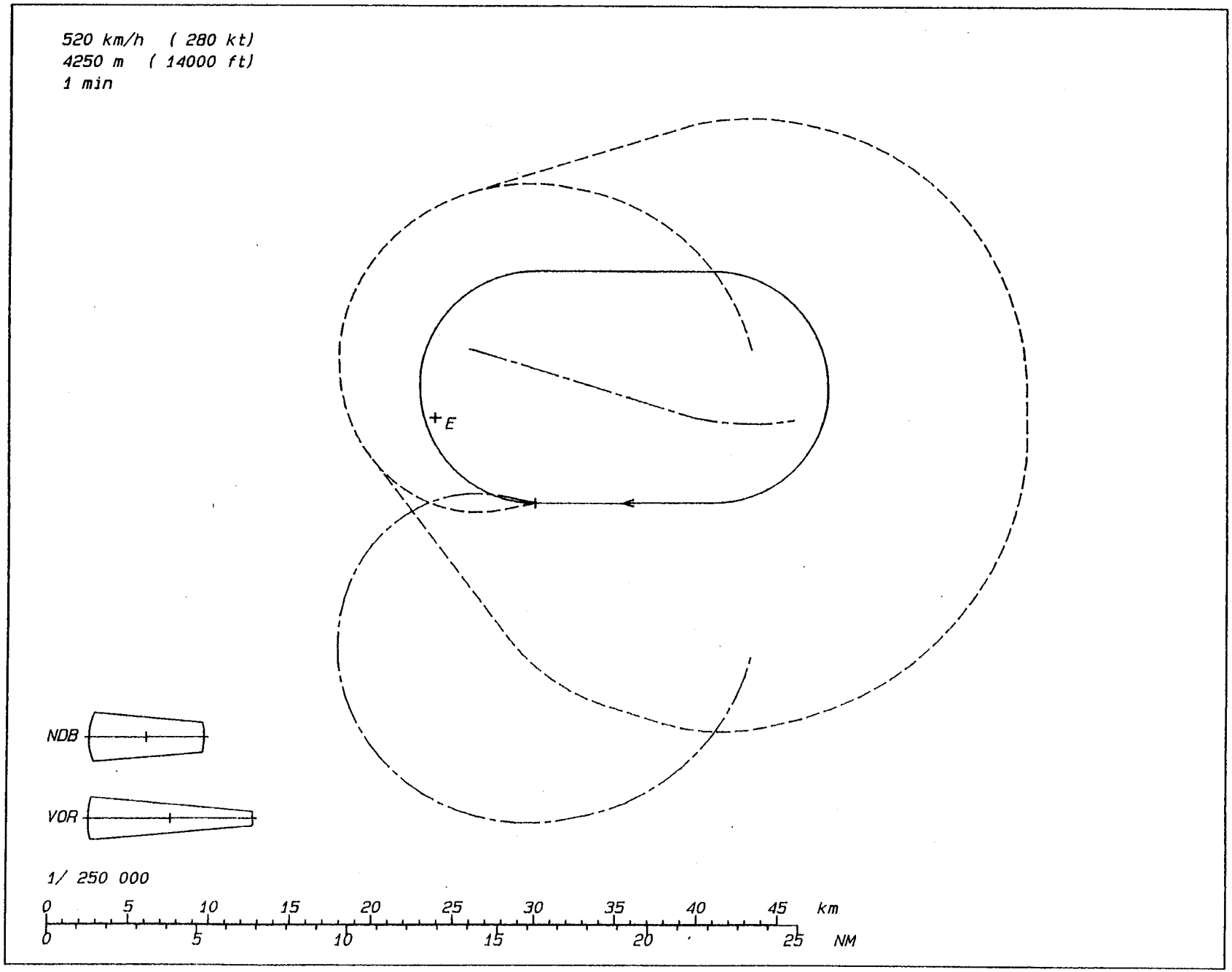
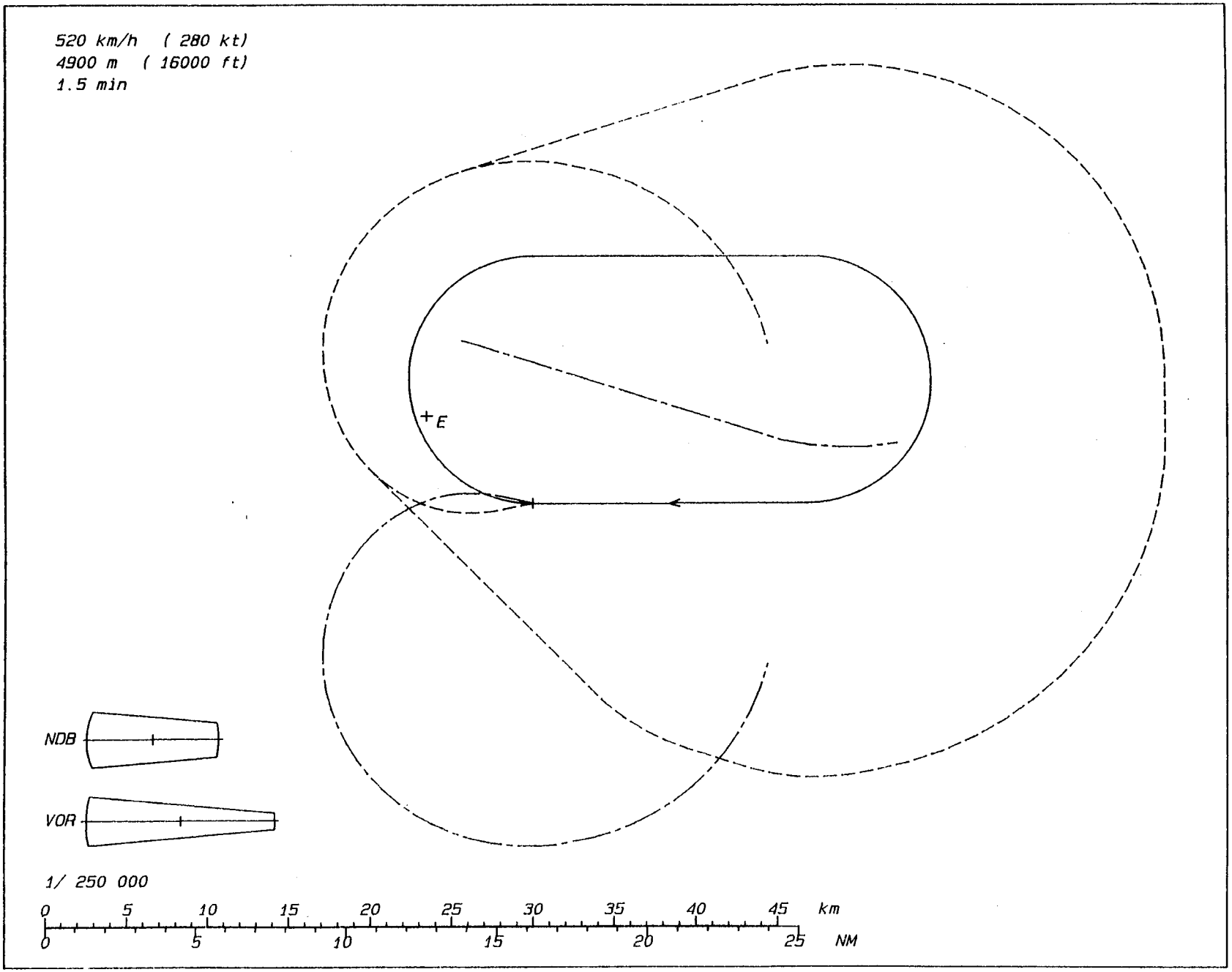



520 km/h (280 kt)
4250 m (14000 ft)
1 min
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM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NDB
VOR
1/ 250 000
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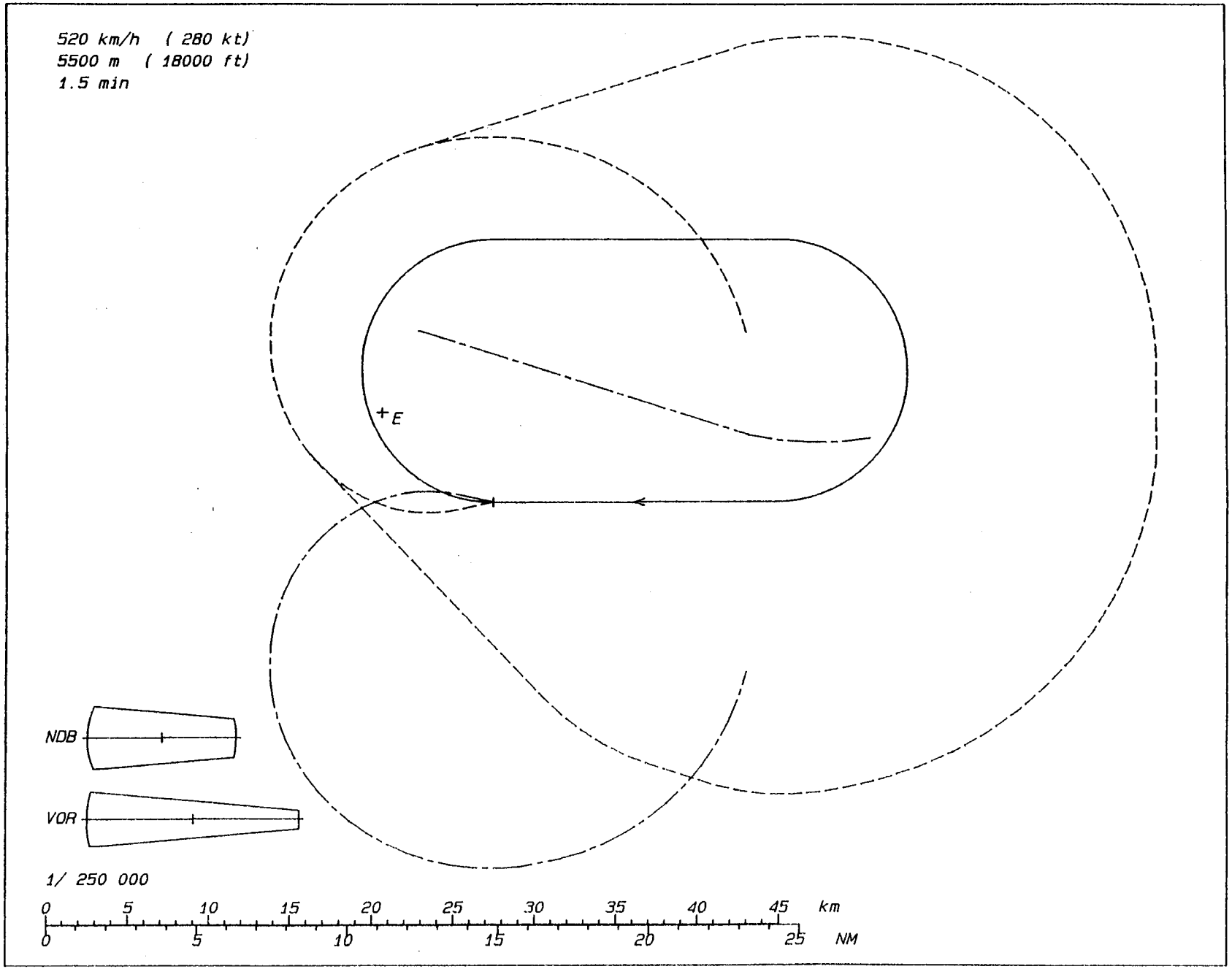
0 5 10 15 20 25 NM


520 km/h (280 kt)
5500 m (18000 ft)
1.5 min
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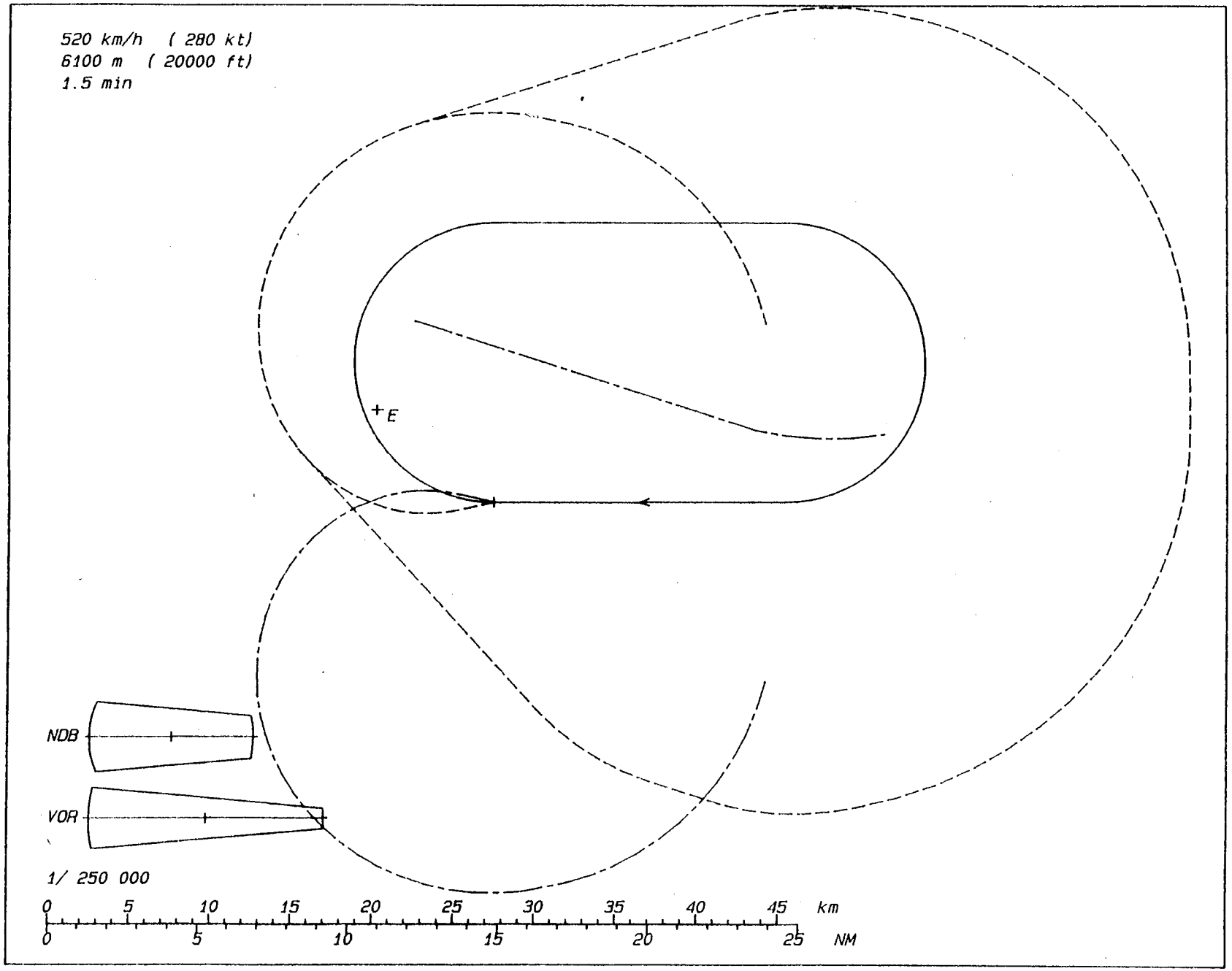
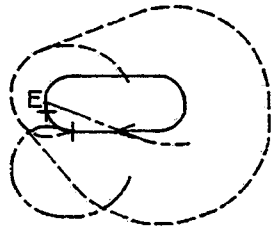
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM


520 km/h (280 kt)
6100 m (20000 ft)
1.5 min
E
NDB
VOR
1/ 250 000
0 5 10 15 20 25 30 35 40 45 km
0 5 10 15 20 25 NM

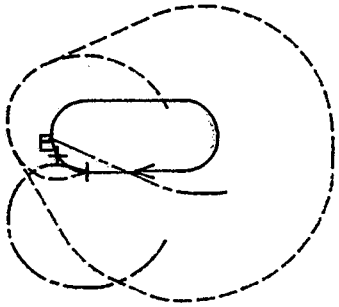
315 km/h (170 kt)
600 m (2000 ft)
1 min



NDB

VOR

315 km/h (170 kt)
3050 m (10000 ft)
1 min



NDB

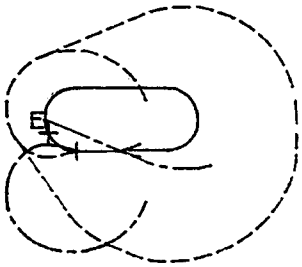
VOR

1/ 500 000

0 5 10 15 20 25 30 35 40 45 50 55 60 65 km

0 5 10 15 20 25 30 35 NM

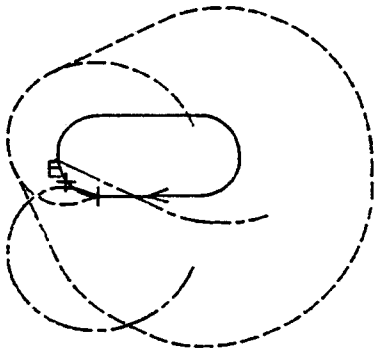
315 km/h (170 kt)
1850 m (6000 ft)
1 min



NDB

VOR

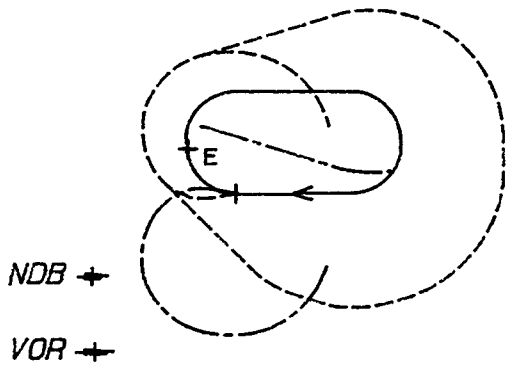
315 km/h (170 kt)
4250 m (14000 ft)
1 min



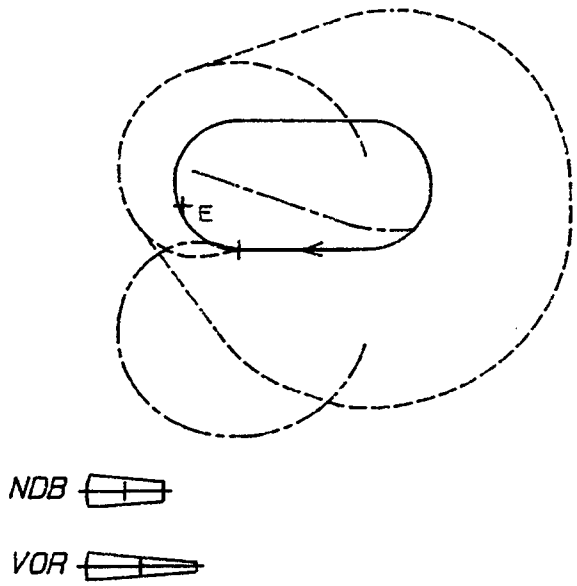
NDB

VOR

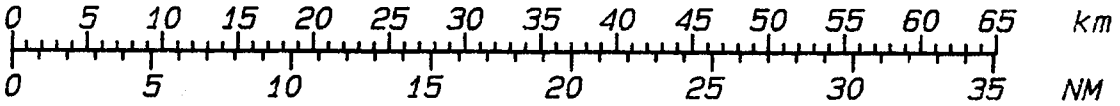
425 km/h (230 kt)
600 m (2000 ft)
1 min



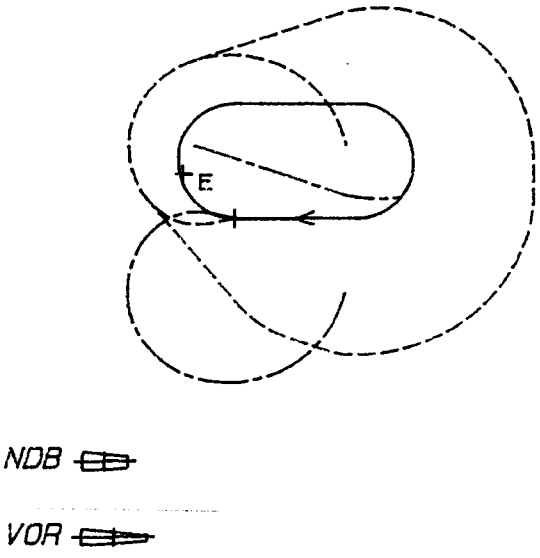
425 km/h (230 kt)
3050 m (10000 ft)
1 min



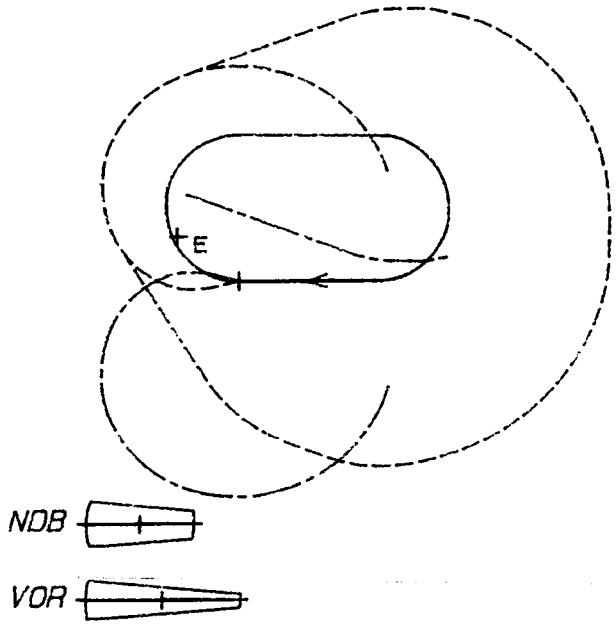
1/ 500 000



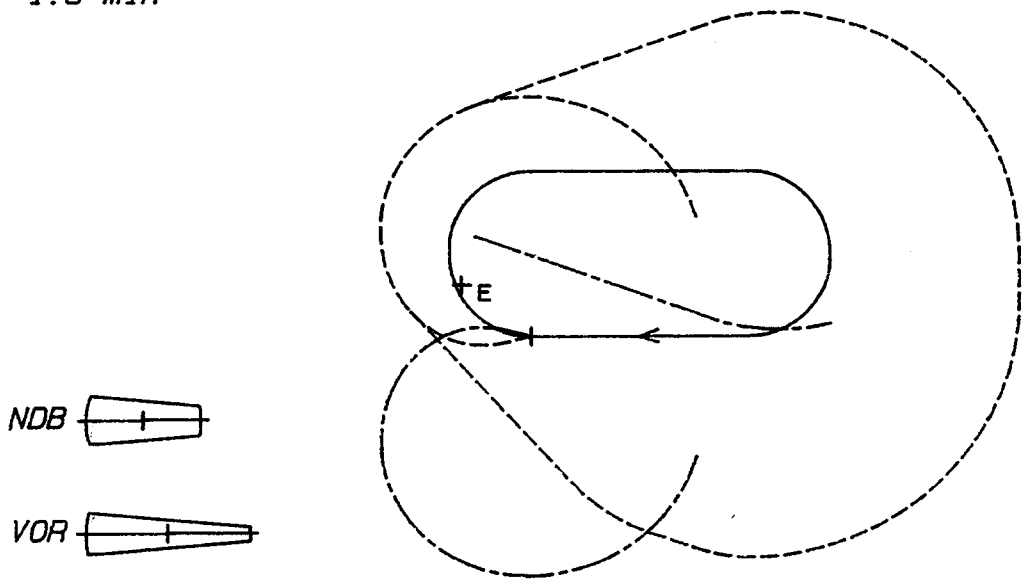
425 km/h (230 kt)
1850 m (6000 ft)
1 min



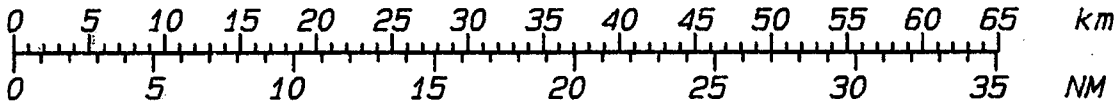
425 km/h (230 kt)
4250 m (14000 ft)
1 min



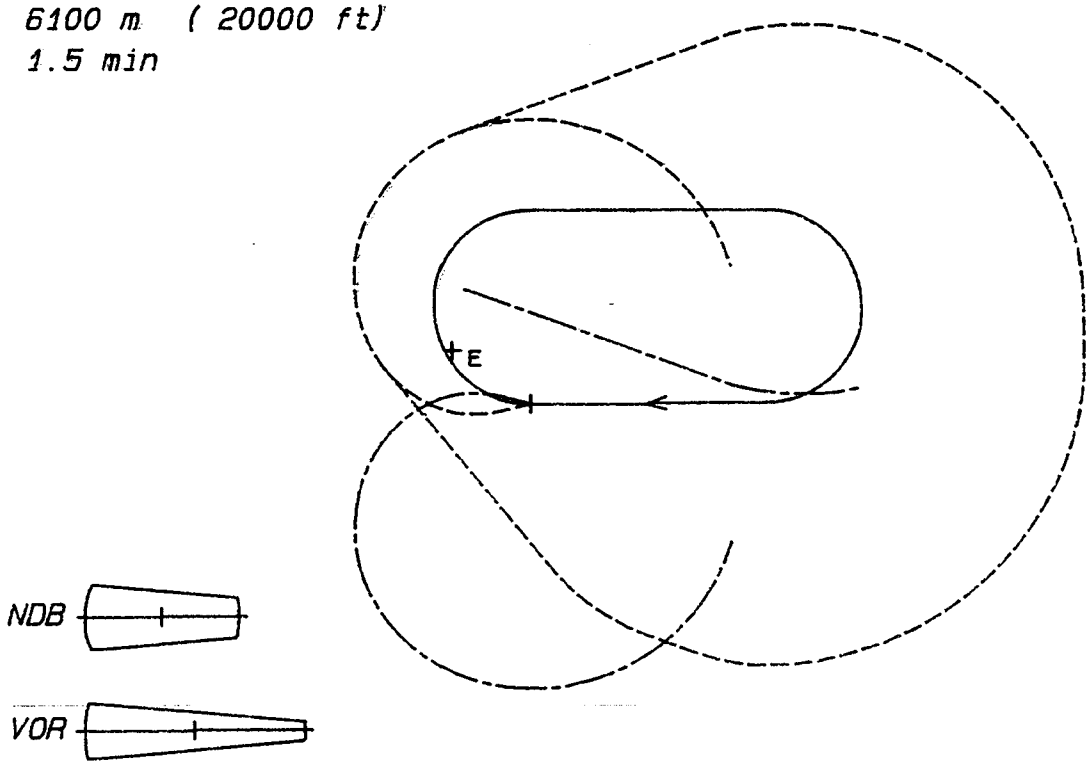
445 km/h (240 kt)
4550 m (15000 ft)
1.5 min



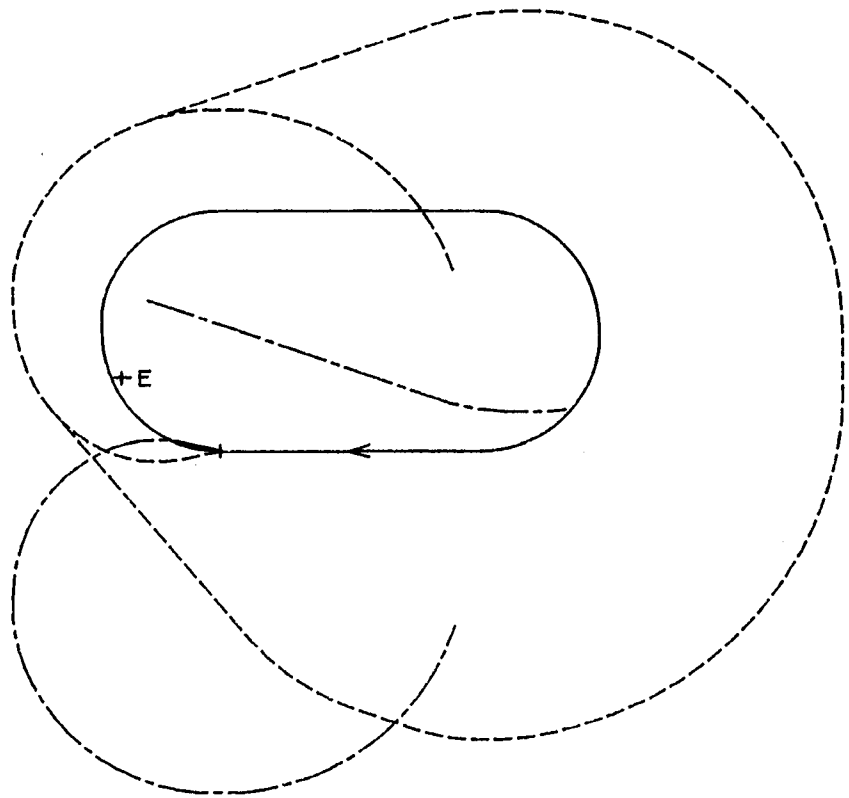
1/ 500 000

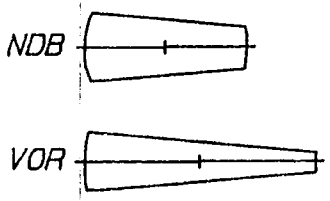


445 km/h (240 kt)
6100 m (20000 ft)
1.5 min

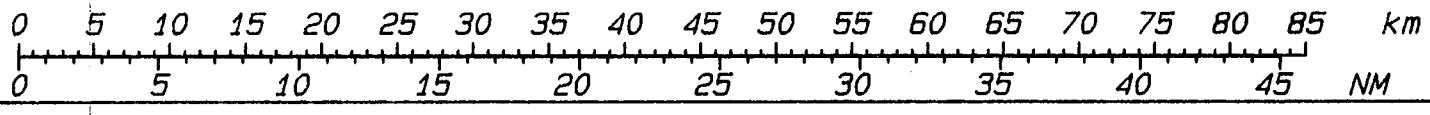


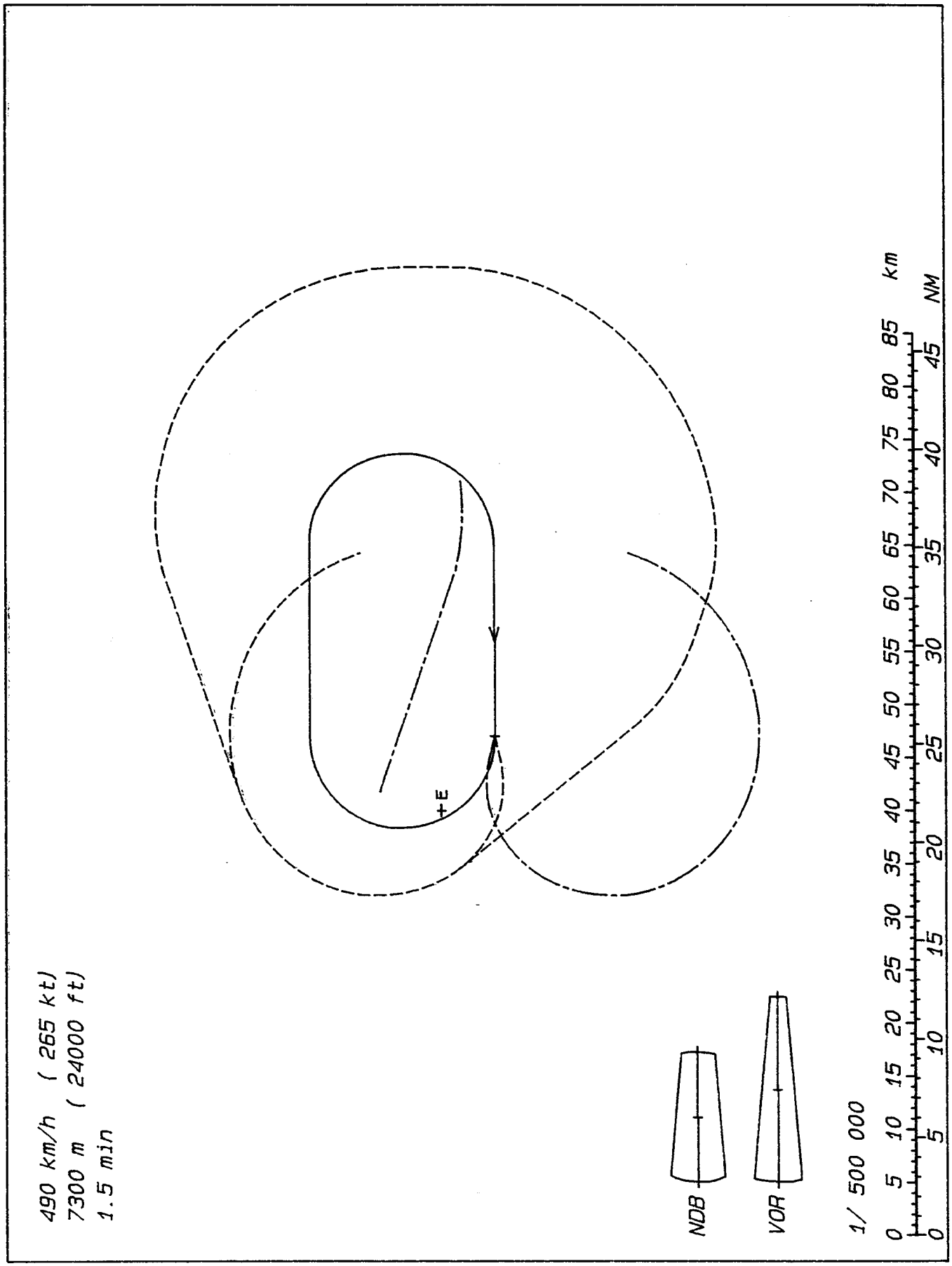
490 km/h (265 kt)
6400 m (21000 ft)
1.5 min

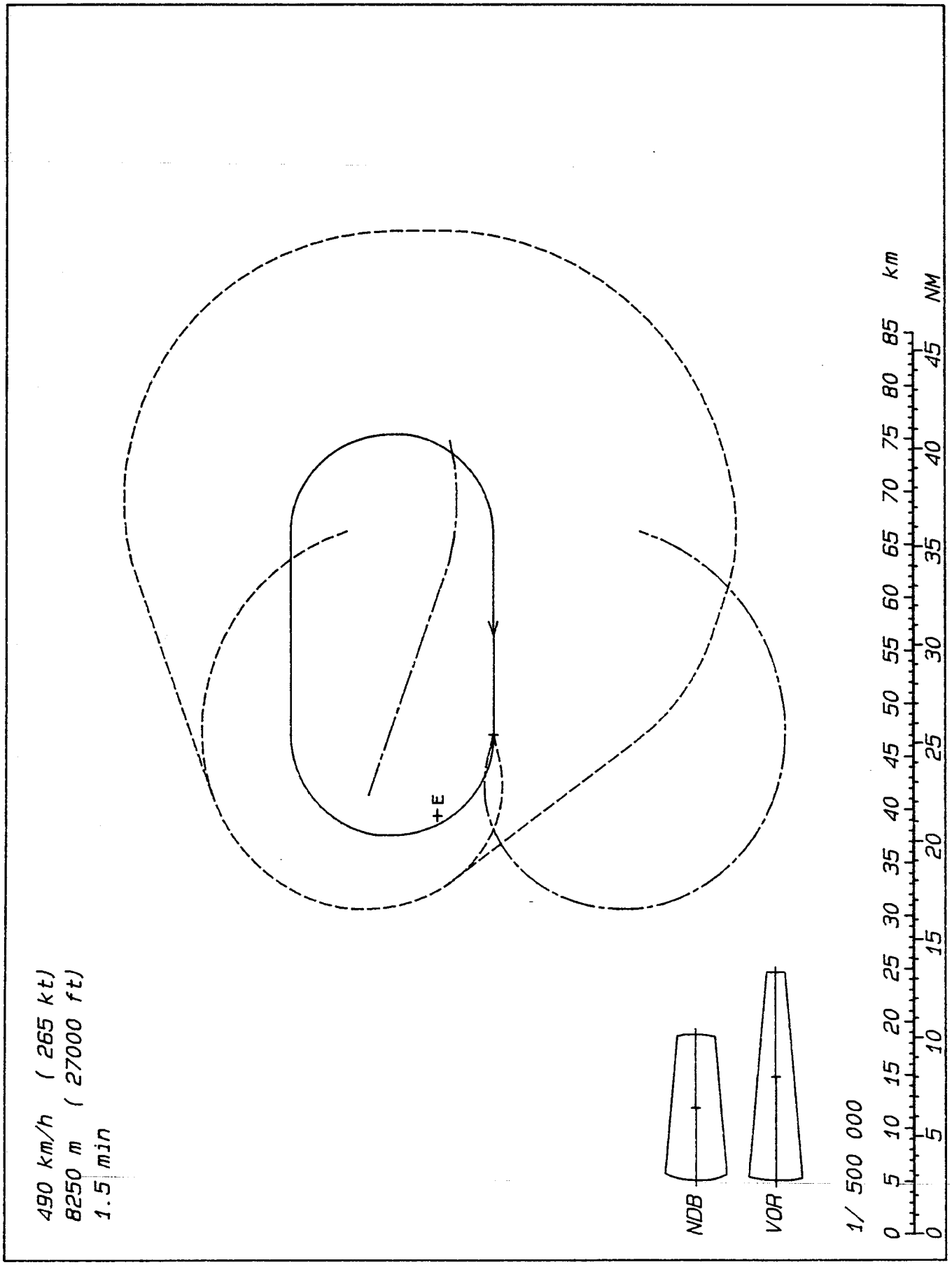


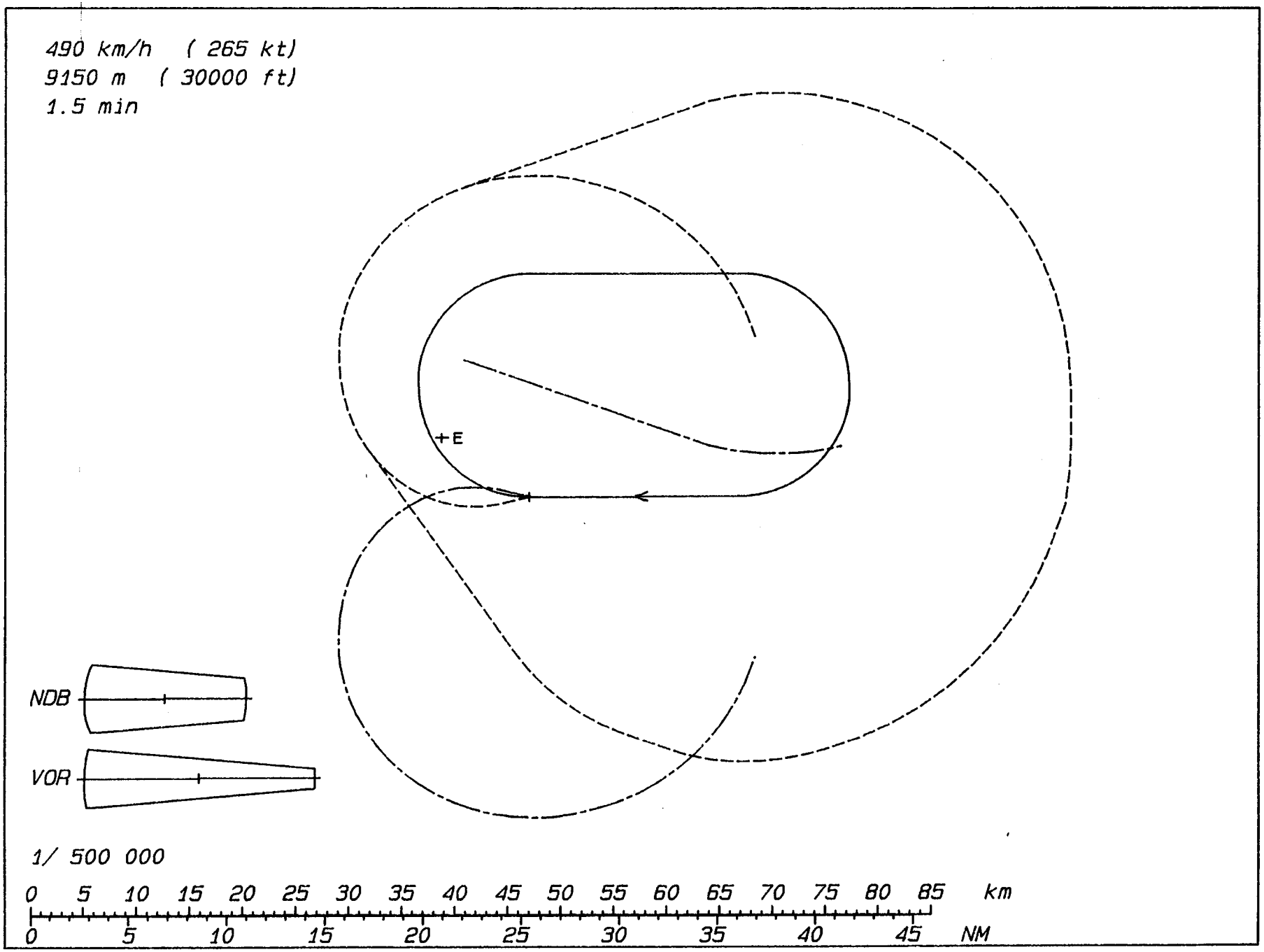


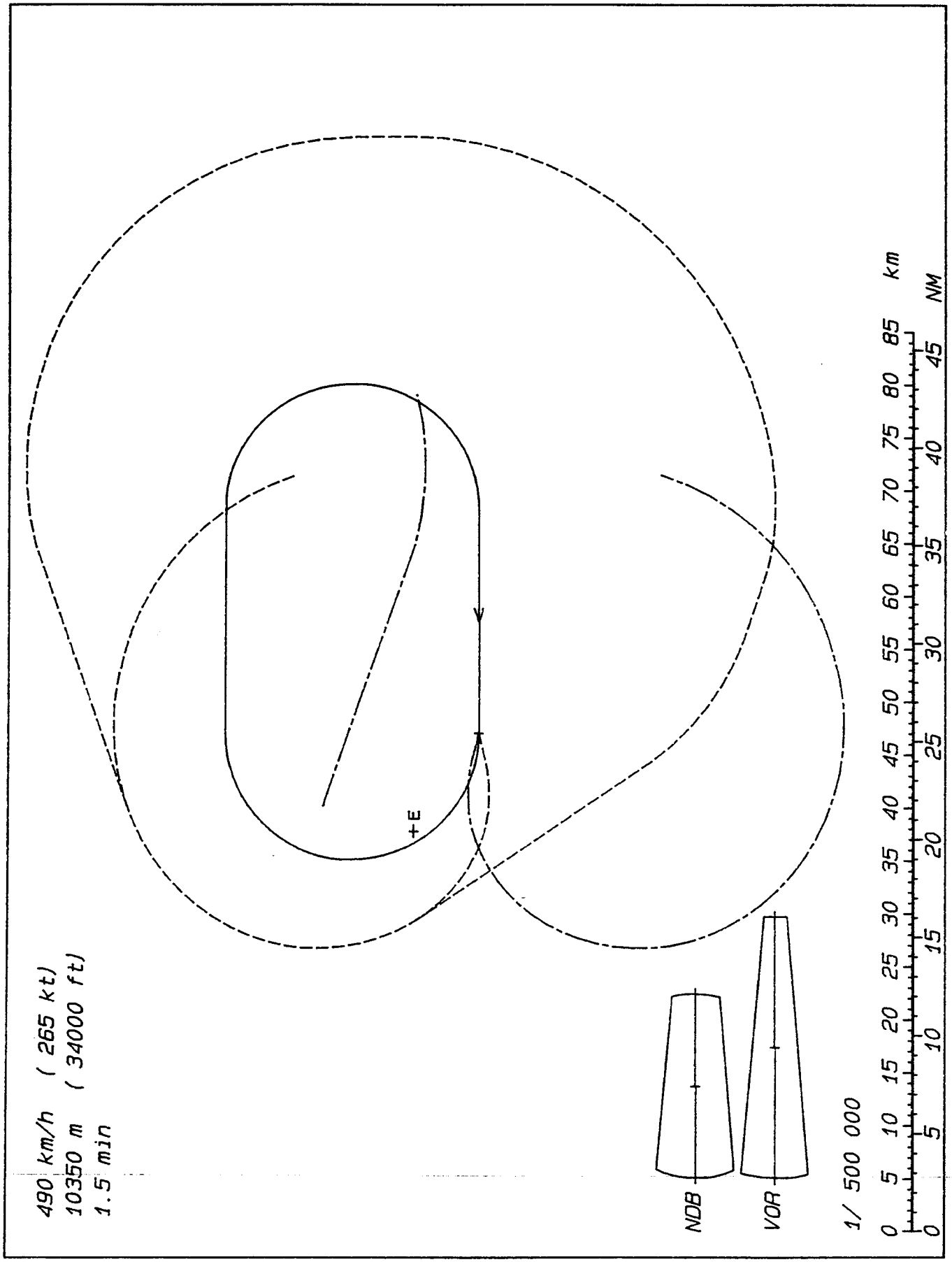
1/ 500 000



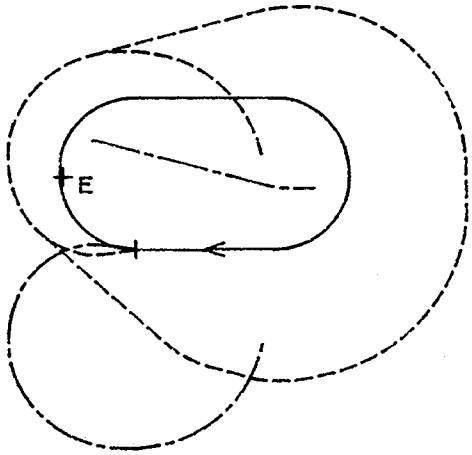

490 km/h (265 kt)
7300 m (24000 ft)
1.5 min
E
NDB
VOR
1/ 500 000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 km
0 10 20 30 40 45 NM


490 km/h (265 kt)
8250 m (27000 ft)
1.5 min
+E
NDB
VOR
1/ 500 000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 km
0 5 10 15 20 25 30 35 40 45 NM


490 km/h (265 kt)
9150 m (30000 ft)
1.5 min
+E
NDB
VOR
1/ 500 000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 km
0 5 10 15 20 25 30 35 40 45 NM


490 km/h (265 kt)
10350 m (34000 ft)
1.5 min
+E
NDB
VOR
1/ 500 000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 km
0 5 10 15 20 25 30 35 40 45 NM

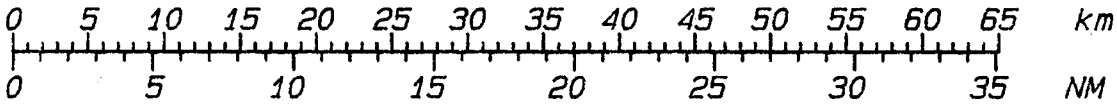
520 km/h (280 kt)
600 m (2000 ft)
1 min



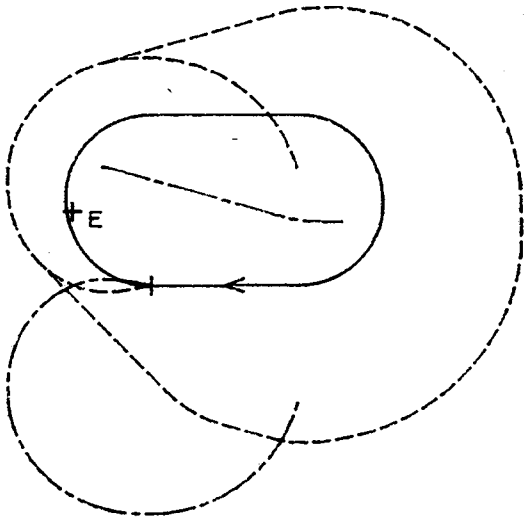
NDB

VOR

1/ 500 000



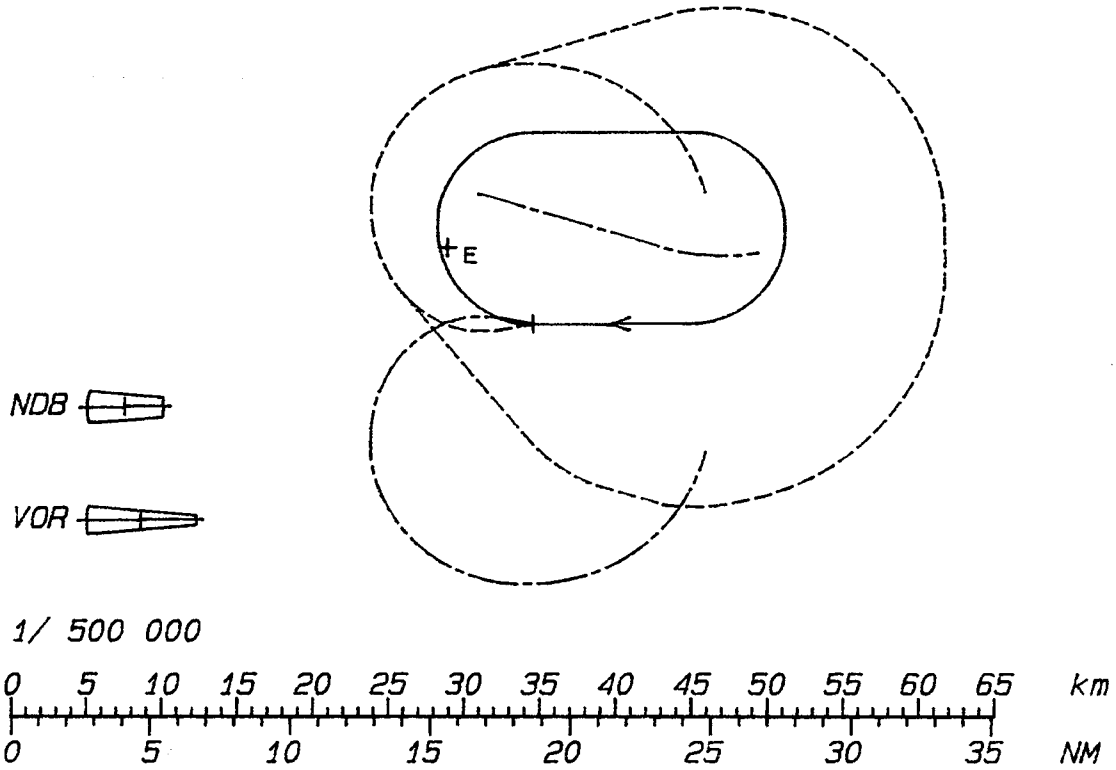
520 km/h (280 kt)
1850 m (6000 ft)
1 min



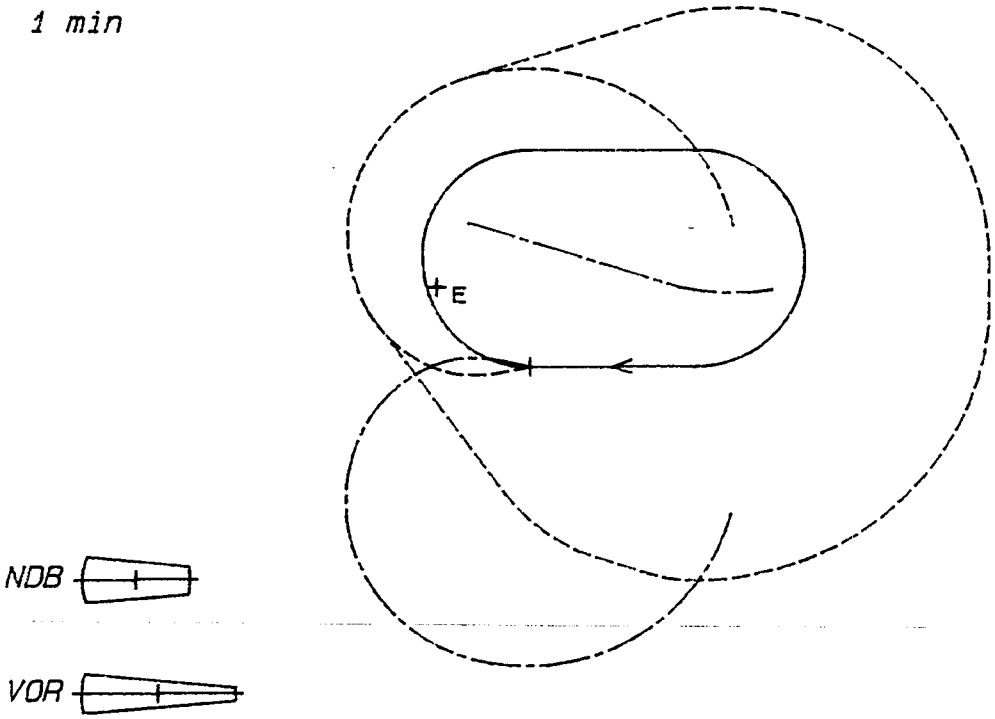
NDB

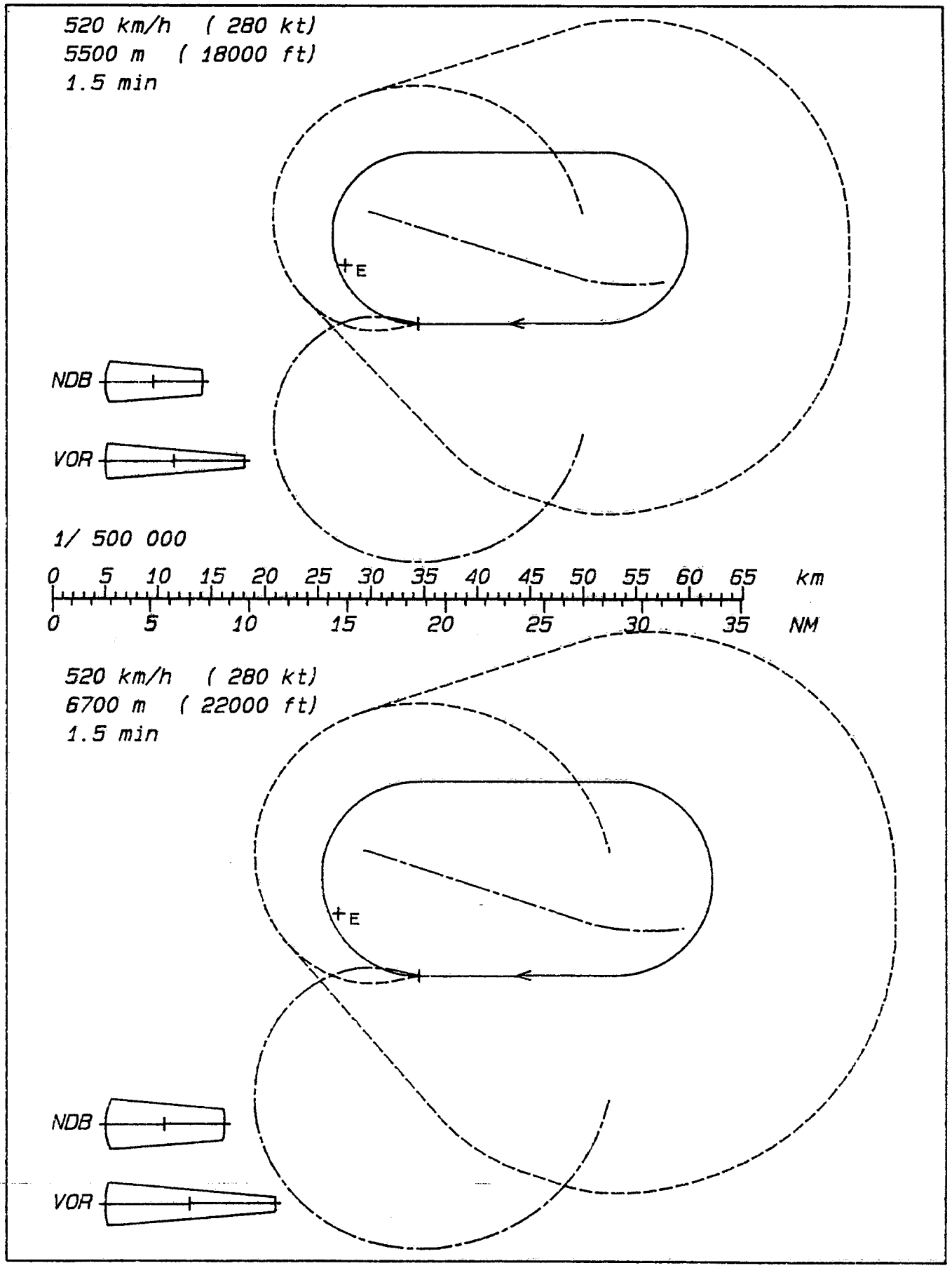
VOR

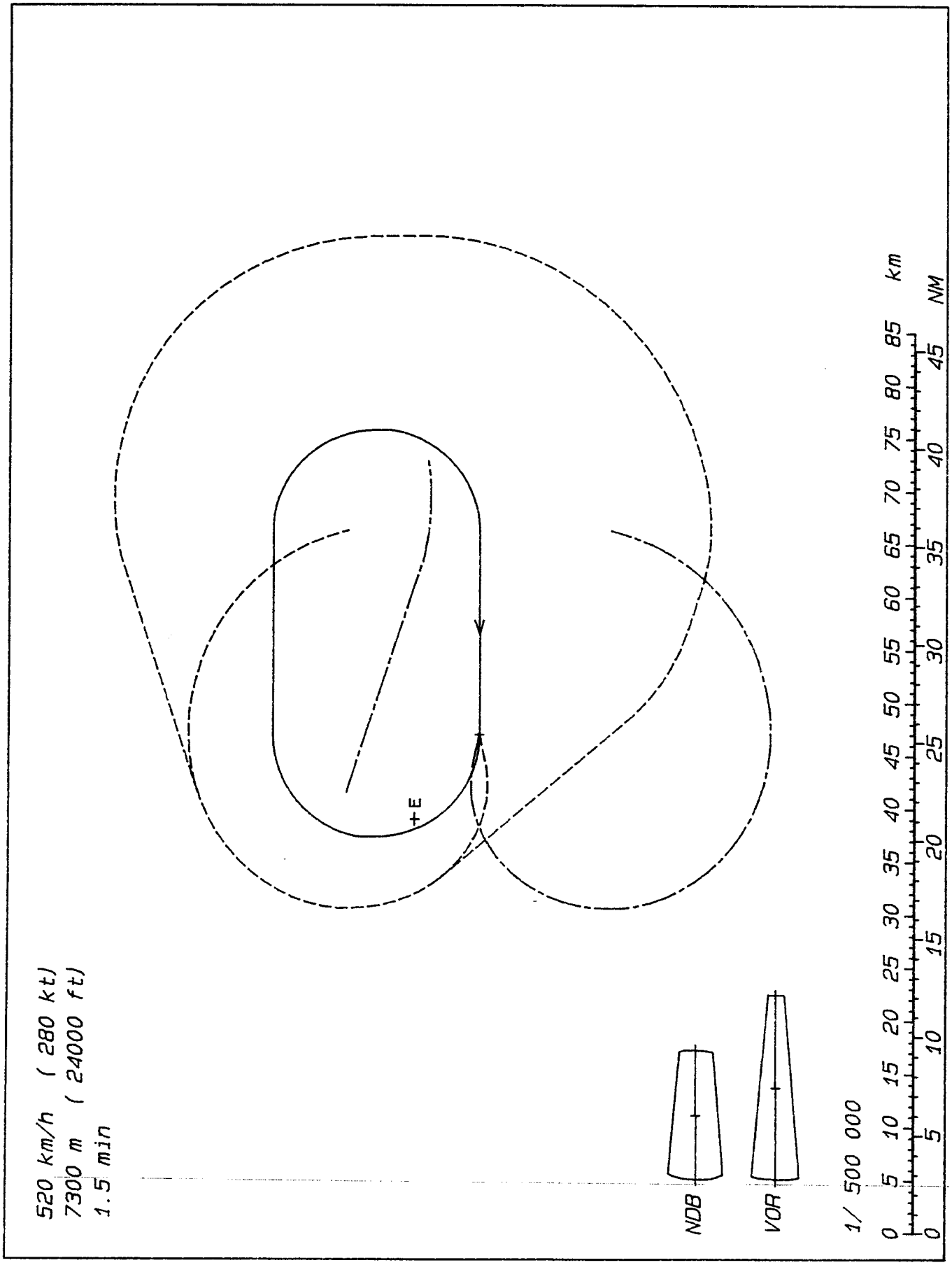
520 km/h (280 kt)
3050 m (10000 ft)
1 min

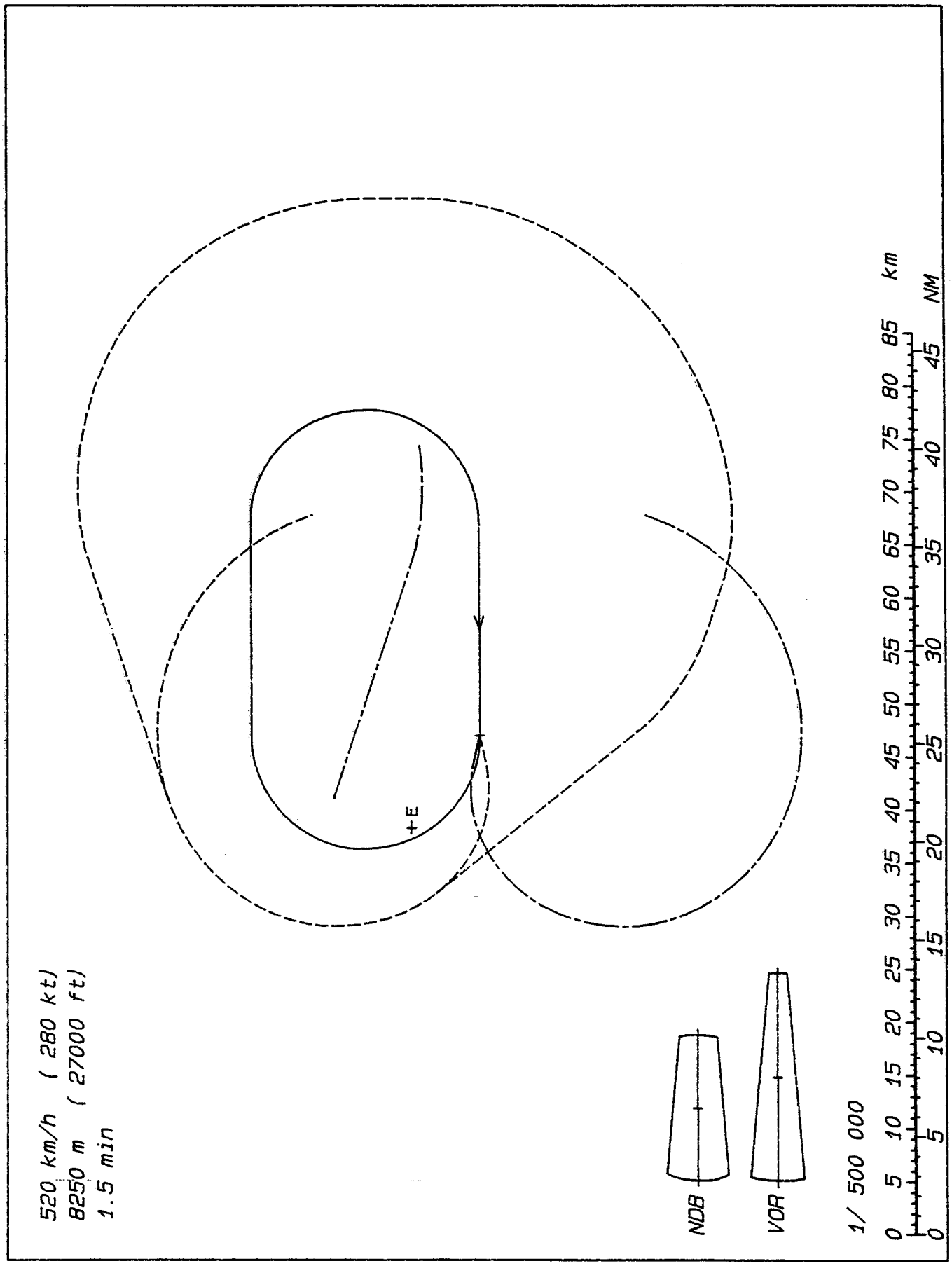


520 km/h (280 kt)
4250 m (14000 ft)
1 min




520 km/h (280 kt)
5500 m (18000 ft)
1.5 min
E
NDB
VOR
1/ 500 000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 km
0 5 10 15 20 25 30 35 NM
520 km/h (280 kt)
6700 m (22000 ft)
1.5 min
E
NDB
VOR


520 km/h (280 kt)
7300 m (24000 ft)
1.5 min
+E
NDB
VOR
1/ 500 000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 km
0 5 10 15 20 25 30 35 40 45 NM


520 km/h (280 kt)
8250 m (27000 ft)
1.5 min
+E
NDB
VOR
1/ 500 000
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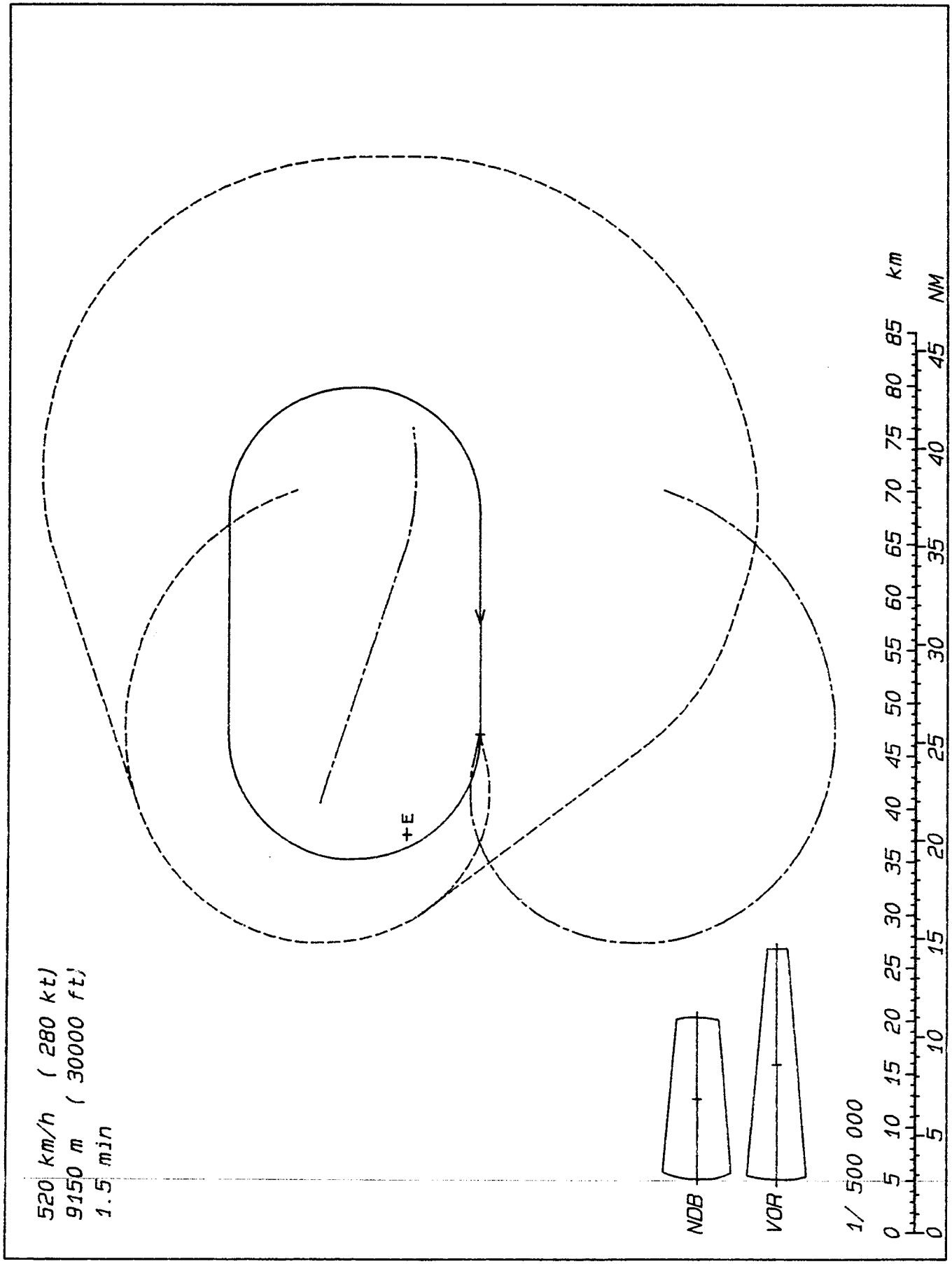
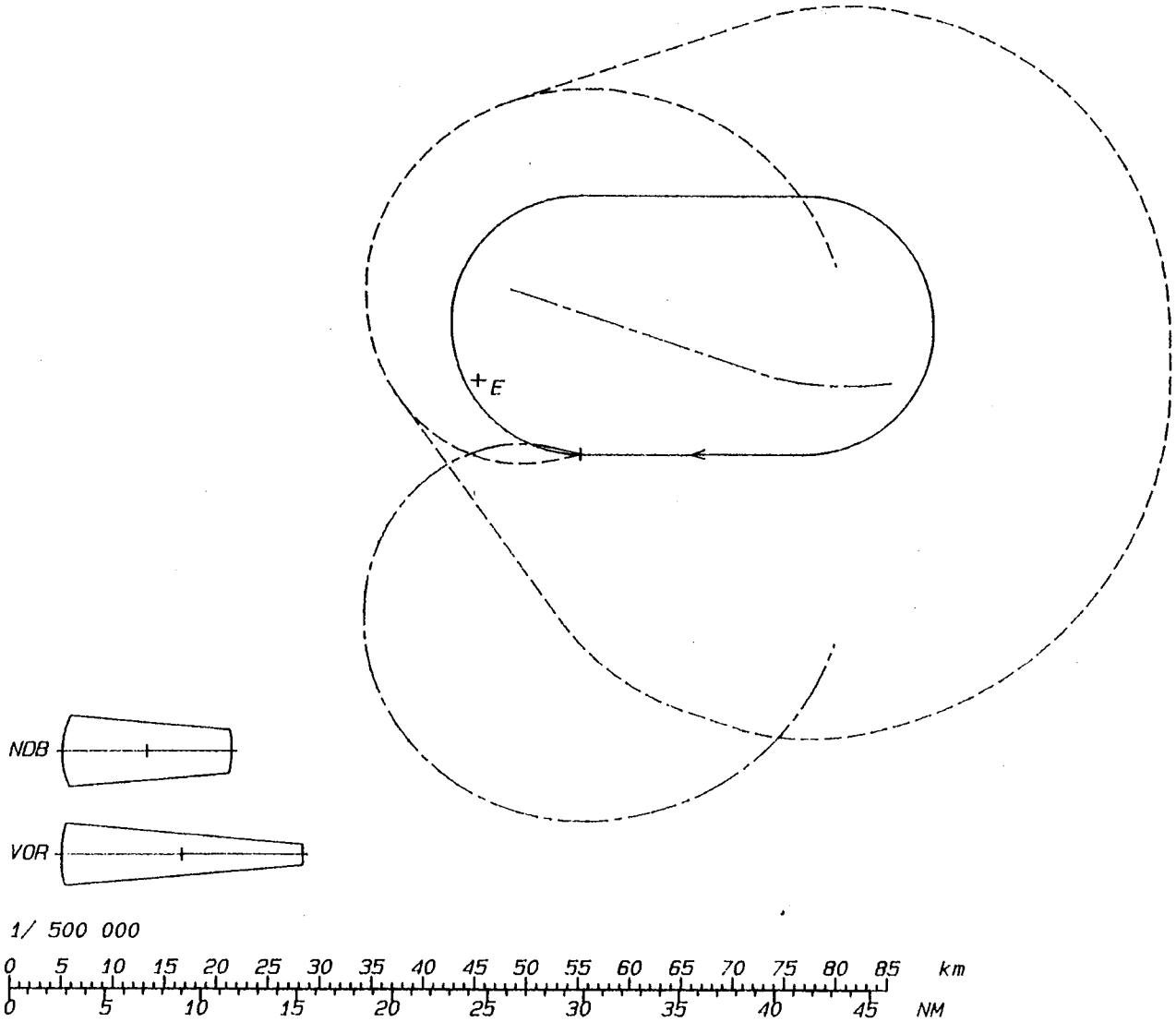
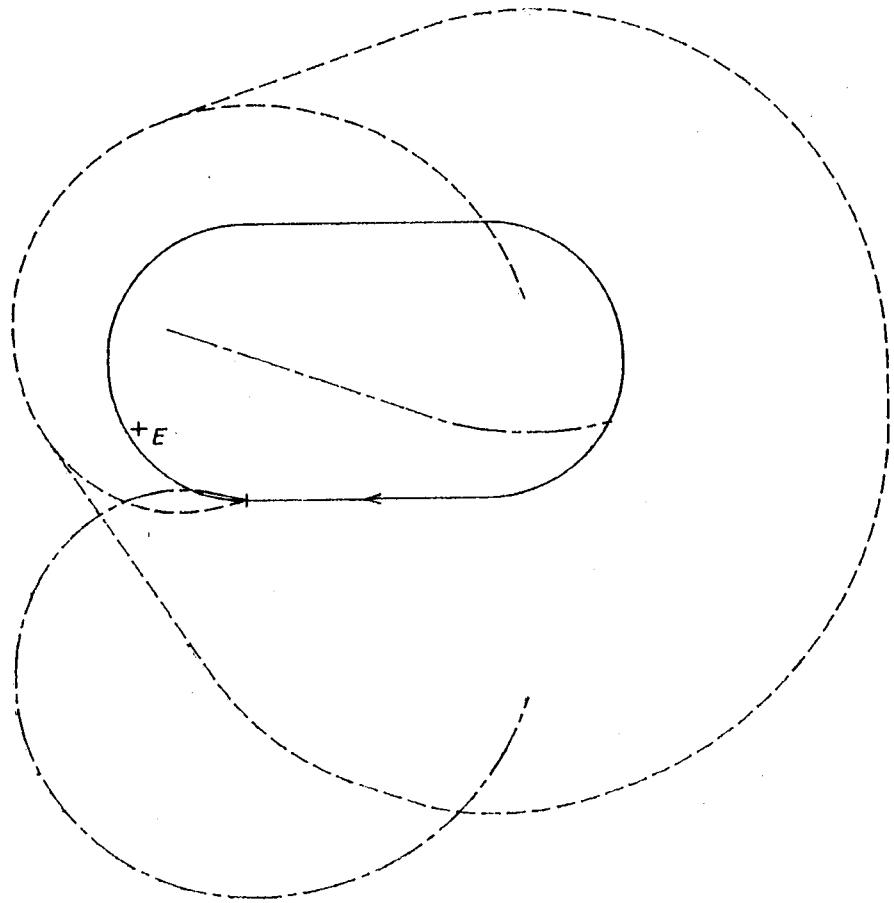
0 5 10 15 20 25 30 35 40 45 NM

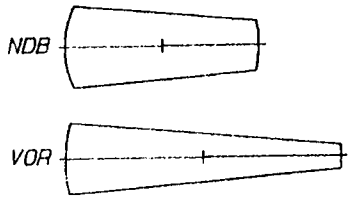

520 km/h (280 kt)
9150 m (30000 ft)
1.5 min
E
NDB
VOR
1/ 500 000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 km
0 5 10 15 20 25 30 35 40 45 NM

520 km/h (280 kt)
9750 m (32000 ft)
1.5 min



M 0.8
10350 m (34000 ft)
1.5 min





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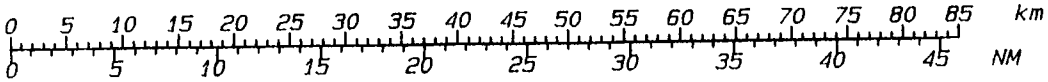

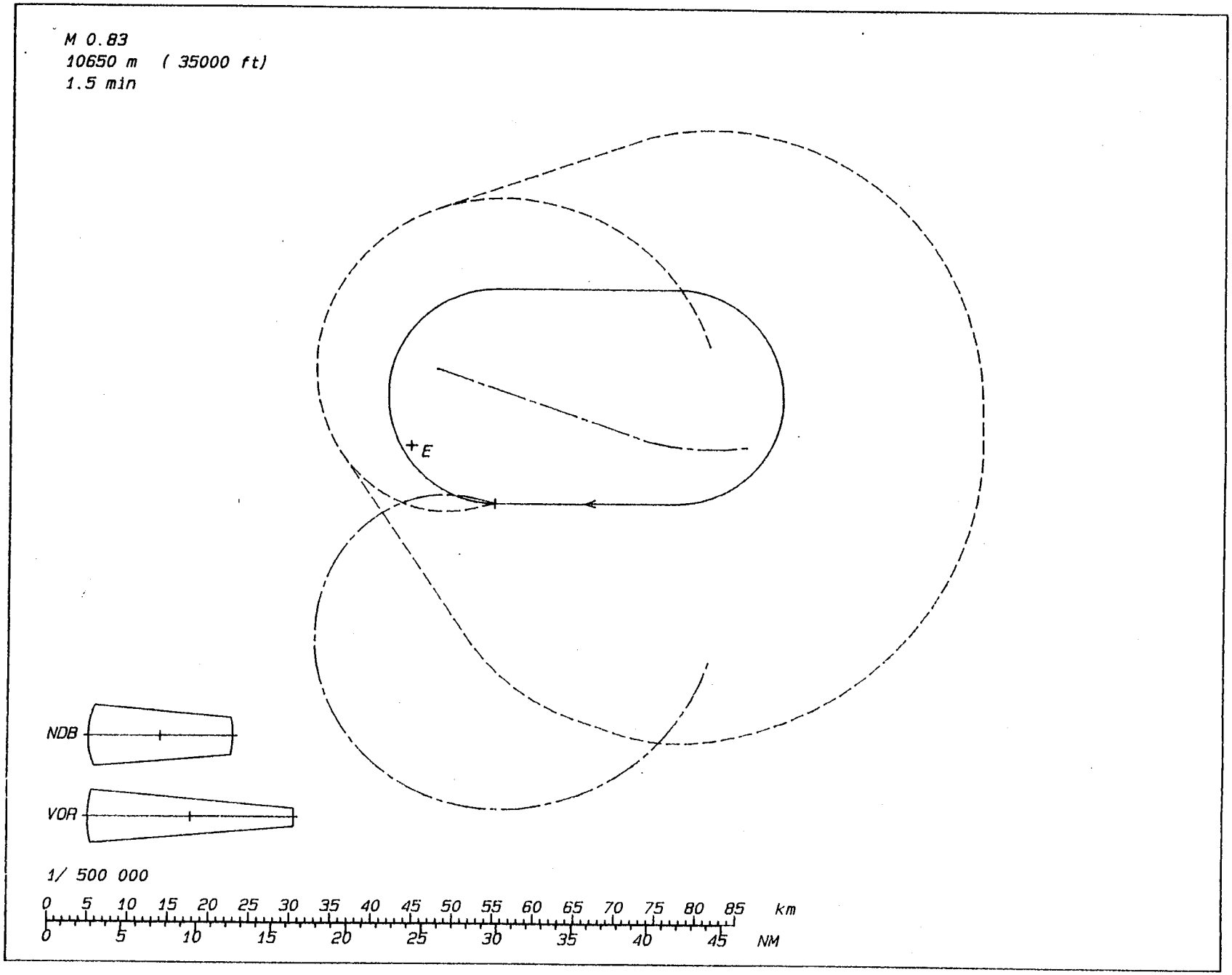
M 0.83
10650 m (35000 ft)
1.5 min
E
NDB
VOR
1/ 500 000
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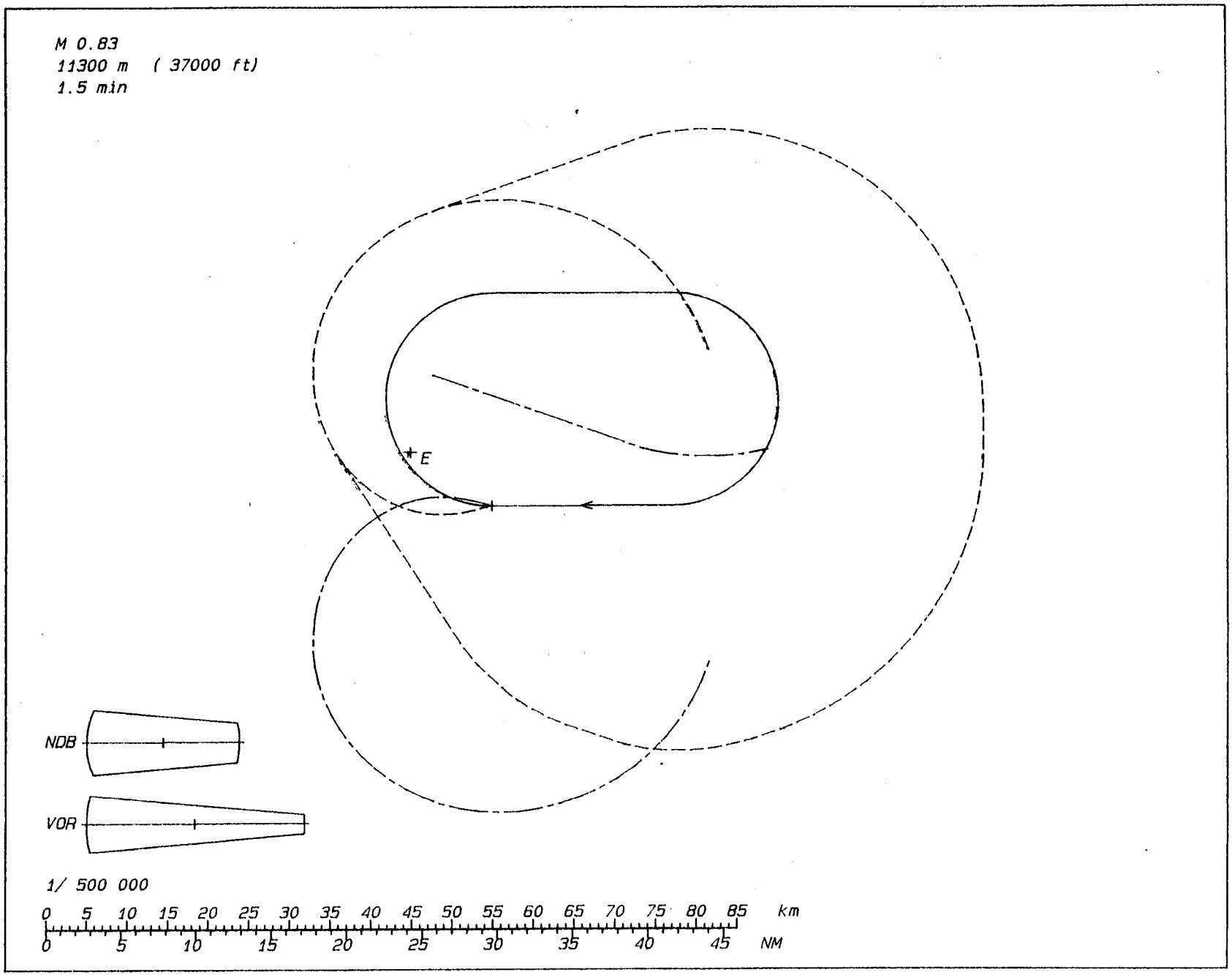
0 5 10 15 20 25 30 35 40 45 NM


M 0.83
11300 m (37000 ft)
1.5 min
E
NDB
VOR
1/ 500 000
0 5 10 15 20 25 30 35 40 45 50 55 60 65 70 75 80 85 km
0 5 10 15 20 25 30 35 40 45 NM

ICAO TECHNICAL PUBLICATIONS

The following summary gives the status, and also describes in general terms the contents of the various series of technical publications issued by the International Civil Aviation Organization. It does not include specialized publications that do not fall specifically within one of the series, such as the Aeronautical Chart Catalogue *or the* Meteorological Tables for International Air Navigation.

International Standards and Recommended Practices are adopted by the Council in accordance with Articles 54, 37 and 90 of the Convention on International Civil Aviation and are designated, for convenience, as Annexes to the Convention. The uniform application by Contracting States of the specifications contained in the International Standards is recognized as necessary for the safety or regularity of international air navigation while the uniform application of the specifications in the Recommended Practices is regarded as desirable in the interest of safety, regularity or efficiency of international air navigation. Knowledge of any differences between the national regulations or practices of a State and those established by an International Standard is essential to the safety or regularity of international air navigation. In the event of non-compliance with an International Standard, a State has, in fact, an obligation, under Article 38 of the Convention, to notify the Council of any differences. Knowledge of differences from Recommended Practices may also be important for the safety of air navigation and, although the Convention does not impose any obligation with regard thereto, the Council has invited Contracting States to notify such differences in addition to those relating to International Standards.

Procedures for Air Navigation Services (PANS) are approved by the Council for world-wide application. They contain, for the most part, operating procedures regarded as not yet having attained a sufficient degree of maturity for adoption as International Standards and Recommended Practices, as well as material of a more permanent character which is considered too detailed for incorporation in an Annex, or is susceptible to frequent amendment, for which the processes of the Convention would be too cumbersome.

Regional Supplementary Procedures (SUPPS) have a status similar to that of PANS in that they are approved by the Council, but only for application in the respective regions. They are prepared in consolidated form, since certain of the procedures apply to overlapping regions or are common to two or more regions.

The following publications are prepared by authority of the Secretary General in accordance with the principles and policies approved by the Council.

Technical Manuals provide guidance and information in amplification of the International Standards, Recommended Practices and PANS, the implementation of which they are designed to facilitate.

Air Navigation Plans detail requirements for facilities and services for international air navigation in the respective ICAO Air Navigation Regions. They are prepared on the authority of the Secretary General on the basis of recommendations of regional air navigation meetings and of the Council action thereon. The plans are amended periodically to reflect changes in requirements and in the status of implementation of the recommended facilities and services.

ICAO Circulars make available specialized information of interest to Contracting States. This includes studies on technical subjects.

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