

PDF I

" #	1
\$ %& ' () * + , - . /	5
1.1	5
1.2	7
1.3	8
1.4	11
0 1 2 3 4	12
2.1 /	12
2.2	12
2.3	14
2.4	14
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N 6 7 0 P > ?	99
9.1	99
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9.6.1.2	113

$D = 0.24 T_c (9.96 / E_4 + 6.1912) T_j$

11.1.4		138
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11.2		141
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Q 0 WXYZ [		152
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12.13		161
Q 5 \] R G		162
Q ; ^)		165
_ ^ ! A `		166
1.		166
2.		168
3.		169
4.		169
5.		170
_ ^ ! B ` a b c d e f G H		171
1.		171
2.		172

_ ^ I C ` 178

1. NTS	178
1mm	178
0.1mm	179
2.	 180
3.	 181
	181
	 182

" #

NTS-380R

NTS-380R

NTS-380R

NTS-380R₄ NTS-380R₆ NTS-380R₈ NTS-380R₁₀ N10



b

c

d

(*)

e

f

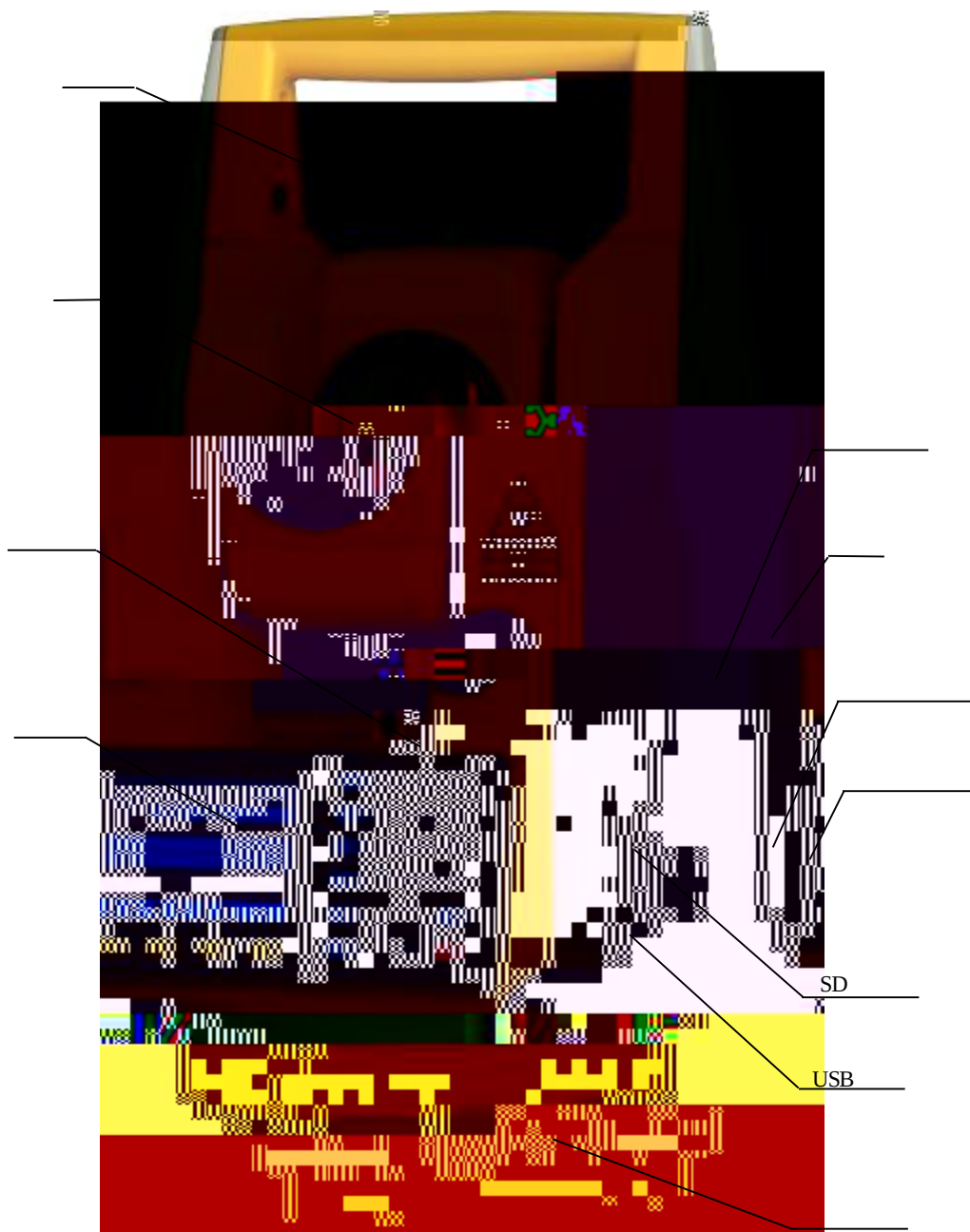
g

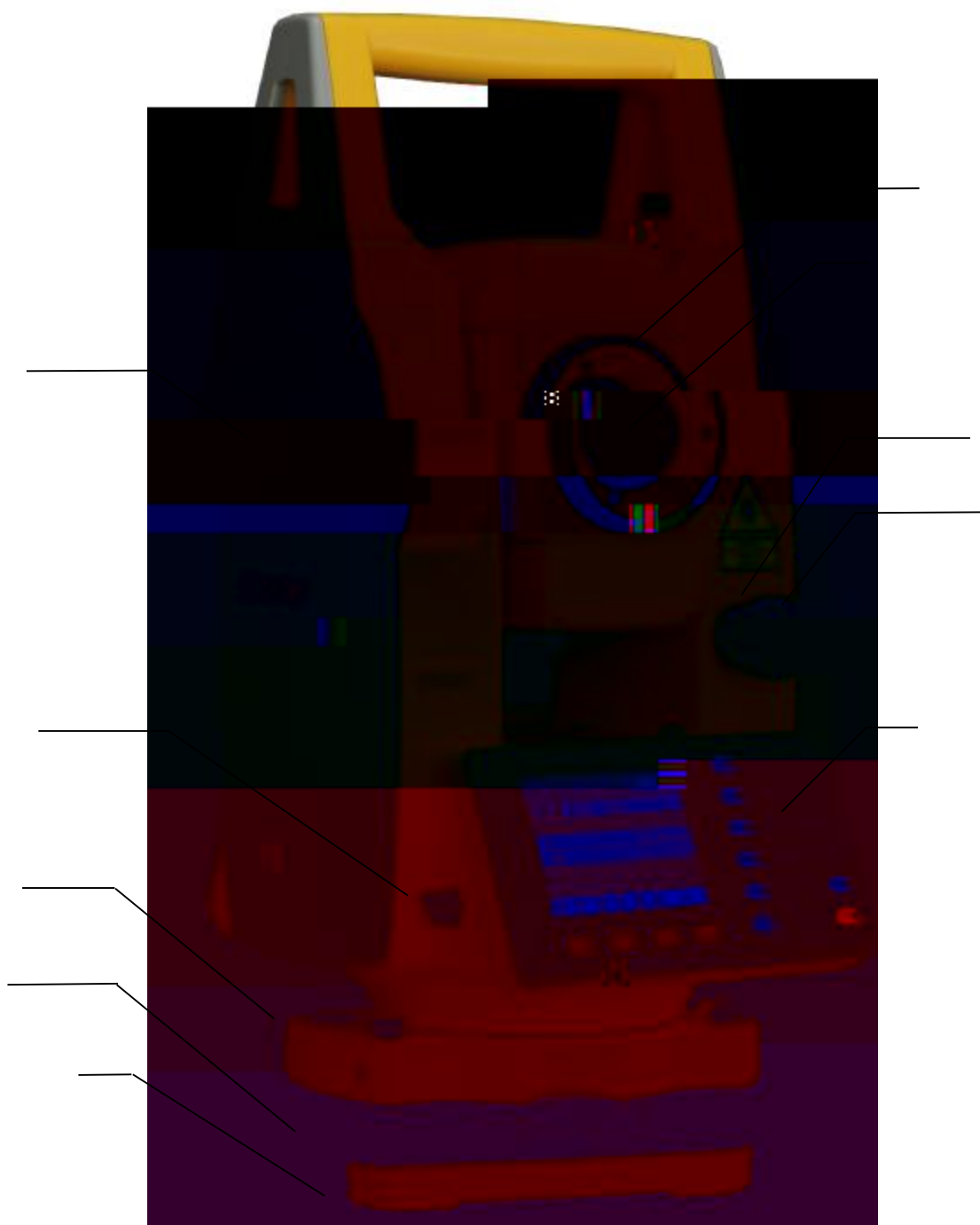
*

**9 2 Class 3R / , a () & 8 % 4 6 A % : ; < 2 = A B 1 1000m(3300ft) < > ? A B
@ A < () B = C D E Class 1(F G H I) J s K L M N =) O**

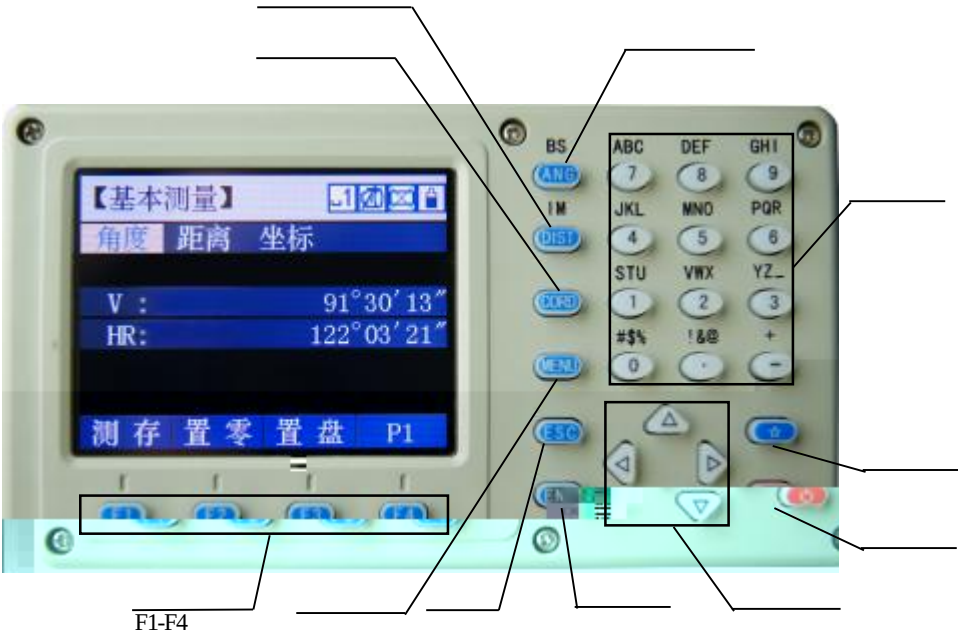
\$ P % & ' () * + , - . /

1.1





1.2



Q R S T

ANG		()
DIST		(/)
CORD		
MENU		
ENT		
ESC		
		/
F1 F4		
0 9		
U -		
★		

V W S T h

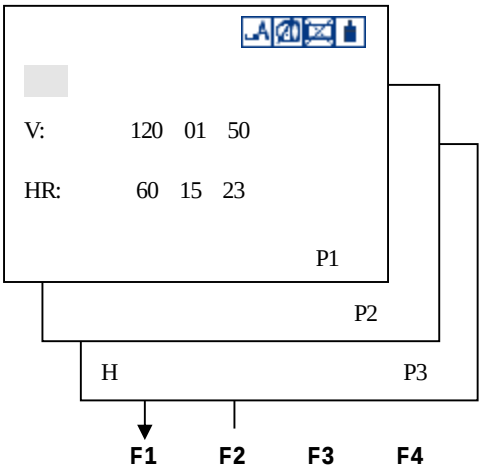
V%	()
HR	()

fi

HR	()
HD	
VD	
SD	
N	
E	
Z	
m	
ft	

1.3

()



1 (P1)	F1		()
	F2		
	F3		
	F4	P1	2
2 (P2)	F1		
	F2		
	F3		/
	F4	P2	3
	F1	H	0 90 180 270

3
(P3)

F2
F3

/

V: 120 01 50

HR: 60 15 23

N: 0.417m

E: 0.077m

Z: 3.063m

P1

P2

m/f/i P3

F1 F2 F3 F4

1 (P1)	F1		(
	F2		)
	F3		/N / / ,
	F4	P1	2
2 (P2)	F1		
	F2		
	F3		
	F4	P2	3
3 (P3)	F1		
	F2		
	F3	m/f/i	/ /
	F4	P3	1

1.4 ()

()

()

1
2

[◀] [▶]

0 < 1 2 3 4

2.1 /

[POWER]

SD

SD

SD



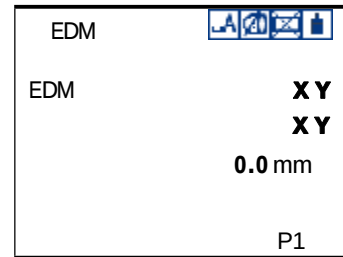
，
，

[]

()	[]	Z [34 0 XY 2 XY 8 XY 100% EDM

[F2]()

1 [] () [F3]
[F3]



EDM 

2 [] [] ,
[] [◀ ▶]

1	[]		 0 XY 2 XY 8 XY 100% EDM
2	[F3] [F4]	[F3]() [F4] P1	EDM  EDM XY XY 0.0 mm P2
3	[F1]	[F1] () 1)	EDM  EDM RX 50%
1) [ESC]			

2.6

PPM

NTS

(0)

1013hPa

20 C

$$S = 278.44 - 0.294922 P / (1 + 0.003661 T) (ppm)$$

S

P (hPa) mmHg 1hPa = 0.75mmHg
T (C)

2.6.1

(PPM)			
1	[] [F3]	[F3](EDM)	EDM EDM X Y X Y 0.0 mm P1
2	[F1]	[F1] ()	0.14 20.0 1013.0hPa 0.0PPM PPM=0
3	[F2] [◀ ▶] [F3]	[F2] () , [◀ ▶] [F3] ()	X Y 20.0 1013.0hPa
3	[F4]	[F4]() 1) PPM	0.16 27.0 1008.0hPa 7.9PPM

1)	[F3]	[F3]
----	------	------

2.6.2

+25 1017.5

1	[]		 0 XY 2 XY 8 XY 100% EDM
2	[F3]	[F3](EDM) EDM .	EDM  EDM XY XY 0.0 mm P1
3	[F1] [F4]	[F1]() PPM 1) ENT [F4]() EDM	 0.15 20.0 1013.0hPa 1.0PPM PPM=0
	1)	PPM 3.7 -99.9 +99.9 (0.1) -99.9 +99.9 (0.1) 0 1066hPa(0.1hPa) 0 1066mmHg(0.1 mmHg) 0 1066inHg(0.1 inHg) 999.9ppm 2	

2.7

\ q [] 8 ^ A h

$$D=S * [\cos + \sin * S * \cos (K-2) / 2Re]$$

\ q [] 8 _ ` h

$$H= S * [\sin + \cos * S * \cos (1-K) / 2Re]$$

a s n o b c d) e f g h i q [, j a b ^ A e _ ` 8 k ? l :

$$D=S \cos$$

$$H=S \sin$$

? m h

$$K=0.14$$

$$Re=6370 \text{ km}$$

()

()

S

1	[]		 0 XY 2 XY 8 XY 100% EDM
2	[F3]	[F3](EDM) EDM .	EDM  EDM XY XY 0.0 mm P1

3	[F1] [F4]	[F1]() 1) [F4]()	ENT EDM	0.15 20.0 1013.0hPa 1.0PPM PPM=0
	1)	3.7	K=0.14 K 0.0 0.2	

2.8 /

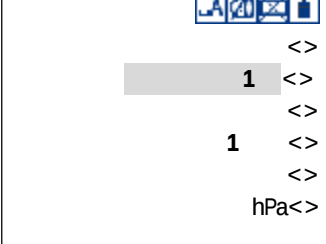
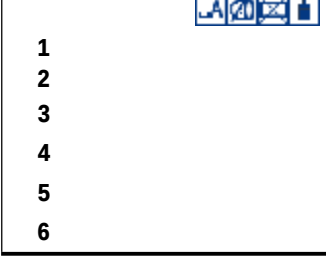
	,	/
NTS-380R	1 /5 /10 /0.1	1mm /0.1mm
[]	0.1	

[MENU] , [5]([MENU]
) [5]

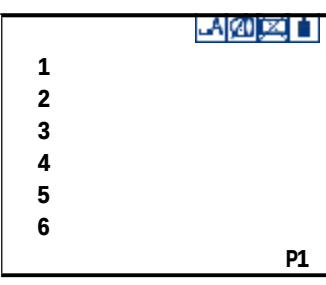
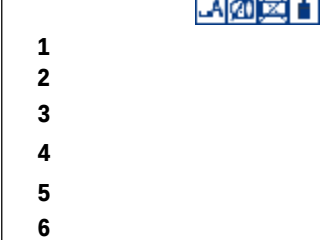
1 2 3 4 5 6 P1



[1] () [1]

[] [◀ ▶] , [F4]()	[F4]	
		

2.9

[MENU] , , [5]()	[MENU] [5]	
		

[4] ()	[4]	 <> <> <> <> <> SD/HD<>
[< >] /20 /30 / [F4]() 10	[F4]	 <> <> <> <> <> SD/HD<>
		 1 2 3 4 5 . 6 .

2.10

12.9



[] , [F3] , EDM []
[F3]

[EDM] [] [F4](P1) [F2]()	[P1] [F2]	EDM EDM XY XY 0.0 mm P2
[] [F4] [EDM]	[F4]	0.0mm 0.0 ppm
1) 3.7 2) [ESC]		

! " #
\$ % & ' () * + , - . / 0 1 2 3 4 5 6 7 8 9 : ; < = > ? @ A B 3 4 C D 7 8 - .
/ & 0 1 (D) E F G H I J K L M 0 N 0 0 1) P ? Q R S 3 4 , 6 T U V A B 3 4 C

2.11



[MENU]
,

[F4](P1)
[1]

[MENU]
[F4]
[1]

[F1]() 2)	[F1]	C001.SCO C002.SCO C003.SCO P1
[] [◀ ▶]	[]	C001.SCO C002.SCO C003.SCO P1
[ENT]() 2/2	[ENT]	1 P2
1) 3.7 2) 11.1.1		

5 P 6 7 " 8 9 :

3.1

n o

S L

(

)

,

3.2

(

)

U p q R r h

1 P y [s g m m Y t ^

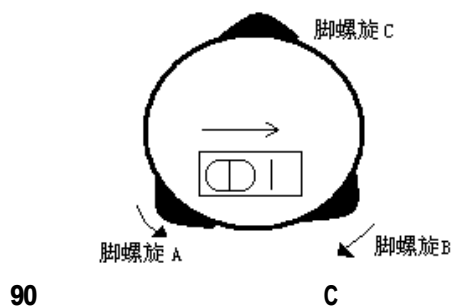
1)

2)

3)

|

)>hi



90 ,

2Py [) umm&mm

1)

2)

3)

4)

A B

90

A B

A B

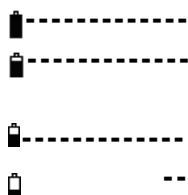
C

5)

()

3.3

vwx y



4

SL~g•t h

300-500

3.4

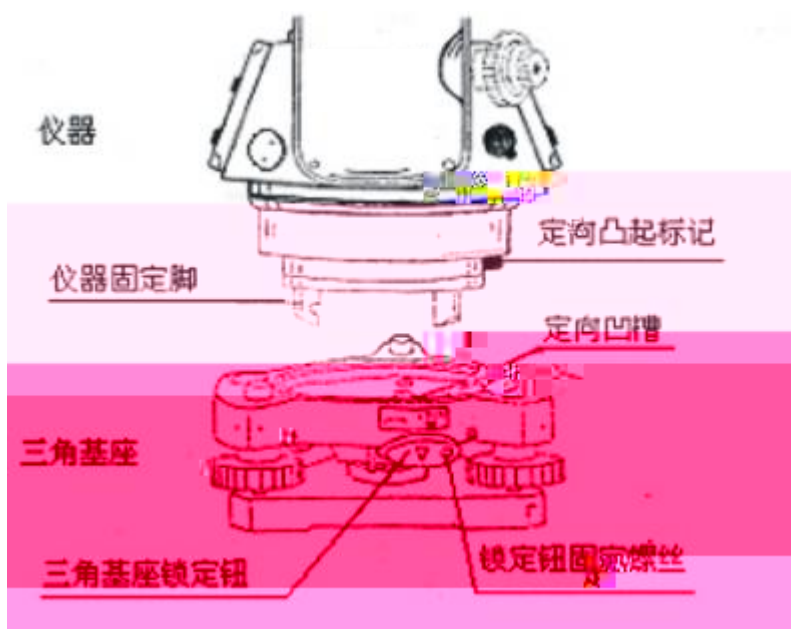
()



3.5

I

()



！"

180

3.6

()

(

)

3.7

NTS-380R

*# \$ G %


```

[.]
[2]      2      [0]      0
[F4]

          90 10 20

*# $%S

[ 3]                      SOUTH1
1    [F4] ,

```

```

2                                [1]

```

```

3      [DIST]                                [DIST]

```

```

g h & ' ( m V W ) % * + ~ , & # $ G % < V W ) G % + ~ , & # $ % * 0
- [ANG] ( . / ) Q < & 0 1 # $ 8 % S 0
& 2 # $ 8 % * m 2 3 4 5 6 % * > 7 $ Q 8 < > # $ - m 8 9 0 6 % * ~ <
) E : ; < : F <

```

; P <= 6 7 > ?

4.1

()

(

)

4.2 (/)

[P1] [P2]





V : 120 01 50
HR: 90 09 30
P1

[P2] , []



V : 120 01 50
H 5

[F3]()	[F3]	V :120 01 50 HR:90 09 30 P1
1)150 10 20 [F4]	[F4]	150 10 20
		V :120 01 50 HR:150 10 20 P1

4.4 (%)



①

[F4]

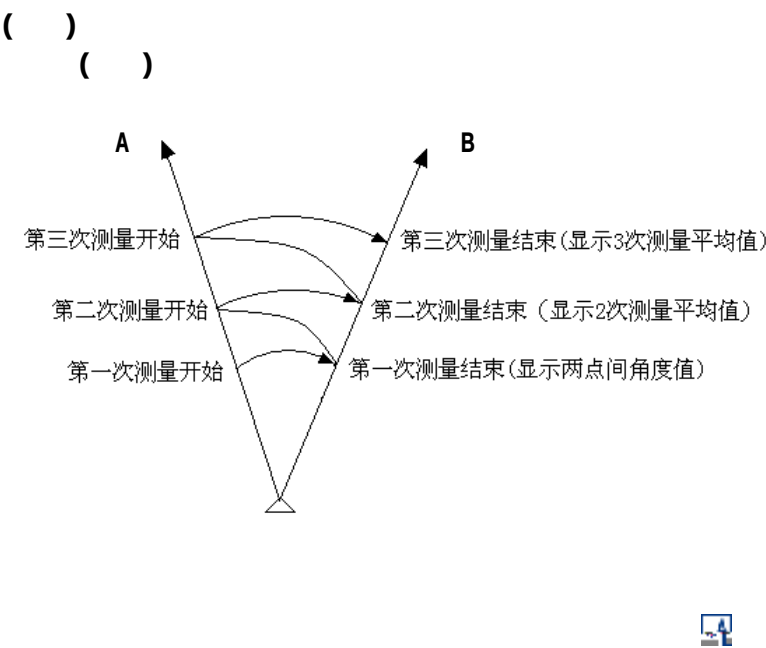
[P1]

[P2]

[F4]

[F3]() 1)		[F3]	V : -57.84% HR: 120 09 30
1) [F3]()	90 () ()		

4.5



[P1] [P2] [F4]

[F2]()	[F2]	 0 0 00 00 0 00 00 HR: 120 09 30
A [F1]()	A [F1]	
[F3]()	[F3]	 0 0 00 00 0 00 00 HR: 0 00 00
[F4]() B	B [F4]	 1 120 20 00 120 20 00 HR: 120 20 00
[F4]() A	A [F4]	 1 120 20 00 120 20 00 HR: 0 00 03
[F4]() B	B [F4]	 2 240 40 02 120 20 01 HR: 120 20 05

6 1) 2)		 6 722 00 06 120 20 01 HR: 120 20 00
[F3]() [F2]()	[F2] [F3]	  V : 120 01 50 HR: 120 09 30 P2
1) (3600 00 00 -) ()		
2) 5 3599 59 55 30		

4.6 90

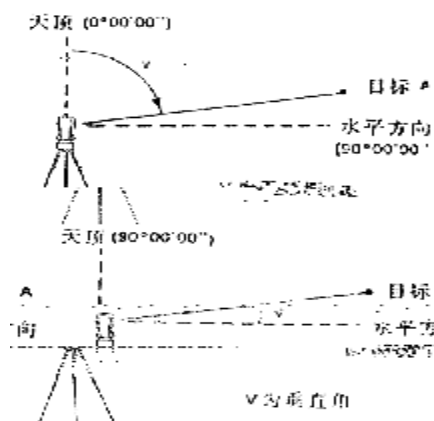
0 (90 180 270) 4 30 15



[F4](P1) [P3] [F4]

[F1](H)	[F1]	HA < >
[< >]	[< >]	HA < >
[]	[F4]	V: 10.30% HR: 120 09 30 H P3

4.7



[P1] [P3]	[F4]	V: 19 51 27 HR: 120 09 30 P1
[F3]() 1)	[F3]	V: 70 08 33 HR: 120 09 30 P3
1) [F3]()		

@ P A B 6 7 > ?

NTS-380R

(
& - / 6 7 Q ~ < % & > m >) d % 8 E n o A B 6 7 0

? @ A 6 A

EDM
() EDM

(12.11)

**m @ A B C 6 A D I [E 9 > ? (@ A > ?) 0
E F () 9 G H I J 6 A**

(12.11)

K k s 7 H I @ A 8 [K ^ L Z G 0

5.1

--	--	--

[DIST]
1)

[DIST]





V : 87 25 25

HR: 120 09 30

: ----.---m

: ----.---m

: ----.---m

P1

[F2]





V: 87 25 25

HR: 120 09 30

: 241.551m

: 235.343m

: 36.551m

P2



2) 3)

1)	(EDM)	[F4][]
2)	m () ft () fi ()	
3)		
4)	7.6	

5.2

NTS-380R / 2 / 3 / 4 / 5 /
/



[DIST]

[DIST]



① [P1]

[P2]

[F4]

[F2]()

[F2]



3	:	0
V		99 55 36
HR		141 29 34
:		----.---m
:		----.---m
:		----.---m
EDM		

[F2]()

[F2]



:		X Y
:		100.000m

, 1).

[< >]

[F4]()

[F4]

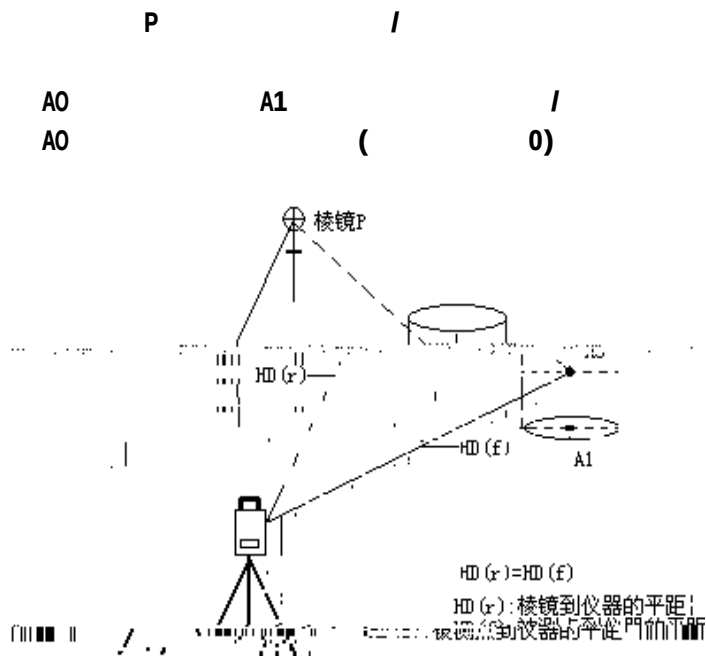


0m		 3 : 0 V 99 55 36 HR 141 29 34 : 2.164m dHd: 0m : 1.250m EDM
1)	3.7	

5.5

- 1
- 2
- 3
- 4

5.5.1



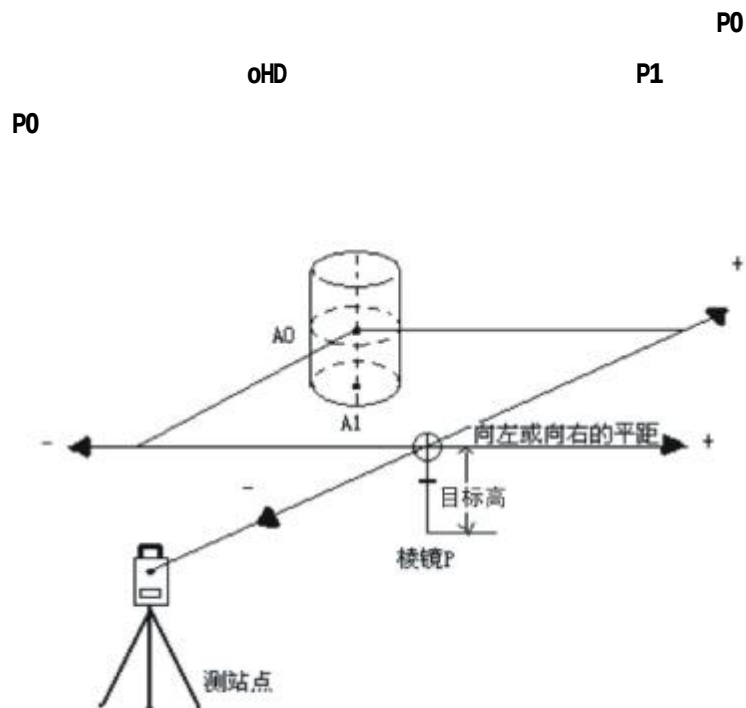
/

6.2

[F4](P1) [P2]	[F4]	V 99 55 36 HR 141 29 34 : ---- --- m : ---- --- m : ---- --- m P1 m/f/i P2
[F1]()	[F1]	1 2 3 4
[1](),	[1]	V 99 55 36 HR 141 29 34 : ---- --- m : ---- --- m : ---- --- m
P [F4]() [F4]() 1)	[P] [F4]	V 99 55 36 HR 141 29 34 : ---- --- m : ---- --- m : ---- --- m 2 1 V 99 55 36 HR 141 29 34 2.557 m 2.175 m 1.278 m

AO AO	AO	V995536 HR1412934 3.564 m 2.175 m 1.278 m
2)AOA1[]	[]	V995536 HR1412934 N0.257 m E0.165 m Z-0.802 m
1) [F1]()4 2) [ESC]		

5.5.2



6.2

[F4](P1)

[P2]

[F4]



V99 55 36

HR141 29 34

:

:

:

P1

m/f/i P2

[1]

[F1]



1

2

3

4

[2]() ,

[

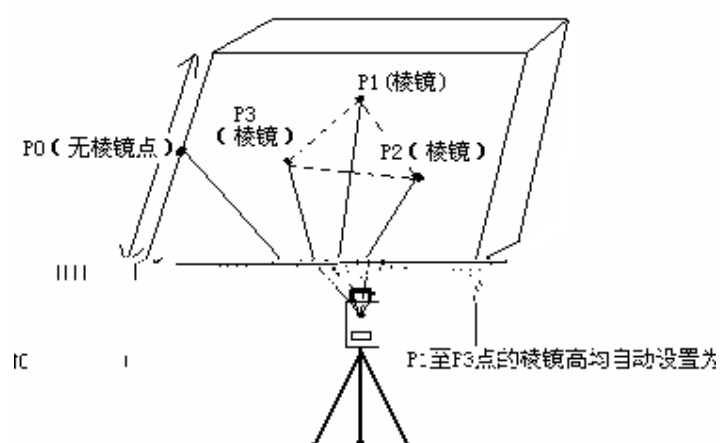


P1 [F1]()

[F4]()

P1

[F1]



6.2

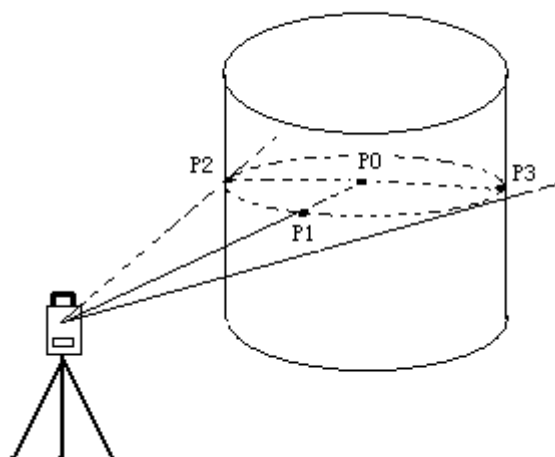
[F4](P1)

P2

[

	P2 [F1]	1 V995536 HR1412934 : 0.556m : 0.588m : -0.534m 2 V1082334 HR1412934 : 0.378m : 0.358m : -0.119m
--	------------------------	---

5.5.4



[4]) 1 (



1) P0 [] []

CPDE67>?

6.1

6.2

6.3

6.4

,

(N0 E0 Z0)

(n e z)

(N1 E1 Z1)

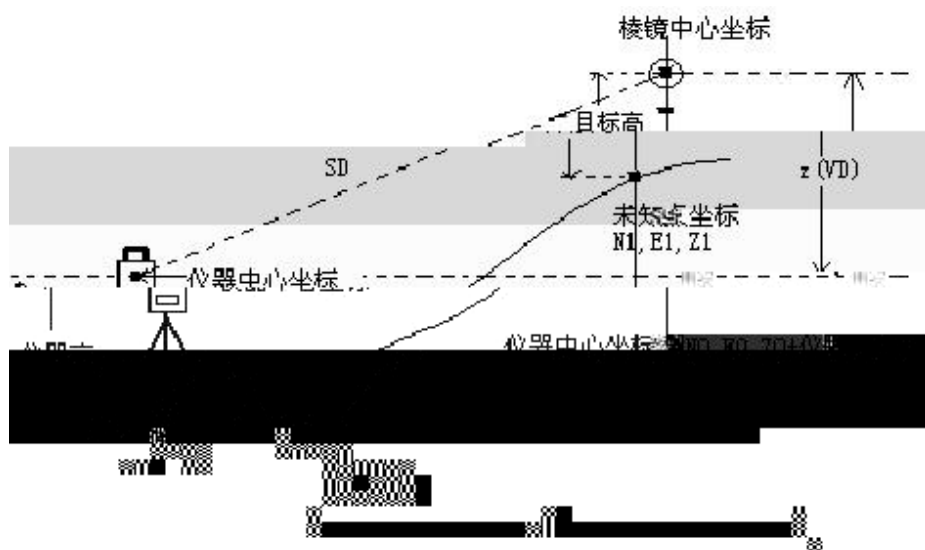
Z(VD)

$$N1=N0+n$$

$$E1=E0+e$$

$$Z1=Z0+ \quad +Z-$$

((N0 E0 Z0+)



$$g \cdot h 5 u 3 4 6 M D E < \% _ < E _ ,] N 0 = < 0$$

① A [F2]() [F1]() +1	[F2] [F1]	V99 55 36 HR141 29 34 N:-----m E:-----m Z:-----m P1 : : : N :-----m E :-----m Z :-----m
		V99 55 36 HR141 29 34 N36.001 m E49.180 m Z23.834 m P1

6.2

()

()

[F4](P1) P2

[F4]

			
V	99	55	36
HR	141	29	34
N:	----,---m		
E:	----,---m		
Z:	----,---m		
P1			
P2			

[F3]()

[F3]

NO 0.000 m
EO 0.000 m 0 m 0 m 0m0mf

[F4]		V995536 HR1412934 N:-----m E:-----m Z:-----m P2
1)	3.7	
	-99999999.9999	N E Z +99999999.9999 m
	-99999999.9999	N E Z +99999999.9999 ft
	-99999999.11.7	N E Z +99999999.11.7 ft+inch

6.3

注:

[F4](P1) (P2) [F4]

1)	3.7	
	-9999.9999	+9999.9999 m
	-9999.9999	+9999.9999 ft
	-9999.11.7	+9999.11.7 ft+inch

6.4

Z

①	[F4] P2	V 99 55 36 HR 141 29 34 N: ----.---m E: ----.---m Z: ----.---m P2
[F1]() ,	[F1]	1.453 m 2.000 m
[F4]() 1)	[F4]	1.453 m 2.000 m
1)	3.7	
	-9999.9999	+9999.9999 m
	-9999.9999	+9999.9999 ft
	-9999.11.7	+9999.11.7 ft+inch

F P G H I J

h [MENU] 1/2
[1]()

[ESC] [MENU]

	    
1	
2	
3	
4	
5	
6	
	P1



NTS-380R

7.1

1

2

3

(
,)

4

5

6

7.2

7.2.1



[MENU]

[1]()

[MENU]

[1]



[]

3)

[]



7.2.1

[1](),	[1]	 1 2 3 4 5
[F3]()	[F3]	 StrName StrCode 0.000m NO 100.000m EO 100.000m ZO 100.000m
[F4]() [F4]()	[F1] [F4] [ENT]	 1 2 3 4  5 Code N 36.001 m E 49.180 m Z 23.834 m  1 2 3 4 5



1) [F2]() [ENT]() [F4]

[F3]()

[F3]

	
	BsName
	Code
	2.000m
NBS	0.000m
EBS	0.000m
ZBS	0.000m
NE/AZ	



[F1]

[F4]()

[F4]

[F4]()

[ENT]

[]



[ESC]

7.4.2



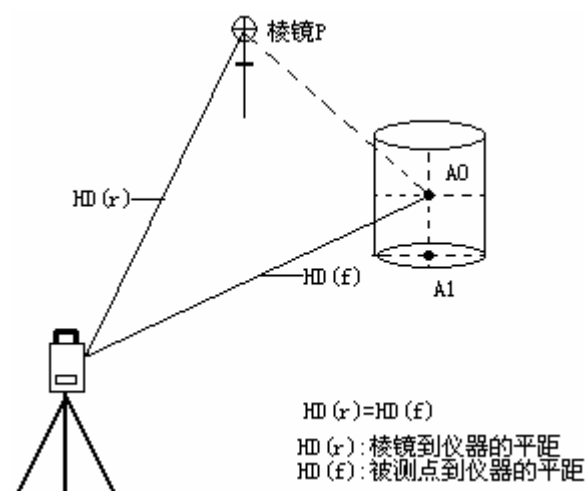
8

Code

0.000m



[]



A0

A1

A0

/
(0)

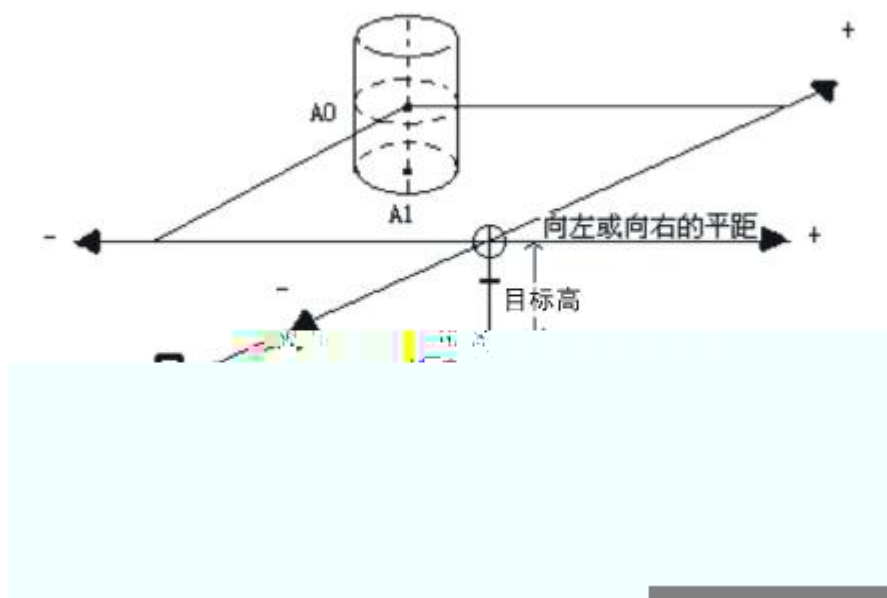
[3](



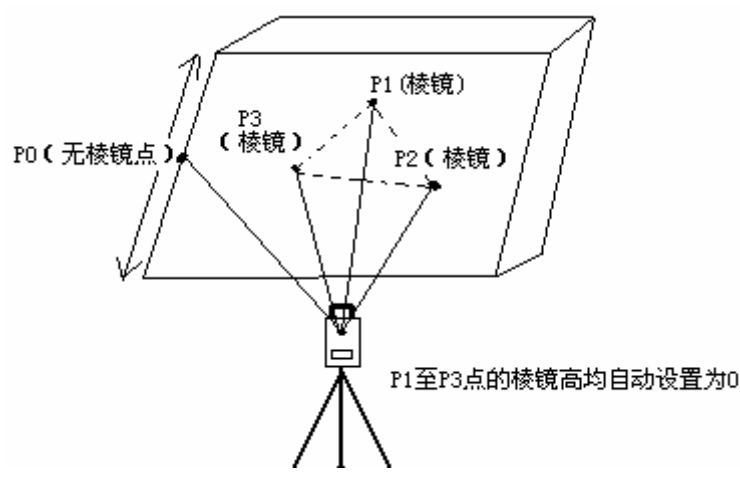
A0

A0

A0



[F3]()	[3] [F3]	
[2]()	[2]	
[F4]()	[F4]	



③ , [F4]() A0
[F4]

(P1 P2 P3)

P0

[F4] ()	[F4]	 1 V 99 55 36 HR 141 29 34 : : : -----m -----m -----m
	P2 [F1] P3 [F1]	 2 V 99 55 36 HR 141 29 34 : : : 0.556m 0.588m -0.534m  3 V 108 23 34 HR 141 29 34 : : : 0.378m 0.358m -0.119m
[F4]() (P0) [F4]() 3)	P0 [F4]	 V 93 49 37 HR 90 09 34 : : : 0.457m 0.456m -0.030m
		 V 93 49 37 HR 90 09 34 : : : 0.457m 0.456m -0.030m



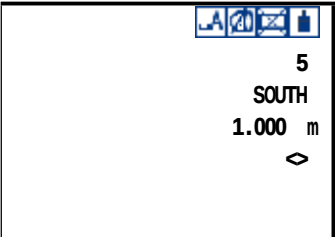
[]

[]

E > > 0.96(DF4+29 TF38.04016.2)(0.96)(F499 TF38.04016.28-0.96 (F4+69 TF58.040-129412-52.8.96 T(84+H) T.:F499 TF38.04016.08)>) TJ TF4+2

6.2

[3]([3]
[F3]() [F3]





(P3)

P3

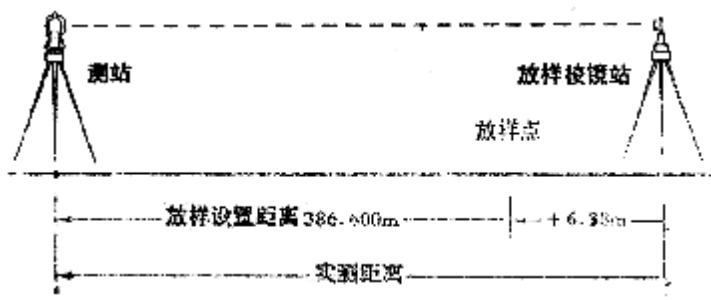
[F4]

(P3) [F4]()

	1	
	2	

K P L M

NTS-380R



8.1

- 1
- 2
- 3
- 4

8.2

8.2.1

- 1)

$=R/(R+ \quad)$

R

2)

3)

=

1)

$HDg=HD$

HDg

HD

2)

$HD= HDg/$

P W 3 4 D E X Y Z [

[] EDM	[F3](EDM) EDM	8 XY 0 XY 2 XY 100% EDM EDM EDM XY XY 0.0 mm P1

F2		 1.000000 0.000m 1.000000
1) 3.7 -9999 +9999m(-32805 +32805ft) 0.990000 1.010000		

8.2.2

[2]()	[2]	 1 2 3 4 5 6 P1
[F1]() 1)	[F1]	 south2
2)		 SOUTH1.SCD [] SOUTH2.SCD [] P1

[] []

[] []

	
SOUTH.SCD	[]
SOUTH2.SCD	[]



[ENT]()

[ENT]

)) 1) [F3]([F4](	[F3] [F4]	1 2 3 4 NO 50.000m E0 50.000m Z0 50.000m 1.450m
1) 3.7		

8.2

78r 

[1]

[1]

[F3] ,



N:	50.000m
E:	50.000m
Z:	99.500m
	1.500m





1.500m
0
south

N: 0.000m
E: 0.000m
Z: 0.000m



1
2
3
4

[F3]()

[F3]

[ENT]

[ENT]



1)		 south1  6 1.500m N: ----,---m E: ----,---m Z: ----,---m
		 J1 1.630m N: ----,---m E: ----,---m Z: ----,---m
1[F1]() [F4]()	[F1] [F4]	 J1 1.630m N: 99.098m E: 98.787m Z: 101.257m  J2 1.630m N: 99.098m E: 98.787m Z: 101.257m

1)

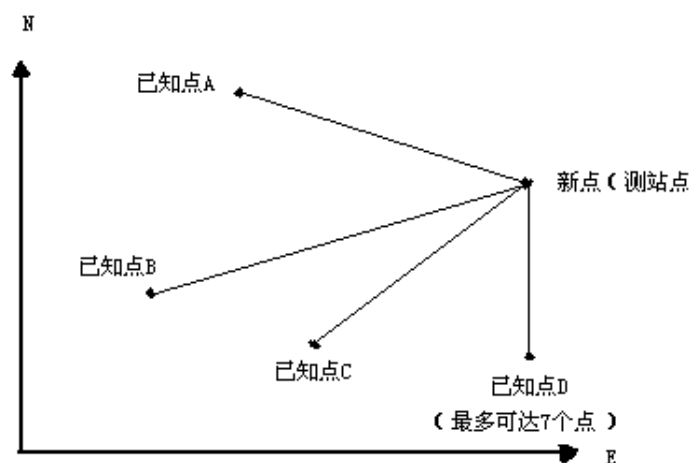
[F4]()

[F]

[F2]

8.4.2

7
2
3
(
)
3



[5]()	[5]	 1 2 3 4 5  STN1 1.450m
[F3]() [F4]()	[F4] [F3]	 H1 1.200m  N 0.000m E 0.000m Z 0.000m 2.000m



N	9.169m
E	7.851m
Z	12.312m
	1.200

[F1]

[F4]

[F1]

[F4]



(mm)

					
SD(n)	=	4	mm		
SD(e)	=	-6	mm		
SD(z)	=	1	mm		

[F4] ()
() [F3] ()

[F4]

NP 670 P > ?

[MENU]

9.1

$1^{\wedge}2 \quad E_{(h)} \# \$ 8_{-} \backslash (a \ h=1.3m)$



K

() 1)

[F4]

[]MLM-1(A-B A-C)
MLM-2(A-B B-C) MLM-1

[2]()	[2]	 1 2 3 Z 4 5 6
	[F4]	 south
[1] A-B A-C	[1]	 1 A-B A-C 2 A-B B-C
A [F1]() 1)	A [F1]	A-B A-C N : 0.000m E : 0.000m Z : 0.000m : 1.500m
A [F4]	[F4]	A-B A-C N : 100.164m E : 100.144m Z : 99.908m : 1.500m

B [F1](

A-B	A-C	
N :	0.000m	
E :	0.000m	
Z :	0.000m	
:	1.500m	

F3]() A

[F3]

		 south
[1]()	[1]	 Z 1. 2.
1) [F4]	[F1] [F4]	 StrnName StrnCode 1.450m NO 100.000m EO 100.000m ZO 100.000m

**2) [dw | 6 7 G H a b Z D E
[]**

[3](Z)	[3]	 1 2 3 Z 4 5 6
[ENT] [ESC] [[ESC] ,]	[ESC]	 SOUTH

[2]()

[2]

Z

1

2

[F4] ()

[F4]

Z

1

N0.000m

E0.000m

Z0.000m

[F4]()

[F4]

[] []

2) [F2]()

9.4.2

--	--	--

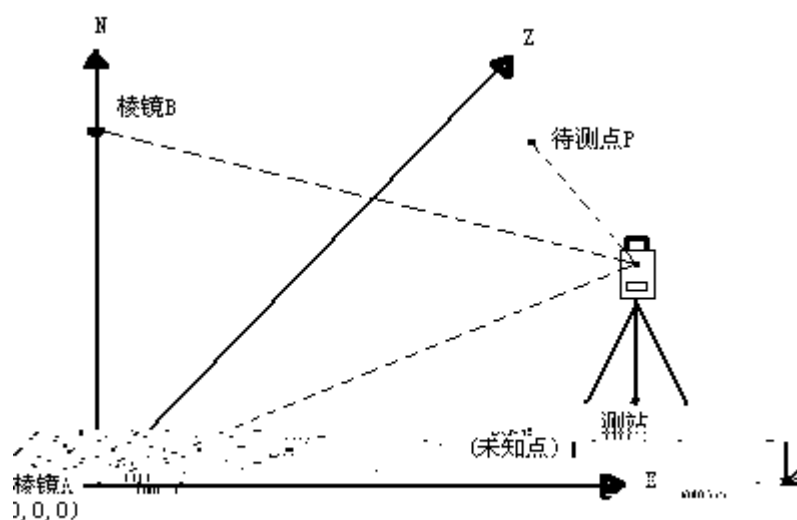


1

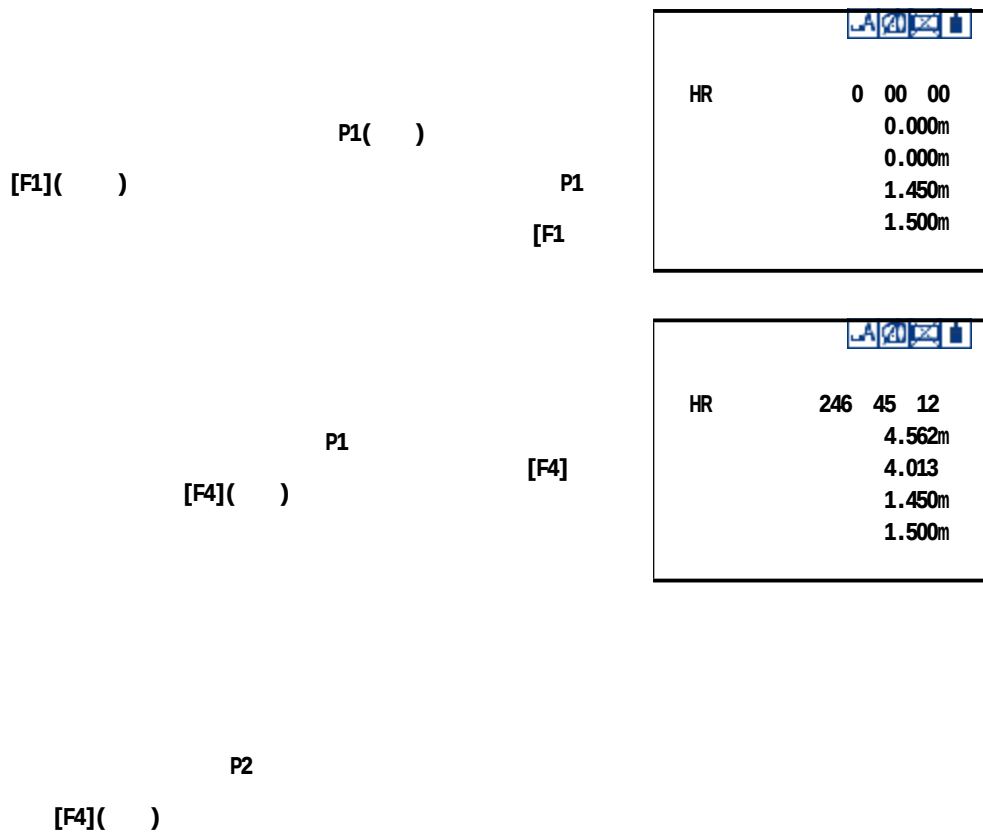
1

[F1]() 1)

[F1]



[MENU] 1/2, [4],	[MENU] [4]	1 2 3 4 5 6 P1
[5]()	[5]	1 2 3 Z 4 5 6
	[F4]	south1





NO

E0:

Z0:

4.315m

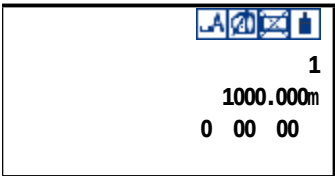
5.110m

-11.035m



[F4]()
[F1]() [F1]() [F4] [F1]
1)

[6]()	[6]	 1 2 3 Z 4 5 6
[1] , [F4]() [ENT]()	[1] [F4]	 1 2 3
[ENT]()	[ENT]	 SOUTH.SHL P2
[F4]()	[F4]	
N E [F4]()	N E	 1 1000.000m N 1.500m E 2.000m
1) [F4] ()	[F4]	

	[F4]	
1) [F2]		

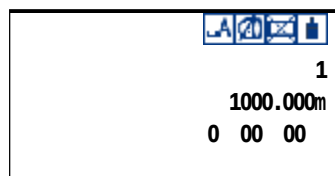
[]

[ESC]

H f

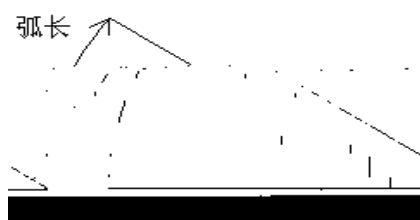
[F1]()

[F1]



[F4]()

[F4]



[F2]()



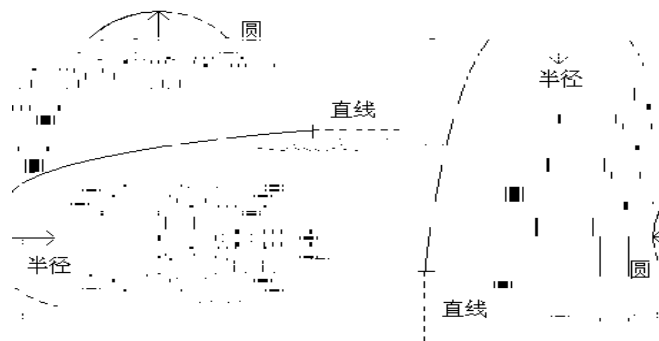
2

1048.420m

[F2]()

[F2]

|f}_



[F3]()

[F3]()

[F3]

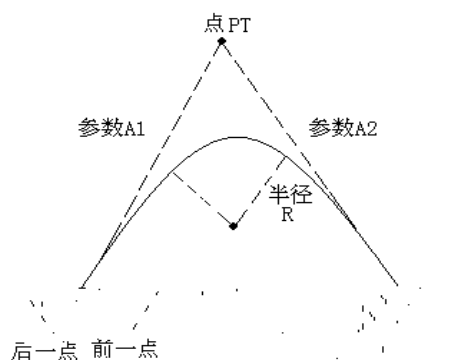
3	
1071.561m	
91	17 38

[F4](

[F4]

4	
0.000m	
0.000m	





[F4]()

[F4]

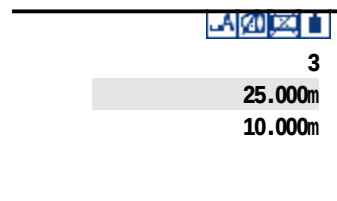
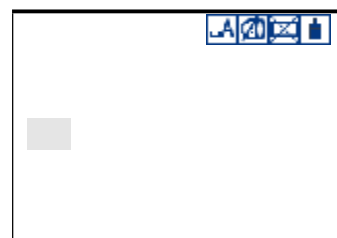
100.000
0 00 00
04

N E

A1 A2

9.6.1.2

) [F1]([F1]



1000	1300	1800	2300
50	70	60	90
0	300	300	0

[]

[ESC]

[2]

[2]

, [ENT]

[F4]

[ENT]

[ENT] 1)






1

2

3






SOUTH .SVL

P1

[F4]

[F4]()

[F4](

[F4]











1

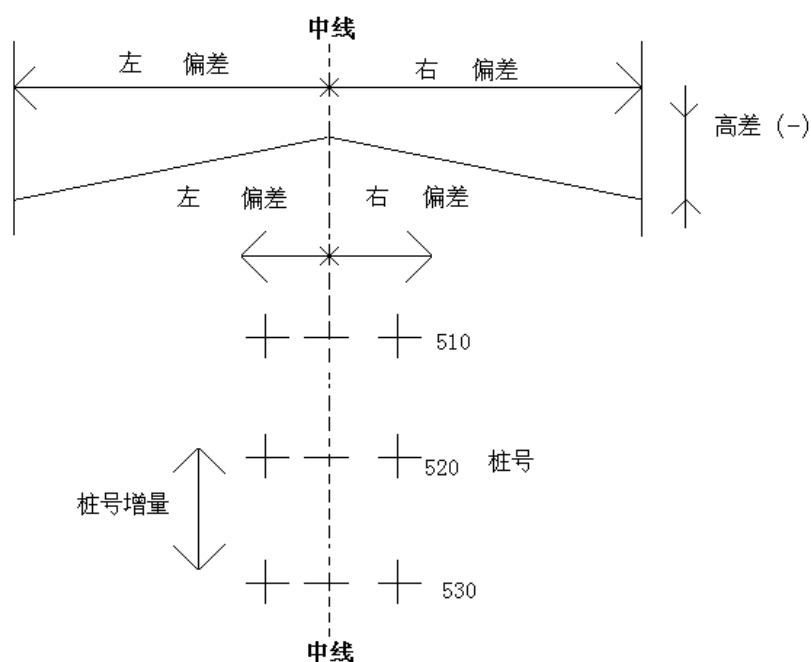
0.000m

0.000m

0.000m



，
[F2]()，
， [F1]
[F2]
[F1]



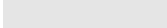
9-1

9.6.2.1

[3] [1]	[3] [1]	 1 2 3  1 2 3 4
) 1) [3] (	[3]	1 2 3



0

			 1 2 3
[3]		[3]	
	[2]		 1 2 3 4
		[2]	
			
		[F1]	
			 0.000 m
			0.000 m
[F1]()			0.000 m

[3]

[3]

[3]

[3]



1
2
3



1
2
3
4

[F1](NE/AZ)

[F3]



0.000 m
0.000 m
1.500 m

NE/AZ



[F2]()

2)y [D E e] N

N E Z



[3]

[3]

[3]

[3]

9.6.2.4

[4]

[4]

q >E>E

	
1	
2	
3	
4	

q

iK



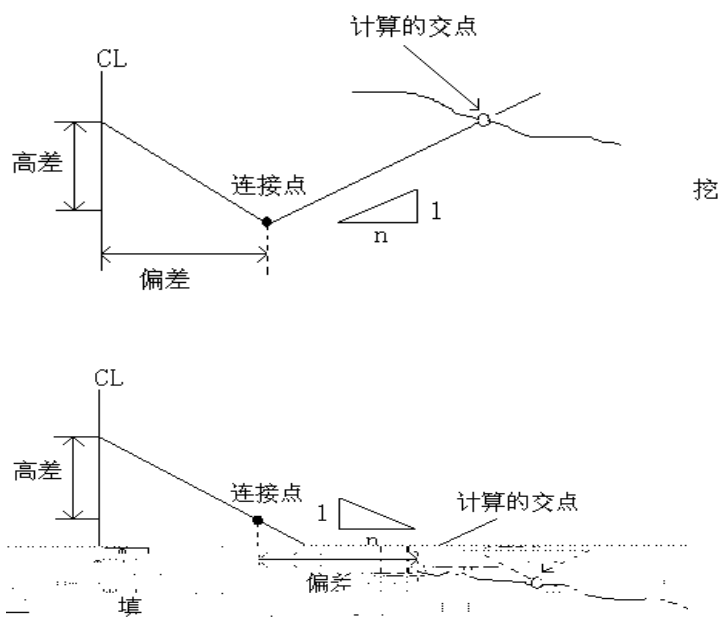
HR

HD

$k = h$
 $hcl < \quad \quad \quad (\quad \quad \quad)$
 $mhn < \quad \quad \quad (\quad \quad \quad)$
 $\blacktriangle h o p < \quad \quad \quad$
 $\blacktriangleright h q p < \quad \quad \quad$

 $[ESC]$
 $[ESC]$

9.6.2.5



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[F2]()	[F2]	 1000.000m 0.000 m 0.000 m 0.000 m
) [F4](	[F4]	 0.000m 0.000m 0.000m 0.000m
[F2]() [F3]()	[F2] [F3]	 2.150m 0.000m 2.150m 0.000m
		 ----,---m ----,---m ----,---m HR 180 13 25
[F4]() ,	[F4]	 3.398 m 3.321 m 2.546 m HR 180 13 25
0 [F4]()	[F4]	 0.000 m 0.001 m 1.546 m HR 140 13 25

[ESC]		 2.150m 0.000m 2.150m 0.000m
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- 1)
- 2)

Q P R G 3 4

[5]



1 h (= 3 4 :1m=3.2803333333333ft

	1 (360) 2 (400G) 3 (6400M)	DEG/GON/MIL(/ /)
	1 2 3	m / ft / ft+in (/ /)
	1 C / F 2 hPa /mmHg/inHg	C / F hPa /mmHg/inHg

2 h r s 3 4

	1 2	:1m=3.280839895013123ft :1m=3.2803333333333ft

3. D E 3 4

	1 NEZ 2 ENZ	N/E/Z E/N/Z

4. - t 3 4

	1 2	
	1. 2.	

- 1.
- 2.
- 1
- 2
- 3

1.
22c ((45) Tj-215.76 -37.56 ^{h3 TDMn}TD -0.84 Tc (4) Tj-1.f Tc (

5. G H I J 3 4

6. u v 3 4

Q \$ P S T U V > ?

- 1) / / /
- 2) / /
- 3) SD SD
- 4) SD SD

[F1]() ,	[F1]	 A FAT12 0.06 M 31.86 M 31.92 M
④ [F2]() , [F3] 2)	[F2] [F3]	
1) [F4]() [ENT]() SD	SD	
2) [F1]()		

建

[MENU])	[3]([3]	 1. 2. 3. 4.
[1]() , [1] [6] [2]	[1] [2]	 1. 2. 3. 4. 5. 6.

[F4](P1)	[F4]	
		 SOUTH.SMD [] SOUTH2 [DIR] SOUTH3.SMD [] P2
[▶] / / [◀] / / [F4]	[F4]	 NewFile ◊
1) 3.7 2) 3) [ESC]		

11.1.3

[] []

[] []

[F2]()

[F2]



:

S0010

1) 3) [F4]() ,

[F4]

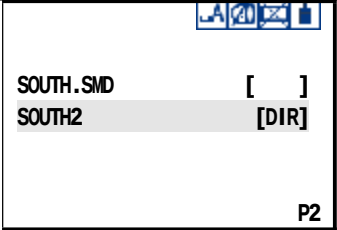


SOUTH.SMD []

SOUTH2 [DIR]

S0010.SMD []

P2

[F3]()	[F3]	
1) [F1]()		

11.1.5 在 阅 下

[MENU] 1/2 [3]()	[MENU] [3]	
[1]() , [1] [6] [2]	[1] [2]	
1) Disk:A Disk:B SD (C/D , [◀] [▶] Disk A Disk B	[F4]	

[] [] , [ENT]()	[ENT]	SOUTH.SCD [] SOUTH2 [DIR] P1
[F1]() 1)	[F1]	C000 C001 C002 C003 C004
[F1]()	[F1]	C001 CODE1 N 0.000 m E 0.000 m Z 0.000 m
[F2]() , [F4]() 3)	[F4]	C001 CODE1 N 0.000 m E 0.000 m Z 0.000 m
1) [F2]() , [F3]() [F4]() , 2) [] [] 3) 3.7		

11.2

导

--	--	--



[MENU]
)

[3](

[MENU]
[3]

11.2.1 : ewxy/z { X?

/

11.2 , [4]() , [4]

- 
 1. 300
 2. 660
 - 3.
 - 4.



[] []

[1] [5]

[▶] [◀] , /N/E/Z/

menu

[3]()

11.4

迅

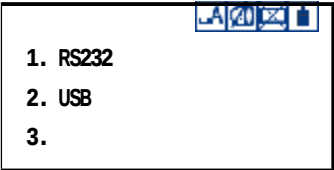
NTS-380R

A

NTS300

NTS660

A



11.4.1

讯

RS232

4800

[2]()	[2]	1. 2. 3. 4. 5.
[1](RS232)	[1]	1. RS232 2. USB 3.
[3]()	[3]	1. 2. 3.

	[2]()	1. 2. 3. 4. 5.
USB [1] (RS232)	RS232 [1]	1. RS232 2. USB 3.

[1] (),

[2] ()

11.4.3



USB

[2]()

[2]

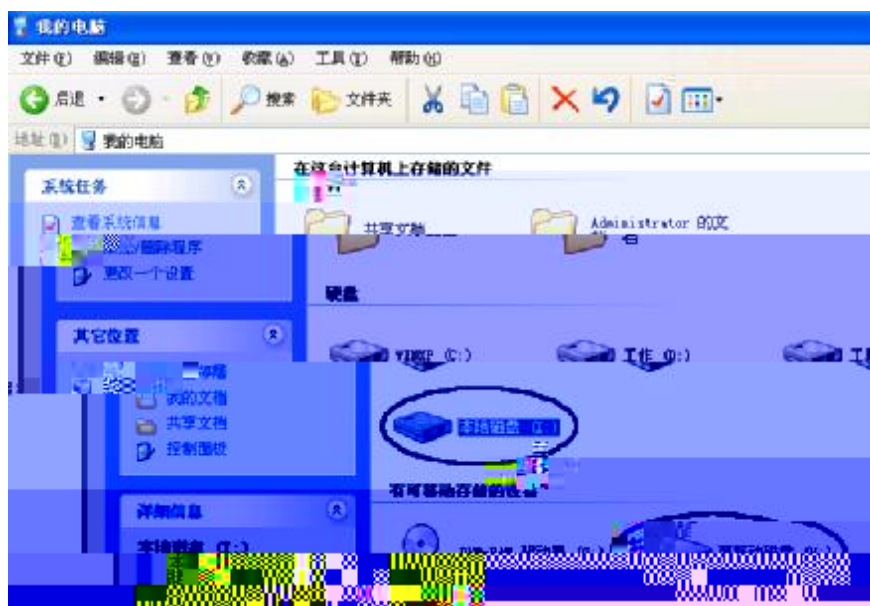
1. 2. 3. 4. 5.	LA 20 24 1
---	--

, ! 3)		[USB] A: SOUTH.SCD 102	
1) 3.7			
2) [F1]	11.2.1	/	
3)	[F4]()		

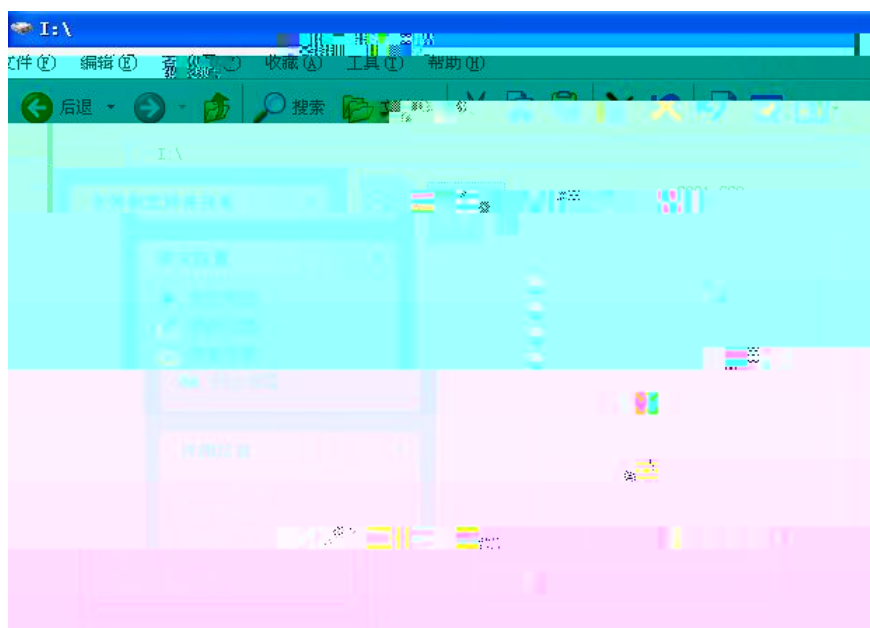
11.4.4



[2]() [2]

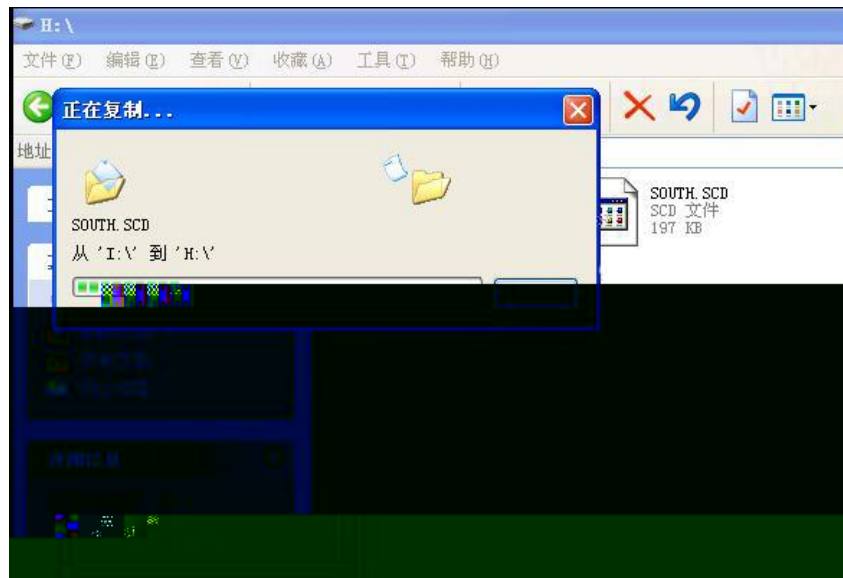


I H (I)



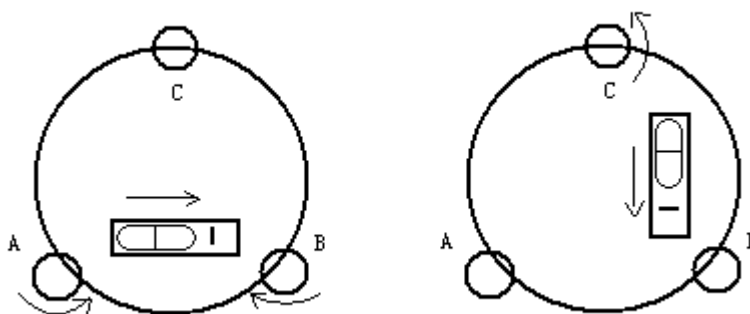
H , ,

[F4]() ,



Q Q P W X Y Z [

12.1



U W X

3.2

U Z [

()

180 ()

90

12.2

UWX

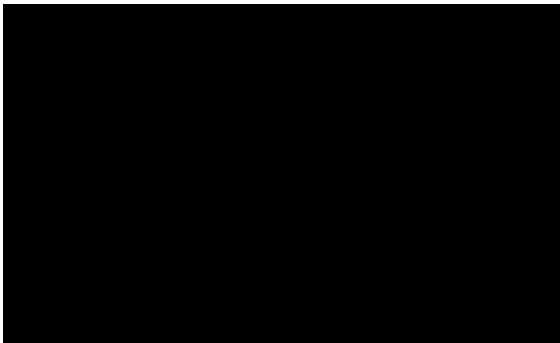
UZ [

()

12.3

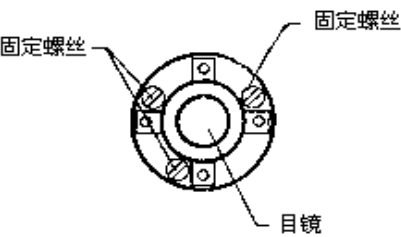
UWX

()



UZ [

Z



12.4 ()

U W X

1 100 3

2

10 13 10

3

190 13 40
(180) 30 20

U Z [
A h

[MENU] [6]	[MENU] [6]	1 2 3 4 5 6 P1
[6]() [2] ()	[1] [2]	1. 2. 3. 4.



) () [F4]([F4]

3

X 10

U8

[F4]() ()	[F4]	V 96 03 15 HR 45 45 49 I 0 00 00
I		1. 2. 3. 4.

1 () ()

2)

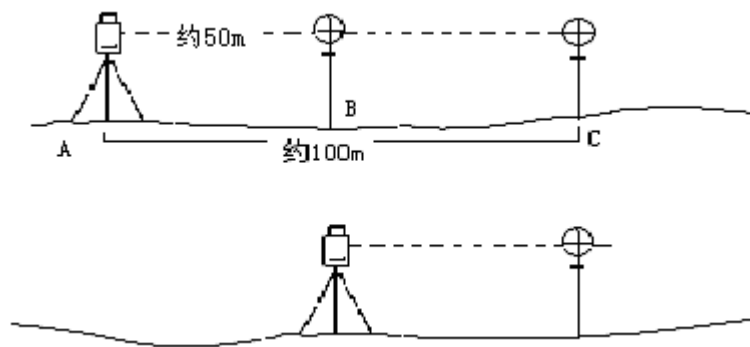
12.7

[MENU] [6] [MENU] [6]

1
2
3
4 UV



[6]() [3] ([1]
[2]

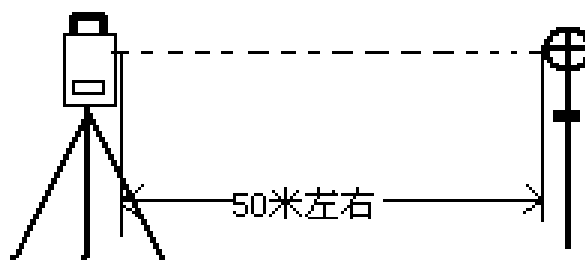


U Z [

K
K

12.10

发



U W X

1 50

2

3

[]([[DE23

DE23

4
U Z [

 12.11

* + h

- . h

U W \ h

5 20

12.12

12.13

12.1

12.7

12. ,

,

Q 5 P \] R G

AB 6 7 (6

NTS-382/5R4/6/8/10/12

0.650 0.690 m

EDM

0.1mm

7 14 / 20m
10 20 / 50m

/ / -
99999999.999 m 0.1 mm
2 5

9 K =

@ / | } m NTS-382/5R4 u ~

(2 2 10⁻⁶ D) 0.3s
(5 2 10⁻⁶ D) 0.1s
(2 2 10⁻⁶ D) 0.3s

(90%)

<200m (3 2 10⁻⁶ D) 0.3-3 -3

<200m (5 2 10⁻⁶ D)

(90%)		
<300m	(3 2 10 ⁻⁶ D)	0.3-3 10
>300m	(5 2 10 ⁻⁶ D)	10
<300m	(10 2 10 ⁻⁶ D)	0.3-3 10
>300m	(10 2 10 ⁻⁶ D)	10
@ / } m NTS-382/5R8 u ~		
	(2 2 10 ⁻⁶ D)	0.3s
	(5 2 10 ⁻⁶ D)	0.1s
	(2 2 10 ⁻⁶ D)	0.3s
(90%)		
<400m	(3 2 10 ⁻⁶ D)	0.3-3 10
>400m	(5 2 10 ⁻⁶ D)	10
<400m	(5 2 10 ⁻⁶ D)	10

		$(2 \ 2 \ 10^{-6} \ D)$	0.3s
		$(5 \ 2 \ 10^{-6} \ D)$	0.1s
		$(2 \ 2 \ 10^{-6} \ D)$	0.3s
(90%)			
	<600m	$(3 \ 2 \ 10^{-6} \ D)$	0.3-3 10
	>600m	$(5 \ 2 \ 10^{-6} \ D)$	10
	<600m	$(10 \ 2 \ 10^{-6} \ D)$	0.3-3 10
	>600m	$(10 \ 2 \ 10^{-6} \ D)$	10
6 0			
@ / } m NTS-382/5R ₄ u ~			
			(60*60)mm
	40	5000m	400m
		1	0.18 2
	40	400m	200m
@ / } m NTS-382/5R ₆ u ~			
			(60*60)mm
	40	5000m	600m
		1	0.18 2
	40	600m	300m
@ / } m NTS-382/5R ₈ u ~			
			(60*60)mm
	40	5000m	800m
		1	0.18 2
	40	800m	400m
@ / } m NTS-382/5R ₁₀ u ~			
			(60*60)mm
	40	5000m	1000m

	1	0.18 2
40	1000m	500m
@ / } m NTS-382/5R12 u ~		
		(60*60)mm
40	5000m	1200m
	1	0.18 2
40	1200m	600m
1	90%	2 18%

 - t R G

	NTS-382R4/6/8/10/12		NTS-385R4/6/8/10/12	
< = 6 7				
	79mm			
	0.1 / 1 / 5			
	2		5	
• 补A				
	48			
	1.2			
: ; 偿水&				
	3			
	1			
(9 &				
	30 2			
	8 2			
) u m m &				
	3			
	0.5			

Q ; P ^)

SD 64 64 1

USB

1

 20 20 30 30,40 40,60 60 1

_ ^ ! A `

1

+9<3283639+3310927-00d014_*56_5.869

- 目标高=5.869米
- 编码=56
- 块校验位=014
- 角度单位=度分秒
- 倾斜改正=00'58"
- 水平角=331°09'27"
- 垂直角=328°36'39"
- 角度测量标志
- 点号=9

3

_+10_R+00000032m3380049+3310926d+00000080t00+00+00000_*56_5.869

_+10_R+00000032m3380049+3310926d+00000080t00+00+00000_*56_5.869

- 目标高=5.869米
- 编码=56
- 块校验位=000
- 棱镜常数=00
- 人' t改正=+00
- 倾斜改正(t表示打开, *表示关闭)
- 高差=0.080米
- 角度单位=度分秒
- 水平角=331°09'26"
- 垂直角=338°00'49"
- 距离单位=米
- 平距=0.032米
- 平距测量标志
- 点号=10

+12?+00000087m3380055+3310925d+00000033t00+00+00063_*56_5.869

+12 ?+00000087m3380955+3310925d+00000033100+00+00063_*56_5.869

- 目标高=5.869米
- 编码=56
- 块校验位=063
- 棱镜常数=00
- 人'改正=+00
- 倾斜改正(t表示打开,*表示关闭)
- 平距=0.033米
- 角度单位=度分秒
- 水平角=331°09'25"
- 垂直角=338°00'49"
- 距离单位=米
- 斜距=0.087米
- 斜距测量标志
- 点号=12

4

+11 U+00003078509+00003743538+00005331546m+3310925d086_*56_5.869

+11 U+00003078509+00003743538+00005331546m+3310925d086_*56_5.869

- 目标高=5.869米
- 编码=56
- 块校验位=063
- 角度单位=度分秒
- 水平角=331°09'25"
- 距离单位=米
- Z坐标=5331.546米
- E坐标=3743.538米
- N坐标=3078.509米
- 坐标测量标志
- 点号=11

2

NTS660 X ? h

E N Z

1, 1000.000,1000.000,1000.000, STN
 2, 990.000,1010.000,100.000, STN
 101,994.890,1000.964,100.113, STN
 102,993.936,1007.799,100.800, STN
 103,998.515,1009.639,100.426, STN
 104,1002.068,1002.568,100.342, STN
 1001,1004.729,997.649,100.1153, PT

1002,1003.702,990.838,100.799, PT

1003,7911.990,990.358,100.403, PT

1004,997.311,998.236,100.354, PT

NTS300 X ? h

_+1 _ x+01111107396_ y+00000005457_ z+00000003612_+2 _
x+01111107397_ y+00000005457_ z+00000003612_+3 _ x+01111107395_
y+00000005457_ z+00000003612_+4 _ x+00000108916_ y+00000101580_
z+00000100118_

3

START() E N
STRAIGHT()
ARC()
SPIRAL()
PT() E N[A1 A2]
 (A1 A2:)

1

START() 1000.000,1050.000,1100.000
STRAIGHT() 25.000,48.420
SPIRAL() 20.000,20.000
ARC() 20.000,23.141
SPIRAL() 20.000,20.000
STRAIGHT() 148.300,54.679

2

START() 1000.000,1050.000,1100.000
PT() 1750.000,1300.000,100.000,80.000,80.000
PT() 1400.000,1750.000,200
PT() 1800.000,2000.000

5

1000.000,50.000,0.000
1300.000,70.000,300.000
1800.000,70.000,300.000
2300.000,90.000,0.000

_ ^ ! B ` a b c d 4 T c ( a ) T j T c 4 ` _ ^

()

[ENT]		0
	N	1100.000
	E	1050.000
	[F4]()	

N	1300.000
E	1750.000
R	100.000
A1	80.000
A2	80.000

N	1750.000
E	1400.000
R	200.000
A1	0.000
A2	0.000

N	2000.000
E	1800.000
R	0.000
A1	0.000
A2	0.000

START 0.000 1050.000 1100.000 CRLF
PT 1750.000 1300.000 100.000 80.000 80.000 CRLF
PT 1400.000 1750.000 200.000 0.000 0.000 CRLF
PT 1800.000 1800.000 2000.000 CRLF

2

$$L_{1.2} = \frac{A_{1.2}^2}{R}$$

$$L_{1.2} :$$

$$A_{1.2} :$$

$$\Delta R$$

$$\Delta R = E - R(1 - \cos t)$$

$$\Delta R = 6.777 - 100(1 - \cos 18^\circ 20' 06'')$$

$$= 1.700$$

$$\Delta R_1 = \Delta R_2$$

$$N_m = N - R \sin t = 63.348 - 100 \sin 18^\circ 20' 06'' = 31.891$$

$$N_{m1} = N_{m2}$$

$$D_1 = R \tan\left(\frac{LA}{2}\right) + \Delta R_2 \operatorname{cosec}(LA) - \Delta R_1 \cot(LA) + N_{m1}$$

$$LA = +111^\circ 55' 47'' \quad \operatorname{cosec} = \frac{1}{\sin}, \quad \cot = \frac{1}{\tan}$$

$$D_1 = 100 * \tan(111^\circ 55' 47'' / 2) + 1.7(1 / \sin 111^\circ 55' 47'')$$

$$1.7(1 / \tan 111^\circ 55' 47'') + 31.891$$

$$= 148.06015 + 1.8326 + 0.6844 + 31.891$$

$$= 182.468$$

$$D_1 = D_2$$

KA1

$$N_{KA1} = N_{IP1} - D_1 \cdot \cos a_1$$

$$E_{KA1} = E_{IP1} - D_1 \cdot \sin a_1$$

$$BP \quad IP1 \quad \Rightarrow \quad a_1 = 74^\circ 03' 16.6''$$

$$N_{KA1} = 1300 - 182.468 * \cos 74^\circ 03' 16.6'' = 1249.872 \text{ m}$$

$$E_{KA1} = 1750 - 182.468 * \sin 74^\circ 03' 16.6''$$

$$^2 \cdot \sin a_3$$

KA2 BC= $\sqrt{(1575.068-1444.032)^2+(1536.058-1637.976)^2}$ =166.005 m

EC EP= $\sqrt{(2000-1867.456)^2+(1800-1587.929)^2}$ = 250.084 m

		(BP)	
	N	1100.000 m	
	E	1050.000 m	
BP	KA1		
		74 03 16.6	
		545.543 m	
KA1	KE1		
		-100 m (-)	
		64 m	
KE1	KE2		
		-100 m (-)	
		131.354 m	
KE2	KA2		
		-100 m (-)	
		64 m	
KA2	BC		
		322 07 30.1	
		166.004 m	
BC	EC		
		200 ()	
		334.648 m	
EC	EP		
		57 59 40.6	
		250.084 m	

_ ^ ! C `

1 NTS

出

1mm

1) (SD)

?+00002157m2675319+0320026d+00002156*00+00+00062EXT(CRLF)

ID	SD	m/f/i	V	H	d/g/m	HD	t/*L	P	0	BCC

块校验符=062
棱镜常数=-00
大气改正=+00
0值
倾斜改正(t表示打开,*表示关闭)



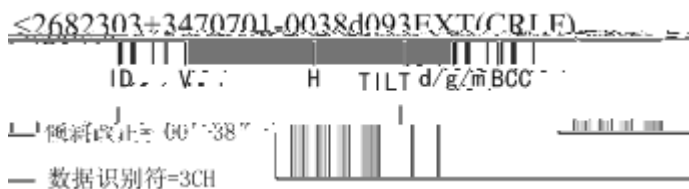
2) / (HD/VD)

R+00002175m2682307+3470701d-00000061t00+00+00008EXT(CRLF)

HD	m/f/i	V	H	d/g/m	VD	t/*L	P	0	BCC	ID

高差=-0.061m
数据识别符=52H

3) (H/V)



4) (N/E/Z)

U+00000002121-00000000485+00000000548m+3470702d095EXT(CRLF)

ID N E Z m/f/i H d/g/m BCC

$$\underline{\text{标}}=0.548\text{m}$$
$$\Delta_{\text{标}} = -0.485\text{m}$$

坐标=2.121m

据识别符=55H

- Z식

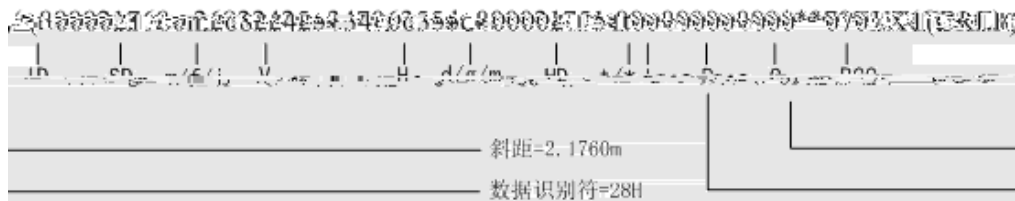
- E식

 $\leq N_{\leq}$

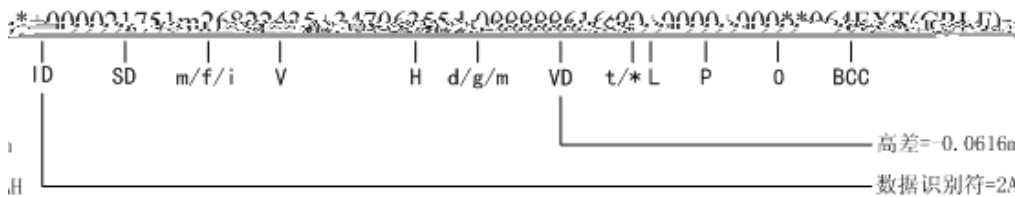
数:

0.1mm

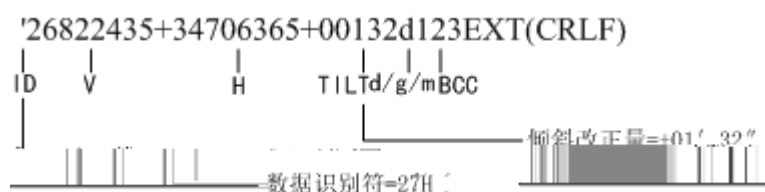
1) (SD)



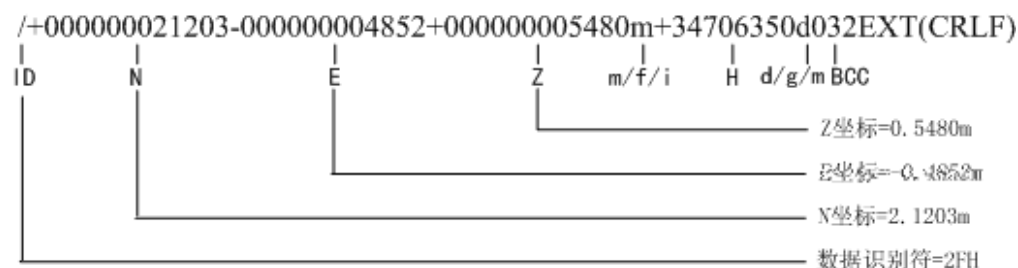
2) / (HD/VD)



3) (H/V)



4) (N/E/Z)



2

		C	067	ETX	CRLF				
ASCII		43H	30H	36H	37H	03H	0DH	0AH	
		ACK	006	ETX	CRLF				
ASCII		06H	30H	30H	36H	03H	0DH	0AH	
		NAK	021	ETX	CRLF				
ASCII		14H	30H	32H	31H	03H	0DH	0AH	
		Z10	091	ETX	CRLF			H/V	
ASCII		5AH	31H	30H	30H	39H	31H	03H	0DH 0AH
		Z12	089	ETX	CRLF			HR	
ASCII		5AH	31H	32H	30H	39H	31H	03H	0DH 0AH
		Z13	088	ETX	CRLF			HL	
ASCII		5AH	31H	33H	30H	39H	31H	03H	0DH 0AH
		Z32	091	ETX	CRLF			SD	
ASCII		5AH	33H	32H	30H	39H	31H	03H	0DH 0AH
		Z34	093	ETX	CRLF			SD	
ASCII		5AH	33H	34H	30H	39H	33H	03H	0DH 0AH

	Z35	092	ETX	CRLF		SD			
ASCII	5AH	33H	35H	30H	39H	32H	03H	0DH	0AH
	Z42	092	ETX	CRLF		HD			
ASCII	5AH	34H	32H	30H	39H	32H	03H	0DH	0AH
	Z44	090	ETX	CRLF		HD			
ASCII	5AH	34H	34H	30H	39H	30H	03H	0DH	0AH
	Z45	091	ETX	CRLF		HD			
ASCII	5AH	34H	35H	30H	39H	31H	03H	0DH	0AH
	Z62	094	ETX	CRLF		NEZ			
ASCII	5AH	36H	32H	30H	39H	34H	03H	0DH	0AH
	Z64	088	ETX	CRLF		NEZ			
ASCII	5AH	36H	34H	30H	38H	38H	03H	0DH	0AH
	Z65	089	ETX	CRLF		NEZ			
ASCII	5AH	36H	35H	30H	38H	39H	03H	0DH	0AH

3

()

元次并
次 (复 6 7 > ? e 次 角 ①补变② 扇②补变 补补重元补补变补②补补补② 启识补补补补② 启代补变补②

<-- C 067 ETX
() -->

$\leftarrow$ () $\rightarrow$
 $\leftarrow$ () $\rightarrow$

变q讯6 7 > ? 8 v U 0

- | | | | |
|----|----|------|------|
| 1) | | | |
| 2) | | C | BCC |
| | | ACK | 0.05 |
| 3) | | 0.05 | ACK |
| 4) | 3) | 10 | |

NTS

```

<-----
      ACK 006 ETX      ---->

```

$$\begin{array}{ccc} < \text{---} & (\quad) & \text{---} > \\ < \text{---} & (\quad) & \text{---} > \end{array}$$

010-67805689