G1000 SAR Tasks

Developed by Lt Col David Yost, NCR-MN-122

G1000 SAR Tasks
Objectives

- Familiarize Pilots with G1000 GPS "Knobology"
- Prepare Mission Pilots and Observers to be able to:
  - Enter search patterns.
  - Mark current location – save as a user waypoint.
  - Display current lat/long in real time.
  - Find the nearest airport and go Direct-To.

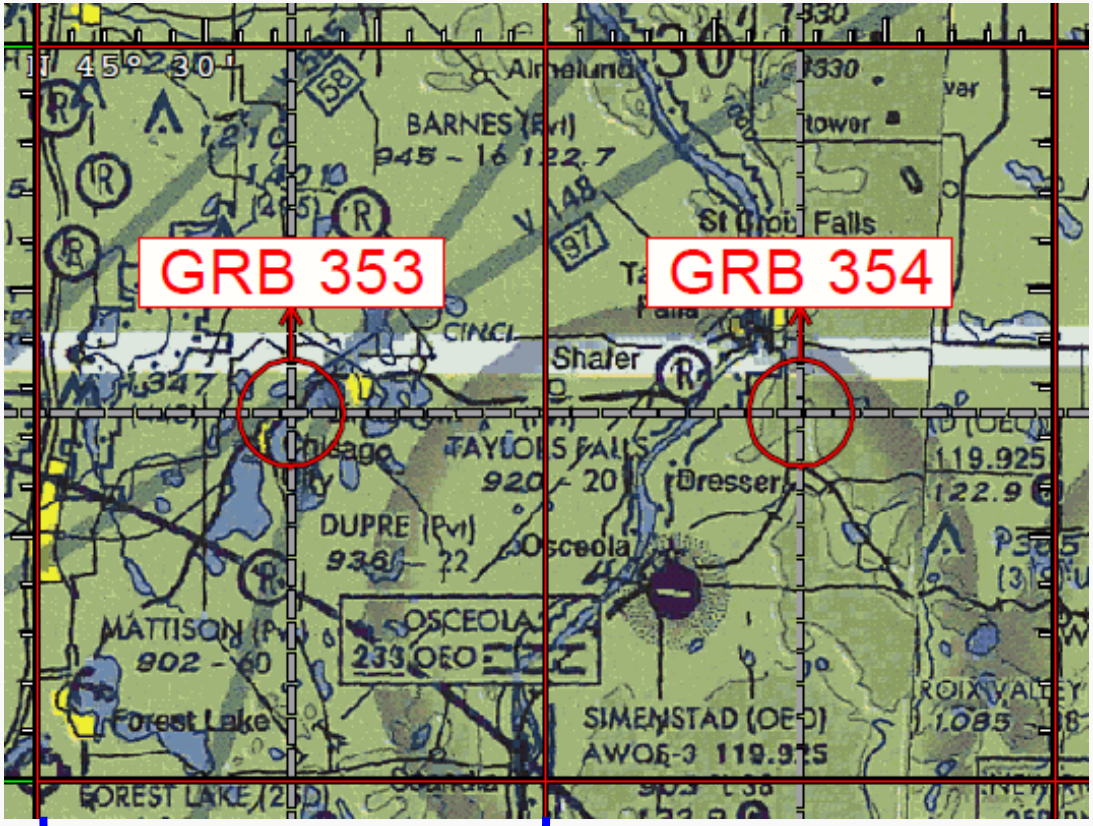
Some basic familiarity with the G1000 MFD is assumed (i.e. ability to turn device ON/OFF and display MAP screens).

This training is not intended to replace the user manual.

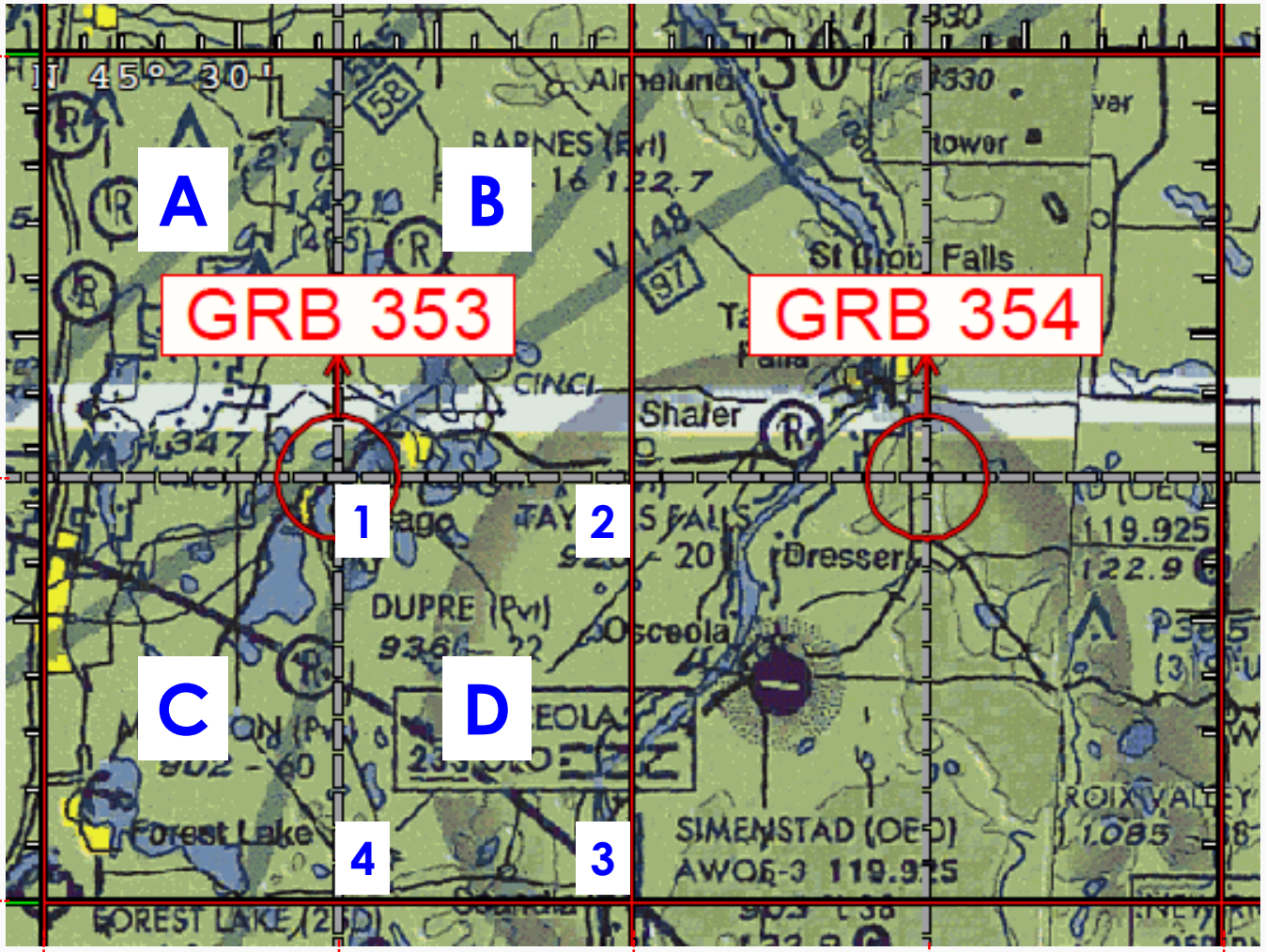
G1000 SAR Tasks
Objectives

- Familiarize Pilots with G1000 GPS “Knobology”
  - Enter a search "Flight Plan"
- Search Patterns:
  - Parallel line (Grid) search
  - Expanding Square search
  - Sector search
  - Creeping Line search
  - Route search with offset

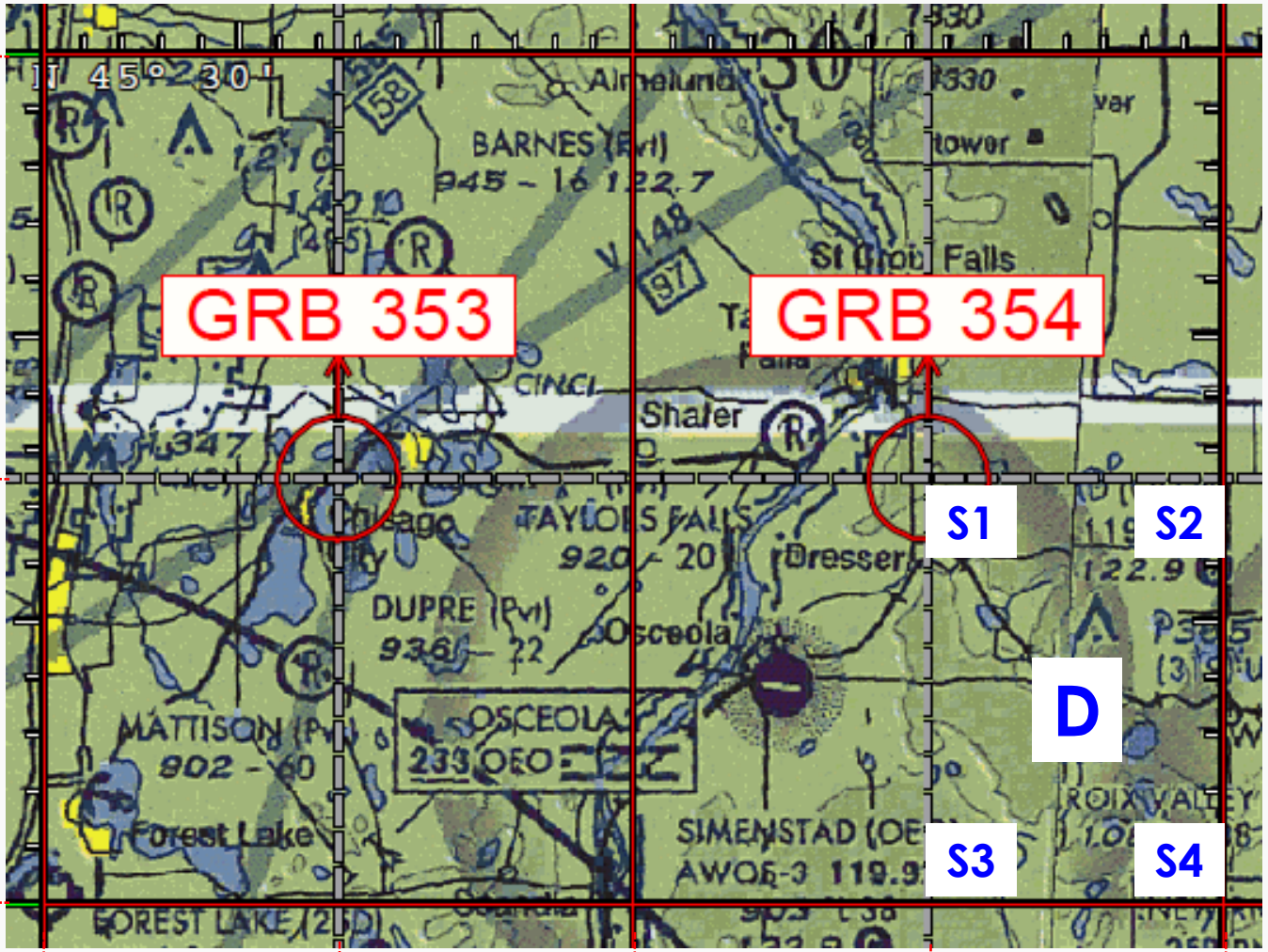
G1000 SAR Tasks
CAP Grids



G1000 SAR Tasks
CAP Grids

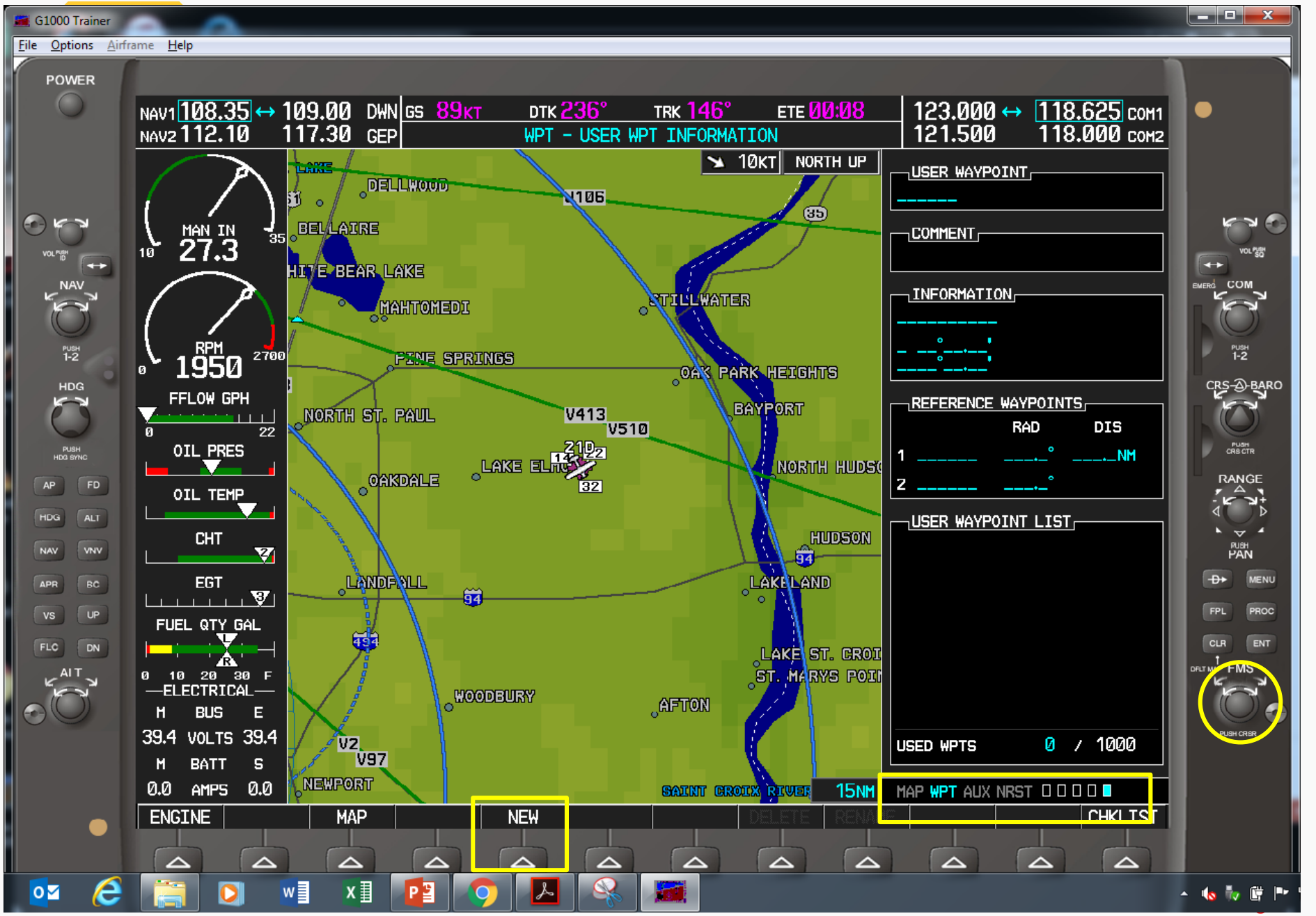


G1000 SAR Tasks
Search CAP Grid GRB 354D



G1000 SAR Tasks
Search CAP Grid GRB 354D
Parallel Search

- Create user waypoints for the corners of the Grid section to be searched.
  - S1 = 45° 22.5' N 92° 37.5' W
  - S2 = 45° 22.5' N 92° 30' W
  - S3 = 45° 15' N 92° 37.5' W
  - S4 = 45° 15' N 92° 30' W

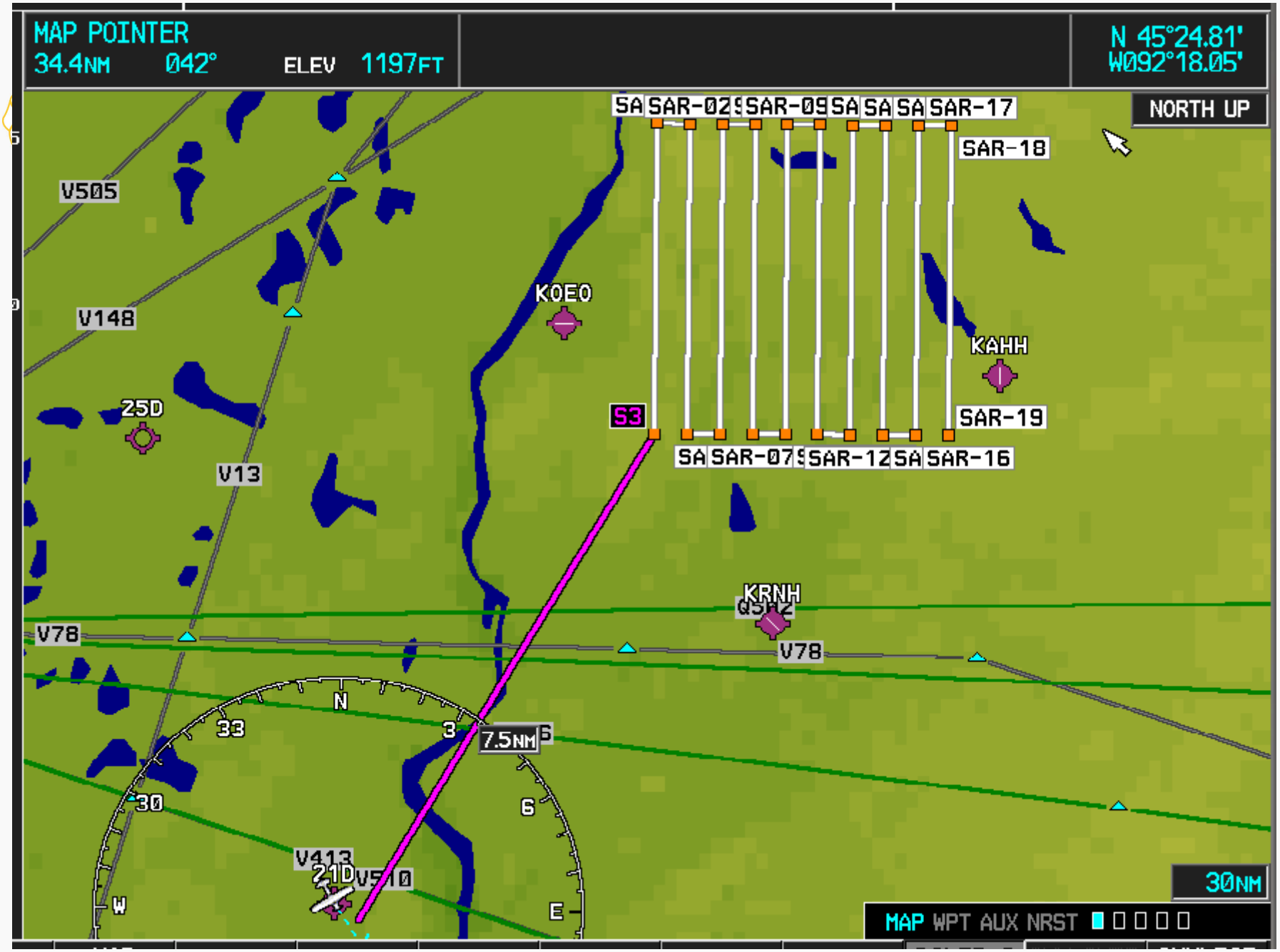

G1000 Trainer
File Options Airframe Help
POWER
NAV1 108.35 ↔ 109.00 DWN
NAV2 112.10 117.30 GEP
GS 89KT DTK 236° TRK 146° ETE 00:08
WPT - USER WPT INFORMATION
123.000 ↔ 118.625 COM1
121.500 118.000 COM2
10KT NORTH UP
MAN IN 27.3
RPM 1950
FFLOW GPH
OIL PRES
OIL TEMP
CHT
EGT
FUEL QTY GAL
ELECTRICAL
M BUS E
39.4 VOLTS 39.4
M BATT S
0.0 AMPS 0.0
DELLWOOD
BELLAIRE
MAHTOMEDI
PINE SPRINGS
NORTH ST. PAUL
OAKDALE
LAKE ELMO
STILLWATER
OAK PARK HEIGHTS
BAYPORT
NORTH HUDSON
HUDSON
LANDFALL
LAKELAND
WOODBURY
AFTON
NEWPORT
SAINT CROIX RIVER
15NM
USER WAYPOINT
COMMENT
INFORMATION
REFERENCE WAYPOINTS
RAD DIS
USER WAYPOINT LIST
USED WPTS 0 / 1000
MAP WPT AUX NRST
ENGINE MAP NEW DELETE RENAME CHKLIST
NAV COM HDG CRS BARO RANGE PAN FMS
AP FD HDG ALT NAV VNV APR BC VS UP FLC DN AIT
MENU FPL PROC CLR ENT


109.00 DWN
117.30 GEP
GS 89KT
DTK 236°
TRK 146°
ETE 00:08
WPT - USER WPT INFORMATION
123.000 ↔ 118.625 COM1
121.500 118.000 COM2
NORTH UP
LMELUND
V13
V148
CENTURIA
35
TAYLORS FALLS
8
ROIX RIVER
SHAFER
DEER LAKE
S1
DRESSER
OSCEOLA
KOEO
10
28
WAND
USER WAYPOINT
S1
COMMENT
MSP040 / 39
INFORMATION
GR LKS USA
N 45°22.50'
W092°37.50'
REFERENCE WAYPOINTS
RAD
DIS
1 MSP
039.9°
38.7NM
2 ------
---.-°
USER WAYPOINT LIST
S1
MSP040 / 39
USED WPTS 1 / 1000


NORTH UP
HALF MOON LAKE
BALSAM LAKE
V148
CROIX RIVER
DEER LAKE
S1
S2
S3
S4
K0E0
KAHH
KRNH
Q502
Q501
V78
J106
TILLWATER
30NM
USER WAYPOINT
S4
COMMENT
MSP054 / 38
INFORMATION
GR LKS USA
N 45°15.00'
W092°30.00'
REFERENCE WAYPOINTS
RAD
DIS
1 MSP
053.6°
37.8NM
2 ------
---.-°
USER WAYPOINT LIST
S1 MSP040 / 39
S2 MSP045 / 42
S3 MSP049 / 34
S4 MSP054 / 38
USED WPTS 4 / 1000
MAP WPT AUX NRST
MAP
NEW
DELETE
RENAME
CHKLIST

1. FPL
2. MENU
3. ENT


46°
ETE 12:10
123.000 ↔ 118.625 COM1
121.500 118.000 COM2
HT PLAN
UP
ACTIVE FLIGHT
S3 / SAR-
S3
SAR-01
SAR-02
SAR-03
SAR-04
SAR-05
SAR-06
SAR-07
Search and Rescue
SAR
WAYPOINT S3
PATTERN PARALLEL
INITIAL DTK 360°
INITIAL TURN RIGHT
LEG LENGTH 10.0NM
SPACING 1.0NM
NUMBER OF LEGS 10
ACTIVATE SAR?
Press "CLR" to cancel


MAP POINTER
34.4NM 042° ELEV 1197FT
N 45°24.81'
W092°18.05'
NORTH UP
SAR-02
SAR-09
SAR-17
SAR-18
SAR-19
SAR-07
SAR-12
SAR-16
V505
V148
V13
V78
V78
V413
V510
KOEO
KAHH
KRNH
25D
21D
S3
7.5NM
30NM
MAP WPT AUX NRST

G1000 SAR Tasks
Start at Osceola airport
Expanding Square Search

- Use KOEO as the initial waypoint.
- Set up a Search-and-Rescue flight plan with an Expanding Square pattern.
  - Initial Direction: 045
  - Initial Turn: Left
  - Spacing: 1.0 nm
  - Number of Legs: 24


121.500
118.000 COM2
CTIVE FLIGH
Search and Rescue
SAR
WAYPOINT
KOEO
PATTERN
EXP SQR
INITIAL DTK
045°
INITIAL TURN
LEFT
SPACING
1.0NM
NUMBER OF LEGS
24
ACTIVATE SAR?
Press "CLR" to cancel


MAP POINTER
28.9NM 359° ELEV 991FT
N 45°28.52'
W092°51.19'
NORTH UP
SAR-22
SAR-18
SAR-14
SAR-10
SAR-06
SAR-02
SAR-21
SAR-23
KOEO
SAR-19
-15
-11
-07
SAR-04
SAR-17
SAR-08
SAR-12
SAR-16
SAR-20
SAR-24
V505
V148
V13
25D
KANE
KRNH
V78
V413
V510
N
33
3
7.5NM
30
12
6
9
30NM
MAP WPT AUX NRST

G1000 SAR Tasks
Start at Osceola airport
Sector Search

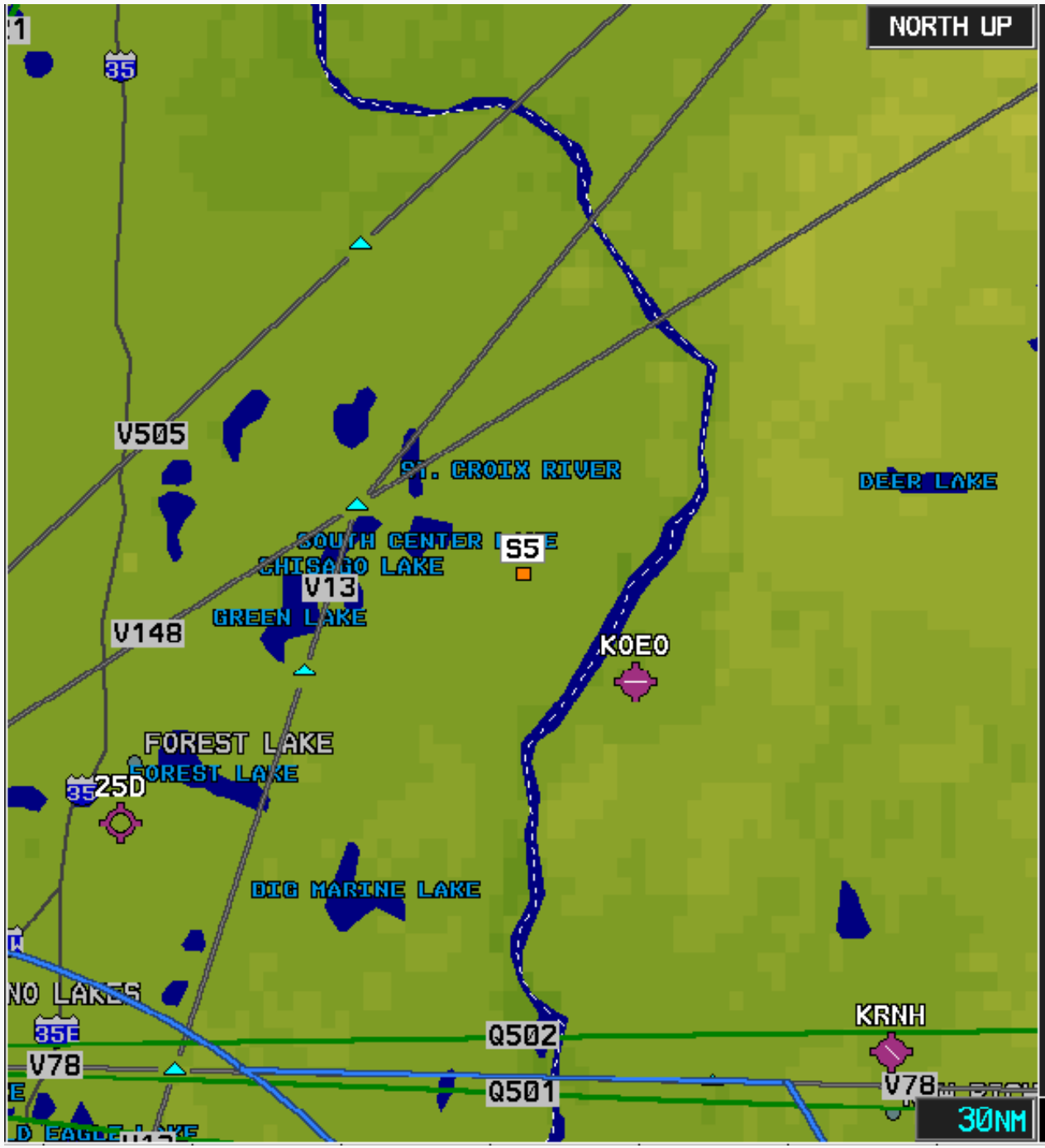
- Use KOEO as the initial waypoints.
- Set up a Search-and-Rescue flight plan with a Sector pattern.
  - Initial Direction: 120
  - Initial Turn: Left
  - Leg Length: 10 nm


121.500
118.000 COM2
FLIGH
Search and Rescue
SAR
WAYPOINT
KOEO
PATTERN
SECTOR
INITIAL DTK
120°
INITIAL TURN
LEFT
LEG LENGTH
10.0NM
ACTIVATE SAR?
Press "CLR" to cancel


MAP POINTER
34.1NM 332° ELEV 991FT
N 45°30.01'
W093°13.19'
NORTH UP
SAR-05
SAR-06
SAR-02
V505
KOEO
V140
25D
SAR-03
SAR-01
KANE
KRNH
SAR-04
V78
V78
N
33
3
7.5NM
V413
V510
30NM
MAP WPT AUX NRST

G1000 SAR Tasks
Start at Osceola airport
Creeping Line Search

- Use KOEO as the initial waypoint.
- Set up a Parallel Line Search-and-Rescue flight plan, starting at a point "half a leg length" before KOEO.
  - Direction of creep: 045
  - Pattern: Parallel
  - Initial Direction: 135
  - Initial Turn: Left
  - Leg Length: 8 nm
  - Spacing: 1.0 nm
  - Number of Legs: 40



USER WAYPOINT

S5

COMMENT

K0E0315 / 4

INFORMATION

GR LKS USA

N 45°21.42'
W092°45.38'

REFERENCE WAYPOINTS

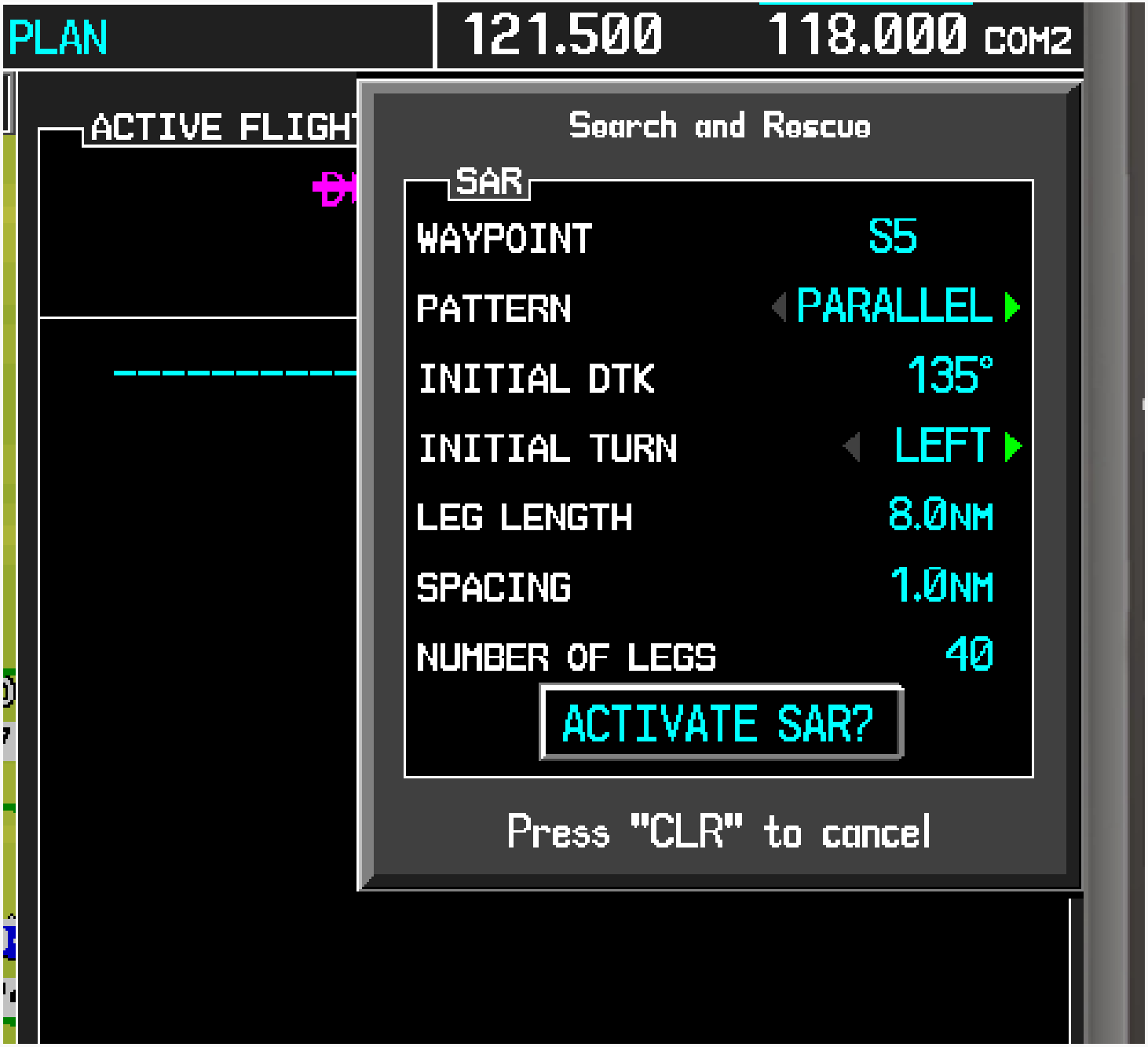
		RAD	DIS
1	K0E0	315.0°	4.0NM
2	_____	___._°	

USER WAYPOINT LIST

S5 ■ K0E0315 / 4

USED WPTS 1 / 1000

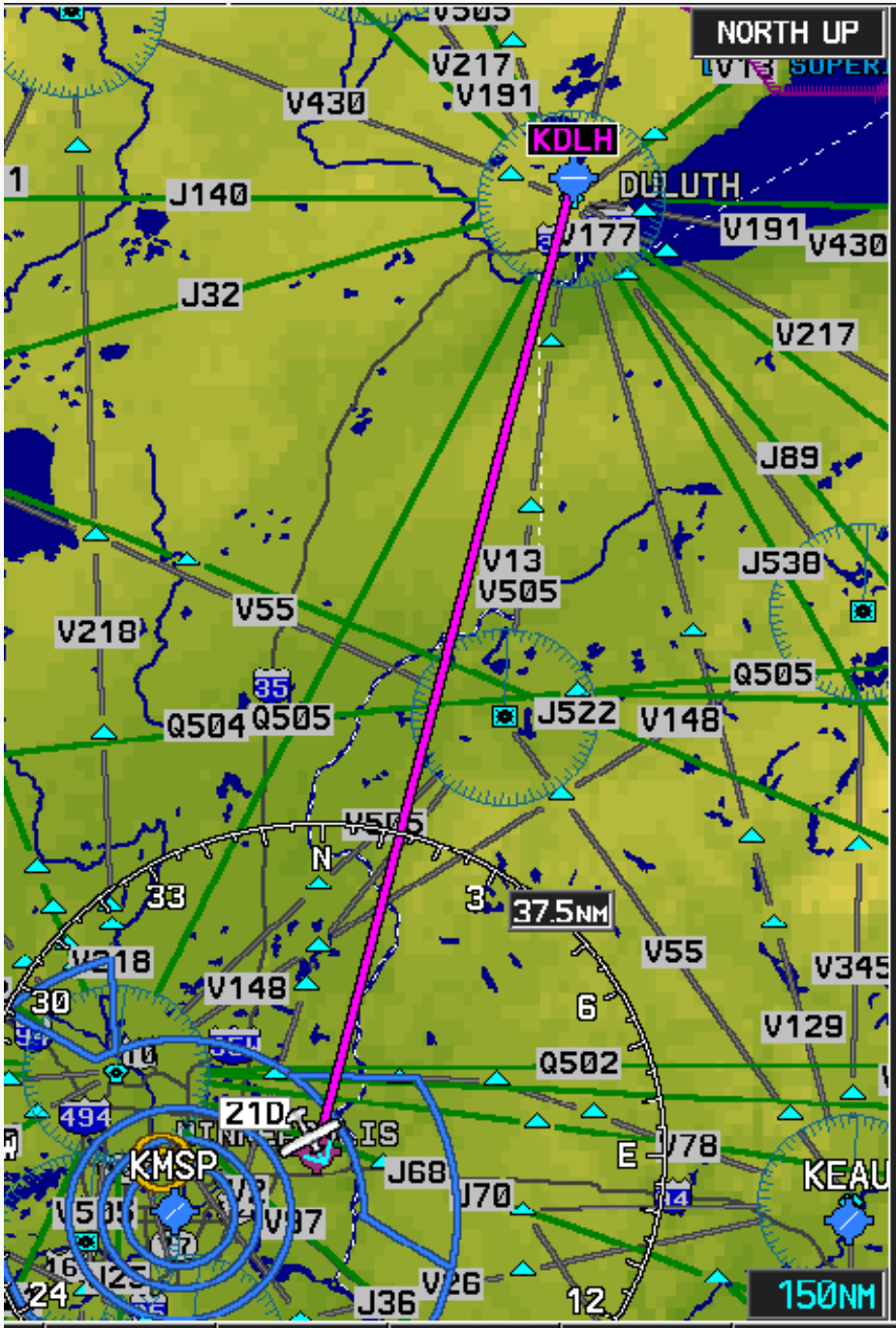
MAP WPT AUX NRST


PLAN
121.500
118.000 COM2
ACTIVE FLIGHT
Search and Rescue
SAR
WAYPOINT S5
PATTERN PARALLEL
INITIAL DTK 135°
INITIAL TURN LEFT
LEG LENGTH 8.0NM
SPACING 1.0NM
NUMBER OF LEGS 40
ACTIVATE SAR?
Press "CLR" to cancel


MAP POINTER
38.0NM 358° ELEV 853FT
N 45°37.69'
W092°52.28'
NORTH UP
045°
SAR-48
SAR-47
SAR-44
SAR-43
SAR-40
SAR-39
SAR-36
SAR-35
SAR-32
SAR-31
SAR-28
SAR-27
SAR-24
SAR-23
SAR-20
SAR-19
SAR-16
SAR-15
SAR-12
SAR-11
SAR-08
SAR-07
SAR-04
SAR-03
S5
SAR-01
SAR-02
SAR-05
SAR-06
SAR-09
SAR-10
SAR-13
SAR-14
SAR-17
SAR-18
SAR-21
SAR-22
SAR-25
SAR-26
SAR-29
SAR-30
SAR-33
SAR-34
SAR-37
SAR-38
SAR-41
SAR-42
SAR-45
SAR-46
SAR-49
SAR-50
SAR-53
SAR-54
SAR-57
SAR-58
SAR-61
SAR-62
SAR-65
V13
KAHH
30NM
MAP WPT AUX NRST

G1000 SAR Tasks
Parallel Track

- Not done using the Search-and-Rescue menu item.
- Fly a route search from Lake Elmo (21D) to Duluth (KDLH) with a 2-nm offset to the left of course.
  - Enter a route from 21D – KDLH
  - On the Flight Plan menu, choose Parallel Track
  - Direction: Left
  - Distance: 2 nm



ACTIVE FLIGHT

21D / KDL

21D

KDLH

PAGE MENU

OPTIONS

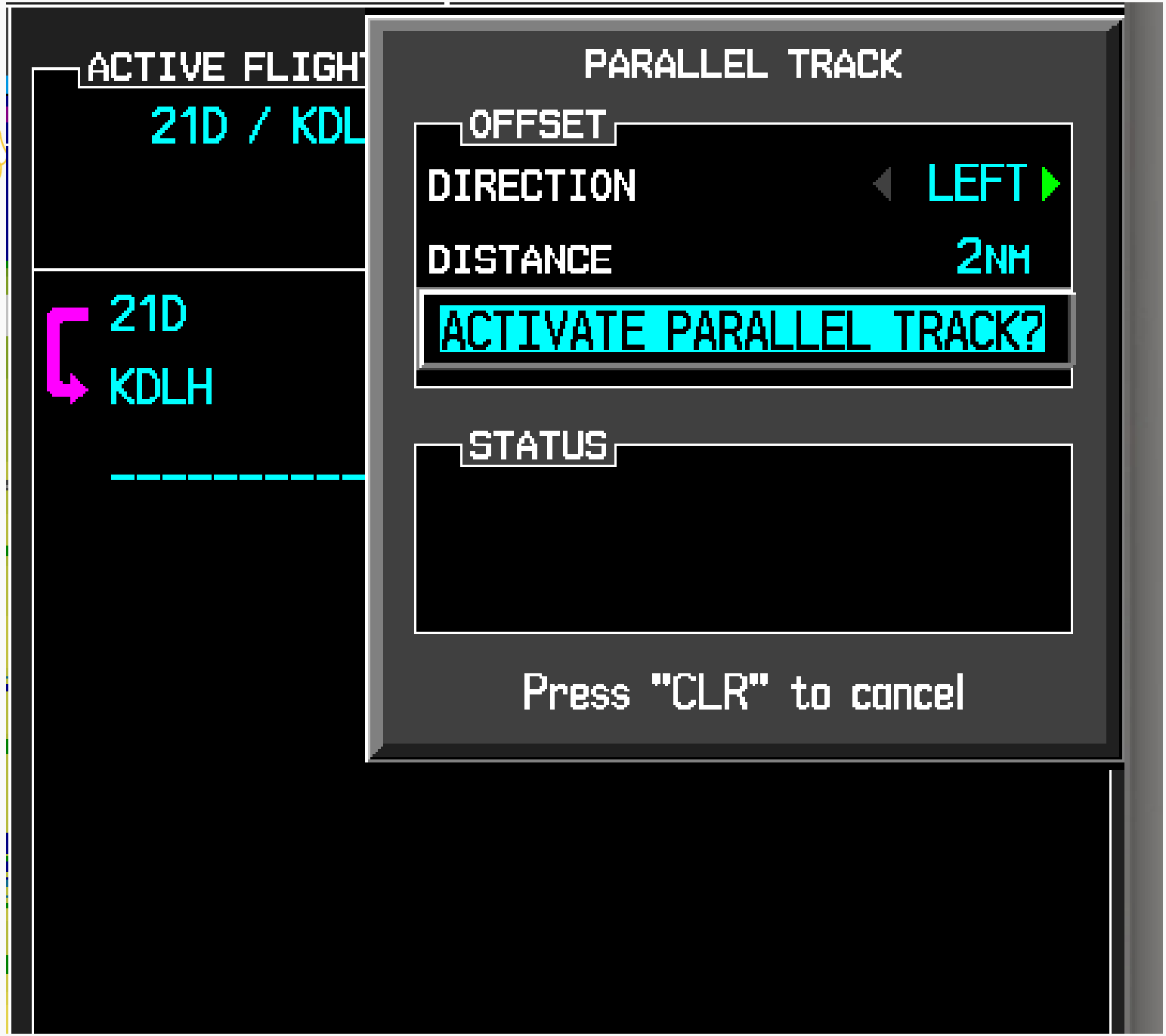
- Remove Departure
- Remove Arrival
- Remove Approach
- Closest Point Of FPL
- Parallel Track
- Load Waypoint
- Select VNV Profile Window
- Cancel VNV

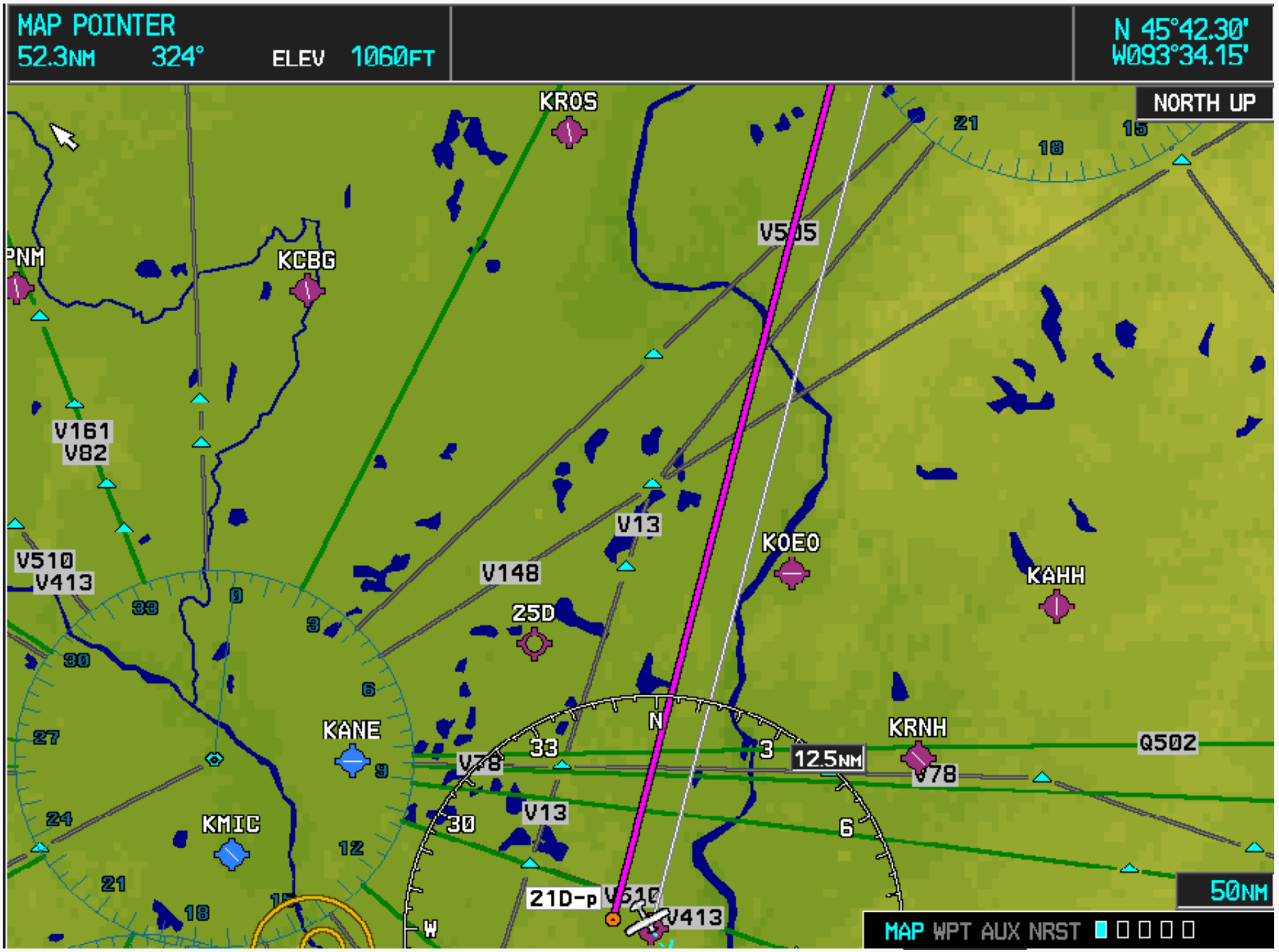
Press the FMS CRSR knob to return to base page

CURRENT VNV PROFILE

ACTIVE VNV WPT	_____FT at _____		
VS TGT	_____FPM	FPA	____°
VS REQ	_____FPM	TIME TO TOD	__:__
V DEV	_____FT		

FPL


ACTIVE FLIGH
21D / KDL
21D
KDLH
PARALLEL TRACK
OFFSET
DIRECTION
LEFT
DISTANCE
2NM
ACTIVATE PARALLEL TRACK?
STATUS
Press "CLR" to cancel

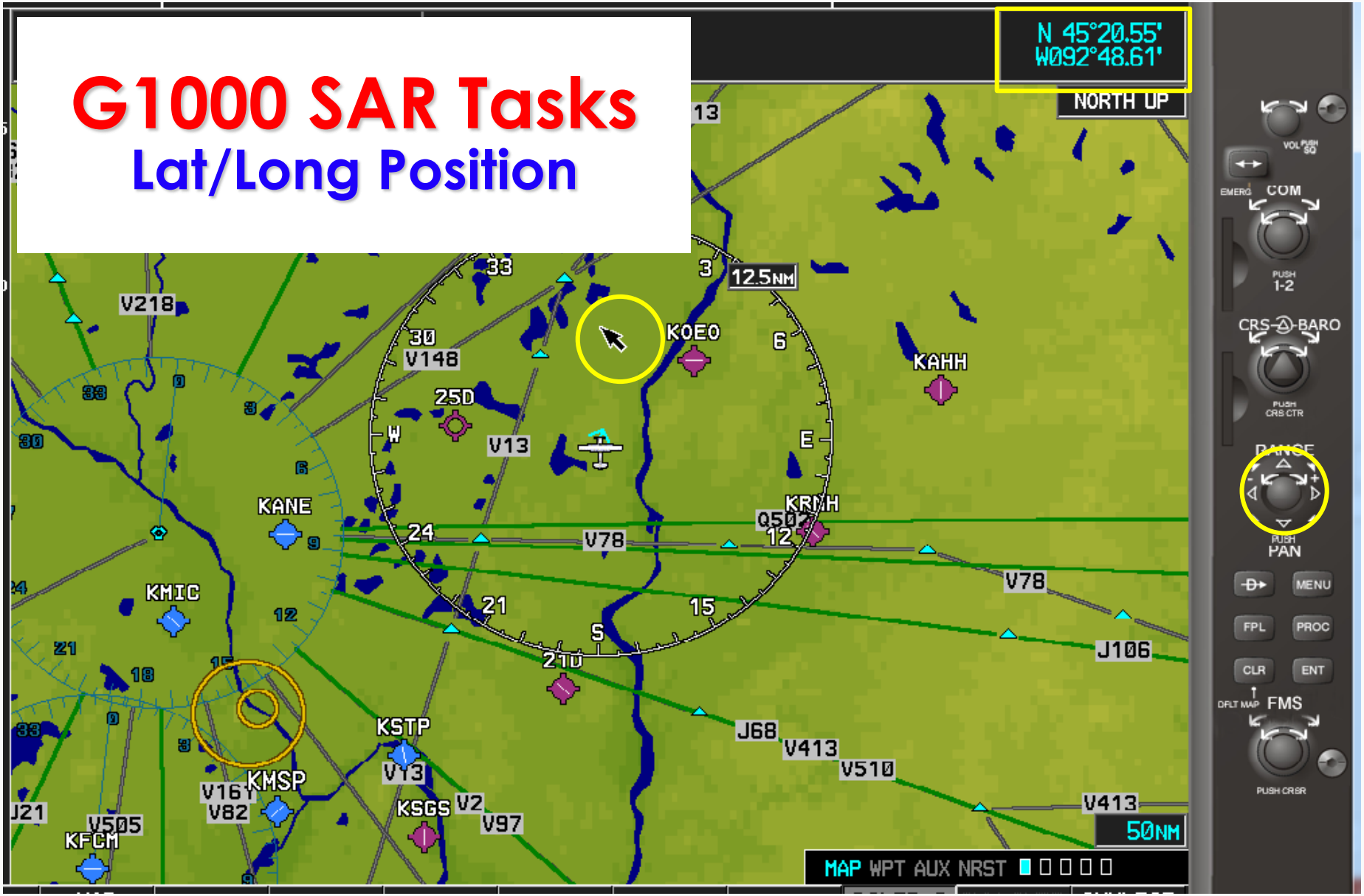

MAP POINTER
52.3NM 324° ELEV 1060FT
N 45°42.30'
W093°34.15'
NORTH UP
KROS
KCBG
PNM
V161
V82
V510
V413
V148
V13
25D
K0E0
KAHH
KANE
KMIC
KRNH
Q502
V78
12.5NM
21D-p
50NM
MAP WPT AUX NRST

G1000 SAR Tasks

New User Waypoint – Present Position

G1000 SAR Tasks

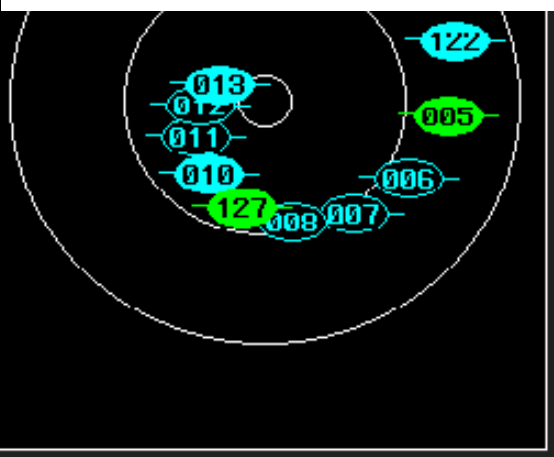
Lat/Long Position



Press Range knob to display Lat/Long of arrow. Defaults to current airplane position.

G1000 SAR Tasks

Real time Lat/Long Aux Page



TUS

	0.03NM
	0.7
	16FT
	23FT
POSITION	N 45°14.69' W092°48.43'
TIME	20:45:13LCL
ALTITUDE	2994FT
GROUND SPEED	95.4KT
TRACK	6°

GPS STATUS

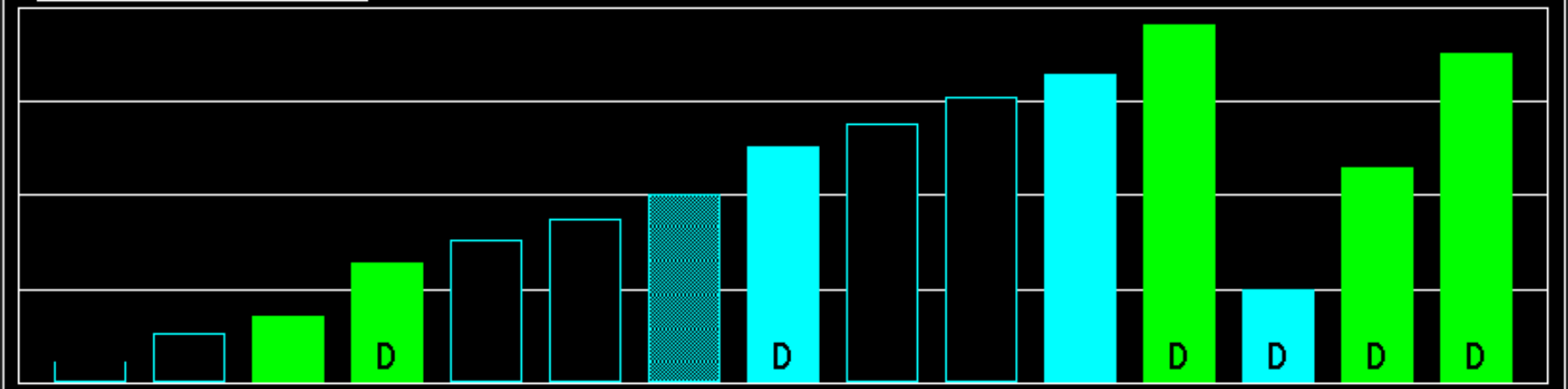
ACTIVE GPS	GPS1
GPS SOLUTION	3D DIFF NAV
SBAS	ACTIVE

RAIM PREDICTION

WAYPOINT	P.POS
ARV TIME	20:44LCL
ARV DATE	04-NOV-17

COMPUTE RAIM?

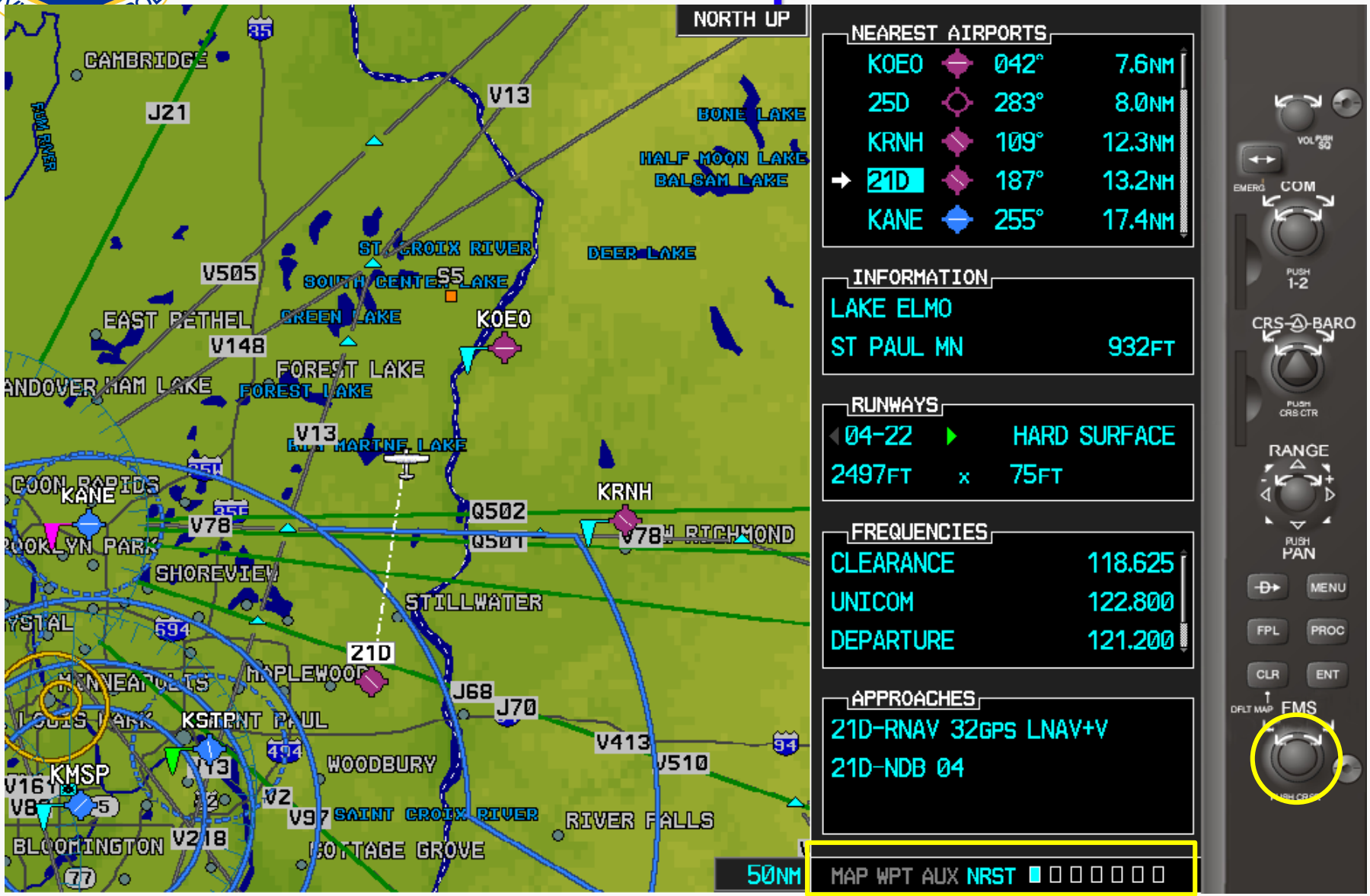
GPS SIGNAL STRENGTH



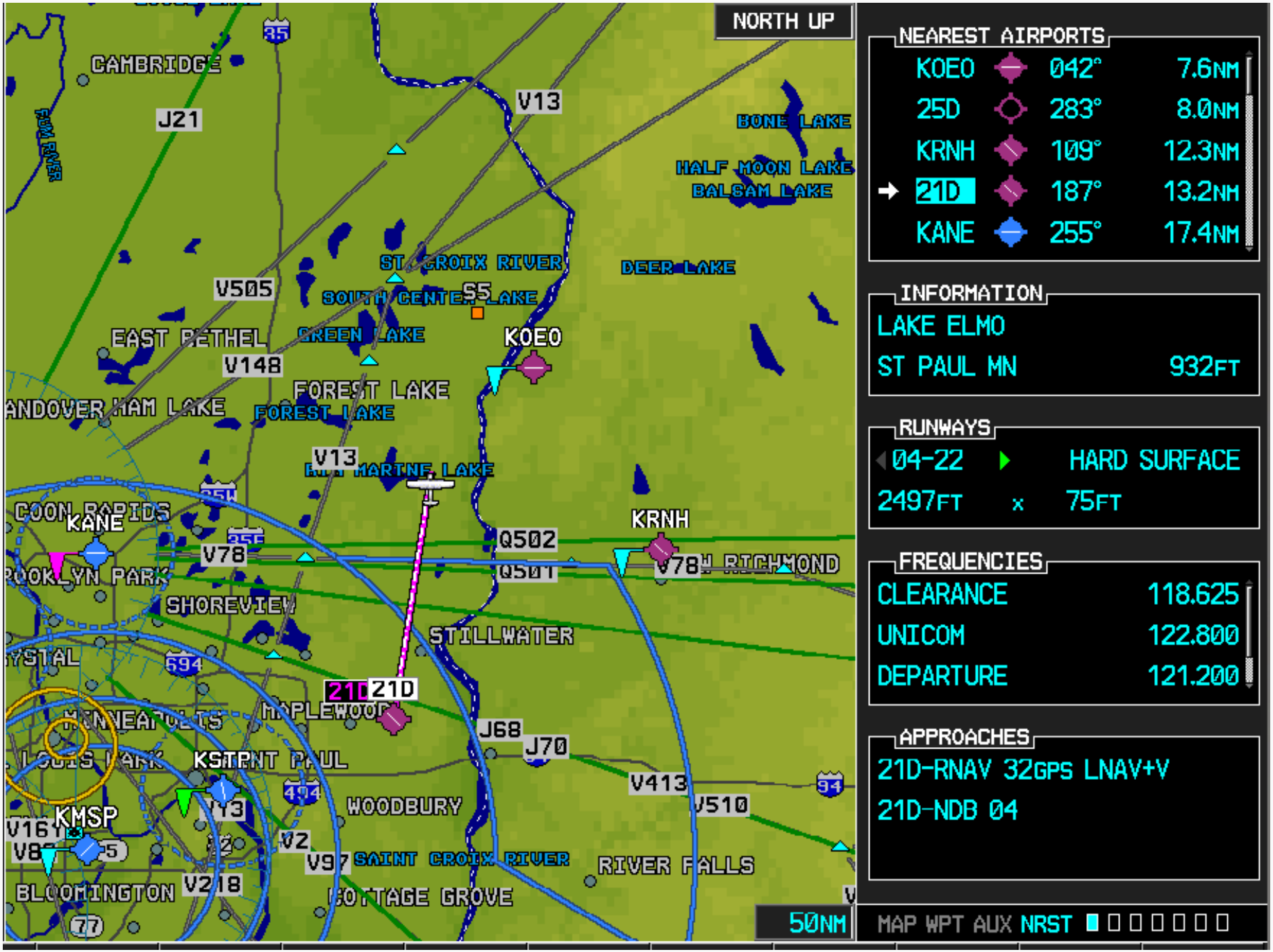
MAP WPT AUX NRST

G1000 SAR Tasks

Nearest Airports



1. Direct
2. ENT
3. ENT


NORTH UP
CAMBRIDGE
J21
V13
BONE LAKE
HALF MOON LAKE
BALSAM LAKE
ST CROIX RIVER
DEER LAKE
V505
S5
LAKE
EAST BETHEL
GREEN LAKE
KOEO
V148
FOREST LAKE
FOREST LAKE
V13
MARINE LAKE
COON RAPIDS
KANE
KRNH
Q502
V78
SHOREVIEW
STILLWATER
21D
21D
MAPLEWOOD
J68
J70
KSTP
KMSP
V413
V510
WOODBURY
V2
SAINT CROIX RIVER
RIVER FALLS
BLOOMINGTON
COTTAGE GROVE
50NM
NEAREST AIRPORTS
KOEO 042° 7.6NM
25D 283° 8.0NM
KRNH 109° 12.3NM
21D 187° 13.2NM
KANE 255° 17.4NM
INFORMATION
LAKE ELMO
ST PAUL MN 932FT
RUNWAYS
04-22 HARD SURFACE
2497FT x 75FT
FREQUENCIES
CLEARANCE 118.625
UNICOM 122.800
DEPARTURE 121.200
APPROACHES
21D-RNAV 32GPS LNAV+V
21D-NDB 04
MAP WPT AUX NRST

G1000 SAR Tasks
Further Resources

- Introduction to G1000 Search Patterns (MN Wing)
  - http://www.rmr.cap.gov/wp-content/uploads/2017/04/g1000-sar-training.pdf
- YouTube
  - Search on "G1000 Search and Rescue"
  - https://www.youtube.com/results?search_query=G1000+search+and+rescue and Rescue

QUESTIONS?