



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
HEADQUARTERS, 8<sup>TH</sup> BRIGADE  
UNITED STATES ARMY CADET COMMAND  
BOX 339500 MS 83  
JOINT BASE LEWIS-MCCHORD, WA 98433-9500

ATCC-HHT

15 April 2010

MEMORANDUM FOR ALL ARMY ROTC SCHOOLS

SUBJECT: Warrior Forge Land Navigation

1. Attached are recommendations and techniques to assist you in preparing your Cadets for land navigation at Joint Base Lewis-McChord during Warrior Forge 2010. This information is intended to supplement what Cadre are already teaching on their respective campuses.
2. If you have further questions regarding how we will execute land navigation during this year, please contact me or MSG Robert Tetu (email: Robert.Tetu@usacc.army.mil).

Encl

Training Spt Package (15 pages)

A handwritten signature in black ink, appearing to read "Brian M. Rogers", is positioned above the printed name.

BRIAN M. ROGERS

LTC, AR

Warrior Forge S3

**1. PURPOSE.** This training support package is intended to assist Cadre with on-campus land navigation preparation for Warrior Forge 2010. It is not a modification or change for lessons taught in the MSL 300 curriculum. The techniques and recommendations are to provide situational awareness and ensure expectations are understood prior to your Cadets arriving to Joint Base Lewis-McChord.

**2. OVERVIEW.** Land Navigation is an assessed event at Warrior Forge. The committee (and regimental cadre when feasible) will conduct review of proper techniques prior to the execution of the written, day, and night portions; however, it is essential that Cadets arrive with a full understanding of land navigation. Odd regiments will take the written exam on D+3/4 and even regiments on D+5. The actual day/night courses are conducted on D+6 for odd regiments and D+7 for even regiments. If required, Cadets will retest land navigation on either D+7 or D+8. If Cadets fail this second attempt, AND are afforded an opportunity to remain at WF and continue to train, they will receive additional land navigation training after tactics (on D+22 or D+23) and retest on D+23 or D+24.

### **3. REQUIREMENTS.**

a. **Written Examination.** Examination is administered in garrison prior to conducting the practical. Cadets must correctly answer 14 out of 20 questions to pass (20 questions in 75 minutes).

b. **Day Land Navigation.** Cadets must correctly navigate to 5 out of 8 points. Total point to point distance will cover approximately 5-8 kms with an average distance between each point of 650-1000 m. Total time allotted for the course is 5 hours.

c. **Night Land Navigation.** Cadets must correctly navigate to 3 out of 5 points. Total point to point distance will cover approximately 3-4 kms with an average distance between each point of 600-800 m. Total time allotted for the course is 3.5 hours.

d. **RECONDO.** Cadets must EXCEED normal passing scores as outlined above to qualify for RECONDO. Without retest, achieve a score of 80% or higher on each event – Written: 16/20 correct answers; Day: 40/50 (6 of 8 points); Night: 24/30 (4 of 5 points).

### **4. SUCCESS AT WARRIOR FORGE (Fort Lewis, now Joint base Lewis-McChord).**

a. Understand that the land navigation practical is conducted on Fort Lewis terrain. The terrain at Fort Lewis is naturally flat, with a rise in elevation of up to about **20 meters**. This makes terrain association difficult, as there are few to no prominent land marks. Given the nature of the terrain, recognize that dead reckoning skills are applicable, but will not guarantee complete success because the **density of the underbrush** prevents this technique in some areas, particularly at night. Therefore, the ability to navigate by roads and trails, **using an attack point is necessary** to ensure success.

b. Hard ball, dirt roads, and trails are accurately depicted on the Fort Lewis map; however, trail depicting is not completely reliable as some trails are reflected on the map, while others are not. Cadets should primarily rely upon their **pace counts** and **reference trails** to ensure they maintain situational awareness of their current location. The land navigation committee will cover reference trails during the overview on site.



c. **Checkpoints** are established on the course to aid Cadets in determining their exact location. Cadets should not use these as a "Crutch" but should instead refer to them as a means to verify their information.

d. Confidence in **pace count** is critical. At a minimum, Cadets must know:

- 1) Day Road and Wooded Terrain Pace Counts (DRPC & WTPC)
- 2) Night Road and Wooded Terrain Pace Counts (NRPC & WTPC)

e. During your campus training and within your resource/training constraints, attempt to mimic the WF land navigation assessment to the best of your ability.

- 1) Employ a **terrain model** of your course.
- 2) Use similar point markings.
- 3) Ensure distances between points are comparable to distances used at WF for both day and night course. If time permits, use the same number of points.
- 4) Due to the size of the training area, recognize that the night course may not take place over the exact same terrain as the day course. This is an important as Cadets may not have had the benefit of the day course familiarity, when they conduct the night course.
- 5) Use comparable times for planning and course conduct for both day and night.
- 6) Use land navigation lane strips so Cadets are forced to practice plotting their course and thinking through "best strategy" for completing the course based upon their knowledge of the terrain, roads and trails.

f. The **G-M Angle** Conversion for Fort Lewis is 17.5 degrees. You can use 17 degrees and maintain accuracy on your land navigation exam and the practical exams in the field. You must **SUBTRACT 17 DEGREES** from the Grid Azimuth (GA) for Magnetic Azimuth (MA) which is an easterly GM angle.

g. Land Navigation **Score Sheets** (Cadets receive at site).

Land Navigation TA13 Score Card		LETTER/NUMBER		LETTER/NUMBER	
NAME: CADET SMITH, JOHN		A7		H1	
REGIMENT: 1 COMPANY A		STAMP .. ..		STAMP ... ...	
PLATOON: 1		LETTER/NUMBER		LETTER/NUMBER	
START TIME: 1230		B3		F8	
FINISH TIME: 1630		STAMP ... ..		STAMP ... ..	
COURSE (DAY/NIGHT): 1		LETTER/NUMBER		LETTER/NUMBER	
LANE #: 100 DATE: 01 JUN 2008		C6		STAMP	
TOTAL VALUE OF POINTS: 5 / 8		STAMP ... ..		STAMP	
PENALTY POINTS:		LETTER/NUMBER		LETTER/NUMBER	
FINAL SCORE: 35		D4		STAMP	
		STAMP ... ..		STAMP	
<b>GRADER'S INITIALS</b>					

h. WF Land Navigation Markings.

1) Land Navigation Point. **12" orange and white placard** with **alpha numeric labeling**. Point has **"clacker"** hanging off the point. The 12" placard is tied off to a tree or stake and is visible from all directions when practical (360 degrees).



2) Picture of **"clacker"** which is tied off to the 12" orange and white placard with 550 Cord. The **"clacker"** is a pin pattern punch assigned to a specific LN point. It is accessible at every point which allows the committee to validate the Cadet found the correct point.



3) Picture of a **Check Point (CP)**. These markers are on a stake with a **yellow placard** with **black lettering** along with the 8 digit grid. Each CP is manned. At night, there is a chemical light attached to the CP.





4) Picture of a **Training Point**. **Red placard** with **white alpha numeric labeling**. These are setup in close proximity to the committee TOC and are used only for Cadets that require additional training after LN1 or LN2. Cadets should ignore these points while conducting the actual test as these points do not aid or provide any reference.



5) Picture of **Reference Point (RP)**. RPs are a **white placard** with **black lettering** on a stake. An 8 digit grid denotes the exact location. These points are located at some (but not all) road and trail intersections. Similar to CPs, these points may assist Cadets in verifying their current location. Unlike CPs though, RPs are not manned. Additionally, at night, RPs **WILL NOT** have a chemical light.

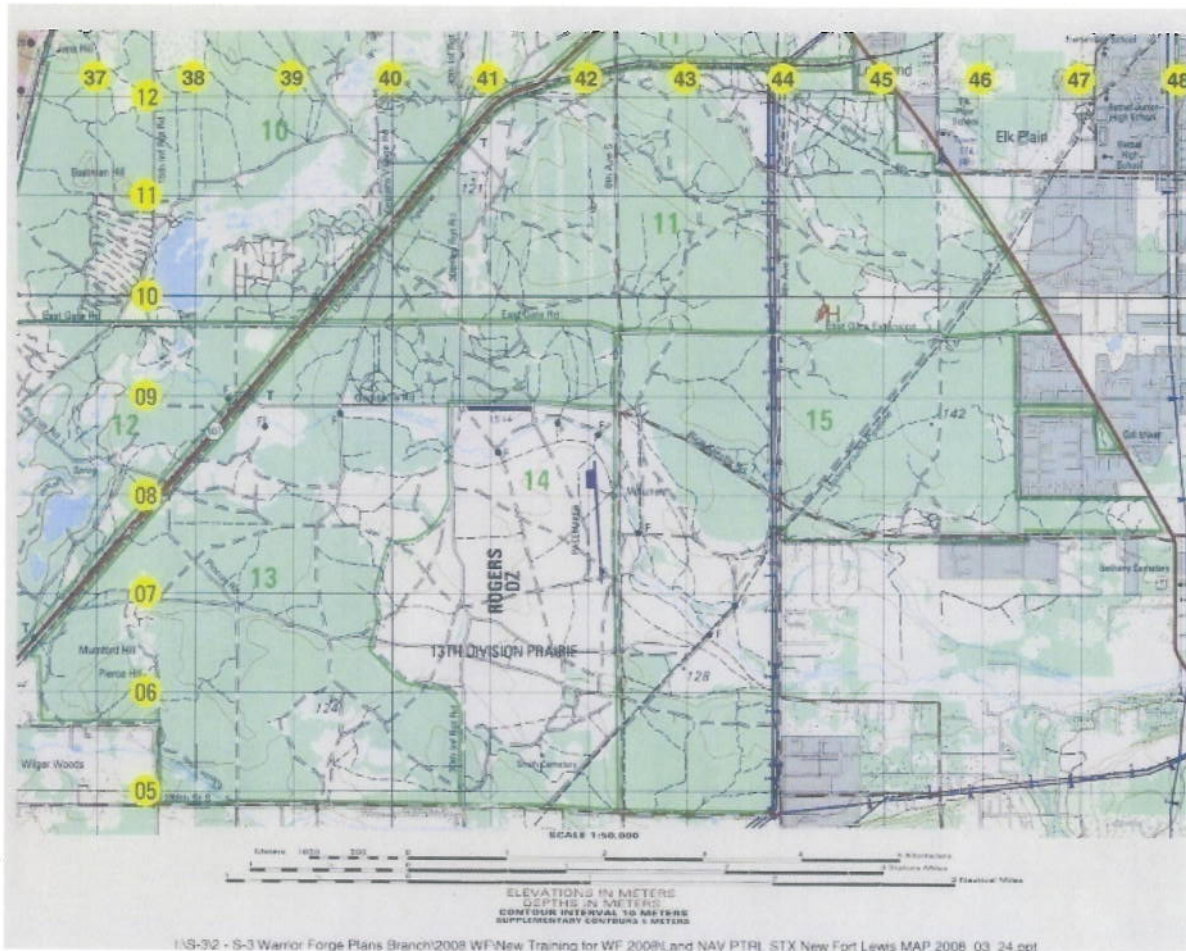


6) Picture of **Siber Stakes**. These markers designate ecologically sensitive land in training areas on Fort Lewis. THEY DO NOT AFFECT the land navigation course. Understand what they represent and ignore – will not affect foot traffic in, around, or through areas.



5. **WF / FORT LEWIS MAPS** (Fort Lewis is now Joint base Lewis-McChord).

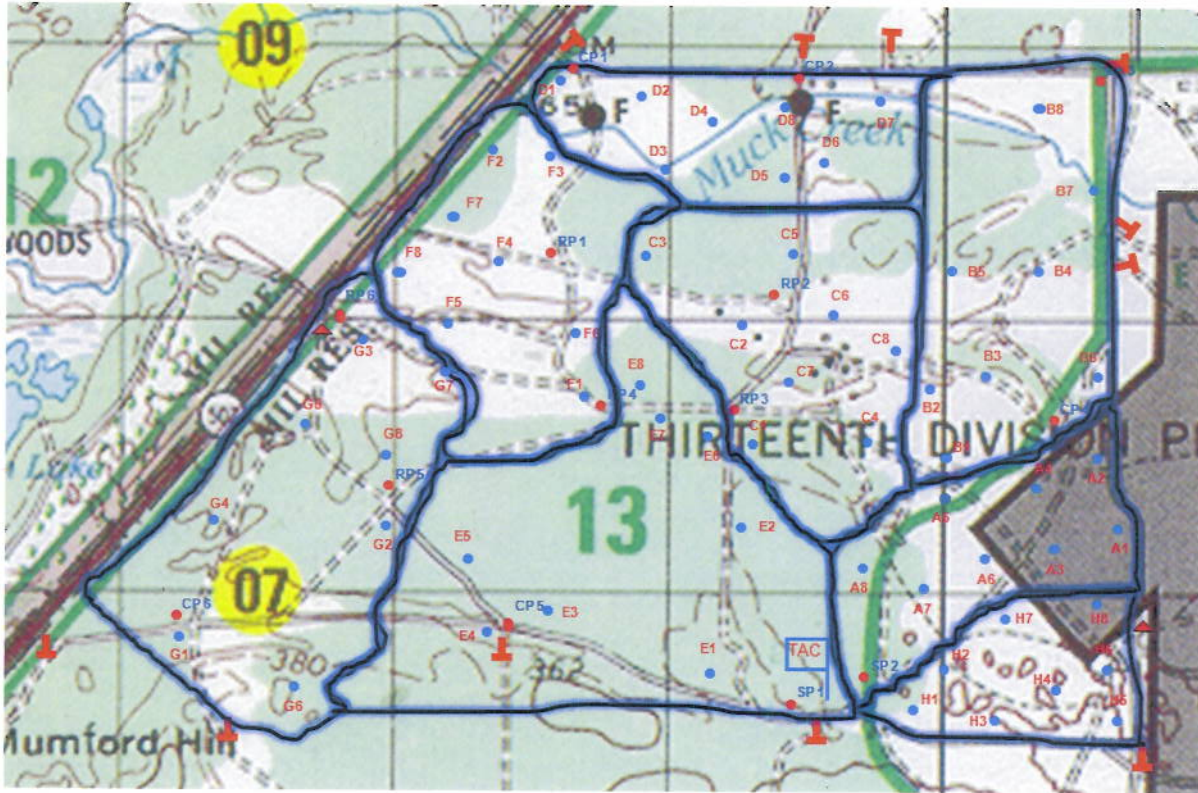
a. Map below represents training area designated for the land navigation course. Majority of land navigation course is in training area 13 with a few points in Rogers DZ, training area 14. This is a 1:50,000 map – the map that Cadets will receive and use during the land navigation testing.







**6. WF LAND NAVIGATION COURSE.** This next map is provided to give you and your Cadets an idea of what the actual land navigation course will look like. This is a representation of the master map used in previous WF. It is only an example and you should not assume that the WF 2010 course will mirror this exactly. However, dispersion, number of points, use of terrain, etc. will be very similar. Familiarity and understanding the course (Map Reconnaissance) should increase confidence of Cadets.



a. CP # - represents various CPs on the outside perimeter and shown in a BLUE lettering/numbering with a red dot. These markers are on a stake with a yellow placard and black lettering; has an 8 digit grid. All CPs are manned.

b. RP # - internal on the inside of the course with blue RP1, RP2 etc. with a red dot. These markers are on a stake with a white placard and black lettering; has an 8 digit grid. They are found within the LN course at major road or trail intersections. They are not manned

c. TAC or course SP will have a detailed terrain model to assist Cadets in plotting, required control measures, and determining their individual needs along with required supplies in order to execute all field training events. Cadets will plot their SP here – hence the first location they will plan their attack from.

d. Land Navigation Points – Red lettered with Blue Dots.



**7. Land Navigation Planning.** It is important that your Cadets understand how to plan their route for actual execution. Without a systematic plan that plots their points from their lane strip and incorporates all control measures, time allocated for determining each point, routes, and a method for finding each point, your Cadets may waste valuable time and not successfully accomplish the course. We recommend that you teach a deliberate planning method for land navigation. The following planning technique is only a recommendation. This may work well for some Cadets, but not others. The intent is for Cadets to have some type of planning knowledge prior to execution. At WF 2010 Cadets at a minimum (to pass), must locate and identify total of 5 out of 8 PTs within 5 hours (Day) and 3 out of 5 PTs within 3.5 hours (Night).

Some acronyms used:

GA	Grid Azimuth
MA	Magnetic Azimuth
SP	Start Point
M	Meters
PT	Point
GM	Grid to Magnetic (which equals 17 degrees on this course)
BA	Black Azimuth
DRPC	Day Road Pace Count
DWPC	Day wooded Pace Count
NRPC	Night Road Pace Count
NWPC	Night Wooded Pace Count

Step 1. Cadet plots all points; double checks each point to ensure accuracy.

Step 2. Cadet reviews points and decides the best way to attack the course.

Step 3. Cadet develops an attack plan for finding plotted points in a loop format. The next few pages provide a technique for planning.

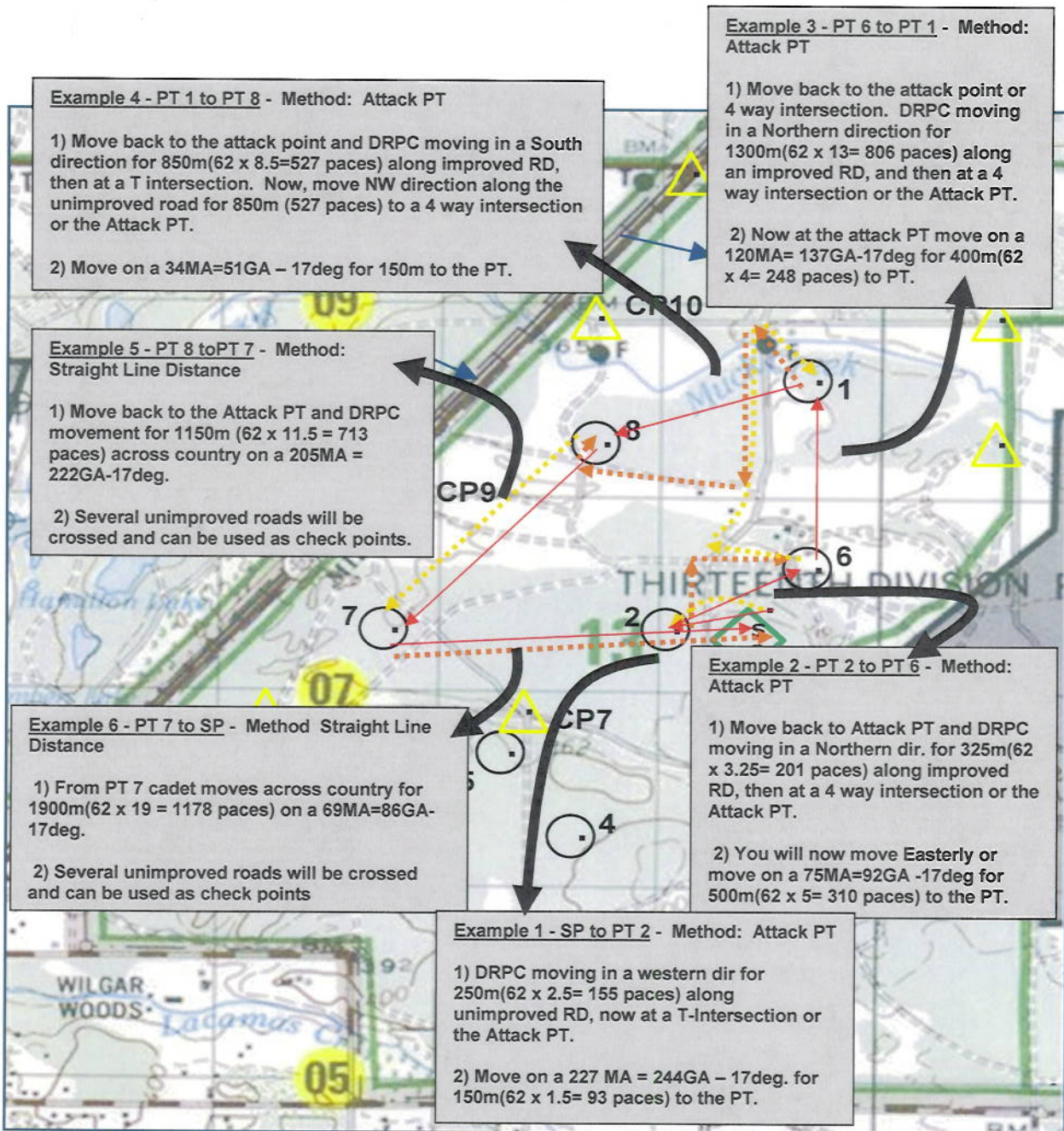
Step 4. Cadets should estimate available time to find each point plotted. Planning should equal no more than 60 minutes for each PT. Cadets will have to carefully manage time available while on the course. If a Cadet uses more than 60 minutes to find one PT, he/she should then spend less than 60 minutes for another PT. After locating each point, Cadets should review their plan and adjust time available, if necessary.

a. Legend for Planning Maps.

- 1) Red Solid Line. Straight line distance from current planned point to next point
- 2) Yellow / Orange Dotted Line. Actual route Cadet will travel from point to point.
- 3) Black Circle. Black Circle with number depicting number from lane strip.
- 4) Yellow Triangle. Check Points (CPs) on the course.

## Warrior Forge 2010, Land Navigation Training Support Package

b. Detailed plan. This map depicts 8 points plotted (Day LN at LDAC), however the following examples cover, only 5 LN points and the SP, with associated routes for a total of 6. This map includes points: SP to PT2 to PT6 to PT1 to PT8 to PT7 and back to the SP.

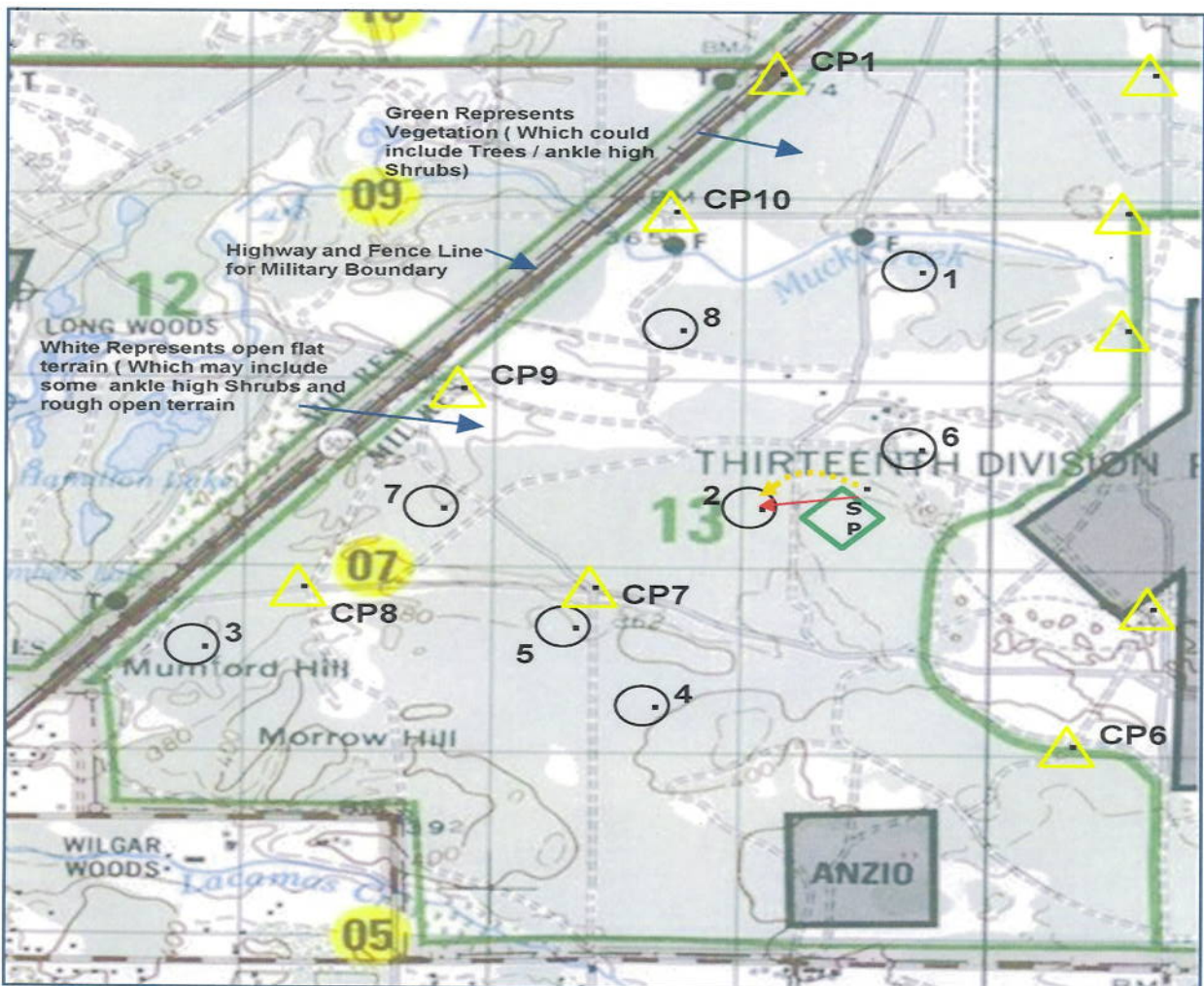


### Planning Notes:

1. Assuming pace count is 62 paces for 100meters.
2. GM angle is 17 degrees for Fort Lewis

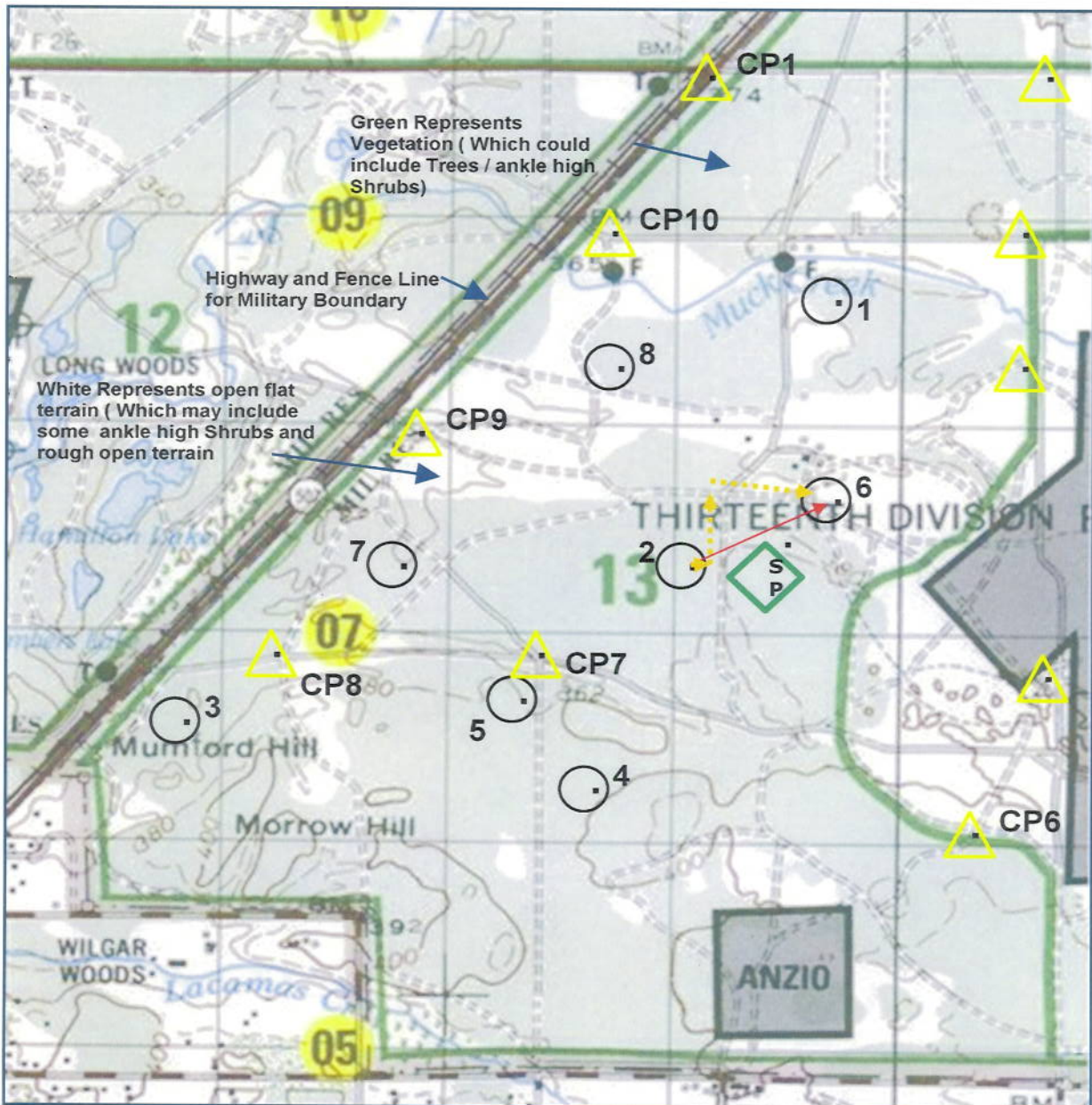


**Example 1: SP to PT2** is determined to be the first point to find/locate, because it is a shortest distance and easiest to find. **2.** Cadet move south of the SP to the unimproved trail (which is represented with the dotted line) and move west to an improved intersection for 250m. **3.** While moving West on the unimproved road, the Cadet will identify each 100m using their (DRPC) with either a speed bead or pick up a rock. **4.** Once you reach approximately 250m you will identify a T-intersection. At this intersection the Cadet arrives at their attack point. **5.** The Cadet gets a 244 GA and then converts to MA, which for Fort Lewis area, you will subtract 17 degrees, which is the GM angle and get 227 degrees for 150m using their (DWPC). **6.** Shoot a MA of 227 degrees and once you move 100m (50m short of the actual distance) on a wood line pace count, you need to be observing for a Land navigation Point (12X12 White placard with alpha numerical labeling the point, with an orienteering clacker attached). **7.** If you do not find this at 150m move another 25m or 175m and scan the sector. If Cadets still do not find this point move back to the attack point on a back azimuth and attack it again. **8.** Once you do find and identify PT2, place the alpha, numerical label point in "Block2" for PT2 of the score sheet then place the clacker in the area on the score sheet and press the device. **9.** Now, a "Plan to move to the next point" needs to be identified.



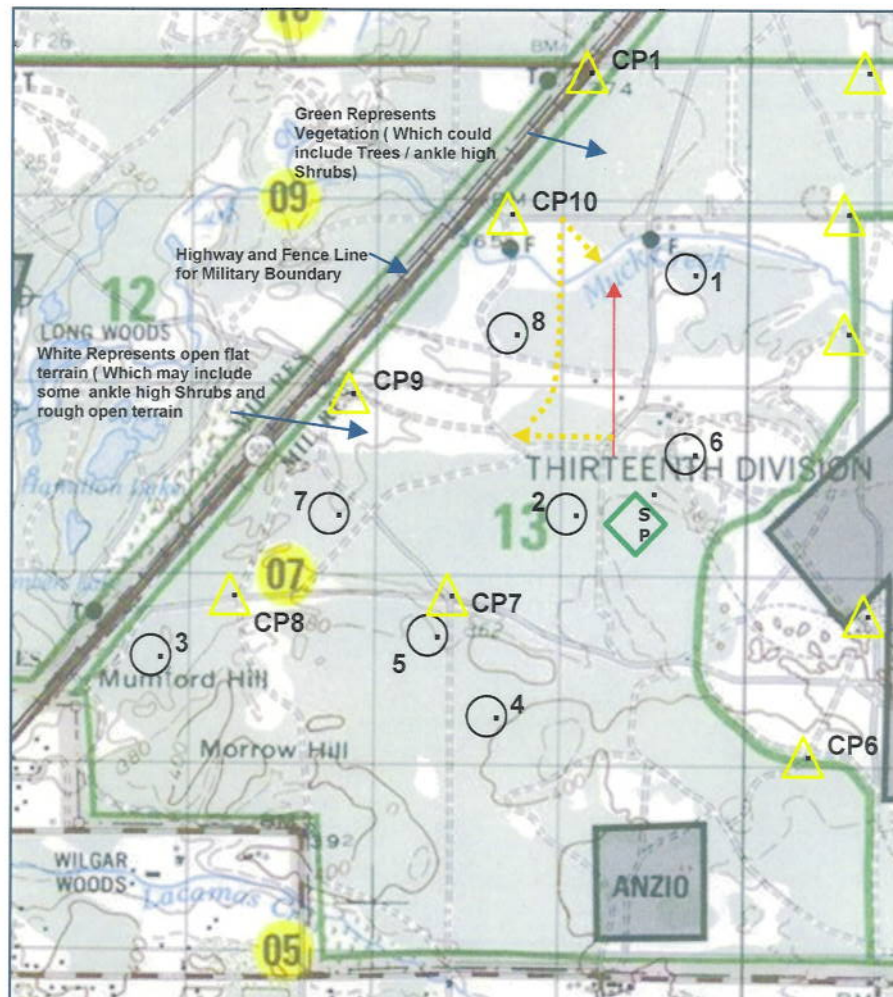


d. **Example 2: PT2 to PT6** move on a back azimuth to the old attack point (227GA-180BA=47degrees MA) then move North on the improved route for 325m. 2. You will then be at a four way intersection. At this intersection will become the attack PT, you will then move East or 75 degrees ( $92-17 = 75$  degrees) for 500m. 3. You will pass by a "y" intersection at 300m and you will keep moving on the 75 degree azimuth and stop short at 450m (50m short of the actual distance) and scan your area for identifiable markings. Keep moving on the 75 degree azimuth and more slowly to scan for PT6. 4. Once you find and identify PT6, place the alpha, numerical point in "Block 6" for PT6 of the score sheet then place the clacker in the area on the score sheet and press the device. 5. Now, a "plan to move to next point" needs to be identified.

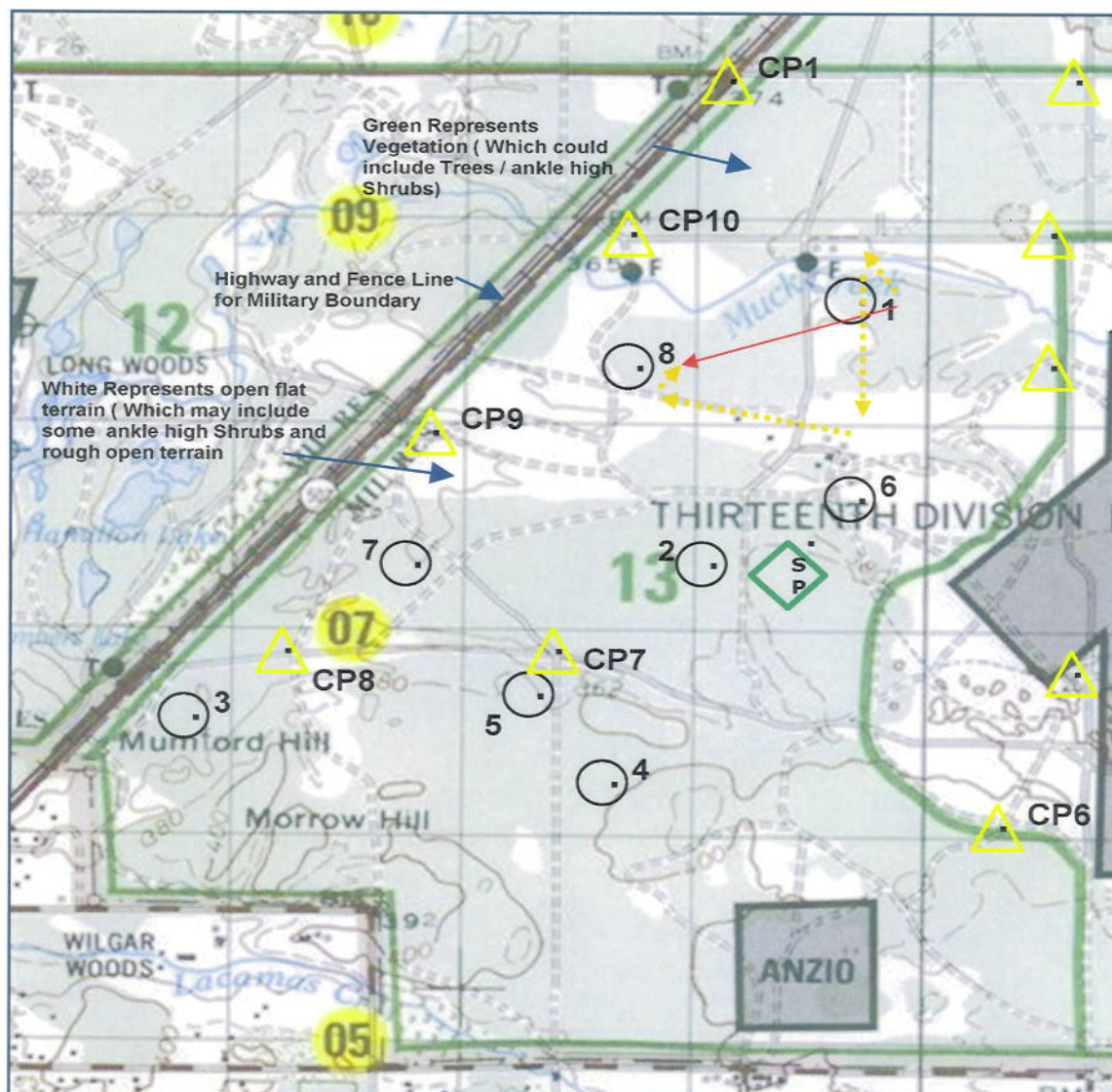




e. **Example 3: PT 6 to PT 1** move on a back azimuth to get back to the old attack point or four way intersection ( $75GA+180GM=255MA$ ) for 450m. **2.** This route should look familiar because you just traveled this area. **3.** Once you reach the four way intersection, now you need to move North on the improved road for 1300m. **4.** While you travel north on the improved road you reach a T-intersection at 300m on the East side of the road which runs SE. Continuing to move North and at the 500m mark or 150m you will have an unimproved road on the West side, running NW. **5.** Continuing moving north for the remainder of the 800+/- m to a prominent four way intersection. **6.** After passing a "Muck Creek" which may have water or a lower water bed area where the creek would run, but this can be used as a land mark and is a 100m short of the four way intersection. **7.** At this intersection the attack point is established. The attack point will be 120 degrees, MA ( $137GA -17GM= 120MA$ ) for 400m. **8.** At 350m (50m short of the actual distance) you will scan your area for identifiable markings. **9.** Keep moving on the 120 degree azimuth slowly and once you find and identify PT1, place the alpha, numerical label point in "Block 1" for PT1 of the score sheet then place the clacker in the area on the score sheet and press the device. Now, a "Plan to move to the next point" needs to be identified.

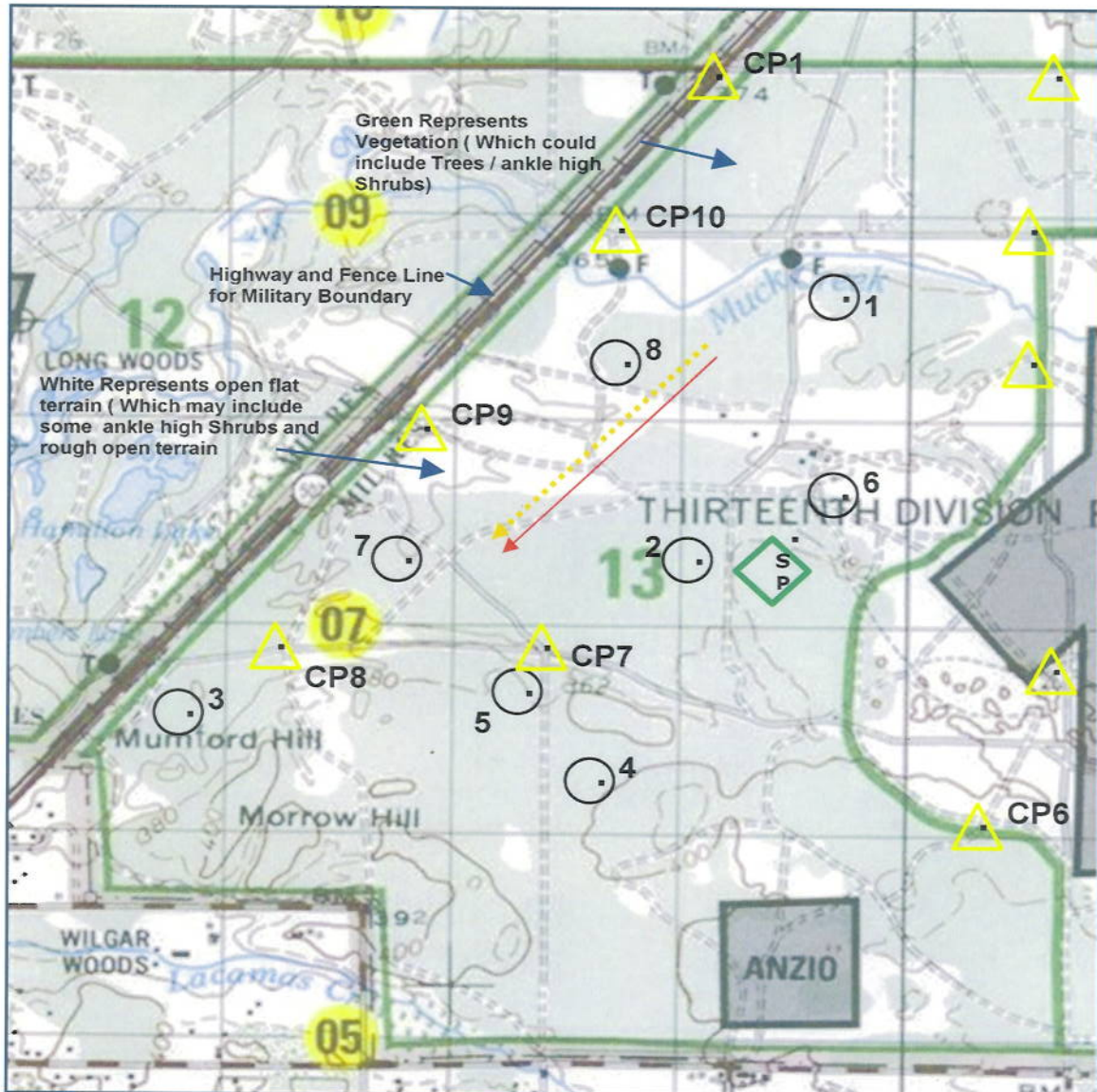


f. **Example 4: PT 1 to PT 8** move on a back azimuth to the last attack point on a 300degree ( $120 + 180BA = 300MA$ ) for 400m. **2.** Once at this four way intersection move South on the improved road for 850m and you will reach an unimproved road running NW. **3.** You traveled down the improved route so it should look familiar. **4.** Move NW for 850 m on the unimproved road to the next four way intersection. While you are traveling along this route you will identify vegetation terrain to the North and open flatter terrain to the South. **5.** This intersection will become the attack point for PT8. **6.** Move on a 34degree ( $51GA-17GM = 34MA$ ) for 100 m.





g. **Example 5: PT 8 to PT 7** move on back azimuth to the old attack point (34MA + 180BA = 214). From AP, Cadet will move 1150m at 205MA (222GA – 17deg = 205MA). **2.** At 300m the Cadet will cross an unimproved road and continue on the 205MA and then cross a second unimproved road at 200m for a total of 500m. **3.** At this point the Cadet needs to keep moving on a 205MA for another 500m and come to the third unimproved road. **4.** Between the 1<sup>st</sup> and 3<sup>rd</sup> unimproved road, the Cadet should be aware of the open flat terrain. **5.** At the third unimproved road the Cadet should place the stick or make a known location of that crossing point so they could use this as a reference. **6.** Now the Cadet can continue to move another 50m and start to observe for the PT.



h. **Example 6: PT 7 to SP** a Cadet will proceed from PT 7 back to SP at 69MA = 86GA-17 deg for the distance of 1900m. You will be crossing two major intersections which will help give references back to the SP. Method for Pt 7 to SP is straight line distance.

