Puzzle Caching FUNdamentals
by
Scott Aleckson
(SSO JOAT)

Central Kenai Peninsula,
Anchorage, Wasilla, and Valdez
16 September 2010
Dedicated to the Memory of fellow Puzzle Meister, Doug “CohoFive”
Tonight’s Topics:

- What is an “Unknown” Cache?
- Approaching a Puzzle Cache
- Methods of Solving Puzzles
- Logging a Puzzle Cache
- Hiding a Puzzle Cache
- Online Puzzle Resources

Pay Attention! There will be a TEST...
What is an “Unknown” Cache?

- Several names:
  - Unknown Cache (official Groundspeak label)
  - Mystery Cache (less used Groundspeak label)
  - Puzzle Cache (most used term by geocachers)
  - Challenge Cache (for logging completion of specific tasks)

- Requires something more than just going to the published coordinates to find a container.

- A Puzzle involves two “hunts”; completing some type of pre-hunt task (e.g. solving a puzzle) followed by a traditional caching expedition.
What is a Puzzle Cache?

THE PUBLISHED COORDINATES OF A TRUE PUZZLE CACHE ARE FAKE!!!

YOU must Figure out the Real Location
Approaching a Puzzle Cache

• Contemplate the exterior of the quadrilateral parallelogram…

• Your goal = Coordinates!

• Look at everything that the Cache Owner can change or customize on the Cache Listing:

  - Cache Name
  - Placed By (Always links to CO)
  - Date Placed (Must be in past)
  - Related Web Page (Hyperlink)
  - Background Image

  - Bookmark Lists & Trackables
  - Short & Long Descriptions (HTML)
  - Hints/Spoiler Info (ROT-13 Encoded)
  - Additional Waypoints & Images
  - Owner Logs (Notes, Maintenance, etc.)
<table>
<thead>
<tr>
<th>Cache Name</th>
<th>Date</th>
<th>Placed By</th>
<th>Web Link</th>
<th>Published Coordinates</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dancing Fall Angies</td>
<td>06/03/2010</td>
<td>SSO JOAT</td>
<td></td>
<td>N 60° 29.250 W 151° 05.065</td>
<td></td>
</tr>
</tbody>
</table>

```
Published:
Coordinates:
Print:
Download:
```

*Please note: Use of geocaching.com services is subject to the terms and conditions in our disclaimer.*
Image Gallery, Maps, Logs...

Find...
- other caches hidden or found by this user
- nearby caches of this type, that I haven't found
- all nearby caches, that I haven't found
- all nearby waymarks on Waymarking.com
- all nearby benchmarks
- nearby Hotels

For online maps...
- Geocaching.com Google Map
- MyTopo Maps
- Google Maps
- MapQuest
- Bing Maps
- Yahoo Maps
- Rand McNally
- MSR Maps (Formerly Terraserver)
- Open Cycle Maps
- Open Cycle Maps

80-Column Printout

2 Logged Visits • View the Image Gallery

16 September 2010 Puzzle Caching FUNdamentals
Descriptions, Backgrounds, Bookmarks, Trackables…

It will be necessary to find the first 7 HP caches before the final cache can be completed. Each of the first 7 colorful micros are concealed by an invisibility cloak to keep them secret from passing muggles. Please replace the cache exactly as found. Pay careful attention to anything HP related about the cache and log. Good luck!

Use the first 7 caches in order by the primary color of the container:

- Yellow -- Black -- Red -- Gold
- Yellow -- Bronze -- Silver -- Green

On the parchment scroll below, make the connections between the initials of the character noted on each cache to a house symbol as described to find the numbers needed to sort out the coordinates.

Trackables may have comments

Bookmark Lists may have comments

Backgrounds
HTML Source Code

The HTML source may reveal secrets in the “User Supplied” Sections
Control, eh? Invisible Ink!

You can check your answers for this puzzle on Geochecker.com.

What, did you think I would hide more hints this way? There are plenty of hints hiding around here already.
Solving Puzzles

- Compile all information about the puzzle from the cache listing
- There is no single method that will let you figure out every puzzle
- Solving a puzzle requires deep thought, research, and lots of scratch paper!
- Holding this presentation to your brow will NOT beam the coordinates into your head
Breaking Things Down

Google Everything

- Thesaurus & Dictionary
- Look up all unusual words
- Specific words are chosen for a purpose as they usually help lead to the solution
- A Google search of the right terms may reveal the puzzle’s method or solution
Solving Puzzles

• You know the solution = Coordinates
• Look for groups of items that may represent numbers:
  15 digits in 60 12.345 150 12.345
  10 digits in just the minutes portion
  6 digits in just the fractional minutes
• Don’t get stuck on these groups as there are other ways to write out coordinates
Coordinate Systems

This is the same spot, written different ways:

DMM:  N 60° 29.190’  W 151° 07.715’

DMS:  N 60° 29’ 11.4”  W 151° 7’ 42.9”

Decimal:  60.48650  -151.12858

UTM:  5V E 602838 N 6707055

MGRS:  5VPH0283807055

British Grid:  4663879 5099347
Switching between Decimal Degrees, DMM, and DMS is a very simple product of 60.

Starting with 60.48650, simply multiply everything to the right of the decimal by 60.

This gives you DMM 60° 29.190’ and then if you multiply the fractional minutes by 60, that gives you 60° 29’ 11.4” for DMS.

Divide the entire seconds or minutes amount by 60 to go the other way (e.g. 11.4 / 60 = 0.190).
Map Datums

- And then there are many Map Datums
- The normal Datum is **WGS 84**
- Most all USGS topographical maps for Alaska were done under NAD27

- **WGS 84** is: **N 60° 29.190’ W 151° 07.715’**
- **NAD 27** is: **N 60° 29.220’ W 151° 07.558’**
Writing Out Coordinates

- We don’t always use numbers
- This: **N 60° 29.190’ W 151° 07.715’**
- Becomes this:
  North sixty degrees twenty nine point one hundred ninety minutes west one hundred fifty one degrees seven point seven hundred fifteen minutes
Codes & Ciphers

- A very common and popular puzzle style
- You’re already familiar with the basic substitution cipher called the Caesar Shift
- Every cache page has the ROT-13 Cipher listed on it:

Decryption Key
A|B|C|D|E|F|G|H|I|J|K|L|M
--------------------------
N|O|P|Q|R|S|T|U|V|W|X|Y|Z
(letter above equals below, and vice versa)
Caesar Cipher

ха The 26 letters of the alphabet can be shifted any number of positions

ха If you were to shift 2 places, then A=C, B=D, and C=E, and so on through Z=B

ха While a 13 place shift gives A=N and N=A, any other shift will not result in the same switch both ways
To further hide the words being encrypted, we will often break the words into same sized groups of perhaps 4 or 5 letters:

nort hsix tyde gree stwe ntyn inep oint
oneh undr edni nety minu tesw esto
nehu ndre dfif tyon edeg rees seve npoi
ntse venh undr edfi ftee nmin utes
After running the coordinates through a simple Caesar Shift, we get this:

YZCE SDTI EJOP RCPP DEHP YEJY
TYPA ZTYE ZYPS FYOC POYT YPEJ
XTYF EPDH PDEZ YPSF YOCP OQTQ
EJZY POPR CPPD DPGP YAZT YEDP
GPYS FYOC POQT QEPP YXTY FEPD
Vigenère Cipher

• This is a much more complex substitution cipher that uses all 26 Caesar Shifts to create a "Tabula recta" for coding

• The “plain text” to be coded is written over the top of a “keyword” or “key phrase”

• For instance, to encode the phrase, “Puzzles are the best caches” with the keyword “cipher”, you would write it out like this:

  PUZZLESARETHEBESTCACHES
  CIPHERCIPHERCIPHERCIPHERCIPHERCIPHE
Vigenère Cipher

To encode each letter, go down the left row headers and find the plain text letter. Go across the top column headers and find the key letter. The junction is the encoded character.
Vigenère Cipher

• After encoding the entire message we have the following:

  RCOGPVUIGLXYGJTZXTCKWLW

• By breaking it up into groups, we get this:

  RCOGP VUIGL XYGJT ZXTCK WLW
Vigenère Cipher

- To turn the code back into plain text, the recipient needs to know the keyword.
- Here is the coded message written over the keyword and ready to decipher:
  
  \[
  \text{RCOGPVUIGLXYGJTZXTCKWLW} \\
  \text{CIPHERCIPHERCIPHERCIPHERCIPHERCIPHER}
  \]

- Simply reverse the encoding process by looking up the junctions in the Tabula.
Solving Puzzles

There are hundreds of websites out there dedicated to describing various types of substitution ciphers.

Almost anything can be used as the substitution for the alphabet to include symbols, fonts, languages, pictures, etc.

They can be very simple or exceedingly complex, so look for the clues in the puzzle that should point toward the cipher.
Image Manipulation

Steganography – Messages hidden inside the computer code of the image itself

- Save all images to your computer
- Look at the Image Properties
- Open image with a Photo Editor
- Zoom in and look all over the image for signs of editing, hints, codes, or even coordinates
Everything about Image Properties can be Changed.
Image Manipulation

It’s easy to hide stuff in Images

Do you see the Coordinates?
Image Manipulation

Zoom In and there they are…
Solving Puzzles

- This presentation would have to go on for hours to cover all the possible ways that one could hide coordinates in a puzzle.
- Hopefully, this will give some tips and tricks to help you start to break the codes.
- Practice is what provides the experience needed to solve most puzzles.
- So, get out there and practice!
Solving Puzzles

A few “Rules” about solving puzzles…

✓ Never ask for help with a puzzle on public internet forums (e.g. Groundspeak forums)

✓ Never post the solution to a puzzle or give the final location anywhere on the internet

✓ Finding the final cache without actually solving the puzzle doesn’t justify a “find”

✓ Working in groups to solve a puzzle is fine, so long as someone in the group hasn’t already solved it and is just giving hints
Logging a Puzzle Cache

📝 Solved It Notes

- It is generally OK to post a *Note* to the cache page at the time you solved the puzzle so long as you intend to actually find the cache

😊 Found It Logs

- Only log a *Found It* after you have actually solved the puzzle AND have found the physical cache and signed the log book
Logging a Puzzle Cache

✓ **NEVER** post anything in your online cache log that will give even the slightest hint about solving the puzzle or the physical location of the final cache!!

✓ Feel free to ramble on about how much fun the puzzle was to solve, what a great cache and location the final was at, how cool the cache owner is, etc. Just keep all your comments vague so that you don’t give anything away.

✓ If you post any hints in your log, expect the cache owner to delete your log in short order. Just go back and post a new log that doesn’t have any hints. Separately message the puzzle owner to apologize for the mistake and all will be fine.
Hiding a Puzzle Cache

• **Challenge Caches**
  – Clearly state the Challenge requirements
  – Individual accomplishment; Not a race
  – CO must verifying completion
    • Bookmark List(s)
    • Profile Info or Pocket Query
  – Cache must use the real coordinates

Challenge Examples: Obtaining a certain number of FTFs, 2TF on same day as FTF, EarthCaches in a specific region, find a cache on each page of a Delorme map book, find a cache for each possible D/T rating combination, find every cache in a certain area, etc.
Hiding a Puzzle Cache

❓ Puzzle Caches

– Must be SOLVABLE by someone else using the information and hints on the cache listing
– There MUST be enough info on the listing to let people figure out what the puzzle is about
– Always triple check your work and even let another puzzle solver check it before publish
– *Design, design, design!* The Puzzle Cache page is extremely important. Put work into it!
Hiding a Puzzle Cache

Rating a Puzzle Cache

- The Terrain rating is for the final cache location just as if it were a traditional
- The Difficulty rating of a puzzle cache is based on the puzzle itself
- The “baseline” for a puzzle is Difficulty 3
- A really easy puzzle might be 2.5
- Harder puzzles should be 3.5 and up
- If your puzzle isn’t solved, bump up the rating
Resources

- GS Knowledge Books: http://support.groundspeak.com/
- Purple Hell: http://www.purplehell.com/
- Rumkin Cipher Tools: http://rumkin.com/tools/cipher/
- Omniglot Writing: http://www.omniglot.com/
- Puzzlehead Blog: http://www.puzzlehead.org/
- GeocacheAlaska! Forums: http://geocachealaska.proboards.com/
I’ve hidden an Ammo Can in the woods… one with a nice camo paint job!

This is an unpublished, yet ready-to-place Ammo Can that is FREE for the FTF! Yes, there is only ONE can, thus only ONE can claim it.

I’m only leaving this cache in place for 26 Days. It will be removed at Noon on Oct 12th at which time I will be placing a new Traditional very close to this nifty spot (so please don’t place the cache within 700’ of this location if you are the one to claim it).

In order to claim this Ammo Can in the woods, you must Solve a Puzzle – part of which is hidden right here in this very presentation, the rest of which is hidden somewhere on the internet. What to look for is half the puzzle.

When you get home, go to the Geocache Alaska! website and download the full sized PDF of this presentation and use the clues on these last slides to find the information in this presentation that will help you solve this Puzzle.

If you are able to solve this puzzle, please post a NOTE to the Event cache page where you attended the event. The person who solves the puzzle and actually makes the journey to claim the Ammo Can needs to post a NOTE to their Event cache page ASAP to let everyone know the Exam is over!

I will post the solution to this puzzle as a note to each event listing on Oct 13.
FINAL EXAM!!

♦ CKNZ=70 : CKND=35 : CKQ2=54 : CKPF=98

♦ Haversine will reveal the area, not the spot. Of course, it is up to YOU to figure out the location.

♦ The Knave knows where to find the URL

♦ A Visionary needs a Key Phrase and a Tabula

♦ The Key appears 129 times in this Portable Document with showings at every screen

♦ It is its own entity, yet comprised of many others, without whom it could not exist on its own
A “spoiler” photo for the final cache hide. It’s in the exact center.

If you solve the puzzle, please click this photo and enter the coordinates into the GeoCheck page. This allows me to verify when someone solves it.