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Puzzle Caching FUNdamentals
 by
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 Central Kenai Peninsula,
 Anchorage, Wasilla, and Valdez
 16 September 2010
 PRINT VERSION


*Dedicated to the Memory of fellow
 Puzzle Meister, Doug "CohoFive"* 



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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...

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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.



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What is a Puzzle Cache? 

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



YOU must Figure out the Real Location

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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:



<input type="checkbox"/> Cache Name	<input type="checkbox"/> Bookmark Lists & Trackables
<input type="checkbox"/> Placed By (Always links to CO)	<input type="checkbox"/> Short & Long Descriptions (HTML)
<input type="checkbox"/> Date Placed (Must be in past)	<input type="checkbox"/> Hints/Spoiler Info (ROT-13 Encoded)
<input type="checkbox"/> Related Web Page (Hyperlink)	<input type="checkbox"/> Additional Waypoints & Images
<input type="checkbox"/> Background Image	<input type="checkbox"/> Owner Logs (Notes, Maintenance, etc.)

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Names, Dates, Links...

Cache Name: Dancing Fall Angies

Date: 06/03/2010

Placed By: SSO JOAT

Web Link: [related Web Pages](#)

Published Coordinates: N 60° 29.250 W 151° 05.060

Attributes: (Log, Print, Download, etc.)

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Image Gallery, Maps, Logs...

Location of Published Coordinates: (Map area)

Images: (Image gallery area)

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Descriptions, Backgrounds, Bookmarks, Trackables...


Trackables may have comments: (Inventory section)

Bookmarks Lists may have comments: (Bookmark Lists section)

Backgrounds: (Image gallery area)

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HTML Source Code



```

<div class="UserSuppliedContent">
  <span id="cc100_ContentBody_ShortDescription"><p>The cache is <b>NOT</b>
at the published coordinates.</p>
<!--For demonstration purposes only, this is a comment or remark line. It can be viewed in the
HTML source code, but is not visible on the Cache Listing when viewed in a browser.-->
</span>

</div>
<hr />
<div class="UserSuppliedContent">
  <span id="cc100_ContentBody_LongDescription"><p>Can you help Scooby,
Shaggy, Fred, Velma, and Daphne solve this
mystery? So far in this episode, Velma has found a reference to
somewhere around <i>N 139350358 W 01' Factory Hill</i> but this clue
has only magnified the difficulty of this case. With your help,
it's a good bet that Scooby will be able to sniff this one out by
the end of the show.</p>
<hr />
<img src=
"http://img.geocaching.com/cache/0c2b0468-8655-4512-8371-4f708d1ccf9.jpg"
alt="Solve Puzzle" /><hr />

```

Remarks (with arrow pointing to the comment line)

The HTML source may reveal secrets in the "User Supplied" Sections

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Control, eh? Invisible Ink!



Normal view: 


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



Highlighted: 

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


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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


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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

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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

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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** 

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DD – DMM – DMS 


- 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. $11.4 / 60 = 0.190$)

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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'**


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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

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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)

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Caesar Cipher




For your eyes only

- ✘ The 26 letters of the alphabet can be shifted any number of positions
- ✘ If you were to shift 2 places, then A=C, B=D, and C=E, and so on through Z=B
- ✘ While a 13 place shift gives A=N and N=A, any other shift will not result in the same switch both ways

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Codes & Ciphers



- ❖ 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

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Codes & Ciphers



❖ After running the coordinates through a simple Caesar Shift, we get this:

**YZCE SDTI EJOP RCPP DEHP YEJY
TYP A 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



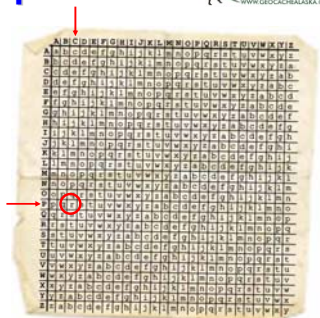
- This is a much more complex substitution cipher that uses all 26 Caesar Shifts to create a “**Tabula recta**” for coding
- The “plain text” to be coded is written over the top of a “keyword” or “key phrase”
- For instance, to encode the phrase, “Puzzles are the best caches” with the keyword “cipher”, you would write it out like this:


**PUZZLESARETHEBESTCACHES
CIPHERCIPHERCIPHERCIPHE**

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

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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:
**RCOGPVUIGLXYGJTZXTCKWLW
CIPHERCIPHERCIPHERCIPHE**
- Simply reverse the encoding process by looking up the junctions in the Tabula

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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

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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



Image Properties

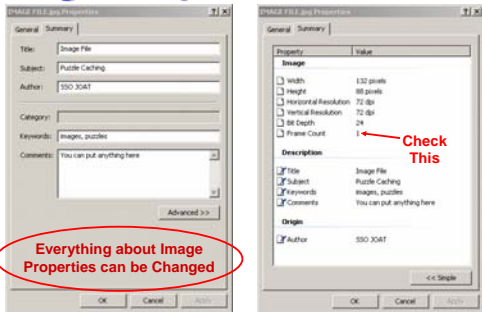


Image Manipulation



It's easy to hide stuff in Images

Do you see the Coordinates?




Image Manipulation 

Zoom In and there they are...




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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!


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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

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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


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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.

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Hiding a Puzzle Cache 

- **Challenge Caches**
 - Clearly state the Challenge requirements
 - Individual accomplishment; Not a race
 - CO must verify 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.

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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!

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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

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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/>
- Online Substitution Cipher Solver: <http://25yearsofprogramming.com/fun/ciphers.htm>
- Parmstro's Puzzle Guide: <http://parmstro.weebly.com/solving-puzzles.html>
- Florida's Puzzle Solving 101 Cache Series by ePeterson2: <http://www.geocaching.com/bookmarks/view.aspx?guid=3713d8f3-62ba-40ac-b0ef-901807ba9c98>
- Puzzle Capital of Alaska Bookmark List for the Central Kenai Peninsula: <http://www.geocaching.com/bookmarks/view.aspx?guid=3e9b65ac-aebc-465f-9cb1-035ae4292485>
- GeocacheAlaska! Forums: <http://geocachealaska.proboards.com/>

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