# The Source Digest

Cory Arcangel

Also by Cory Arcangel:

This is all so crazy, everybody seems so famous (2015)
be the first of your friends (2015)
Working On My Novel (2014)
All The Small Things (2014)
A Couple Thousand Short Films about Glenn Gould (2008)
Nerdzone v.1 (2004)

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*The storage is you*

*The storage is you*

*Typing in step one  typing in have fun*
*Typing in, just type it in*
*Typing in step two  typing in hey you*
*Typing in, let's type it in*

*New Production Goes to Munich "Tippen Ein"* (1987)

Software can take many forms--actually it needs to be assigned different forms for creating, editing, storing, distributing, and running, just to fulfill its basic functions. It might be created as text or with graphical flowcharts, edited using diff tables, stored as compressed bytes on a flash drive, distributed on DVDs, or executed as electrical currents in the registers of a computer processor. In the "Gallery of CSS Descramblers," a website started in 2000 by computer scientist Dr. David Touretzky, DeCSS, the notorious piece of software that cracked the copy protection of commercial DVDs, is presented as images, music, plain language, poetry, and so forth. While a piece of music cannot be used to decrypt an encrypted DVD, it can be transcoded into an actually running software program that does. Datasettes, audio cassette tapes that contain software encoded as different tones, were a common data storage medium in the 1980s that basically made use of this principle. In the end, any complete representation of software bears the potential of actually being that software.

More importantly, software can take on many roles when it is running, when a computer performs it. Attempts made to describe what software is, beyond the strict framework of the logical manipulation of symbols, usually turn into Rorschach inkblot exercises. Software has been compared to mechanical machines, thought processes, evolutionary biology, mathematics, and much more.

In 1991, Philip Zimmermann released the email encryption tool PGP as a free, open-source software. PGP was the first application for public-key encryption that enjoyed wide usage, and it quickly became the de facto standard for secure electronic communication. Since PGP offered "strong cryptography" via algorithms that were previously accessible almost exclusively to governments and the military, the software was

classified as munition and therefore could not be legally exported outside of the United States. To challenge this rule, Zimmermann had MIT Press publish PGP's source code in 1995 as a book. As a printed text, PGP was protected by the constitution's guarantee of freedom of expression and could legally leave the United States. In Europe, activists typed in the source code from the book, thereby producing the "international" version of PGP, called PGPi. Of course the book could not be used to encrypt any emails, but it managed to losslessly transform executable software from a weapon into just text. "PGP: Source Code and Internals" is a 993-page magnum opus of C source code that has become a rare collector's item, despite the fact that the executable PGP software has been available in abundance online since its inception.

Starting in the late 1970s, the first years of the home computer boom, software was commonly published in print: magazines for enthusiasts contained code for small tutorials on how to program home computers, as well as complete software programs, so-called "type-ins." They were typically written in a BASIC dialect and made to play music, draw graphics, or offer simple games. Anyone who wanted to run these programs would need to manually type them into their computer.

This made sense on many levels: mass-producing prerecorded storage media (either datasettes or the more expensive floppy disks) was too costly for magazines, and even if it was affordable, the media failed half of the time anyway. Home computers typically offered between 4 and 64 kilobytes of memory, an amount that could be easily filled with some dedicated typing. Moreover, computer users of that time regarded the computer -- the actual hardware -- as a finished product, whereas software was something to understand and learn how to create yourself. In the best case, by learning from a master and typing in the code, by making and fixing mistakes, the typist would gain valuable insight. (In the worst case, the printed code already came with errors that the typist would repeat, or the print was of such bad quality that important characters were unrecognizable.)

Once it became cheap enough to mass-produce diskettes, typing in source code felt increasingly useless. From around 1984 on, magazines started to include reliable diskettes that contained ready to use software. What had already happened a long time prior with commercial software, happened again for enthusiasts: software became an object and appeared as a stable form.

It is quite unlikely that the software on a 1984 diskette would be readable today; typically you won't have the diskette drive that one needs to access the data on it in the first place. However, if there is a computer

magazine from 1980 stashed away in a box in some attic, the source code printed in it is likely still readable. And this is not because of some mysterious superiority that is sometimes assigned to the printed word: the source code is still readable because it was recorded on absolutely worthless material.

There is not much one can do with cheap paper that is printed on both sides. You cannot take notes on the back, you cannot give it to your children to draw on. To make a paper plane from it you'd need to cut the magazine's binding. Few papier-mâché projects could use up even a single volume of "COMPUTE!'s Gazette." A diskette, on the other hand! You could simply erase the programs that came on it and use it to store your own stuff! And then erase that again!

Now Cory Arcangel is releasing some of the software programs he created as code printed on pages of this very paperback. Each of the programs was first published as a zine in a series called "The Source." The zines contain much more than source code, they are guides on how to recreate and run complete artworks for which software happens to play a central part, plus some inspirational thoughts to entertain yourself as you follow the instructions. My personal favorite, "Pizza Party," a collaboration with Michael Frumin, is a piece of software that cannot perform its original raison d'être anymore, which is to be a command-line client for ordering pizza: just type

pizza_party -vgb

to order a pizza with olives, green peppers, and bacon, or set up a cron job with this command to automatically order that exact pizza every Wednesday at 7 pm!

"Pizza Party" could only work as intended with the 2004 version of the Domino's website. It was fun while it lasted, but since Domino's changed their site and pizza_party.pl became functionally obsolete a long time ago, its source code is beginning to reveal itself as a great play on computer culture: essentially theater with UNIX as its stage, it pays major respect to the living history and applied folklore of this classic operating system. As for the 1980s enthusiasts who enjoy typing in endless listings, there are many insights to gain here, even if no useful software is produced in the end. And UNIX is not even needed to do this.

Issue 5 of "The Source" is being released as I am typing this, and will include the source code for a modified Atari game as well as an interview with Cory about preservation. Cory talks about the zine series in it, but not about why he chose to reproduce these zines as a paperback.

Each issue of “The Source” is printed with archival toner on acid-free archival paper. They don’t look like cheap computer mags, and they will appear shiny and fresh decades after generic printed material fades and crumbles. So how does an archivally inferior paperback even help with preservation?

Simply put, preservation is not necessarily equivalent to archiving or safe storage. In fact, there is a material and a social component to it. Flooding the world with as many versions of an artifact as possible, in all possible formats, increases its cultural circulation and keeps it in use instead of in remembrance. When the archival vault where artifacts are stored and taken care of with best practice rigor burns down, the cloud server’s memory is erased by some magnetic sun storm, and the museum deaccessions the artwork from its collection because a new, radical curator wants to make their mark, a shabby newsprint reproduction ends up as an inlay of somebody’s sock drawer and is unwittingly passed on for generations. Then it is proven that worse is better.

The social component of preservation that I am referring to is not really about convincing the right people that something is in fact worth being preserved, but rather about allowing a piece of culture to be taken care of by culture itself. The more people who have a chance to lay their eyes on “The Source,” the more likely it is that the software will survive in one form or another.

So, on the one hand, software seems to be one of the most difficult things to preserve. It is essentially performance: unseizable, unstable, and flimsy. Its ability to perform depends on seemingly bottomless, nested sets of preconditions: a computer, an operating system, maybe some visual display, a certain input device, even a specific cultural background of the person operating it. In the worst case it requires “The Internet.” On the other hand, the most variable cultural artifacts are made of software. Software has an incredible potential for changing its form, because it has no imperative form. Pinning a piece of software down to a single object makes preservation more difficult. Forcing uniqueness on the object-level is a futile struggle against the logic of software. Fanning it out into a larger number of objects makes preservation easier. Compared with eternity, uniqueness looks ridiculous anyway.

*Dragan Espenschied*

*March 2015, New York*

# Desktop Wireform

[1]2010

Requirements: Perl

A perl[2] file which generates .dae[3] data for a line consisting of random XYZ points in 3d space where the Z dimension is always increasing[4].

"If my kid couldn't draw I'd make sure that my kitchen magnets didn't work" - Mitch Hedberg [5] [6]

Sample output: ./perl desktop-wireform.pl > hello-world.dae

**1.** *Hello World*, 2011 (CNC bent stainless steel with electro-polish finish) Photo: Arcangel Studio

**2.** This code is written in the language Perl - a general purpose UNIX scripting language written in 1987 by Larry Wall. It's a great language, especially for quick no bullshit text hacks. Also, FYI, it's my favorite language, the first one I learned, and the one I program in most.

**3.** .dae is an open standard XML schema for exchanging digital assets aka "D"igital "A"sset "E"xchange. In English: basically it's a file format that was developed in order to allow different 3d programs to exchange digital information between each other. Otherwise, a 3d object composed in, say, the 3d program Bryce could not be opened in another 3d program like Maya. Editors note: I don't expect many people to read both the code AND footnote sections of this text, so it is probably worth explaining again ... the above pages of Perl code generate a 3d file in the .dae file format, which, when loaded into a 3d rendering application, manifests as a line of random points where one dimension is always increasing, aka a "bent line". I have chosen to generate this 3d file in .dae format because it is the only language I could get Google Sketchup - the 3d program I use - to both export and import, thus allowing me to reverse engineer the .dae file format.

**4.** So ... each time this program runs, a new bent line is generated as a 3d file. These 3d files can be imported into a 3d rendering program to be viewed virtually, but when writing this program it was my interest to realize these lines IRL as "Sculpture". ~~Sculpture - with a capital S - has come a bit slow to my output, but~~ from the late '00s on, I have become more and more comfortable with the idea of creating objects while at the same time becoming less and less comfortable with creating exclusively screen based performances and software. My discomfort with the virtual is primarily archival. A digital work, let's say a web page, relies on many systems to exist - the power grid, the Internet, a computer, a browser, etc, etc. Since

these systems are constantly changing, and are sometimes simply not available - last week the Internet in my studio went out because someone stole the copper wire from the roof of the building to sell as scrap, LOL - they are therefore best thought of as performance or as temporary realizations. And after a decade of temporary realizations I have taken lately to swinging in the other direction.

**5.** To realize these 3d objects in IRL, I have been working with a factory in Illinois which has a "CNC wireform" machine. This CNC machine is a robot whose sole purpose is to bend metal wire. Generally it is used to make springs and mass produced metal objects. Think "Spaceley's Sprockets and Cogswell's Cogs". To turn the shape produced by the above code into an object really is quite easy: I run this program, email the file to the factory, they "print" this file out as a bent metal wire and snail mail me the sculpture.

~~"Boom, there goes the dynamite!"~~

**6.** *Another good line by Mitch Hedberg, "An escalator can never break: it can only become stairs."*

*Read more at http://www.brainyquote.com/quotes/authors/m/mitchhedberg.html#dKvX3b4zYUetVldC.99"*

**7.** I kinda lied above when I described the sculpture as being "a line of random points where one dimension is always increasing." This isn't exactly true, as the bent line always starts out with only the Z dimension increasing - aka straight. This way, a small plate can be welded onto the bottom thus enabling the sculpture to stand.

*desktop-wireform.pl:*

```
use Data::Dumper;
use XML::Writer;

# Set Z variable. This is static, because I want these sculptures
to have a 'stand' [7]

$random_number_z_old = 11.111869;

# What is the max number of points the sculpture will have?

$range_points = 7;
$random_number_points = int(rand($range_points)) + 1;

# Generate a string of XYZ points.

for ($i = 0; $i<$random_number_points; $i++){
  $range_x = 10;
  $random_number_x = rand($range_x) - 5;
  $range_y = 10;
  $random_number_y = rand($range_y) - 5;
  $range_z = (40/$random_number_points);
  $random_number_z = rand($range_z) + $random_number_z_old;
  $random_number_z_old = $random_number_z;
  $string = $string_old . ' ' . $random_number_x . ' ' .
  $random_number_y . ' ' . $random_number_z;
  $string_old = $string; }
```

```
 $string = "0.0 0.000000 -0.013131 0.0 0.000000 11.111869 " .
 $string_old;
 $weird_string_old = '0';

# Create weird string needed for file format.

for ($i = 1; $i<$random_number_points+1; $i++){
 $weird_string = $weird_string_old . ' ' . $i . ' ' . $i;
 $weird_string_old = $weird_string;
}
$weird_string = $weird_string_old . ' ' . $i . ' ';

# I copied all this crap from a DAE Sketchup outputted, so I
have little idea what most of this does.[8] [9]

my $writer = new XML::Writer( OUTPUT => $output );
$writer->setDataMode(1);
$writer->setDataIndent(2);
$writer->xmlDecl( 'UTF-8' );
$writer->startTag( 'COLLADA', 'xmlns'=>
'http://www.collada.org/2005/11/COLLADASchema',version=>'1.4.1');
 $writer->startTag('asset');
  $writer->startTag('contributor');
   $writer->startTag('authoring_tool');
   $writer->characters("Google SketchUp 7.0.10248");
   $writer->endTag(  );
  $writer->endTag(  );
  $writer->startTag('created');
  $writer->characters("2010-02-19T04:34:41Z");
  $writer->endTag(  );
  $writer->startTag('modified');
  $writer->characters("2010-02-19T04:34:41Z");
  $writer->endTag(  );
  $writer->emptyTag('unit', 'name'=>'inches',
  'meter'=>'0.0254');
  $writer->startTag('up_axis');
  $writer->characters("Z_UP");
  $writer->endTag(  );
 $writer->endTag(  );
 $writer->startTag('library_materials');
  $writer->startTag('material', 'id'=>'material_0_0ID',
  'name'=>'material_0_0');
   $writer->emptyTag('instance_effect',
   'url'=>'#material_0_0-effect');
  $writer->endTag(  );
 $writer->endTag(  );
 $writer->startTag('library_effects');
  $writer->startTag( 'effect', 'id'=>'material_0_0-effect',
  name=>'material_0_0-effect');
   $writer->startTag( 'profile_COMMON');
    $writer->startTag( 'technique', 'sid'=>'COMMON');
     $writer->startTag( 'lambert');
      $writer->startTag( 'emission');
       $writer->startTag('color');
       $writer->characters("0.000000 0.000000 0.000000 1");
       $writer->endTag(  );
      $writer->endTag(  );
      $writer->startTag( 'ambient');
```

**8.** fasdfasdfads

**9.** AMETURE

**10.** *"Biz Markie has been all about the biz lately. The old school rapper has landed a new gig with TuneUpMedia.com to promote the company's new software that cleans up digital music libraries. In TuneUp's first major commercial, Biz plays the role of Captain Tune Up showing how the software works along side co-star Andy Milonakis. TuneUp's software allows iTunes users to add information to mislabeled tracks, find missing cover art and present useful, fun and contextual information. In other news, Biz Markie keeps the checks rolling in from his popular 1989 hit 'Just A Friend.' RadioShack licensed the song for a series of their 2009 holiday commercials. Last year Heineken also enlisted the Biz and the famed track for a national campaign ad."*

```
          $writer->startTag('color');
          $writer->characters("0.000000 0.000000 0.000000 1");
          $writer->endTag(  );
        $writer->endTag(  );
        $writer->startTag( 'diffuse');
          $writer->startTag('color');
          $writer->characters("0.000000 0.000000 0.000000 1");
          $writer->endTag(  );
        $writer->endTag(  );
        $writer->startTag( 'transparent');
          $writer->startTag('color');
          $writer->characters("1 1 1 1");
          $writer->endTag(  );
        $writer->endTag(  );
        $writer->startTag( 'transparency');
          $writer->startTag('float');
          $writer->characters("0.000000");
          $writer->endTag(  );
        $writer->endTag(  );
      $writer->endTag(  );
    $writer->endTag(  );
    $writer->startTag('extra');
      $writer->startTag('technique', 'profile'=>'GOOGLEEARTH');
        $writer->startTag('double_sided');
        $writer->characters("1");
        $writer->endTag(  );
      $writer->endTag(  );
    $writer->endTag(  );
   $writer->endTag(  );
  $writer->endTag(  );
$writer->endTag(  );
$writer->startTag('library_geometries');
  $writer->startTag('geometry', 'id'=>'mesh1-geometry',
  'name'=>'mesh1-geometry');
   $writer->startTag('mesh');
    $writer->startTag('source',
    'id'=>'mesh1-geometry-position');
     $writer->startTag('float_array',
```

```
        'id'=>'mesh1-geometry-position-array',
        'count'=>($random_number_points + 2)*3);
        $writer->characters("$string ");
        $writer->endTag(  );
        $writer->startTag('technique_common');
         $writer->startTag('accessor',
         'source'=>'#mesh1-geometry-position-array',
         'count'=>$random_number_points + 2,
         'stride'=>'3');
          $writer->emptyTag('param', 'name'=>'X',
          'type'=>'float');
          $writer->emptyTag('param', 'name'=>'Y',
          'type'=>'float');
          $writer->emptyTag('param', 'name'=>'Z',
          'type'=>'float');
         $writer->endTag( );
       $writer->endTag( );
      $writer->endTag(  );
      $writer->startTag('vertices',
      'id'=>'mesh1-geometry-vertex');
       $writer->emptyTag('input', 'semantic'=>'POSITION',
       'source'=>'#mesh1-geometry-position');
      $writer->endTag( );
      $writer->startTag('lines', 'material'=>'material_0_0',
      'count'=>$random_number_points + 1);
       $writer->emptyTag('input', 'semantic'=>'VERTEX',
       'source'=>'#mesh1-geometry-vertex', 'offset'=>'0');
       $writer->startTag('p');
       $writer->characters($weird_string);
       $writer->endTag( );
      $writer->endTag( );
    $writer->endTag(  );
   $writer->endTag(  );
  $writer->endTag(  );
  $writer->startTag('library_visual_scenes');
  $writer->startTag('visual_scene', 'id'=>'SketchUpScene',
  'name'=>'SketchUpScene');
    $writer->startTag('node', 'id'=>'Model', 'name'=>'Model');
     $writer->startTag('node', 'id'=>'mesh1', 'name'=>'mesh1');
      $writer->startTag('instance_geometry',
      'url'=>'#mesh1-geometry');
       $writer->startTag('bind_material');
        $writer->startTag('technique_common');
         $writer->emptyTag('instance_material', 'symbol'=>
         'material_0_0', 'target'=>'#material_0_0ID');
        $writer->endTag( );
       $writer->endTag( );
      $writer->endTag( );
     $writer->endTag( );
    $writer->endTag( );
   $writer->endTag( );
  $writer->endTag( );
  $writer->startTag('scene');
   $writer->emptyTag('instance_visual_scene'
   'url'=>'#SketchUpScene');
  $writer->endTag( );
$writer->endTag(  );
$writer->end(  ); [11] [12] [14]
```

**11.** Corys-Computer:wireforms-generated-for-show coryarcangel$ ls -l • total 800 • -rw-r–r–@ 1 coryarcangel coryarcangel 53103 Mar 3 2011 Whitney-Pro-Tools-Wireforms.skp • -rw-r–r–@ 1 coryarcangel coryarcangel 100965 Mar 2 2011 Wireform-Gallery-Whitney.skp • -rw-r–r– 1 coryarcangel coryarcangel 3208 Feb 27 2011 desktop-1.dae • -rw-r–r– 1 coryarcangel coryarcangel 3094 Feb 27 2011 desktop-10.dae • -rw-r–r– 1 coryarcangel coryarcangel 3267 Feb 27 2011 desktop-11.dae • -rw-r–r– 1 coryarcangel coryarcangel 3374 Feb 27 2011 desktop-12.dae • -rw-r–r– 1 coryarcangel coryarcangel 3209 Feb 27 2011 desktop-13.dae • -rw-r–r– 1 coryarcangel coryarcangel 3265 Feb 27 2011 desktop-14.dae • -rw-r–r– 1 coryarcangel coryarcangel 3262 Feb 27 2011 desktop-15.dae • -rw-r–r– 1 coryarcangel coryarcangel 3318 Feb 27 2011 desktop-16.dae• -rw-r–r– 1 coryarcangel coryarcangel 3430 Feb 27 2011 desktop-17.dae • -rw-r–r– 1 coryarcangel coryarcangel 3378 Feb 27 2011 desktop-18.dae • -rw-r–r– 1 coryarcangel coryarcangel 3324 Feb 27 2011 desktop-19.dae • -rw-r–r– 1 coryarcangel coryarcangel 3433 Feb 27 2011 desktop-2.dae • -rw-r–r– 1 coryarcangel coryarcangel 3268 Feb 27 2011 desktop-20.dae • -rw-r–r– 1 coryarcangel coryarcangel 3265 Feb 27 2011 desktop-21.dae • -rw-r–r– 1 coryarcangel coryarcangel 3376 Feb 27 2011 desktop-22.dae • -rw-r–r– 1 coryarcangel coryarcangel 3210 Feb 27 2011 desktop-23.dae • -rw-r–r– 1 coryarcangel coryarcangel 3094 Feb 27 2011 desktop-24.dae • -rw-r–r– 1 coryarcangel coryarcangel 3208 Feb 27 2011 desktop-25.dae • -rw-r–r– 1 coryarcangel coryarcangel 3378 Feb 27 2011 desktop-26.dae • -rw-r–r– 1 coryarcangel coryarcangel 3431 Feb 27 2011 desktop-27.dae • -rw-r–r– 1 coryarcangel coryarcangel 3263 Feb 27 2011 desktop-28.dae • -rw-r–r– 1 coryarcangel coryarcangel 3152 Feb 27 2011 desktop-29.dae • -rw-r–r– 1 coryarcangel coryarcangel 3095 Feb 27 2011 desktop-3.dae • -rw-r–r– 1 coryarcangel coryarcangel 3262 Feb 27 2011 desktop-30.dae • -rw-r–r– 1 coryarcangel coryarcangel 3096 Feb 27 2011 desktop-4.dae • -rw-r–r– 1 coryarcangel coryarcangel 3372 Feb 27 2011 desktop-5.dae • -rw-r–r– 1 coryarcangel coryarcangel 3377 Feb 27 2011 desktop-6.dae • -rw-r–r– 1 coryarcangel coryarcangel 3315 Feb 27 2011 desktop-7.dae • -rw-r–r– 1 coryarcangel coryarcangel 3319 Feb 27 2011 desktop-8.dae • -rw-r–r– 1 coryarcangel coryarcangel 3265 Feb 27 2011 desktop-9.dae • Corys-Computer:wireforms-generated-for-show coryarcangel$

**12.** ~~So, I suppose it is I guess this work which I imagine will that which is archived, as the sculptures will rust and disappear, blah blah blah blah blah. So it is my hope, that this code will live as a representative of the sculpture.~~ These sculptures are part of a series of stuff I have been making for a few years called ”Hello World”.

**14.** *WIKIPEDIA: ”A ”Hello world” program is a computer program that outputs ”Hello, world” on a display device. Because it is typically one of the simplest programs possible in most programming languages, it is by tradition often used to illustrate to beginners the most basic syntax of a programming language, or to verify that a language or system is operating correctly.”*

**15.** Schnipper, Matthew. *Interview with Cory Arcangel*. Originally appeared in Issue 74 of The Fader Magazine, 2011.

**Arcangel:** [...] With these abstract, computer-generated wire-form

sculptures, one thing I considered is that they're just going to look like weird sculptures. You don't have to know anything about how they're made. It's kind of funny to me that someone will walk in and see them and think that I'm just some kind of sculptor. I press a button, they take me less than a second to make. They look like a lot of sculptures from the '50s, and they're kind of a play on that. If people don't understand that, that's kind of funny.

**Schnipper:** So are you kind of an asshole then?

**Arcangel:** I like this interview a lot. Put that in bold. Directly after that question, "Are you an asshole?" put, "I like this interview a lot. This is fun." I think one of the ways to make art is to cut down the past, or to invalidate what came before, or to play on it, or to comment on it. It's a more polite way to say part of what I'm doing is making fake versions of art, but that doesn't necessarily translate into me doing something negative. In fact, this process has to happen in order for art to move forward. I'm doing this in good spirit because I think it's cool, but there's an element of criticality to it. Criticality, that's the word art people use for being an asshole.

**Schnipper**: Why are you so attracted to decrepit things?

**Arcangel:** I think that everything becomes useless, especially in terms of fashion and style and culture and technology. So the question is, Why am I attracted to that transition? I'm either attracted to things that currently have no value, or making work about things that will very shortly have no value. There are these loopsin life, and fashion and technology traverse through them, but everyone is just doing the same shit every day over and over again, so none of it really matters.

**Schnipper:** Do you ever look at something you made afterwards and think it wasn't right?

**Arcangel:** Yeah, totally.

**Schnipper:** That stinks.

**Arcangel:** But it happens. Sometimes you have to cut your losses and move on. I'm curious which of these will end up in that bin. Certainly some of them have to. It's the law of averages.

**Schnipper:** Isn't it cool then that it becomes its own unwanted thing?

**Arcangel:** Yeah, totally. Oh, there's the end. That's the perfect end of the interview.

KELLY CLARKSON | CORY ARCANGEL

**16.** *Cory Arcangel: Pro Tools.* Whitney Museum of American Art, New York, May 26, 2011–September 11, 2011. Photo: Adam Reich

**17.** *Hello World*, 2011 (CNC bent stainless steel with electro-polish finish) Photo: Arcangel Studio

**18.** *Hello World*, 2011 (CNC bent stainless steel with electro-polish finish) Photo: Arcangel Studio

**19.** *Hello World*, 2011 (CNC bent stainless steel with electro-polish finish) Photo: Arcangel Studio

# Pizza Party

2004 [1]

Cory Arcangel & Michael Frumin,
http://www.frumin.net/ation/

Requirements: Perl

Introduction:
pizza_party is a command-line utility for ordering customized Domino's Pizza (tm) to your door.

Overview:
This software is written for people who spend so much time at the command-line that they don't have time to pick up the phone and call Domino's, or even to go thru the many-step process of using Domino's web interface.

pizza_party comes with one executable, written in Perl, and a man page.

Installation:
As pizza_party is written for command-line junkies, so too are these installation instructions.

1) presumably, you've already downloaded and extracted the .tar.gz file which contained this README.

2) make sure you've got the following Perl modules (and all their dependencies) installed:

LWP::UserAgent;
HTTP::Request;
HTTP::Response;
HTTP::Cookies;
URI::Escape;
Getopt::Mixed;

if you don't know how to install Perl modules, you're clearly not hard enough to be ordering pizza at the command line.

3) place the pizza_party executable (./pizza_party) somewhere in your path -- /usr/local/bin should work fine.

4) place the man page (./man/pizza_party.1) in the usual man location -- /usr/local/man/man1/ is typical.

5) go to http://www.dominos.quikorder.com/ and get an account

6) if you want to, make a .pizza_partyrc file in your home directory with your username and password and, optionally, other default settings. The structure of this file described in the man page.

7) order pizza, pay for it, tip your delivery guy well, and enjoy.

Licensing
pizza_party, is distributed under the GPL.

See http://www.gnu.org/copyleft/gpl.html if you don't know what the GPL is.

"I always wanted to be a basketball player." - Ronnie James Dio

pizza party.pl

```
#!/usr/bin/perl

use strict;
use LWP::UserAgent;
use HTTP::Request;
use HTTP::Response;
use HTTP::Cookies;
use URI::Escape;
use Getopt::Mixed;

use constant FRONT_PAGE_URL => 'http://www.dominos.quikorder.com/
scripts/mgwms32.dll?MGWLPN=MWEBLINK&wlapp=QUIKORDER&guid=';
use constant LOGIN_URL => 'http://www.dominos.quikorder.com/
scripts/mgwms32.dll';
use constant ORDER_URL => 'http://www.dominos.quikorder.com/
scripts/mgwms32.dll';
```

```
use constant CHECKOUT_URL => 'http://www.dominos.quikorder.com/
scripts/mgwms32.dll';

use constant PPRINT_FATAL => -1;
use constant PPRINT_QUIET => 0;
use constant PPRINT_OUTPUT => 1;
use constant PPRINT_VERBOSE => 2;
use constant PPRINT_DEBUG => 3;
use constant MIN_QTY => 1;
use constant MAX_QTY => 5;

sub pprint;

our $PPERROR = "";
our $PPRINT_LEVEL = PPRINT_OUTPUT;
#our $PPRINT_LEVEL = PPRINT_DEBUG;

# dont fuck with the ordering of these toppings.  it is keyed to
the web page

our $TOPPINGS = [
 { short => 'o', long => 'onions', type => '', default
 => '0', desc => 'with onions'},
 { short => 'g', long => 'green-peppers', type => '', default
 => '0', desc => 'with green peppers'},
 { short => 'm', long => 'mushrooms', type => '', default
 => '0', desc => 'with mushrooms'},
 { short => 'v', long => 'olives', type => '', default
 => '0', desc => 'with olives'},
 { short => 't', long => 'tomatoes', type => '', default
 => '0', desc => 'with tomatoes'},
 { short => 'h', long => 'pineapple', type => '', default
 => '0', desc => 'with pineapple'},
 { short => 'x', long => 'extra-cheese', type => '', default
 => '0', desc => 'extra-cheese'},
 { short => 'd', long => 'cheddar-cheese', type => '', default
 => '0', desc => 'with cheddar cheese'},
 { short => 'p', long => 'pepperoni', type => '', default
 => '0', desc => 'with pepperoni'},
 { short => 's', long => 'sausage', type => '', default
 => '0', desc => 'with sausage'},
 { short => 'w', long => 'ham', type => '', default
 => '0', desc => 'with ham (sWine, Wilbur)'},
 { short => 'b', long => 'bacon', type => '', default
 => '0', desc => 'with bacon'},
 { short => 'e', long => 'ground-beef', type => '', default
 => '0', desc => 'with ground beef'},
 { short => 'c', long => 'grilled-chicken', type => '', default
 => '0', desc => 'with grilled chicken'},
 { short => 'z', long => 'anchovies', type => '', default
 => '0', desc => 'with anchovieZZZZ'},
 { short => 'u', long => 'extra-sauce', type => '', default
 => '0', desc => 'with extra sauce '},
 ];

### non-topping options

our $OPTIONS =
```

```
[
 { short => 'U', long => 'username', type => ':s', default
 => undef, desc => 'user name'},
 { short => 'P', long => 'password', type => ':s', default
 => undef, desc => 'password'},
 #MAYBE CAP I
 { short => 'I', long => 'input-file', type => '=s', default
 => '', desc => 'input file to read batch of pizza
 (see man page)'},
 { short => 'V', long => 'verbose', type => '', default
 => '', desc => 'verbose'},
 { short => 'Q', long => 'quiet', type => '', default
 => '', desc => 'quiet'},
 { short => 'F', long => 'force', type => '', default
 => '', desc => 'don\'t ask for confirmation before ordering'},
 { short => 'H', long => 'help', type => '', default
 => '', desc => 'show the command options/arguments for pizza_
 party'},
];

#combine the toppings list into the commandline args

foreach(@$TOPPINGS) { push(@$OPTIONS, $_); }

#get list of the long option names

our (@TOPLIST) = map {$_->{long};} @$TOPPINGS;

#possible sizes

our $SIZES = {
 s => { name => 'small', aliases => ['s', 'small']},
 m => { name => 'medium', aliases => ['m', 'med', 'medium']},
 l => { name => 'large', aliases => ['l', 'large']},
};

#possible crusts

our $CRUSTS = {
 t => { name => 'thin', aliases => ['t', 'thin']},
 r => { name => 'regular', aliases => ['r', 'reg', 'regular']},
 d => { name => 'deep', aliases => ['d', 'deep']},
};

# default default is 1 Large Regular [crust]

our (@DEFAULTS) = qw(1 l r);
my $rc_file = "$ENV{HOME}/.pizza_partyrc";
my $rc = readRCFile($rc_file);
$DEFAULTS[0] = $rc->{quantity} unless !defined($rc->{quantity});
$DEFAULTS[1] = $rc->{size} unless !defined($rc->{size});
$DEFAULTS[2] = $rc->{crust} unless !defined($rc->{crust});
our $optHash = hashifyOptions($OPTIONS);
markToppings($optHash, \@TOPLIST);
my $args = getOrder(\@ARGV, \@DEFAULTS, $OPTIONS, \&asshole);


if($args->{help}) {
```

```
 printUsage();
 print "\n";
 printHelp();
 pprint "\n", PPRINT_FATAL;
}

my (@orders);

if(!$args->{I}) {
 my $order = \%{$args};
 push(@orders, prepareOrder($order));
}
else {
 push(@orders, parseBatchFile($args->{I}));
}

if(scalar(@orders) < 1) {
 pprint "You have not specified any orders.\n\n", PPRINT_FATAL;
}

my ($user, $pass) = getAccountInfo($args, $rc);
setOutputLevel($args);
pprint "Order:\t" . join("\n\t", map { orderStr($_) } @orders) .
"\n\n", PPRINT_OUTPUT;
my $ua = LWP::UserAgent->new;
$ua->agent("PizzaParty");
my ($formData, $cookies) = getLoginPage($ua, LOGIN_URL);
($formData, $cookies) = login($user, $pass, $formData, $cookies,
$ua, ORDER_URL);

#foreach order, do something

my $price = 0;

for(my $i = 0; $i < scalar(@orders); $i++) {
 ($formData, $cookies, $price) = order($orders[$i], $i + 1,
 ($i < scalar(@orders) - 1 ? 0 : 1), $formData, $cookies,
 $ua, CHECKOUT_URL);
}

my $o = $orders[0];
$o->{price} = $price;

if($args->{F} || confirmOrder($o)) {
 ($formData, $cookies) = checkout($o, $formData, $cookies, $ua);
}


#################### WEB REQUESTING FUNCTIONS ##################

sub getLoginPage {
 my ($ua, $nextURL) = @_;
 pprint "Getting login page...\n", PPRINT_OUTPUT;
 my $req = nextReq("GET", FRONT_PAGE_URL, {}, "");
 my $res = $ua->request($req);
 printPage($res->content, "loginpage");

 if ($res->is_success) {
```

```
   pprint "LOGIN PAGE REQUEST SUCCESS\n", PPRINT_DEBUG;
   my $hid = parseHiddens($res->content);
   my $cooks = mergeCookies($req, $res, $nextURL, {});
   pprint "LOGIN PAGE RESPONSE HIDDENS: " . join(" ; ", map {"$_
   : $hid->{$_}"} keys %$hid) . "\n", PPRINT_DEBUG;
   pprint "LOGIN PAGE RESPONSE COOKIES: $cooks\n", PPRINT_DEBUG;
   return ($hid, $cooks);
  }
  else {
   pprint "LOGIN PAGE REQUEST FAILURE\n", PPRINT_DEBUG;
   return ({}, "");
  }
}

sub login {
 my ($user, $pass, $hiddens, $cooks, $ua, $nextURL) = @_;
 pprint "Logging in as $user...\n", PPRINT_OUTPUT;
 my $data = {
  B2 => "Let's Go",
  UNAME => $user,
  UPWORD => $pass,
 };
 my $req = nextReq("POST", LOGIN_URL,
 mergeHashes($hiddens,$data), $cooks);
 my $res = $ua->request($req);
 printPage($res->content, "loginresp");

 if ($res->is_success) {
  pprint "LOGIN REQUEST SUCCESS\n", PPRINT_DEBUG;
  if(storeClosed($res->content)) {
   pprint "\nSorry, but your dominos is currently unavailable
   for ordering over the internet.\n\n" , PPRINT_FATAL;
  }

  my $hid = parseHiddens($res->content);
  my $cooks = mergeCookies($req, $res, $nextURL, {});

  pprint "LOGIN RESPONSE FORM VARIABLES: " .
  join(" ; ", map {"$_ : $hid->{$_}"} keys %$hid) .
  "\n", PPRINT_DEBUG;
  pprint "LOGIN RESPONSE COOKIES: $cooks\n", PPRINT_DEBUG;
  return ($hid, $cooks);
 }
 else {
  pprint "LOGIN REQUEST FAILURE\n", PPRINT_DEBUG;
  return ({},"");
 }
}

sub order
{
 my ($order, $nO, $final, $hiddens, $cooks, $ua, $nextURL) = @_;
 pprint "Submitting order for " . orderStr($order) . " ...\n",
 PPRINT_OUTPUT;
 my $data = {
  "PQTY$nO" => $order->{qty},
  "PTYP$nO" => pizzaSelect($order),
 };
```

```
  if($final) {
    $data->{B3} = 'Checkout';
  }
  else {
    $data->{B1} = 'Update Order';
  }

  for(my $i = 1; $i < $nO; $i++) {
    $data->{"DELPI$i"} = "ON";
  }

  #no toppings

  for(my $i = 1; $i <= 16; $i++) {
    $data->{"PINGI${nO}T$i"} = "01;";
  }

  #no side orders

  for(my $i = 1; $i <= 30; $i++) {
    $data->{"POTHI$i"} = "0";
  }

  #just the toppings i want

  foreach(@{$order->{toppings}}) {
    $data->{"PINGI${nO}T" . $optHash->{$_}->{topping_id}} = "11;";
  }

  my $req = nextReq("POST", ORDER_URL,
  mergeHashes($hiddens, $data), $cooks);
  my $res = $ua->request($req);

  printPage($res->content, "orderresp$nO");

  if ($res->is_success) {
    pprint "ORDER REQUEST SUCCESS\n", PPRINT_DEBUG;
    my $hid = parseHiddens($res->content);
    my $cooks = mergeCookies($req, $res, $nextURL, {});
    $_ = $res->content;
    my (@prices) = /(\$[\d\.]+)/igs;
    my $price = $prices[-1];
    pprint "ORDER RESPONSE FORM VARIABLES: " .
    join(" ; ", map {"$_ : $hid->{$_}"} keys %$hid) .
    "\n", PPRINT_DEBUG;
    pprint "ORDER RESPONSE COOKIES: $cooks\n", PPRINT_DEBUG;
    return ($hid, $cooks, $price);
  }
  else {
    pprint "ORDER REQUEST FAILURE\n", PPRINT_DEBUG;
    return ({},"", 0);
  }
}

sub confirmOrder {
  my $o = shift;
  print "Confirmation: order for $o->{price} (y|yes|n|no)? ";
```

```
  while(<STDIN>){
    chomp($_);
    $_ = lc($_);

    if($_ eq 'y' || $_ eq 'yes') {
      return 1;
    }
    elsif($_ eq 'n' || $_ eq 'no') {
      return 0;
    }
    print "Please type 'y' or 'yes' or 'n' or 'no': ";
  }
}

sub checkout {
  my ($order, $hiddens, $cooks, $ua, $nextURL) = @_;
  pprint "Checking out for your order of $order->{price}...\n",
  PPRINT_OUTPUT;

  # TESTING!!

  return ;
  my $data = {
    DELIVER => "Delivery", PAY => "Cash",
    PAOK => "ON", B1 => 'Submit Order',
  };
  my $req = nextReq("POST", CHECKOUT_URL,
  mergeHashes($hiddens, $data), $cooks);
  my $res = $ua->request($req);
  printPage($res->content, "checkoutresp");

  if ($res->is_success) {
    pprint "CHECKOUT REQUEST SUCCESS\n", PPRINT_DEBUG;
    $_ = $res->content;
    my ($statLink) = /href\=\"([^\s\"]+qordstat[^\s\"]+)\"/is;
    if(defined($statLink) && $statLink) {
      $statLink = "http://www.dominos.quikorder.com$statLink";
      pprint "Checkout successful!  To view the real-time status of
      your order, please go to:\n\t$statLink\n", PPRINT_OUTPUT;
    }
  }
  else {
    pprint "CHECKOUT REQUEST FAILURE\n", PPRINT_DEBUG;
    return ({},"");
  }
}

sub storeClosed {
  $_ = shift;
  return/sorry.*store.*unavailable/is||sorry.
  *not.*taking.*orders/is;
}
```

```
##################### OPTION/ORDER HANDLING ###################

sub prepareOrder {
 my $order = shift;
 $order->{toppings} = getToppings($order, \@TOPLIST);
 checkOrder($order);
 return $order;
}

sub parseBatchFile {
 my $fname = shift;
 pprint "OPENING BATCH FILE: $fname\n", PPRINT_DEBUG;
 (open BATCH, "< $fname") || pprint("Couldn't open batch file
 $fname for reading\n\n", PPRINT_FATAL);
 my (@orders);
 my $LINE = 0;

 while(<BATCH>)
 {
  $LINE++;
  chomp($_);
  if(/^\#/ || /^\s*$/) {
   next;
  }
  my (@lp) = split(/\s/);

  #unshift(@lp, "");
  #print "READ LINE: $_, parts: " . join(" ; ", @lp) . "\n";

  my $order = getOrder(\@lp, \@DEFAULTS, $OPTIONS, sub {
   batcherr(@_, $LINE, $fname); });
   push(@orders, prepareOrder($order));
  }

  if(scalar(@orders) < 1) {
   pprint qq{Your batch file "$fname" does not contain any valid
   orders\n}, PPRINT_OUTPUT;
  }
 return (@orders);
}

sub readRCFile {
 my $fname = shift;
 my $rc = {};

 if(! -e $fname) {
  return $rc;
 }

 if(open INIFILE, "< $fname") {
  my $ln = 0;

  while(<INIFILE>) {
   $ln++;
   chomp($_);
   my $line = $_;
   next if($line =~ /^\s*\#/i || $line =~ /^\s*$/i);
   my ($k, $v) = split(/\=/, $line, 2);
```

```
    if(defined($k) && defined($v)) {
       $k =~ s/^\s+//ig;
       $v =~ s/^\s+//ig;
       $k =~ s/\s+$//ig;
       $v =~ s/\s+$//ig;
       $k =~ s/^default\_//ig;
       $rc->{lc($k)} = $v;
    }
    else {
       pprint "Line $ln of your rc file is malformed:
       \"$line\"\n", PPRINT_OUTPUT;
    }
   }

   (!defined($rc->{quantity}))
     || ($rc->{quantity} = parseQty($rc->{quantity}))
     || pprint "'default_quantity' invalid in rc file: $PPERROR\n",
       PPRINT_OUTPUT;

   (!defined($rc->{size}))
     || ($rc->{size} = parseSize($rc->{size}))
     || pprint "'default_size' invalid in rc file: $PPERROR\n",
       PPRINT_OUTPUT;

   (!defined($rc->{crust}))
     || ($rc->{crust} = parseCrust($rc->{crust}))
     || pprint "'default_crust' invalid in rc file: $PPERROR\n",
       PPRINT_OUTPUT;
  }
  else {
   pprint "NO INI FILE FOUND\n", PPRINT_DEBUG;
  }
  return $rc;
}

sub setOutputLevel {
  my $options = shift;

  if($options->{quiet}) {
   $PPRINT_LEVEL = PPRINT_QUIET;
  }
  elsif($options->{verbose}) {
   $PPRINT_LEVEL = PPRINT_VERBOSE;
  }
}

sub getAccountInfo {
  my $options = shift;
  my $rc = shift;

  #read from file....

  my $user = $rc->{username} || "";
  my $pass = $rc->{password} || "";

  if(defined($options->{username}) && $options->{username}) {
   $user = $options->{username};
  }
```

```
    if(defined($options->{password}) && $options->{password}) {
    $pass = $options->{password};
   }

   if(!($user && $pass)) {
    #pprint "You haven't entered a username and password\n",
    PPRINT_FATAL;
    argError ("You haven't entered a username and password");
   }
   return ($user, $pass);
}

sub checkOrder {
  my $o = shift;
  if($o->{size} eq 's' && $o->{crust} eq 'd') {
    pprint "You cannot order Small pizzas with a Deep Dish crust.
    \n", PPRINT_FATAL;
  }
}

sub pizzaSelect {
  my $o = shift;
  my $s = $o->{size};
  my $c = $o->{crust};
  if($s eq 'l' || $s eq 'm') {
    return join(" ", (ucfirst($SIZES->{$s}->{name}),
    ucfirst($CRUSTS->{$c}->{name}), ($c eq 'd' ? "Dish" :
    "Crust")));
  }
  else {
    return  ucfirst($SIZES->{$s}->{name}) . " " .
    ($c eq 'r' ? "Reg Crust" : "Thin");
  }
}

sub orderStr {
  my $order = shift;
  return "$order->{qty} $SIZES->{$order->{size}}->{name}
  $CRUSTS->{$order->{crust}}->{name} pizza" .
  ($order->{qty} > 1 ? "s" : "") .
  (scalar(@{$order->{toppings}}) > 0 ? " with " .
  join(", ", @{$order->{toppings}}) : "" ) .
  ($order->{comment} ? " ($order->{comment})" : "");
}

sub markToppings {
  my ($optHash, $toppings) = @_;

  for(my $i = 0; $i < scalar(@$toppings); $i++) {
    my $id = $i+1;
    my $t = $toppings->[$i];
    $optHash->{$t}->{topping_id} = $id;
  }
}

sub hashifyOptions {
  my $optHash = {};
  map {$optHash->{$_->{long}} = $_;
```

```
  $optHash->{$_->{short}} = $_;} @$OPTIONS;
  return $optHash;
}

sub getToppings {
  my ($order, $toppings) = @_;
  my (@mytops) = map { (exists($order->{$_}) &&
  $order->{$_} ? $_ : () ) } @$toppings;
  return \@mytops;
}

sub getOrder {
  my ($args, $DEFAULTS, $OPTIONS, $errfn) = @_;
  my (@tempARGV) = (@ARGV);
  (@ARGV) = @$args;
  my $res = {};
  map {
    $res->{$_->{long}} = $_->{default};
    $res->{$_->{short}} = $_->{default};
  } @$OPTIONS;
  my $optStr = join(" ", map {"$_->{short}$_->{type}" .
  ($_->{long} ? " $_->{long}>$_->{short}" : "")} @$OPTIONS);
 Getopt::Mixed::init($optStr);
  $Getopt::Mixed::badOption = $errfn;

  while (my ($opt, $val, $pretty) =
  Getopt::Mixed::nextOption({
    $opt = $optHash->{$opt};

    if($opt->{type} =~ /s/i) {
      $val = lc($val);
    }
    elsif(!$opt->{type}) {
      $val = 1;
    }
    $res->{$opt->{long}} = $val;
    $res->{$opt->{short}} = $val;
  }

  Getopt::Mixed::cleanup();
  $res->{qty} = parseQty(shift(@ARGV) || $DEFAULTS->[0]) ||
    argError($PPERROR);
  $res->{size} = parseSize(shift(@ARGV) || $DEFAULTS->[1]) ||
    argError($PPERROR);
  $res->{crust} = parseCrust(shift(@ARGV) || $DEFAULTS->[2]) ||
    argError($PPERROR);
 $res->{comment} = join(" ", @ARGV);

  (@ARGV) = @tempARGV;

  return $res;
}

sub parseQty {
  my $q = shift;


if($q !~ /^\d+$/i) {
```

```
    $PPERROR = "quantity '$q' must be a numeric integer";
    return undef;
  }
  elsif(!($q >= MIN_QTY && $q <= MAX_QTY)) {
    $PPERROR = "quantity $q must be between " . MIN_QTY
    . " and " . MAX_QTY . " pizzas";
    return undef;
  }
  return $q;
}

sub parseSize {
  my $s = shift;
  my $os = $s;
  $s = matchArg(lc($s), $SIZES);
  if(!defined($s)) {
    $PPERROR = "size '$os' was invalid";
    return undef;
  }
  return $s;
}

sub parseCrust {
  my $c = shift;
  my $oc = $c;
  $c = matchArg(lc($c), $CRUSTS);
  if(!defined($c)) {
    $PPERROR = "crust '$oc' was invalid";
    return undef;
  }
  return $c;
}

sub matchArg {
  my ($a, $vals) = @_;
  foreach my $k (keys %$vals) {
    my $v = $vals->{$k};
    foreach my $v2 (@{$v->{aliases}}) {
      if($a eq $v2) {
         return $k;
      }
    }
  }
  return undef;
}

sub printArg {
  my ($name, $vals,) = @_;
  while(my ($k, $v) = each(%$vals)) {
    foreach my $v2 (@{$v->{aliases}}) {
      print "$name: $k, $v2\n";
    }
  }
}

sub asshole {
  my ($pos, $arg) = @_;
  argError("Argument $arg was invalid");
```

```
}

sub batcherr {
 my ($pos, $arg, $line, $file) = @_;
 argError("Error on line $line of batch file: argument $arg was
 invalid.");
}

sub argError {
 my $s = shift;
 print "$s\n";
 printUsage();
 pprint "Try `pizza_party --help' for more information.\n\n",
 PPRINT_FATAL;
}

sub printUsage() {
 print "Usage: pizza_party [OPTIONS] [QUANTITY=1] [SIZE=large]
 [CRUST=regular]\n";
}

sub printHelp {
 print MIN_QTY . " <= QUANTITY <= " . MAX_QTY . ".
 Default is $DEFAULTS[0].\n";
 print "SIZE can be: (small|s) or (medium|med|m) or (large|l).
 Default is large.\n";
 print "CRUST can be: (thin|t) or (regular|reg|r) or (deep|d).
 Default is regular.\n";
 print "Example: `pizza_party -pmx 2 medium regular` orders 2
 medium regular crust pizzas\n with pepperoni, mushrooms, and
 extra-cheese, right to your door!\n";
 print "\n";
 map {print "[-$_->{short} " . ($_->{long} ? "| --$_->{long}" :
 "") . "] " . (strMult(17 - length($_->{long}), " ")) .
 "$_->{desc}\n"} @$OPTIONS;
 print "\n";
 print "See the man page for more details on accounts,
 configuration files, and batch ordering.\n";
}

sub strMult {
 my $n = shift;
 my $s = shift;
 my $r = '';

 while($n-- > 0) {
  $r .= $s;
 }
 return $r;
}

############################ HELPER ############################

sub pprint {
 my ($s, $level) = @_;

 if($level <= $PPRINT_LEVEL) {
  print $s;
```

```
   if($level == PPRINT_FATAL) {
    exit;
   }
  }
}

sub printPage {
 my ($html, $name) = @_;
 if($PPRINT_LEVEL < PPRINT_DEBUG) {
  return;
 }
 my $fname = "$name.html";
 open OUTFILE, "> pages/$fname" || die "couldn't open $fname for
 writing";
 print OUTFILE $html;
 close OUTFILE;
}

##################### WEB ORDERING HELPER ######################

sub nextReq {
 my ($type, $url, $data, $cooks) = @_;
 my $req = HTTP::Request->new($type => $url);
 set_post_data($req, $data);
 set_cookie_data($req, $cooks);
 return $req;
}

sub mergeHashes {
 my $res;

 foreach my $h (@_) {
  map {$res->{$_} = $h->{$_}; } keys %$h;
 }
 return $res;
}

sub mergeCookies {
 my ($oldReq, $resp, $newReq, $extra) = @_;
 my $cjar = new HTTP::Cookies(
  file => "",
  autosave => 0,
  hide_cookie2=> 1,
  ignore_discard => 1
 );

 my $reqC = parseCookies($oldReq->header('Cookie') || "");
 if(!ref($newReq)) {
  my $t = $newReq;
  $newReq = new HTTP::Request();
  $newReq->uri($t);
 }

 my $host = $newReq->uri()->host();
 $host =~ s/^[^\.]*(\..*)$/$1/is;
 my $port = $newReq->uri()->port();
  while(my ($k, $v) = each(%$reqC)) {
  $cjar->set_cookie(0, "$k", $v, "/", $host, $port, 0, 0,
```

```
    10000, 0);
  }

  $cjar->extract_cookies($resp);

  if(!defined($extra)) {
    $extra = {};
  }
  elsif(!ref($extra)) {
    $extra = parseCookies($extra);
  }

  while(my ($k, $v) = each(%$extra)) {
    $cjar->set_cookie(0, $k, $v, "/", $host, $port, 0, 0,
    10000, 0);
  }

  # if they just pass the uri, we need an HTTP::Request object
  # for the cookie jar to work on.

if(!ref($newReq)) {
    my $t = $newReq;
    $newReq = new HTTP::Request();
    $newReq->uri($t);
  }
  $cjar->add_cookie_header($newReq);
  return ($newReq->header('Cookie') || "");
}

sub parseCookies {
  my $s = shift;

  if (ref($s) =~ /HASH/) {
    return $s;
  }
  my $r = {};
  $_ = $s;
  my (@pairs) = split(/\;/);
  foreach(@pairs) {
    my ($k, $v) = split(/\=/);
    $k =~ s/^\s*//igs;
    $r->{$k} = $v;
  }
  return $r;
}

sub parseHiddens {
  $_ = shift;
  my (@in) = m|<input[^>]+>|igs;
  my $res = {};
  map {(lc(getAtt($_, "type")) eq 'hidden' ?
  $res->{getAtt($_, "name")} = getAtt($_, "value") : "");} @in;
  return $res;
}

sub getAtt {
  my ($html, $att) = @_;
  my $var = '(?:\"[^\"]*\"|\'[^\']*\'|[^\'\"][^\s\>]*)';
```

```
  $_ = $html;
  my ($v) = /$att\=($var)/is;
  $v =~ s/^[\'\"](.*)[\'\"]$/$1/is;
  return $v;
}

sub set_post_data {
  my ($self, $data) = @_;

  if (defined($data) && $data)
  {
     my (@c, $content, $len);

     if (ref($data) =~ /HASH/) {
        while (my($k, $v) = each(%$data)) {
               push(@c, "$k=" . uri_escape($v));
        }
        $content = join('&', @c);
     }
     elsif (ref($data) =~ /ARRAY/) {
        for (my $i = 0; $i < scalar(@$data); $i += 2) {
        push(@c, "$data->[$i]=" . uri_escape($data->[$i + 1]));
     }
     $content = join('&', @c);
   }
   else {
     $content = $data;
   }
   $len = length($content);

   if($len > 0) {
     $self->method('POST');
        $self->content($content);
        $self->content_type("application/x-www-form-urlencoded");
        $self->content_length($len);
   }
  }
}

sub set_cookie_data {
  my ($self, $data) = @_;
  if(defined($data) && $data) {
    $self->header('Cookie' => $data);
  }
}
```

*Man.txt*

```
.TH pizza_party 1 "April 29th 2004" "Pizza Party" "BEIGE"
.SH NAME
pizza_party \- text-based client for ordering pizza.

.SH SYNOPSIS
.B pizza_party
.RB [ \-o | \-\-onions ]
.RB [ \-g | \-\-green-peppers ]
.RB [ \-m | \-\-mushrooms ]
.RB [ \-v | \-\-olives ]
```

```
.RB [ \-t | \-\-tomatoes ]
.RB [ \-h | \-\-pineapple ]
.RB [ \-x | \-\-extra-cheese ]
.RB [ \-d | \-\-cheddar-cheese ]
.RB [ \-p | \-\-pepperoni ]
.RB [ \-s | \-\-sausage ]
.RB [ \-w | \-\-ham ]
.RB [ \-b | \-\-bacon ]
.RB [ \-e | \-\-ground-beef ]
.RB [ \-c | \-\-grilled-chicken ]
.RB [ \-z | \-\-anchovies ]
.RB [ \-u | \-\-extra-sauce ]
.RB [ \-U| \-\-user=
.IR username ]
.RB [ \-P | \-\-password=
.IR pasword ]
.RB [ \-I | \-\-input\-file=
.IR input-file ]
.RB [ \-V | \-\-verbose ]
.RB [ \-Q | \-\-quiet ]
.RB [ \-F | \-\-force ]
.RB [ QUANTITY ]
.RB [ SIZE ]
.RB [ CRUST ]

.SH DESCRIPTION
The
.B pizza_party
program provides a text only command line interface for ordering
DOMINOS pizza from the terminal.  This program is intended to aid
in the throwing of
.IR PIZZA
.IR PARTIES
which are also sometimes known as
.IR ZA
.IR PARTIES

.SH USAGE
.TP
pizza_party -pmx 2 medium regular
.TP
Orders 2 medium regular crust pizzas with pepperoni, mushrooms,
and extra-cheese.

.SH DIRECTIONS
You will first need to go to www.dominos.quikorder.com and sign
up for an account.  Then use your user name and password in the
.pizza_partyrc file, or in your command line request.

.SH OPTIONS
.TP

.BR \-o | \-\-onions
Order your pizza with onions.
.TP
.BR \-m | \-\-mushrooms
Order your pizza with mushrooms.
.TP
```

```
.BR \-v | \-\-olives
Order your pizza with olives.  To remember this try to think that
often olives go in [v]odka.
.TP
.BR \-t | \-\-tomatoess
Order your pizza with tomatoes.
.TP
.BR \-h | \-\-pineapple
Order your pizza with pineapple.  To remember this try to think
of [h]awaii
.TP
.BR \-x | \-\-extra-cheese
Order your pizza with extra cheese.  To remember this try to
think of [x]tra, a common misspelling of extra.
.TP
.BR \-d | \-\-cheddar-cheese
Order your pizza with cheddar-cheese.
.TP
.BR \-p | \-\-pepperoni
Order your pizza with pepperoni.
.TP
.BR \-s | \-\-sausage
Order your pizza with sausage.
.TP
.BR \-w | \-\-ham

Order your pizza with ham.  To remember this try to think of the
pig from chroltette's web named [w]ilber.  Or actually better
yet, lets think of "House of Pains" second album title "Same as
it ever [w]as".  fact: House of Pain started a pizza place in LA
names HOUSE OF PIZZA.
.TP
.BR \-b | \-\-bacon
Order your pizza with bacon.
.TP
.BR \-e | \-\-ground-beef
Order your pizza with ground-beef.  To remember this try to think
of [e]coli bacteria.
.TP
.BR \-c | \-\-grilled-chicken
Order your pizza with grilled chicken.
.TP
.BR \-a | \-\-anchovies
Order your pizza with anchovies.
.TP
.BR \-u | \-\-extra-sauce
Order your pizza with extra sauce.
.TP
\fB\-U\fP|\fP\-\-username=\fP\fIusername\fP
Include your dominos username in the command line as opposed to
using the ini file.
.TP
\fB\-P\fP|\fP\-\-password=\fP\fIpassword\fP
Include your dominos password in the command line as opposed to
using the ini file.
.TP
\fB\-I\fP|\fP\-\-input-file=\fP\fIinput-file\fP
Read pizza orders from a batch file.  This batch file will be
```

```
formatted the same way as your single command line pizza orders
except each order will be separated by a UNIX new line.
.TP
.BR \-Q | \-\-quiet
quiet.
.TP
.BR \-F | \-\-force
Order your pizza without asking for a confirmation.
.TP
.BR \-H | \-\-help
show the command options/arguments for pizza_party.
.TP
.BR QUANTITY
Quantity can be 1-9
.TP
.BR SIZE
Size can be (small|s) or (medium|med|m) or (large|l).  Default is
large.
.TP
.BR CRUST
Crust can be (thin|t) or (regular|reg|r) or (deep|d).  Default is
regular.

.SH RC FILE: .pizza_partyrc
.TP
.pizza_partyrc
.TP
To be placed in your home directory, this file can contain all
your default information.  A typical format would look like...
.P
username=rtm
.RS 1
.RE 1
password=simple
.RE 1
default_quantity=3
.RE 1
default_size=medium
.RE 1
default_crust=deep
.RE 1
default_toppings=pmx

.SH AUTHOR
Ver 0.1 beta, distribution 00.00.04
.RE 1
Eyebeam.org & BEIGE Programming Ensemble commission /
collaboration
.RE 1
Cory Arcangel (studio ATTTTT coryarcangel DOT com),
.RE 1
Michael Frumin (michael ATTTTT frumin DOT neeeeet).
.RE 1
This software comes with no warranty.
.\" end of man page
```

**1.** Arcangel, Cory. *Interview with Michael Frumin*. Phone conversation, 2013

**Arcangel:** I think the most important thing to put out there is that this project would have NOT happened without you. Does that make sense?
**Frumin:** It does, and I appreciate your statement.
**Arcangel:** It's true though. You really took the concept and ran with it. I don't remember how far along the idea was when we met. Do you remember?
**Frumin:** I think the basic idea was that you add the notion that pizza is part of the culture of techie people and computer programmers because it's such an easy thing to order when you're so focused on the task at hand. And you wonder whether there is a way to order pizza within the regular sort of process or environment of the hacker...
**Arcangel:** Uh huh, uh huh.
**Frumin:** And I can't remember what it is you pointed out, that Domino's had this website, or not, I don't remember which of us found that. But then, I think where I picked it up was, I established that yes, in fact, because Domino's has this website, it's possible to make a command line program to order pizza.
**Arcangel:** Yeah.
**Frumin:** And the command line being the environment that many hackers live in, and then just take it from there and make a program that did it as within the normal kind of conventions of command line programs and utilities.
**Arcangel:** See, what I remember is that I had a vague idea to do a pizza virus. Do you remember that?
**Frumin:** Maybe not ...
**Arcangel:** [laughs]
**Frumin:** What would a pizza virus have been?
**Arcangel:** It would have been an email virus where people would have clicked on an executable and that then would have scraped their address book that then would have ordered all the people in their address book a pizza. And then ...
**Frumin:** Right.
**Arcangel:** And then sent a copy of itself to everybody else. I feel like maybe that was the idea that I went to Eyebeam with. And somehow the command line thing came up and I remember you getting pumped ...
**Frumin:** Yeah.
**Arcangel:** You were like, "It's gotta have flags, and ..."
**Frumin:** Right. Configuration files, and ...
**Arcangel:** [laughs]
**Frumin:** Yeah, I wish that I was enough of a hacker to actually know how to make a pizza-ordering, you know, email virus, but unfortunately I'm not quite that capable.
**Arcangel:** Oh, I'm sure you could have done it. Do you remember how you got involved in that Eyebeam group? Do you even remember what group it was?
**Frumin:** Well, I certainly remember how I first hooked up with Jonah [Peretti].
**Arcangel:** How was that?
**Frumin:** Well it was the guy who ... did you ever meet [REDACTED]?
**Arcangel:** [REDACTED]. Um ...
**Frumin:** Yeah. It's okay. I mean, I worked for him in San Francisco.
**Arcangel:** [REDACTED].
**Frumin:** But he's an art collector interested in technology.
**Arcangel:** Right.
**Frumin:** So he knew Jonah, and when I moved back to New York, he introduced me to Jonah, and then Jonah and I started talking, and he just said, "Oh, why don't you come and join this group?" that, I guess was the first iteration of the Contagious Media Group. With Chelsea, and Ann, and Paul, and ...
**Arcangel:** Right. Oh my God, yeah.
**Frumin:** Jonah and Ann and Chelsea's big initial smash hit "Black People Love Us" and the Nike emails, all of those things were in the past when I got involved [inaudible]. And also, Jonah wanted to start the open lab, so I was like the first, you know, hacker in residence.
**Arcangel:** Yeah, yeah. [laughs] Yeah, you

were, right?
**Frumin:** I mean, I think so.
**Arcangel:** And the firm that you worked for before all this?
**Frumin:** They had started this new research group which was oriented around basically hacking, so to speak, not in a malicious way ... information that otherwise wouldn't have been available, so, you know, scraping tons of information off various websites that somehow tell you about, something about a stock. Like, eBay, or ...
**Arcangel:** Cool. Yeah. So that's how you were familiar with all that Perl. Were you a Perl guy?
**Frumin:** Yeah, well, I mean, because so much of what we did, you know, screen scraping websites that had kind of publicly available but otherwise unused information about companies, for example all the eBay auctions, we could tell from screen scraping.
**Arcangel:** Mmhm.
**Frumin:** Perl was kind of the language of choice because of all the regular expressions.
**Arcangel:** Right. [laughs]
**Frumin:** For three years I wrote lots and lots of Perl because we were just constantly doing that, so it became what I was most comfortable with for doing random stuff at the command line.
**Arcangel:** Right. And I remember in the meeting when, I think Jonah and I were joking about this pizza idea, I remember at a certain point you were just like, "I wanna do that, I'm gonna do that." Do you remember that?
**Frumin:** Right. I can't say that I remember the actual moment, but I can certainly remember, I mean that certainly sounds like something that would have happened. I mean that's what we did at Eyebeam. We all were just kind of like, "That sounds like an idea I'm interested in, that I can do something that could do it."
**Arcangel:** Jonah and I were just joking, as usual, and your antenna picked up, and you were like, "I would like that football, and I'm gonna run with it." [laughs] And you went and programmed it all.
**Frumin:** Right. I mean even today, the idea of being able to be in the middle of something and with literally ten keystrokes in the course of of seconds order pizza is exactly what I'm doing, I mean that is the, obsessive-command-line-hacker sort of world. Just super fast, super tailored.
**Arcangel:** Have you kept up on all the updates of it that other people have written?
**Frumin:** *Pizza Party*?
**Arcangel:** Yeah.
**Frumin:** No, I haven't. I didn't realize people had. And until you put it on Github, probably by the time you did that, the thing that it actually used was long gone.
**Arcangel:** Yeah. Somebody made a Python version of it years ago, pizza.py party, and then people used the Python version. I think people have been going off the Python version. But if you search Github for "Pizza Party" there's a bunch. And one, the newest version someone ported into Siri.
**Frumin:** Ported to what? Oh, really?
**Arcangel:** Yeah. So you can just tell Siri to order you a pizza and it'll order you a pizza. I haven't used it, but apparently it's a real thing and it works. And we get shouted out in the readme or whatever.
**Frumin:** Yeah. A Siri plugin that lets you order pizza.
**Arcangel:** Yeah. [laughs]
**Frumin:** Yeah, you know, the thing is, at some level, these days almost anything that you would want to do like this, you make it a smartphone app, right?
**Arcangel:** Right, yeah, yeah.
**Frumin:** You can make a smartphone app that has your Domino's account and it knows what's the favorite kind of pizza you like and it knows where you are, right, and then it literally just has a button that's just, "Order Pizza," and you press that button, and ...
**Arcangel:** The pizza comes.
**Frumin:** The pizza comes and so, that's

kind of like a mass market ...
**Arcangel:** Yeah, it's the company's app these days.
**Frumin:** Something that previously was only available to hackers, right? The fact that you can have something that ready-to-go, and then press one button, and then you're done.
**Arcangel:** That's a good point that the landscape has changed. It was almost ten years ago if you can believe it!
**Frumin:** I'm sure whatever website we were ordering through no longer exists.
**Arcangel:** "Quick Order", yeah. It was some third-party company that Domino's and other places used. It probably sent them a fax or something, you know. It was probably really budget, the way that it worked back then.
**Frumin:** It was. You could tell it was because it said .dll in the URL.
**Arcangel:** What is that? DLL?
**Frumin:** Like in Windows, whenever you have a library that's not a program but a library that other programs use, it's always something.dll. Dynamic Link Library.
**Arcangel:** Okay.
**Frumin:** And so the fact ... I'm just looking at the script, the original *Pizza Party* script. In the URLs that it used, it's all something.dll. So it was just some really ...
**Arcangel:** [laughs]
**Frumin:** You just never see that in websites.
**Arcangel:** Right.
**Frumin:** Frankly, even that much in the past. It's just extremely ...
**Arcangel:** It's ...
**Frumin:** [inaudible]
**Arcangel:** It's worse than seeing .aspx.
**Frumin:** Oh, much worse.
**Arcangel:** [laughs]
**Frumin:** At least .aspx is supposed to be for the web.
**Arcangel:** Right. [laughs]
**Frumin:** .dll is supposed to be for running, you know, like, Microsoft Word.
**Arcangel:** So it was probably sending messages to some Windows machine sitting under somebody's desk at some horrible company ...
**Frumin:** [laughs]
**Arcangel:** ... That was then running a script to send a fax to Domino's or something.
**Frumin:** Exactly.
**Arcangel:** [laughs]
**Frumin:** Quite possibly.
**Arcangel:** Are you still doing similar stuff? Oh, wait, hello? I think it went dead.
**Frumin:** In my current work, you mean?
**Arcangel:** Yeah, 'cause what I remember at Eyebeam, you were sitting, you were just ...
**Frumin:** In my current job, you mean?
**Arcangel:** Yeah.
**Frumin:** I mean, certainly when you're doing something that has to run 24 hours a day for thousands of vehicles to be used by millions of people ...
**Arcangel:** Right.
**Frumin:** It can't be quite as much of a hack, right?
**Arcangel:** [laughs] Right.
**Frumin:** Yeah. But you know, the principles of doing things over the web and using open data and certainly using open source software, all these are really intricate parts of how my current project works.
**Arcangel:** Right.
**Frumin:** But then also my role is, I'm not the actual hands-on developer. I'm more of the lead engineer and integrator. I have different people who are contractors, different parts of the system according to the specications that I've written. So at some level yes and some level no.
**Arcangel:** Right, so you're not grinding it out in front of a terminal, writing as much.
**Frumin:** So by and large, no. Except that part of my role is to be doing lots of ... making sure all the other people are doing their jobs, in particular, these contractors that we're paying millions of dollars, and so I do spend some amount of my time (though decreasing over time) building little utilities ...
**Arcangel:** Yeah.
**Frumin:** ... To validate and test what

they're doing. But it isn't anything the customer actually sees.
**Arcangel:** Right. Cool.
**Frumin:** If that makes sense. It's different. It's interesting.
**Arcangel:** Yeah, 'cause at Eyebeam everyone was just kind of bouncing from project to project, so you would work really hard, you would go hard on something for a couple of weeks, and then a few weeks later you'd be hacking something totally different together. Do you know what I mean? It was a special place in that way, you know?
**Frumin:** Yeah.
**Arcangel:** We all had a lot of total freedom in a way. And time. [laughs] And time.
**Frumin:** Yeah, it was special. I mean, now, talking to you, Jonah's intent from the beginning I think was to create that environment. It just turned out to not be the organization that can sustain that environment.
**Arcangel:** Right, yeah, yeah. I mean it makes sense. Those things never last as long as ... they never really last, 'cause it's not really sustainable.
**Frumin:** Probably the strongest memory that I have in my mind that ever came from this project, aside from, you know, the actual time that we ordered the pizza and made the demo video because that video reinforces the memory, the strongest memory I have is when you were doing this performance at The Kitchen, right, and what you were basically doing was, with a lot of cleverness and humor, introducing a bunch of people to the command line, right? People who'd probably never even seen a command line. Except for, like, slashing lines in a movie. Introducing them to command line programs and to flags in that trying to explain to someone, this is grep command. I'm sure you know grep, right?
**Arcangel:** Uh huh, yeah.
**Frumin:** Imagine trying to explain to some, you know, English major who's never programmed anything: this is the grep command and if you wanna have it be case-insensitive you have to use the -i for that. How boring would they think that is? Basically through *Pizza Party* it was the exact same, you could use it to introduce someone to all of the same concepts: command line, command line programs, flags, a configuration file, you know, in a way that was so much more interesting and tangible to people. So I always thought that was a really special thing that came out of doing this. And then the singular thing was that you walk in, you're like, What do we want? Do you want mushrooms, -m, and, peppers, -p ...
**Arcangel:** I asked the audience.
**Frumin:** People voted on which ones they would want.
**Arcangel:** I forgot that I'd asked the audience. You know, I forgot. I have no memory of that part of the performance, because I was so worried whether the pizza would come in time.
**Frumin:** Me too.
**Arcangel:** My whole focus was just on the unknown: that delivery guy. So I could explain for people reading this that at the beginning of the performance at The Kitchen, I did what you explained, we ran the program and we explained it to the audience and we ordered a pizza, and the idea was that the delivery would come before the end of the performance with a pizza! There were a couple people in between. I forget, I think it was Tracy + the Plastics and some other artist. And I guess we were just so stressed out because there could have been a million things that could have gone wrong. It was classic software demo. You know what I mean? [laughs]
**Frumin:** Yeah, totally, totally.
**Arcangel:** Did you wait outside with me? Or were you sitting in the seat?
**Frumin:** No, I actually think you're misremembering a little. I don't think that there were any performers in between when you ordered the pizza and when the pizza came. I think you got the pizza ordering out of the way quickly, and then maybe explained to people or showed them some other thing you had.

**Arcangel:** Oh, maybe I showed them something else.
**Frumin:** Something like that, some other Nintendo stuff, possibly.
**Arcangel:** Yeah, that could be, yeah. That could be.
**Frumin:** You still only had a limited amount of time before the guy was supposed to come.
**Arcangel:** Yeah, for me it was just a total blur because I was so focused. I just remember waiting outside The Kitchen and just looking around the corner, to see. And maybe our memories are … maybe I'm remembering waiting outside for another performance.
**Frumin:** At The Kitchen you were onstage the whole time.
**Arcangel:** Oh, wow, okay.
**Frumin:** And once ten minutes had elapsed, I went outside to wait.
**Arcangel:** Right. Okay!
**Frumin:** But there were two things about it, aside from the fact that this was a good way to really introduce normal people to the command line, was the fact that after you went through and said to people, "What do you like? Who wants mushrooms? Peppers?" and had the whole command ready to go and enter, and said, "Okay everyone, this is actually the performance," just you pressing the enter key, you know?
**Arcangel:** [laughs] Yeah, that sounds like something I would do.
**Frumin:** I thought it was really funny.
**Arcangel:** Very ham. I'm a big ham when I perform. [laughs]
**Frumin**: You are, you are. But the other thing too about The Kitchen, I kind of forgot this, when you're talking about the tension about would the pizza come or not, the truth is that I am someone who doesn't really like to perform. I like to give talks, right? Talk about work or talk about ideas or whatever. But that's different from a performance. You know, where people are, from my perspective, people are buying into what I'm explaining, whereas in a performance, in more of an artistic or a dramatic sense, it's a little more buying into the performers themselves. Right?
**Arcangel:** Yeah, yeah.
**Frumin:** And the feedback that you get, I think, giving a talk, is whether people understood the idea.
**Arcangel:** Right.
**Frumin:** But I think a lot of people who perform music or play drums, to a large degree they do it 'cause they want the applause, right? That's what's gonna make it for them. I was never really a performer. I had some traumatic experience in elementary school performances in plays and getting everything wrong, I just didn't like that stuff.
**Arcangel:** [laughs]
**Frumin:** I never really was into it. But when I went outside and got the pizza from the guy and brought it in …
**Arcangel:** Yeah, people were going crazy.
**Frumin:** And everyone was crazy and was cheering, it was like, oh, now I understand why people like to perform and have the crowd give them energy, 'cause it's awesome.
**Arcangel:** Yeah, it's addictive.
**Frumin:** Yeah. It's basically the only time I've ever performed in an artistic sense and got audience reactions and was happy about the whole thing rather than traumatized.
**Arcangel:** [laughs] Well it's not a bad situation.
**Frumin:** No.
**Arcangel:** At The Kitchen … oh, yeah. I can't believe that worked. I think we might have done it twice, too. I think that that performance happened twice.
**Frumin:** We did. We did two nights in a row.
**Arcangel:** Yeah, wow.
**Frumin:** Friday and Saturday.
**Arcangel:** Yeah, so all my memories of it are just so mixed up. It's so funny. I'm glad that … [laughs]
**Frumin:** Yeah, I mean, if you kind of demoed it a bunch of different times I could see that, but that was the only time that I was actually there.

**Arcangel:** Yeah, I think I did it once at Eyebeam, and I did it once somewhere else, maybe SVA? I think I did it in two different artist lectures.
**Frumin:** Yeah.
**Arcangel:** But those weren't stress 'cause if the pizza didn't come, it didn't really matter. But The Kitchen, that was like a high pressure scenario.
**Frumin:** I mean, that was part of your Whitney Biennial thing, with the Mario Clouds.
**Arcangel:** Yeah. It was related, yeah. In terms of performances though, that was a very special one. That was one of the tops.
**Frumin:** I'm glad you think so.
**Arcangel:** Yeah, that was a really ... 'cause there was such tension, and such build-up, do you know what I mean?
**Frumin:** Yeah, yeah.
**Arcangel:** Usually, it's ...
**Frumin:** Yeah, that's true. You know what's funny, I hadn't really thought about that, the whole timing of it, but yeah, I'm sure that was part of it at the time, I just forgot. I forgot that there was tension, I just sort of remembered that it worked, you know?
**Arcangel:** Right, yeah, and it's funny, 'cause I only remember the tension, and barely remember the applause ... but that's me. I'm always glass half empty.
**Frumin:** Because at any point you could have run the program and it would have just crashed. And that would have been no fun for anyone.
**Arcangel**: Yeah, that would have been a really tough situation. Remember when Bill Gates did that? He was demonstrating Windows capabilities with USB, when USB came out? And he plugged in the USB wire live and it crashed the computer? Do you remember that?
**Frumin:** Oh. I did not, but that's ... not surprised. It's funny, I hadn't really thought about it until we just started talking, but I think the original concept was to just do something hacker-y, right? To do something as a hacker, like you would want, which is ...
**Arcangel:** Right.
**Frumin:** ... Order pizza at the command line. But ...
**Arcangel:** Oh, say it...
**Frumin:** I never thought about it this way until literally just right now, thinking about that performance. But making a command line program that orders pizza, it's just such an ideal way to not do something for the hacker but to explain the hacker world or life or way of working to everybody else, right? To normal people. So they can just kind of see this command line thing, and have a little more of a tangible understanding of, you know, what we do. How it works.
**Arcangel:** Right. Yeah. I don't know if that ever crossed my mind. I'm not sure what ... the thought that I always had was that it was supposed to be apocalyptic. That you could just press ...
**Frumin:** What do you mean?
**Arcangel:** The idea that it was now possible to type a few keystrokes and to send these poor pizza delivery men running around Manhattan, or running around the United States. But that was the thought I always had.
**Frumin**: Right, right, right, right. You could accidentally or intentionally order a thousand pizzas from a thousand different places ...
**Arcangel:** [laughs] Yeah.
**Frumin:** ... And just kind of trash the world.
**Arcangel:** And even just ordering one pizza was somehow, it was finally possible to press a button and send somebody running around. You know what I mean? It seemed ... that was kind of where my thoughts always were about it, that it just seemed crazy that we had so much power all of a sudden. Remotely. You know. Like pressing a button and launching a nuclear missile or something.
**Frumin:** [laughs]
**Arcangel:** And so, that was where the energy always was with the project. Do you know what I mean? And in terms of translating it, that was just, you know, I have that kind of vaudeville side of me, I

always like to translate things to as broad an audience as possible. Or something. Do you know what I mean?
**Frumin:** Yeah. Yeah.
**Arcangel:** I don't know where that comes from. Maybe it's the comedian in me or something. But ...
**Frumin:** Well I mean, to be honest, that's why I like a lot of your work, much more than a lot of other people who are sensibly working the same kind of general kind of new media-whatever world. I think so many things that people do make sense if you really understand where they're coming from and the technology or the idea, but a lot of it is just, if you just look at it, doesn't make any sense. Whereas, I think most of the things you do ...
**Arcangel:** Yeah. Well thank you.
**Frumin:** Someone can, someone who, without getting the [inaudible] explanation can appreciate it and understand it.
**Arcangel:** Yeah, and I don't know if you remember, but it was a big meme. I mean, it went really hard when we put it online. Do you remember that?
**Frumin:** Yeah. Yeah, yeah, yeah.
**Arcangel:** Like, it got Slashdotted and it got Dugg, and we had, we put it on Jonah's server at MIT, all the media ...
**Frumin:** The video?
**Arcangel:** Yeah, the video and all the .jpegs.
**Frumin:** Yeah, because that was before YouTube and everything.
**Arcangel:** Yeah, all the .jpegs, all the media was actually served off of Jonah's server 'cause we knew that it was gonna get crashed. And he had a really powerful server at MIT. So yeah, it was pre-YouTube, and somebody put the video on YouTube years ago. As a bootleg. And it has a ton of views. Every few years people kind of get onto it. But that went to the kind of hacker audience. You know, the kind of Slashdot ...
**Frumin:** Yeah, yeah. Yeah.
**Arcangel:** I think it was before Digg, even.
**Frumin:** This is definitely late 2003 or early 2004, so, yeah.
**Arcangel:** Yeah, totally.
**Frumin:** Slashdot and blogs [inaudible].
**Arcangel:** [laughs] And Delicious! I think I put it on Delicious, even.
**Frumin:** Yeah, that was also happening.
**Arcangel:** At the beginning of Delicious. And that was a really powerful way. That was a big thing then, you know.
**Frumin:** Yeah. I can't decide whether, it's possibly nostalgic, or just kind of like an old fart right now.
**Arcangel:** [laughs] Yeah, it's hard. I have the same ... I feel kind of bitter that I put all this work into these social networks that no longer exist. [laughs]
**Frumin:** Yeah.
**Arcangel:** Like my Delicious. Auuugh, man. I wish I had scrapes of all those sites I linked to, that's the one thing I wish I had. But whatever.
**Frumin:** Yeah.
**Arcangel:** You live and you learn.
**Frumin:** Yeah. Everything always changes.

# I Shot Andy Warhol

*2002* [1] [2]

*Requirements: Nintendo Entertainment System, Zapper, Hogan's Alley cartridge, CRT television, 2 27C256 EEPROMs*[3].

*A mod of the Nintendo Entertainment System game Hogan's Alley where the characters were changed to Andy Warhol, the Pope, Flavor Flav*[4]*, and Col. Sandersr*[5].

*"I love to sleep. I'd sleep all day if I could." - Miley Cyrus* [6] [7]

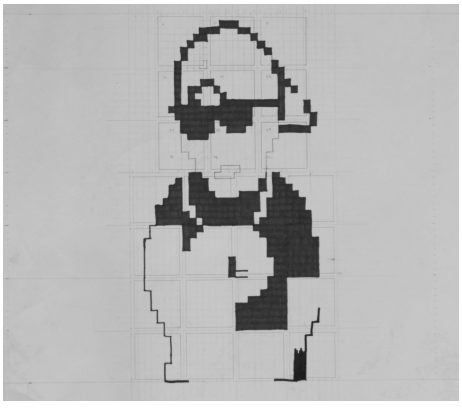
**1.** *I Shot Andy Warhol*, 2002 (Modded Hogans Alley cartridge) Fact Center, Liverpool Biennial, 2004. Photo: Michael Connor.

My favorite shot of this game in action, mainly due to the jeans the pictured teen is wearing.

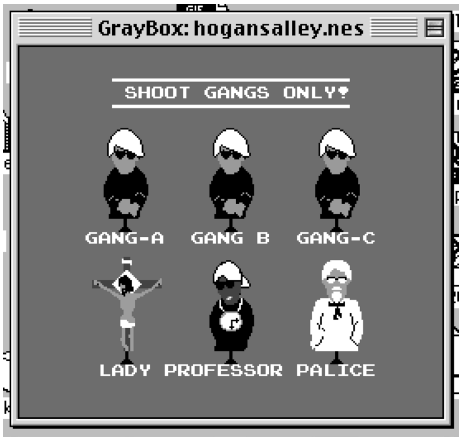
**2.** This project still has a bug somewhere, which I had fixed, but the file was on a laptop that was stolen from me in the early aughts. It's a glitch in the text on the second level of the game. The text reads "AndyTV" or something like that. I can't remember where it is, but it's there. I was too heartbroken about my computer going missing to ever fix it. ;(

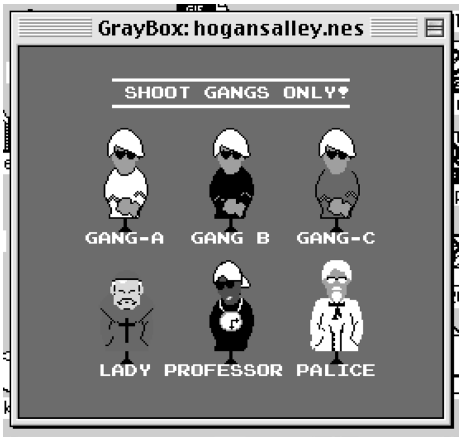
**3.** Actually, the easiest way to see this thing is to prolly just use a Nintendo emulator. In a hex editor, start with 4E 45 53 1A 02 01 01 00 00 00 00 00 00 00 00 00, paste the PRG binary twice, the CHR binary 4 times, ... then double click and you should be ready to go. Otherwise, yeah, you could go out and get 2 27C256 EEPROMS, burn the PRG twice in a row on one, and the CHR 4 times in a row on the other, and swap them out with the EEPROMS in a real Hogan's Alley cartridge. That will also work. What's all this stuff about pasting the PRG code twice, and the CHR code a few times? Well, I learned how to do this NES stuff using 32k 27C256 EEPROMS, therefore if the code was smaller then 32k, I needed to paste it a few times to ll up the EEPROM. ;-)

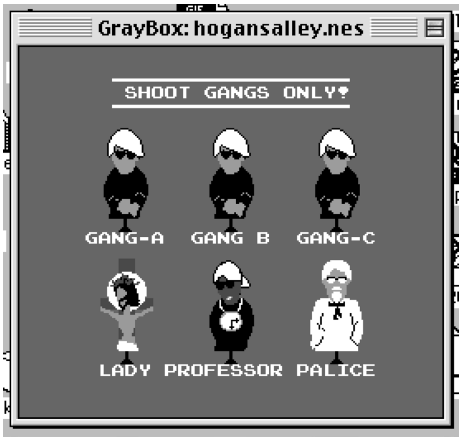
**4.** Flavor Flav, 2002 (Pen on paper). Photo: Arcangel Studio

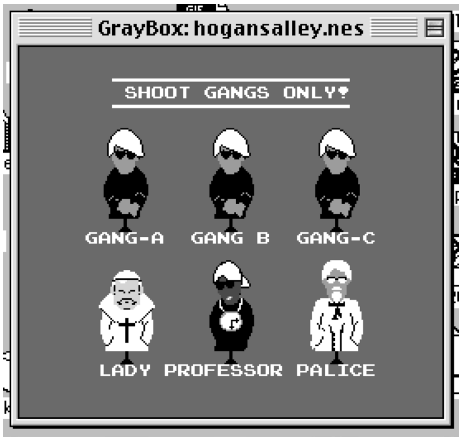


**5.** In progress lineups, I went with something similar to the third here:




**6.** "I've only ever lost one computer. It was one of those white MacBooks. Remember those hippy purple clam shell computers Steve Jobs made right after his second stint on the job? It was one of the laptops that came right after that. Man, it was heavy! It was like carrying around lead. But actually, it was a super solid machine. I wrote alot of awesome software on it. I used to take the Amtrak train alot then back and forth to Buffalo, and would just zone out on that computer doing assembly and eating Doritos. But anyway, what happened was, the computer was stolen. I left it in the hallway at the office where I was working. This was like maybe 10 years ago. I went in that morning to open up, and I placed the laptop bag on the ground, outside the door, in the hallway, and then did all the complicated unlocking and disarming stu, yada, yada, yada, but I like totally forgot about my bag! So, I went in, red up the office Power PC clone, and probably went straight to the http://www.nytimes.com. That's where I go when I am too tired to do anything. All the while, my computer was just sitting in the hall! It was probably stolen right away. The police later told me that there is a class of criminal in that neighborhood who follow people into work for exactly that

purpose. Like kinda high level white collar pick pockets. They look for zoned out, exhausted office drones with brief cases or whatever. Uuuugh. What I remember most was how tired I was that morning. It was the Saturday morning shift, and those Saturday morning shifts were so000ooo000oooo tough, cause nothing usually happened at the office that day, so there was no adrenaline available to pep up anything. I could have fallen asleep on command. I was probably up half the night surfing the web. There was alot of awesome stuff happening on the web then; K10k, slashdot, ebaums world, graphics interchange format! I had to stay up half of every night just to figure out what the hell was going on. But seriously, when I get into those exhaustion fogs, I'm dangerous. I can lose anything. After my computer was taken, I stayed in bed for a week. The depression affected me physically - I had actual physical pain. And, of course, I didn't have like a grand just sitting around at the time for a new laptop. My wallet was also in the laptop bag, tho it was mailed back to me about a month later. That was cool. Though, I remember thinking I wished they would have mailed me my hard drive instead. I lost a lot of work."

**7.** *<h2>The Yada Yada</h2> Unfortunately, the copyright holders of Seinfeld have led a DMCA request, compelling me to remove the The Yada Yada script from this website. Even though the The Yada Yada script was transcribed by a Seinfeld fan who spent hours and hours completing the transcript, the publication of the The Yada Yada transcript would somehow cause harm to the copyright owners of Seinfeld. Figure that one out. <br /><br /> <a href="http://www.stanthecaddy.com/the-yada-yada-discuss.html">Join the discussion</a>*

**8.** This work is what - at least in 2002 - was called a ROM hack. ROM hacks were popular in the late '90s when video emulation and the net really began to pick up speed. Some clever ppl found out that you could go changing the ones and zeros of video game ROMs and, because things weren't really compressed so much yet, the changes would have a one to one correspondence to the game. ;-) This particular project wz a tiny bit more complicated, since some of the graphics were kinda compressed in Hogan's Alley. For example, if a character in the game was symmetrical, only half of that character would be saved in the game's graphic storage, and the other half would just be a program command to display that part once forwards and another time backwards - thus a symmetrical character. Therefore making this ROM hack required a few late nights poking junk values in the game ROM until I found and reverse engineered the way the game delt with symmetry (I'm half face palming here, and half bragging as it iz a pretty good hack). Thus some of the following notes are graphic maps I made for the characters in the game in order to figure out the symmetry. Because I was working on a copy of the ROM with a header and duplicate code, the offset key for these Attribute and Name CHR drawings and the corresponding PRG code is -4010 bytes.

*prg:*

```
00000000  d8 78 ad 02 20 10 fb a2  00 8e 00 20 8e 01 20 ca  |.x.. ..... .. .|
00000010  9a ae ec 05 a0 06 84 01  a0 00 84 00 a9 00 91 00  |................|
00000020  88 d0 fb c6 01 10 f7 8a  d0 02 a2 5f 8e ec 05 a9  |...........____.|
00000030  b6 85 29 20 21 c2 20 31  c2 a0 00 8d 05 20 8d 05  |..) !. 1..... ..|
```

[8]

```
00000040  20 a0 01 84 24 a9 0f 8d  15 40 20 f7 ff a9 90 8d  | ...$....@ .....|
00000050  00 20 85 08 a9 02 85 09  a2 0b bd 6a e3 9d f0 05  |. .........j....|
00000060  ca 10 f7 30 19 a5 24 f0  04 a5 26 f0 03 20 f4 ff  |...0..$...&.. ..|
00000070  20 37 c3 20 b8 c0 e6 2f  a9 00 85 20 85 22 a5 20  | 7. .../... .". |
00000080  d0 e3 20 bd c6 4c 7e c0  08 48 8a 48 98 48 a9 00  |.. ..L~..H.H.H..|
00000090  8d 03 20 a9 02 8d 14 40  a5 22 d0 0f 20 bd c2 20  |.. ....@."..  .. |
000000a0  4e c2 20 a8 c3 20 82 c2  20 d0 c3 a0 01 84 22 84  |N. .. .. ....."."|
000000b0  20 68 a8 68 aa 68 28 40  a5 24 f0 03 4c 56 c1 a5  | h.h.h(@.$..LV..|
000000c0  16 29 10 f0 55 ac fc 05  d0 55 c8 8c fc 05 a4 25  |.)..U....U.....%|
000000d0  c0 07 f0 32 c0 03 f0 0c  c0 04 f0 08 c0 0a f0 04  |...2............|
000000e0  c0 0f d0 3b a2 05 b5 2a  9d 30 04 ca 10 f8 20 4a  |...;...*.0.... J|
000000f0  c1 20 b4 cd a9 25 85 45  20 4b ce a5 25 85 1c a9  |. ...%.E K..%...|
00000100  07 85 25 4c 0e c1 a9 11  85 25 a9 30 85 1d 20 46  |..%L.....%.0.. F|
00000110  c7 20 91 d2 20 f4 ff 4c  b4 d2 a9 00 8d fc 05 a5  |. .. ..L........|
00000120  25 20 4d c3 6e c7 91 c7  ee c7 06 c8 00 cd 67 d2  |% M.n.........g.|
00000130  cc cd 64 c7 01 d3 48 d3  5f d3 a9 d6 64 c7 6e d8  |..d...H. ...d.n.|
00000140  94 d8 ad d8 45 dc 64 c2  5c dc a2 e8 bd ff 01 9d  |....E.d.\.......|
00000150  17 02 ca d0 f7 60 a0 00  8c ff 05 c8 84 99 a5 26  |.....`.........&|
00000160  f0 46 20 3e cf 20 6c cf  ad ff 05 c9 01 f0 0e c9  |.F >. l.........|
00000170  02 f0 26 a5 16 29 30 c9  10 d0 1a f0 05 a6 26 ca  |..&..)0.......&.|
00000180  d0 1c a9 00 85 24 85 25  20 91 d2 20 58 c7 a9 02  |.....$.% .. X...|
00000190  85 2a 85 2d 60 c9 20 d0  26 a6 26 ca f0 0c 20 91  |.*.-`. .&.&... .|
000001a0  d2 20 f4 ff a9 00 85 26  f0 6a ad fd 05 d0 1e ac  |. .....&.j......|
000001b0  fe 05 c8 c0 03 d0 02 a0  00 8c fe 05 4c c8 c1 c9  |............L...|
000001c0  00 d0 05 8d fd 05 f0 0f  a9 01 8d fd 05 a5 2d c9  |..............-.|
000001d0  25 b0 04 a9 25 85 2d a6  26 ca d0 38 a2 07 bd 4f  |%...%.-.&..8...O|
000001e0  e6 9d 00 02 ca 10 f7 ae  fe 05 a9 6f 18 69 10 ca  |...........o.i..|
000001f0  10 fa 8d 00 02 ad fe 05  0a 0a 18 69 03 aa a0 03  |...........i....|
00000200  bd f0 05 99 b4 00 ca 88  10 f6 20 b6 cc a2 ef a0  |.......... .....|
00000210  22 20 24 d1 a5 26 20 4d  c3 d5 c6 34 c7 84 d1 e1  |" $..& M...4....|
00000220  d1 a9 02 20 28 c2 a9 01  85 01 a9 ff 85 00 4c 05  |... (.........L.|
00000230  c3 20 37 c2 4c f8 c3 a0  02 84 01 a0 00 84 00 a9  |. 7.L...........|
00000240  f4 91 00 88 d0 fb 60 86  00 84 01 4c 9f c3 a4 23  |......`....L...#|
00000250  d0 01 60 88 98 0a a8 be  57 e6 b9 58 e6 a8 a9 00  |..`.....W..X....|
00000260  85 23 f0 e3 c6 1d d0 0e  a2 05 bd 30 04 95 2a ca  |.#.........0..*.|
00000270  10 f8 a5 1c 85 25 60 48  a9 00 85 20 a9 01 85 22  |.....%`H... ...”|
00000280  68 60 a2 01 8e 16 40 ca  8e 16 40 20 8f c2 e8 a0  |h`....@...@ ....|
00000290  08 48 bd 16 40 85 00 4a  05 00 4a 68 2a 88 d0 f1  |.H..@..J..Jh*...|
000002a0  dd 36 04 d0 0f fe 38 04  bc 38 04 c0 05 90 0d 95  |.6....8..8......|
000002b0  16 4c b7 c2 9d 36 04 a9  00 9d 38 04 60 a5 21 f0  |.L...6....8.`.!.|
000002c0  43 a9 61 85 00 a9 05 85  01 ae 02 20 a0 00 f0 28  |C.a........ ...(|
000002d0  8d 06 20 c8 b1 00 8d 06  20 c8 b1 00 0a 48 a5 08  |.. ..... ....H..|
000002e0  09 04 b0 02 29 fb 8d 00  20 85 08 68 4a aa c8 b1  |....)... ..hJ...|
000002f0  00 8d 07 20 ca d0 f7 c8  b1 00 d0 d4 8d 60 05 8d  |... .........`..|
00000300  61 05 85 21 60 20 77 c2  ae 02 20 a5 08 29 fb 8d  |a..!` w... ..)..|
00000310  00 20 85 08 a9 1c 18 69  04 c6 01 d0 fa 85 02 8d  |. .....i........|
00000320  06 20 a9 00 8d 06 20 a2  04 a0 00 a5 00 8d 07 20  |. .... ........ |
00000330  88 d0 fa ca d0 f7 60 a2  01 c6 2a 10 06 a9 0a 85  |......`...*.....|
00000340  2a a2 03 b5 2b f0 02 d6  2b ca 10 f7 60 0a a8 c8  |*...+...+...`...|
00000350  68 85 14 68 85 15 b1 14  aa c8 b1 14 85 15 86 14  |h..h............|
00000360  6c 14 00 8d 06 20 c8 b1  00 8d 06 20 c8 b1 00 0a  |l.... ..... ....|
00000370  48 a5 08 09 04 b0 02 29  fb 8d 00 20 85 08 68 0a  |H.......)... ..h.|
00000380  90 03 09 02 c8 4a 4a aa  b0 01 c8 b1 00 8d 07 20  |.....JJ........ |
00000390  ca d0 f5 38 98 65 00 85  00 a9 00 65 01 85 01 ae  |...8.e.....e....|
000003a0  02 20 a0 00 b1 00 d0 bb  48 a5 0a 8d 05 20 d0 19  |. ......H.... ..|
000003b0  a5 3f c9 01 d0 13 a5 27  f0 0f c9 01 d0 0b e6 27  |.?.....'.......'|
000003c0  a5 08 49 01 85 08 8d 00  20 a5 0b 8d 05 20 68 60  |..I..... .... h`|
000003d0  a5 27 f0 23 ad 02 20 29  40 d0 f9 a5 28 f0 07 c9  |.'.#.. )@...(...|
000003e0  02 f0 03 20 fa d7 ad 02  20 29 40 f0 f9 a5 1e 8d  |... .... )@.....|
000003f0  05 20 a5 1f 8d 05 20 60  a5 24 d0 1f a6 3f ca d0  |. .... `.$...?..|
00000400  1a a5 25 c9 06 f0 14 a5  29 8d 00 02 a9 b0 8d 03  |..%.....).......|
00000410  02 a9 ec 8d 01 02 a9 22  8d 02 02 60 a0 01 84 21  |.......”...`...!|
00000420  88 b1 02 29 0f 85 05 b1  02 4a 4a 4a 4a 85 04 ae  |...).....JJJJ...|
00000430  60 05 a5 01 9d 61 05 20  73 c4 a5 00 9d 61 05 20  |`....a. s....a. |
00000440  73 c4 a5 05 85 06 9d 61  05 20 73 c4 c8 b1 02 9d  |s......a. s.....|
```

```
00000450  61 05 c6 06 d0 f3 20 73  c4 8e 60 05 18 a9 20 65  |a..... s..`... e|
00000460  00 85 00 a9 00 65 01 85  01 c6 04 d0 c5 a9 00 9d  |.....e..........|
00000470  61 05 60 e8 8a c9 4f 90  0a ae 60 05 a9 00 9d 61  |a.`...O...`....a|
00000480  05 68 68 60 a0 01 84 21  ae 60 05 88 f0 4d 85 04  |.hh`...!.`...M..|
00000490  a5 01 9d 61 05 20 73 c4  a5 00 9d 61 05 20 73 c4  |...a. s....a. s.|
000004a0  a5 04 29 bf 9d 61 05 29  7f 85 05 20 73 c4 24 04  |..)..a.)... s.$.|
000004b0  50 01 c8 24 04 70 01 c8  b1 02 9d 61 05 20 73 c4  |P..$.p.....a. s.|
000004c0  a9 01 24 04 10 02 a9 20  18 65 00 85 00 a9 00 65  |..$.... .e.....e|
000004d0  01 85 01 c6 05 d0 dc 8e  60 05 c8 b1 02 d0 af 20  |........`...... |
000004e0  7c c4 a0 01 84 21 ae 60  05 88 4c 9a c5 85 11 20  ||....!.`..L.... |
000004f0  ae c5 a5 05 9d 61 05 20  73 c4 a5 04 9d 61 05 20  |.....a. s....a. |
00000500  73 c4 a5 11 29 3f 85 10  24 11 30 0e a5 04 29 1f  |s...)?..$.0...).|
00000510  85 13 a9 20 38 e5 13 4c  30 c5 a5 05 29 03 85 13  |... 8..L0...)...|
00000520  a5 04 0a 26 13 0a 26 13  0a 26 13 a9 1e 38 e5 13  |...&..&..&...8..|
00000530  85 13 c5 10 90 0a a5 10  48 a9 00 85 10 68 d0 11  |........H....h..|
00000540  a5 10 38 e5 13 85 10 a5  11 29 c0 05 10 85 10 a5  |..8......).....|
00000550  13 85 12 a5 11 29 80 05  12 9d 61 05 20 73 c4 24  |.....)....a. s.$|
00000560  11 50 01 c8 24 11 70 01  c8 b1 02 9d 61 05 20 73  |.P..$.p.....a. s|
00000570  c4 a5 01 24 11 10 02 a5  00 18 69 08 24 11 30 04  |...$......i.$.0.|
00000580  85 01 10 02 85 00 c6 12  d0 da 8e 60 05 a5 10 f0  |...........`....|
00000590  08 24 11 50 01 88 4c ed  c4 c8 b1 02 85 00 c8 b1  |.$.P..L.........|
000005a0  02 85 01 c8 b1 02 f0 03  4c ed c4 20 7c c4 8a 48  |........L.. |..H|
000005b0  98 48 a5 08 4a 66 06 4a  66 06 a5 0a 18 65 01 66  |.H..Jf.Jf....e.f|
000005c0  06 4a 4a 4a 85 04 06 06  6a 6a 45 06 85 07 a0 20  |.JJJ....jjE.... |
000005d0  24 07 50 02 a0 24 84 05  a5 0b 18 65 00 b0 02 c9  |$.P..$.....e....|
000005e0  f0 08 66 06 28 90 03 18  69 10 4a 4a 4a aa 06 06  |..f.(...i.JJJ...|
000005f0  6a 45 06 10 07 a5 05 18  69 08 85 05 8a f0 10 a5  |jE......i.......|
00000600  04 18 69 20 85 04 a5 05  69 00 85 05 ca d0 f0 68  |..i ....i......h|
00000610  a8 68 aa 60 ae 60 05 a0  01 84 21 d0 45 9d 61 05  |.h.`.`....!.E.a.|
00000620  20 73 c4 c8 b1 02 9d 61  05 20 73 c4 c8 b1 02 85  | s.....a. s.....|
00000630  04 29 bf 9d 61 05 29 7f  85 05 20 73 c4 24 04 50  |.)..a.)... s.$.P|
00000640  01 c8 24 04 70 01 c8 b1  02 9d 61 05 20 73 c4 c6  |..$.p.....a. s..|
00000650  05 d0 ef 8e 60 05 38 98  65 02 85 02 a9 00 65 03  |....`.8.e.....e.|
00000660  85 03 a0 00 b1 02 d0 b5  20 7c c4 20 ae c6 65 01  |........ |. ..e.|
00000670  c9 0a 90 02 69 05 18 65  02 85 02 a5 03 29 f0 65  |....i..e.....).e|
00000680  02 90 04 69 5f 38 60 c9  a0 b0 f8 60 20 ae c6 e5  |...i_8`....` ...|
00000690  01 85 01 b0 0a 69 0a 85  01 a5 02 69 0f 85 02 a5  |.....i.....i....|
000006a0  03 29 f0 38 e5 02 b0 03  69 a0 18 05 01 60 48 29  |.).8....i....`H)|
000006b0  0f 85 01 68 29 f0 85 02  a5 03 29 0f 60 ad ec 05  |...h).....).`...|
000006c0  65 2f a8 a2 03 b9 52 de  7d ec 05 9d ec 05 ca 10  |e/....R.}.......|
000006d0  f7 ad ec 05 60 20 58 c7  a9 01 85 23 20 26 c2 a9  |....` X....# &..|
000006e0  02 85 01 a9 fc 85 00 20  05 c3 20 46 c7 a2 8e a0  |....... .. F....|
000006f0  e8 20 47 c2 20 31 c2 20  46 c7 a2 e8 a0 e4 20 47  |. G. 1. F..... G|
00000700  c2 a5 08 29 fc 85 08 8d  00 20 a0 01 8c fd 05 88  |...)..... ......|
00000710  84 27 84 0a 84 1e 84 0b  84 1f e6 26 a4 30 d0 08  |.'.........&.0..|
00000720  a0 02 84 30 a9 27 d0 04  c6 30 a9 25 85 2d 20 46  |...0.'...0.%.- F|
00000730  c7 4c 65 c7 a4 2d f0 0b  c0 27 d0 09 20 d0 d2 c6  |.Le..-...'.. ...|
00000740  2d d0 02 e6 26 60 20 60  d2 a5 20 f0 fc 4c f4 ff  |-...&` `.. ..L..|
00000750  20 60 d2 a5 20 f0 fc 60  20 50 c7 a5 09 29 e7 85  | `.. ..` P...)..|
00000760  09 8d 01 20 60 20 50 c7  a5 09 09 18 d0 f1 20 83  |... ` P....... .|
00000770  d2 a0 93 b9 5c ea 99 3f  04 88 d0 f7 a9 01 ac fe  |....\..?........|
00000780  05 84 3f f0 07 a9 08 88  f0 02 a9 0d 85 25 4c 31  |..?..........%L1|
00000790  c2 20 21 c2 20 59 d8 a2  ff a0 e8 20 47 c2 a9 02  |. !. Y..... G...|
000007a0  85 23 20 46 c7 20 bb c7  a2 02 a9 18 20 70 d2 20  |.# F. ..... p. |
000007b0  c8 d2 20 46 c7 20 65 c7  4c 77 cd a2 03 b5 b4 48  |.. F. e.Lw.....H|
000007c0  ca 10 fa e8 a5 3f 0a 0a  a8 b9 f0 05 95 b4 e8 c8  |.....?..........|
000007d0  e0 04 d0 f5 20 b6 cc a6  3f ca f0 07 a2 36 a0 23  |.... ...?....6.#|
000007e0  20 24 d1 a2 00 68 95 b4  e8 e0 04 d0 f8 60 20 87  | $...h.......` .|
000007f0  d2 20 79 d2 20 fc cb a9  02 85 23 a9 00 85 97 a9  |. y. .....#.....|
00000800  03 85 25 4c 11 cc 20 3e  cf 20 6c cf 20 16 c8 20  |..%L.. >. l. .. |
00000810  cf d0 ea ea ea 60 a0 00  84 94 84 80 ad 00 03 f0  |.....`..........|
00000820  09 20 dc cb 20 97 c8 20  ec cb e6 80 ad 20 03 f0  |. .. .. ..... ..|
00000830  0b a0 20 20 dc cb 20 97  c8 20 ec cb e6 80 ad 40  |..  .. .. .....@|
00000840  03 f0 0b a0 40 20 dc cb  20 97 c8 20 ec cb 20 b9  |....@ .. .. .. .|
00000850  cb 20 83 c8 20 b5 d3 ac  01 03 d0 24 ac 21 03 d0  |. .. ......$.!..|
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00000860  1f ac 41 03 d0 1a a4 2b  d0 0d 8c 11 03 8c 31 03  |..A....+......1.|
00000870  8c 51 03 a0 02 84 2b 88  d0 06 a9 02 85 23 e6 25  |.Q....+......#.%|
00000880  4c 3b ce a2 02 bd 64 e3  a8 b9 1d 03 95 9a b9 1c  |L;....d.........|
00000890  03 95 9d ca 10 ef 60 a5  41 20 4d c3 b8 c8 c2 c8  |......`.A M.....|
000008a0  16 c9 3c c9 4e c9 e2 c9  f7 c9 4c ca 88 ca d4 ca  |..<.N.....L.....|
000008b0  10 cb 34 cb 50 cb 81 cb  a5 51 f0 03 20 97 cb 4c  |..4.P....Q.. ..L|
000008c0  4b ce 20 f8 c8 a4 80 d0  03 20 03 c9 a6 80 bd 5e  |K. ..... .....^|
000008d0  e3 85 47 85 4a a2 02 a4  b2 88 d0 14 a9 18 85 47  |..G.J..........G|
000008e0  a6 80 e0 02 d0 08 84 40  8c 20 03 e8 86 7c a2 0c  |.......@. ...|..|
000008f0  86 41 20 d7 d2 4c 4b ce  a2 1f bd 59 e1 95 40 ca  |.A ..LK....Y..@.|
00000900  10 f8 60 a4 a8 b9 3b e3  c9 aa d0 04 a0 18 d0 f5  |..`...;.........|
00000910  c8 84 a8 85 7d 60 e6 47  a4 47 c4 4a d0 0a 20 db  |....}`.G.G.J.. .|
00000920  d2 a9 1e a2 03 20 8e cb  c0 e8 d0 0d a4 80 88 d0  |..... ..........|
00000930  04 a9 03 85 7c a9 18 85  47 4c 4b ce a9 09 85 45  |....|...GLK....E|
00000940  a9 01 85 99 a2 04 a9 04  20 8e cb 4c 4b ce a5 80  |........ ..LK...|
00000950  d0 22 20 bd c6 a6 a7 dd  33 e3 26 70 20 bd c6 29  |.” .....3.&p ..)|
00000960  3f c9 36 90 0d a8 ad ed  05 29 1f 69 0a 85 19 98  |?.6......).i....|
00000970  e5 19 85 71 a4 71 b9 fd  e0 85 0d a9 00 06 0d 2a  |...q.q.........*|
00000980  06 0d 2a 49 03 a8 a5 70  c4 80 d0 02 49 01 85 5b  |..*I...p....I..[|
00000990  a6 80 e0 02 f0 09 06 0d  06 0d e8 e0 02 d0 f7 06  |................|
000009a0  0d 26 5b 06 0d 26 5b a5  5b 85 5a 29 04 f0 21 06  |.&[..&[.[.Z)..!.|
000009b0  5b 38 66 5b a5 82 d0 16  e6 82 e6 5a a5 5a 38 e9  |[8f[.......Z.Z8.|
000009c0  05 aa a0 01 c8 ca d0 fc  84 23 84 aa f0 04 c6 5a  |.........#.....Z|
000009d0  c6 5a a9 02 85 7c e6 41  20 4b ce a5 5a 85 45 4c  |.Z...|.A K..Z.EL|
000009e0  ea d2 a4 73 88 d0 0d 20  b1 ca 86 45 a9 00 85 99  |...s... ...E....|
000009f0  a2 09 86 41 4c 4b ce a5  5b 10 20 20 9d d2 a0 00  |...ALK..[.  ....|
00000a00  84 99 c8 84 7c a9 0b 85  23 20 b1 ca 86 45 e6 51  |....|...# ...E.Q|
00000a10  20 04 ce a9 10 85 86 a2  08 d0 10 20 30 ca d0 0d  | .......... 0...|
00000a20  20 87 cc 20 99 d2 20 a9  d2 a2 07 86 41 4c b8 c8  | .. .. .....AL..|
00000a30  a2 02 bd 64 e3 a8 a9 07  d9 01 03 f0 06 ca 10 f2  |...d............|
00000a40  a9 00 60 a9 03 d5 9a d0  02 b5 9d 60 20 6b ca a9  |..`........` k..|
00000a50  01 85 72 a5 73 f0 11 c6  5e d0 0d a9 0b 85 45 a0  |..r.s...^.....E.|
00000a60  00 84 41 84 72 c8 84 74  4c 4b ce a5 5c d0 16 a6  |..A.r..tLK..\...|
00000a70  5d bd f8 e0 c9 aa d0 04  a2 00 f0 f5 e8 85 45 86  |].............E.|
00000a80  5d a9 02 85 5c c6 5c 60  20 a4 ca c6 5f d0 0f 20  |]...\.\` ..._.. |
00000a90  b1 ca 86 45 e6 73 a9 09  85 41 a9 01 85 86 20 c6  |...E.s...A.... .|
00000aa0  ca 4c b8 c8 20 bc ca a6  5a b0 03 20 b1 ca 86 45  |.L.. ...Z.. ...E|
00000ab0  60 a2 0f a4 5a c0 06 90  02 a2 0d 60 a6 80 e8 a5  |`...Z......`....|
00000ac0  84 4a ca d0 fc 60 a5 86  d0 07 20 ad d2 a9 10 85  |.J...`.... .....|
00000ad0  86 c6 86 60 20 e7 ca d0  0b a2 00 86 5d a2 0a a9  |...` .......]...|
00000ae0  20 20 8e cb 4c b8 c8 20  f7 ca a6 5c 10 04 a2 04  |  ..L.. ...\....|
00000af0  86 5c a6 5d e0 03 60 a6  5c d0 12 a6 5d bd f8 e0  |.\.]..`.\...]...|
00000b00  c9 aa d0 04 a2 00 f0 f5  e8 86 5d 85 45 c6 5c 60  |..........].E.\`|
00000b10  a2 00 a4 5b 30 19 a4 72  d0 17 a9 0b 85 23 e6 72  |...[0..r.....#.r|
00000b20  a4 5a 84 45 a9 01 85 5d  85 51 20 04 ce a2 0b 86  |.Z.E...].Q .....|
00000b30  41 4c b8 c8 c6 50 d0 12  20 e7 ca d0 09 a2 00 86  |AL...P.. .......|
00000b40  72 86 41 e8 86 86 e6 50  d0 03 20 c6 ca 4c b8 c8  |r.A....P.. ..L..|
00000b50  e6 47 a4 80 d0 12 a6 47  e0 59 d0 03 ee 20 03 e0  |.G.....G.Y... ..|
00000b60  99 d0 1b ee 40 03 d0 16  88 f0 13 a6 47 e0 40 d0  |....@.......G.@.|
00000b70  0d 20 db d2 a9 0d 85 41  8d 01 03 8d 21 03 4c 4b  |. .....A....!.LK|
00000b80  ce a5 43 d0 04 a5 42 85  41 c6 43 4c b8 c8 86 42  |..C...B.A.CL...B|
00000b90  85 43 a9 0d 85 41 60 20  bc ca 90 1c a2 03 b5 44  |.C...A` .......D|
00000ba0  48 ca 10 fa e8 86 44 a9  0e 85 45 20 4b ce a2 00  |H.....D...E K...|
00000bb0  68 95 44 e8 e0 04 d0 f8  60 a5 83 d0 1c a9 08 a6  |h.D.....`.......|
00000bc0  24 f0 02 a9 01 85 83 a6  85 bd 7c e3 c9 aa d0 04  |$.........|.....|
00000bd0  a2 00 f0 f5 e8 86 85 85  84 c6 83 60 84 81 a2 00  |...........`....|
00000be0  b9 00 03 95 40 c8 e8 e0  20 d0 f5 60 a4 81 a2 00  |....@... ..`....|
00000bf0  b5 40 99 00 03 c8 e8 e0  20 d0 f5 60 a0 01 8c 00  |.@...... ..`....|
00000c00  03 8c 20 03 8c 40 03 8c  01 03 8c 21 03 8c 41 03  |.. ..@.....!..A.|
00000c10  60 e6 b1 a5 b1 a6 3f d0  1e a6 a7 dd 37 e3 90 09  |`.....?.....7...|
00000c20  e8 e0 04 90 02 a2 03 86  a7 a6 b0 e8 e0 10 d0 02  |................|
00000c30  a2 01 86 b0 4c 52 cc a6  a7 dd d3 e1 90 09 e8 e0  |....LR..........|
00000c40  0a 90 02 a2 09 86 a7 a6  b0 e8 e0 06 d0 02 a2 01  |................|
00000c50  86 b0 a5 b2 85 03 a9 01  18 20 6b c6 85 b2 29 f0  |......... k...).|
00000c60  4a 4a d0 02 a9 34 a8 a2  01 20 33 d1 a5 b2 29 0f  |JJ...4... 3...).|
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00000c70  0a 0a a8 20 33 d1 a6 3f  ca f0 95 a9 24 8d 00 05  |... 3..?....$...|
00000c80  a2 0e a0 23 4c 24 d1 a6  5a bd 67 e3 85 03 a5 b6  |...#L$..Z.g.....|
00000c90  18 20 6b c6 85 b6 a5 b5  85 03 a9 00 20 6b c6 85  |. k......... k..|
00000ca0  b5 20 b6 cc a6 3f ca f0  2b a2 24 a0 23 20 24 d1  |. ...?..+.$.# $.|
00000cb0  20 d5 cc 4c bb c7 a2 02  a0 05 b5 b5 29 0f 99 01  | ..L........)...|
00000cc0  05 88 b5 b5 4a 4a 4a 4a  99 01 05 88 ca 10 eb a9  |....JJJJ........|
00000cd0  16 8d 00 05 60 a4 3f c8  98 0a 0a a8 88 84 0f 38  |....`.?........8|
00000ce0  a2 03 b9 f0 05 85 03 b5  b4 20 8c c6 88 ca 10 f2  |......... ......|
00000cf0  b0 0d a2 03 a4 0f b5 b4  99 f0 05 88 ca 10 f7 60  |.............`|
00000d00  a9 00 85 41 a2 06 a4 b3  c0 10 b0 1e a9 0c a4 3f  |...A...........?|
00000d10  f0 0d a4 b1 c0 04 d0 03  20 30 cd a2 0b d0 0b a4  |........ 0......|
00000d20  b0 c0 0f d0 03 20 60 cd  a2 02 20 70 d2 4c 3b ce  |..... `... p.L;.|
00000d30  20 b4 cd 20 bc d2 a0 1c  a6 ab d0 0e 20 f9 d2 20  | .. ........ .. |
00000d40  ee d2 c8 a6 b2 e0 04 90  01 c8 84 45 20 4b ce a9  |...........E K..|
00000d50  24 a4 ab d0 0a a5 a6 c9  04 f0 02 e6 a6 a9 18 60  |$.............`|
00000d60  20 b4 cd 20 ee d2 a0 1d  a6 b1 e0 10 90 01 c8 84  | .. ............|
00000d70  45 20 4b ce a9 18 60 20  b4 cd a9 1b 85 45 20 4b  |E K...` .....E K|
00000d80  ce 20 ab cd a5 b2 85 03  a9 01 18 20 6b c6 85 00  |. ......... k...|
00000d90  4a 4a 4a 4a 18 69 d0 99  00 02 c8 c8 c8 c8 a5 00  |JJJJ.i..........|
00000da0  29 0f 18 69 d0 99 00 02  4c 3b ce a6 94 8a 38 e9  |)..i....L;....8.|
00000db0  08 a8 c8 60 a9 04 a6 3f  ca f0 02 a9 00 85 94 a9  |...`...?........|
00000dc0  70 85 46 a9 80 85 47 a9  00 85 44 60 a5 41 20 4d  |p.F...G...D`.A M|
00000dd0  c3 d5 cd f5 cd 20 b4 cd  a9 1a 85 45 20 4b ce 20  |..... .....E K. |
00000de0  ab cd a5 b3 85 00 20 90  cd a9 20 85 2d e6 41 20  |...... ... .-.A |
00000df0  b8 d2 4c 3b ce a4 2d d0  0a 84 30 84 26 c8 84 24  |..L;..-...0.&..$|
00000e00  20 83 d2 60 a6 3f d0 03  20 46 c7 a5 b3 85 03 a9  | ..`.?.. F......|
00000e10  01 18 20 6b c6 85 b3 a2  c3 4a 4a 4a 4a f0 01 aa  |.. k.....JJJJ...|
00000e20  8e 01 05 a5 b3 29 0f 8d  02 05 a9 12 8d 00 05 a6  |.....).....(....|
00000e30  3f ca f0 cf a2 51 a0 23  4c 24 d1 a6 94 a9 f4 9d  |?....Q.#L$......|
00000e40  00 02 e8 e8 e8 e8 d0 f7  4c f8 c3 a5 45 0a a8 a9  |........L...E...|
00000e50  91 85 12 a9 dc 85 13 b1  12 85 10 c8 b1 12 85 11  |................|
00000e60  a0 00 84 18 a4 18 b1 10  c9 00 f0 dc 85 13 c8 b1  |................|
00000e70  10 c8 85 12 b1 10 c8 18  65 46 85 91 b1 10 c8 18  |........eF......|
00000e80  65 47 85 92 84 18 a0 00  b1 12 a2 00 a8 f0 1c a2  |eG..............|
00000e90  34 88 f0 17 a2 52 88 f0  12 a2 62 88 f0 0d a2 6a  |4....R....b....j|
00000ea0  88 f0 08 a2 7e 88 f0 03  4c 06 cf a0 00 86 19 c8  |....~...L.......|
00000eb0  b1 12 c9 ff f0 ae c9 fe  d0 07 e6 19 e6 19 4c af  |..............L.|
00000ec0  ce c9 fd d0 0e c8 b1 12  a6 44 f0 02 09 20 85 93  |.........D... ..|
00000ed0  4c af ce a6 19 bd ba dd  e6 19 18 65 91 20 fe ce  |L..........e. ..|
00000ee0  de 00 02 b1 12 c8 20 fe  ce a5 93 20 fe ce a6 19  |...... ... ....|
00000ef0  bd ba dd e6 19 18 65 92  20 fe ce 4c b0 ce a6 94  |......e. ..L....|
00000f00  9d 00 02 e6 94 60 a5 11  48 a5 10 48 a5 91 85 00  |.....`..H..H....|
00000f10  a5 92 85 01 20 ae c5 a5  04 85 00 a5 05 85 01 a5  |.... ...........|
00000f20  12 18 69 01 85 02 a5 13  69 00 85 03 20 1c c4 68  |..i.....i... ..h|
00000f30  85 10 68 85 11 4c 64 ce  49 ff 18 69 01 60 ad 17  |..h..Ld.I..i.`..|
00000f40  40 29 10 c5 95 f0 07 85  95 a9 00 85 96 60 e6 96  |@).........`..|
00000f50  a4 96 c0 01 d0 f7 29 10  f0 04 84 98 d0 eb a4 98  |......).........|
00000f60  f0 e7 84 97 20 9d d2 88  84 98 f0 dd a5 99 d0 03  |.... ...........|
00000f70  85 97 60 a4 97 f0 fb 88  84 97 a9 09 85 23 20 37  |..`..........# 7|
00000f80  c2 20 58 c7 a5 24 f0 08  a9 03 85 90 c6 0a d0 30  |. X..$.........0|
00000f90  a9 0a 85 23 a9 00 85 90  a0 20 20 ae cf e6 90 a0  |...#.....  .....|
00000fa0  40 20 ae cf e6 90 a0 00  20 ae cf 4c 4f d0 b9 00  |@ ...... ..LO...|
00000fb0  03 f0 07 b9 01 03 c9 05  f0 01 60 68 68 20 87 d0  |..........`hh ..|
00000fc0  20 60 d2 a5 20 d0 0a ad  17 40 29 08 d0 f5 4c 7d  | `.. ....@)...L}|
00000fd0  d0 20 60 d2 a5 09 29 e7  85 09 a9 08 a4 90 c0 03  |. `...).........|
00000fe0  f0 02 a9 10 05 09 85 09  8d 01 20 20 37 c2 a0 40  |.......... 7..@|
00000ff0  a6 90 f0 0c e0 01 f0 06  e0 02 f0 14 d0 15 a0 00  |................|
00001000  e8 b9 00 03 f0 ee b9 01  03 c9 05 d0 e7 20 87 d0  |............. ..|
00001010  20 60 d2 a5 20 d0 4a ad  17 40 29 08 d0 f5 a5 90  | `.. .J..@).....|
00001020  c9 03 d0 15 a9 01 8d ff  05 a9 01 85 23 e6 0a 20  |............#.. |
00001030  60 d2 a5 20 f0 fc 4c 65  c7 a2 06 a4 90 d0 05 8e  |`.. ..Le........|
00001040  21 03 f0 0b 88 d0 05 8e  41 03 f0 03 8e 01 03 a0  |!.......A.......|
00001050  08 a6 3f e0 02 f0 02 a4  aa 84 23 20 37 c2 4c 2f  |..?.......# 7.L/|
00001060  d0 a0 40 a6 90 f0 05 ca  d0 13 a0 00 e6 90 b9 00  |..@.............|
00001070  03 f0 ee b9 01 03 c9 05  d0 e7 4c ee cf a5 90 c9  |..........L.....|
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00001080  03 d0 cc a9 02 d0 9f b9  06 03 85 91 b9 07 03 85  |................|
00001090  92 b9 08 03 0a a8 b9 80  e3 85 10 b9 81 e3 85 11  |................|
000010a0  a0 00 a2 04 b1 10 c9 aa  d0 01 60 c8 18 65 91 9d  |..........`..e..|
000010b0  00 02 de 00 02 e8 a9 ec  9d 00 02 e8 a9 00 9d 00  |................|
000010c0  02 e8 b1 10 18 65 92 c8  9d 00 02 e8 4c a4 d0 a4  |.....e......L...|
000010d0  7c f0 22 88 f0 1f 88 f0  19 88 f0 1a a9 00 85 7c  ||.”.............||
000010e0  a9 24 8d 00 05 a9 fc a0  08 99 01 05 88 10 fa 4c  |.$.............L|
000010f0  20 d1 20 4e d1 60 a9 00  85 7c a0 28 a5 7d 4a 4a  | . N.`...|.(.}JJ|
00001100  4a 4a f0 08 aa a0 2c ca  f0 02 a0 30 a9 24 8d 00  |JJ....,....0.$..|
00001110  05 a2 01 20 33 d1 a5 7d  29 0f 0a 0a a8 20 33 d1  |... 3..}).... 3.|
00001120  a2 8e a0 20 86 00 84 01  a2 00 a0 05 86 02 84 03  |... ............|
00001130  4c 1c c4 b9 56 e8 9d 00  05 e8 b9 57 e8 9d 00 05  |L...V......W....|
00001140  e8 b9 58 e8 9d 02 05 b9  59 e8 9d 03 05 60 a5 7e  |..X.....Y....`.~|
00001150  85 03 a4 7f b9 5a e3 c8  c9 aa d0 04 a0 00 f0 f4  |.....Z..........|
00001160  84 7f 38 20 8c c6 85 7e  b0 19 a5 7d 85 03 38 a9  |..8 ...~...}..8.|
00001170  01 20 8c c6 85 7d b0 0b  a0 01 84 7c 84 73 88 84  |. ...}.....|.s..|
00001180  7e 84 7d 60 20 58 c7 20  26 c2 20 46 c7 a2 97 a0  |~.}` X. &. F....|
00001190  e8 20 47 c2 a9 0d 85 23  20 46 c7 a0 00 84 94 a2  |. G....# F......|
000011a0  02 8a 48 b9 33 e1 85 46  c8 b9 33 e1 85 47 c8 b9  |..H.3..F..3..G..|
000011b0  33 e1 85 45 c8 98 48 a9  01 85 44 20 4b ce 20 46  |3..E..H...D K. F|
000011c0  c7 68 a8 68 aa ca 10 d9  e6 26 a4 30 c0 02 d0 04  |.h.h.....&.0....|
000011d0  a9 3d d0 02 a9 3b 85 2d  20 79 d2 20 46 c7 4c 65  |.=...;.- y. F.Le|
000011e0  c7 a9 00 85 94 a0 00 84  80 20 dc cb 20 2f d2 20  |......... .. /. |
000011f0  ec cb e6 80 a0 20 20 dc  cb 20 2f d2 20 ec cb e6  |.....  .. /. ...|
00001200  80 a0 40 20 dc cb 20 2f  d2 20 ec cb 20 b9 cb 20  |..@ .. /. .. .. |
00001210  3b ce a2 13 bd 45 e1 9d  ec 02 ca 10 f7 a5 2d f0  |;....E........-.|
00001220  0b c9 3d d0 09 20 c4 d2  c6 2d d0 02 85 26 60 a5  |..=.. ...-...&`.|
00001230  41 20 4d c3 38 d2 5a d2  a5 80 0a 0a 38 e5 80 aa  |A M.8.Z.....8...|
00001240  bd 3c e1 85 46 e8 bd 3c  e1 85 47 e8 bd 3c e1 85  |.<..F..<..G..<..|
00001250  5a 85 45 a9 01 85 44 85  41 60 20 a4 ca 4c 4b ce  |Z.E...D.A` ..LK.|
00001260  a9 00 85 20 85 22 60 a5  2d d0 04 a5 1a 85 25 60  |... .”`.-.....%`|
00001270  86 1a 85 2d a9 05 85 25  60 a0 00 98 99 00 03 c8  |...-...%`.......|
00001280  d0 fa 60 a2 c0 d0 02 a2  60 a9 00 95 3f ca d0 fb  |..`.....`...?...|
00001290  60 a9 01 d0 1a a9 02 d0  16 a9 04 d0 12 a9 08 d0  |`...............|
000012a0  0e a9 10 d0 0a a9 20 d0  06 a9 40 d0 02 a9 80 05  |...... ...@.....|
000012b0  f0 85 f0 60 a9 01 d0 1a  a9 02 d0 16 a9 04 d0 12  |...`............|
000012c0  a9 08 d0 0e a9 10 d0 0a  a9 20 d0 06 a9 40 d0 02  |......... ...@..|
000012d0  a9 80 05 f1 85 f1 60 a9  01 d0 15 20 fd d2 a9 02  |......`.... ....|
000012e0  d0 0e a9 04 d0 0a a9 08  d0 06 a9 40 d0 02 a9 80  |...........@....|
000012f0  05 f2 85 f2 60 a9 00 f0  b8 a9 00 f0 d7 a9 00 f0  |....`...........|
00001300  f1 20 46 c7 20 21 c2 20  31 c2 20 46 c7 a2 06 a0  |. F. !. 1. F....|
00001310  ea 20 47 c2 20 c3 d7 a5  aa 85 23 20 46 c7 a9 0c  |. G. .....# F...|
00001320  85 ac 20 26 d7 20 59 d8  20 83 d7 20 46 c7 20 83  |.. &. Y. .. F. .|
00001330  d7 20 46 c7 20 b6 cc 20  09 d6 a2 09 20 aa c7 e6  |. F. .. .... ...|
00001340  b2 a9 2c 85 ac 4c 2a d7  20 87 d2 20 79 d2 ee 00  |..,..L*. .. y...|
00001350  03 ee 20 03 e6 99 a9 05  85 89 a9 0a 85 25 60 20  |.. .........%` |
00001360  3e cf 20 6c cf 20 6c d3  ea ea ea 60 a9 04 85 94  |>. l. l....`....|
00001370  a0 00 84 80 ad 00 03 f0  09 20 dc cb 20 d1 d3 20  |......... .. .. |
00001380  ec cb e6 80 ad 20 03 f0  0b a0 20 20 dc cb 20 d1  |..... ....  .. .|
00001390  d3 20 ec cb 20 b9 cb 20  b5 d3 ad 00 03 d0 13 ad  |. .. .. ........|
000013a0  20 03 d0 0e a5 73 d0 04  a5 aa 85 23 c6 99 a9 04  | ....s.....#....|
000013b0  85 25 4c 3b ce a5 74 f0  17 a9 00 85 74 a2 02 bd  |.%L;..t.....t...|
000013c0  64 e3 a8 a9 07 d9 01 03  f0 06 ca 10 f2 20 e6 d2  |d.......... ..|
000013d0  60 a5 41 20 4d c3 f2 d3  b0 d4 c7 d4 3c c9 f1 d4  |`.A M.......<...|
000013e0  fd d4 38 d5 5e d5 6b d5  d4 ca 7b d5 a1 d5 c4 d5  |..8.^.k...{.....|
000013f0  81 cb a6 89 d0 04 86 40  f0 0d ca 86 89 20 5f d4  |.......@..... _.|
00001400  20 08 d4 a5 aa 85 23 60  20 bd c6 a0 03 c9 55 90  | .....#` .....U.|
00001410  06 88 c9 aa 90 01 88 84  5a 84 5b 20 bd c6 c9 33  |........Z.[ ...3|
00001420  b0 11 a5 5b 09 04 85 5a  09 80 85 5b 20 3d d4 c6  |...[...Z...[ =..|
00001430  5a d0 03 20 3d d4 c6 5a  a5 5a 85 45 60 20 fd d5  |Z.. =..Z.Z.E` ..|
00001440  a5 5b dd 1b 03 d0 17 29  84 85 0c a5 5b 29 03 a8  |.[.....)....[)..|
00001450  88 d0 02 a0 03 98 05 0c  85 5b 29 07 85 5a 60 20  |.........[)..Z` |
00001460  f8 c8 a5 b1 0a aa bd 10  e2 85 10 e8 bd 10 e2 85  |................|
00001470  11 20 bd c6 29 07 85 0c  0a a8 b1 10 85 14 c8 b1  |. ..)...........|
00001480  10 85 15 20 fd d5 a0 03  b1 14 dd 09 03 d0 0a a4  |... ............|
```

```
00001490  0c 88 10 02 a0 07 98 10  dd a0 07 b1 14 99 46 00  |..............F.|
000014a0  88 10 f8 a5 a6 a8 0a 0a  85 4e b9 2e e3 85 4f 60  |.........N....O`|
000014b0  20 bd c6 29 7f a2 05 a4  4d d0 06 a0 0b 84 45 a2  | ..)....M.....E.|
000014c0  02 20 8e cb 4c 4b ce 20  20 d5 20 d7 d2 a5 47 c5  |. ..LK.  . ...G.|
000014d0  4a 20 e7 d4 f0 0e a5 4a  85 47 a9 1e a2 03 20 8e  |J .....J.G.... .|
000014e0  cb 20 db d2 4c 4b ce a5  4c 85 00 a9 00 2a 45 00  |. ..LK..L....*E.|
000014f0  60 a5 5a 85 45 e6 41 20  4b ce 4c ea d2 a5 4d d0  |`.Z.E.A K.L...M.|
00001500  0b c6 4f d0 56 a5 4a 85  47 4c f0 c9 20 20 d5 20  |..O.V.J.GL..  . |
00001510  d7 d2 a5 47 c5 4a 20 e7  d4 f0 40 20 db d2 d0 e5  |...G.J ...@ ....|
00001520  a5 2f 29 03 18 65 4e aa  bd 1a e3 a6 4c f0 03 20  |./)..eN.....L.. |
00001530  38 cf 18 65 47 85 47 60  a5 5b 10 0f 20 61 d6 20  |8..eG.G`.[.. a. |
00001540  db d2 20 9d d2 c6 99 a2  08 d0 0e 20 06 d6 20 db  |.. ........ .. .|
00001550  d2 20 99 d2 20 a9 d2 a2  07 86 41 4c 4b ce 20 6b  |. .. .....ALK. k|
00001560  ca c6 5e d0 f6 a9 01 85  74 d0 74 20 a4 ca 20 c6  |..^.....t.t .. .|
00001570  ca c6 5f d0 e6 a9 01 85  50 d0 0a a5 5b 30 60 20  |.._.....P...[0` |
00001580  db d2 20 61 d6 a9 01 85  5d a5 5a 85 45 c6 99 a9  |.. a....].Z.E...|
00001590  0c 85 41 d0 c6 a2 00 a5  47 c5 4b 90 01 e8 86 4c  |..A.....G.K....L|
000015a0  60 20 d7 d2 a9 0b 85 45  20 20 d5 a5 47 c5 4b 20  |` .....E  ..G.K |
000015b0  e7 d4 f0 0d 20 bd c6 29  1f a2 00 20 8e cb 20 db  |.... ..)... .. .|
000015c0  d2 4c 4b ce 20 c6 ca c6  50 d0 2f 20 e7 ca d0 28  |.LK. ...P./ ...(|
000015d0  20 fd d5 a9 01 85 99 9d  00 03 a9 00 9d 01 03 20  | .............. |
000015e0  95 d5 a4 b3 c0 10 90 0c  20 fd d5 e6 73 a9 00 85  |........ ...s...|
000015f0  40 9d 00 03 a0 0b 84 41  e6 50 4c 4b ce a2 20 a4  |@......A.PLK.. .|
00001600  80 f0 02 a2 00 60 20 87  cc a2 05 bd 01 05 9d 90  |.....` .........|
00001610  04 ca 10 f7 a2 c8 a0 20  20 30 d6 20 d5 cc 20 bb  |.......  0. .. .|
00001620  c7 a2 05 bd 01 05 9d a2  04 ca 10 f7 a2 c8 a0 b0  |................|
00001630  86 19 20 3e d6 20 44 d8  20 56 d6 4c 44 d8 a2 05  |.. >. D. V.LD...|
00001640  bd 01 05 9d 03 05 ca 10  f7 a6 19 8e 00 05 8c 01  |................|
00001650  05 a9 06 8d 02 05 a9 00  85 02 a9 05 85 03 4c e2  |..............L.|
00001660  c4 a9 0c 85 23 20 fd d5  bd 00 03 f0 07 e6 89 a9  |....# ..........|
00001670  00 9d 00 03 20 04 ce ad  01 05 8d c0 04 ad 02 05  |.... ...........|
00001680  8d c1 04 a2 d0 a0 88 86  19 84 18 20 9b d6 a6 19  |........... ....|
00001690  a4 18 20 44 d8 20 9b d6  4c 44 d8 86 00 84 01 20  |.. D. ..LD..... |
000016a0  ae c5 a6 04 a4 05 4c 24  d1 a5 28 d0 20 a4 27 d0  |......L$..(. .'.|
000016b0  1c a6 b1 e0 04 d0 03 20  77 cd a9 01 85 27 20 cc  |....... w....' .|
000016c0  d2 20 eb d6 20 2a d7 20  83 d7 20 b1 d7 a5 28 c9  |. .. *. .. ...(.|
000016d0  02 f0 06 a9 01 85 28 d0  11 a9 00 85 27 85 28 20  |......(.....'.( |
000016e0  46 c7 a5 aa 85 23 a9 09  85 25 60 a6 ae bd f1 e9  |F....#...%`.....|
000016f0  c9 01 d0 06 a2 00 86 ae  f0 f3 85 18 38 e5 0a 85  |............8...|
00001700  19 a5 18 c5 0a d0 17 e6  ae a5 19 4a 4a 4a aa a4  |...........JJJ..|
00001710  ac c8 c0 58 d0 02 a0 00  84 ac ca d0 f2 60 e6 0a  |...X.........`..|
00001720  20 46 c7 4c 01 d7 a0 20  d0 07 a5 08 4a b0 f7 a0  | F.L... ....J...|
00001730  24 84 07 a5 ac 48 a5 0a  4a 4a 4a 85 ad 85 06 a5  |$....H..JJJ.....|
00001740  ac 0a aa bd f0 ea 85 02  e8 bd f0 ea 85 03 a5 07  |................|
00001750  85 01 a5 06 85 00 20 84  c4 e6 ac c8 b1 02 d0 02  |...... .........|
00001760  85 ac a4 06 c8 c0 20 d0  0b a5 08 4a 90 02 a0 24  |...... ....J...$|
00001770  84 07 a0 00 84 06 20 46  c7 a5 06 c5 ad d0 c0 68  |...... F.......h|
00001780  85 ac 60 a5 b0 c9 2a d0  04 a9 00 85 b0 0a aa bd  |..`...*.........|
00001790  99 ed 85 02 e8 bd 99 ed  85 03 20 14 c6 e6 b0 a5  |.......... .....|
000017a0  b0 c9 13 f0 05 c9 28 f0  01 60 20 46 c7 a5 b0 d0  |......(..` F....|
000017b0  dc a4 b1 c8 c0 05 d0 08  20 e0 d7 20 c3 d7 a0 00  |........ .. ....|
000017c0  84 b1 60 a6 ab d0 16 a2  02 86 ab a6 a9 bd 76 e3  |..`...........v.|
000017d0  c9 aa d0 04 a2 00 f0 f5  e8 86 a9 85 aa c6 ab 60  |...............`|
000017e0  20 52 cc a2 03 bd 01 05  9d 74 04 ca 10 f7 a2 03  | R.......t......|
000017f0  bd 05 05 9d 9a 04 ca 10  f7 60 a5 af c9 02 b0 20  |.........`..... |
00001800  20 4b d8 20 e2 c4 a5 29  18 69 10 85 29 8d 00 02  | K. ...).i..)...|
00001810  c8 e6 af b1 02 d0 2c a9  b6 85 29 8d 00 02 d0 23  |......,...)....#|
00001820  e9 02 d0 08 a6 0a 86 1e  a6 0b 86 1f 20 4b d8 20  |............ K. |
00001830  44 d8 20 e2 c4 20 44 d8  c8 e6 af b1 02 d0 04 85  |D. .. D.........|
00001840  af e6 28 60 a5 08 49 01  85 08 60 0a aa bd 59 ea  |..(`..I...`...Y.|
00001850  85 02 e8 bd 59 ea 85 03  60 a5 af 20 4b d8 20 e2  |....Y...`.. K. .|
00001860  c4 20 46 c7 e6 af c8 b1  02 d0 ee 85 af 60 20 46  |. F.........` F|
00001870  c7 20 21 c2 20 59 d8 a2  1e a0 ea 20 47 c2 a2 34  |. !. Y..... G..4|
00001880  a0 ea 20 47 c2 20 46 c7  20 bb c7 a9 08 85 23 a2  |.. G. F. .....#.|
00001890  0e 4c aa c7 20 87 d2 20  79 d2 ee 00 03 e6 99 a9  |.L.. .. y.......|
```

```
000018a0  05 85 8a 20 11 cc a2 0f  a9 06 4c 70 d2 20 3e cf  |... ......Lp. >.|
000018b0  20 6c cf 20 ba d8 ea ea  ea 60 a9 00 85 94 85 80  | l. .....`......|
000018c0  ad 00 03 f0 0b a0 00 20  dc cb 20 1f d9 20 ec cb  |....... .. .. ..|
000018d0  e6 80 ad 20 03 f0 0b a0  20 20 dc cb 20 1f d9 20  |... ....  .. .. |
000018e0  ec cb e6 80 ad 40 03 f0  0b a0 40 20 dc cb 20 1f  |.....@....@ .. .|
000018f0  d9 20 ec cb ac 00 03 d0  13 ac 20 03 d0 0e ac 40  |. ........ ....@|
00001900  03 d0 09 a5 2b d0 05 20  db d2 e6 25 20 b9 cb a5  |....+.. ...% ...|
00001910  2b d0 06 85 8c a9 0f 85  8b 20 19 dc 4c 3b ce a5  |+........ ..L;..|
00001920  41 20 4d c3 38 d9 64 c7  64 c7 64 c7 64 c7 b3 d9  |A M.8.d.d.d.d...|
00001930  b7 db ec db 64 c7 f7 db  a6 b3 e0 10 90 11 a9 00  |....d...........|
00001940  8d 00 03 8d 20 03 8d 40  03 85 40 85 94 f0 10 a6  |.... ..@..@.....|
00001950  8a d0 04 86 40 f0 08 c6  8a 20 60 d9 20 a5 d2 60  |....@.... `. ..`|
00001960  a2 1f bd 79 e1 95 40 ca  10 f8 a5 a7 85 00 0a 0a  |...y..@.........|
00001970  18 65 00 aa bd a1 e1 85  4a e8 bd a1 e1 85 4b e8  |.e......J.....K.|
00001980  bd a1 e1 85 4e e8 bd a1  e1 85 4f e8 bd a1 e1 85  |....N.....O.....|
00001990  50 a2 01 b5 4f 95 55 b5  4a 95 53 ca 10 f5 20 bd  |P...O.U.J.S... .|
000019a0  c6 29 03 0a aa e8 a0 01  bd 99 e1 99 51 00 ca 88  |.).........Q...|
000019b0  10 f6 60 20 58 db 20 85  db 20 fd d9 20 c8 d9 20  |..` X. .. .. .. |
000019c0  3a da ea ea ea 4c 4b ce  a5 5a f0 03 20 d0 d9 60  |:....LK..Z.. ..`|
000019d0  a2 02 b5 45 48 ca 10 fa  a2 01 b5 57 95 46 ca 10  |...EH......W.F..|
000019e0  f9 a2 19 a5 5a c9 03 b0  02 a2 18 86 45 20 4b ce  |....Z.......E K.|
000019f0  a2 00 68 95 45 e8 e0 03  d0 f8 c6 5a 60 a2 05 a5  |..h.E......Z`...|
00001a00  59 4a b0 05 ca d0 fa 85  5e a6 5f d0 24 a6 5e bd  |YJ......^._.$.^.|
00001a10  dd e1 85 5f a2 18 a0 10  a5 5d 10 04 a2 0f a0 17  |..._.....]......|
00001a20  86 00 84 01 a5 45 18 65  5d c5 00 d0 02 a5 01 85  |.....E.e].......|
00001a30  45 c6 5f a6 59 f0 02 c6  59 60 a9 07 85 00 a5 00  |E._.Y...Y`......|
00001a40  0a 0a aa a8 a5 46 20 f5  da a5 47 20 f5 da 98 aa  |.....F ...G ....|
00001a50  a5 5c 20 0c db d0 03 4c  db da a6 00 d0 15 20 38  |.\ ....L...... 8|
00001a60  db a5 50 30 6f 20 04 ce  20 e2 d2 a9 23 85 45 e6  |..P0o .. ...#.E.|
00001a70  5b d0 61 a5 50 10 14 a5  4f 49 ff 18 69 01 85 4f  |[.a.P...OI..i..O|
00001a80  a5 50 49 ff 69 00 85 50  4c 95 d2 ca bd 09 e2 85  |.PI.i..PL.......|
00001a90  03 c9 01 d0 02 e6 8c aa  20 1c db a5 00 48 20 8e  |........ ....H .|
00001aa0  cc 20 38 db 20 a1 d2 68  c9 05 b0 28 aa ca a5 47  |. 8. ..h...(...G|
00001ab0  38 fd 05 e2 10 0a 20 38  cf 4a 20 38 cf 4c c1 da  |8..... 8.J 8.L..|
00001ac0  4a 18 7d 05 e2 85 47 a9  24 85 45 a2 07 86 41 a9  |J.}...G.$.E...A.|
00001ad0  3c 85 43 60 a9 1e a2 00  4c 10 dc a6 00 e0 05 b0  |<.C`....L.......|
00001ae0  aa a5 4a 49 ff 18 69 01  85 4a a5 4b 49 ff 69 00  |..JI..i..J.KI.i.|
00001af0  85 4b 4c 95 d2 dd e5 e1  90 08 e8 dd e5 e1 b0 02  |.KL.............|
00001b00  e8 60 68 68 c6 00 30 03  4c 3e da 60 a0 01 dd e5  |.`hh..0.L>.`....|
00001b10  e1 90 07 e8 dd e5 e1 b0  01 88 98 60 a9 01 e0 03  |...........`....|
00001b20  f0 0b 0a e0 08 f0 06 0a  e0 50 f0 01 0a 49 ff 25  |.........P...I.%|
00001b30  8b 85 8b a9 78 85 2b 60  a5 8a d0 1b a6 81 9d 01  |....x.+`........|
00001b40  03 a2 02 bd 61 e3 a8 a9  05 d9 01 03 f0 09 ca 10  |....a...........|
00001b50  f2 20 db d2 20 f4 ff 60  a9 0a 38 e9 05 aa a0 00  |. .. ..`..8.....|
00001b60  b5 49 10 01 88 18 75 4a  95 4a 85 15 98 a0 00 75  |.I....uJ.J.....u|
00001b70  4b 95 4b 10 01 88 06 15  75 4c 95 4c 98 75 4d 95  |K.K.....uL.L.uM.|
00001b80  4d 8a d0 d6 60 a5 4d 85  47 a5 4c a2 02 0a 26 47  |M...`.M.G.L...&G|
00001b90  ca d0 fa a5 46 85 5c a5  52 85 46 a5 51 a2 05 0a  |....F.\.R.F.Q...|
00001ba0  26 46 ca d0 fa a5 47 c9  b0 b0 0b a6 80 bd 61 e3  |&F....G.......a.|
00001bb0  a8 a9 01 99 00 03 60 a9  e0 85 59 a9 04 85 5a a5  |......`...Y...Z.|
00001bc0  5d 20 38 cf 85 5d a2 00  86 5f e8 b5 55 95 4f b5  |] 8..]..._..U.O.|
00001bd0  53 95 4a b5 46 95 57 ca  10 f1 a9 01 85 03 20 8e  |S.J.F.W....... .|
00001be0  cc c6 41 20 4b ce 20 a5  d2 4c 95 d2 c6 43 d0 04  |..A K. ..L...C..|
00001bf0  a9 00 85 41 4c 4b ce a5  43 d0 06 e6 43 a5 42 85  |...ALK..C...C.B.|
00001c00  41 c6 43 a5 5b f0 11 a5  41 d0 02 85 40 4c 4b ce  |A.C.[...A...@LK.|
00001c10  86 42 85 43 a9 09 85 41  60 a9 00 85 46 85 47 a9  |.B.C...A`...F.G.|
00001c20  1f 85 45 a2 03 86 40 a5  8b 05 84 85 41 a6 45 e0  |..E...@.....A.E.|
00001c30  22 d0 04 a6 8c f0 07 46  41 90 03 20 4b ce e6 45  |"......FA.. K..E|
00001c40  c6 40 10 e9 60 a9 00 85  41 a2 06 a4 b3 c0 10 b0  |.@..`...A.......|
00001c50  05 20 66 dc a2 12 20 70  d2 4c 3b ce 20 77 cd a2  |. f... p.L;. w..|
00001c60  0e a9 0c 4c 70 d2 20 b4  cd 20 c0 d2 a9 12 a6 b0  |...Lp. .. ......|
00001c70  e0 05 d0 1c 20 f9 d2 20  ee d2 a0 1d a6 b2 e0 06  |.... .. ........|
00001c80  90 01 c8 84 45 20 4b ce  a9 24 a4 b0 d0 02 a9 18  |....E K..$......|
00001c90  60 dd dc e2 dc e7 dc ec  dc f1 dc fa dc 03 dd 0c  |`...............|
00001ca0  dd 19 dd 26 dd 2b dd 30  dd 35 dd 3a dd 3f dd e1  |...&.+.0.5.:.?..|
```

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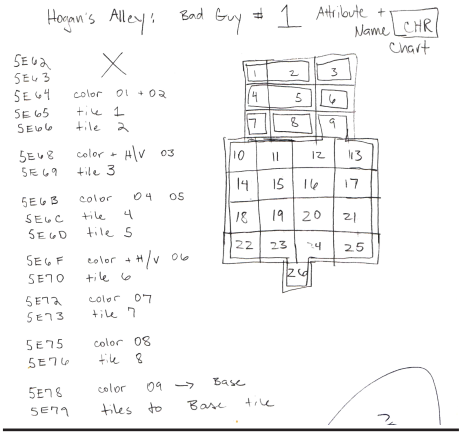
00001cb0  dc 44 dd 49 dd 4e dd 53  dd 58 dd 5d dd 62 dd 67  |.D.I.N.S.X.].b.g|
00001cc0  dd 71 dd 76 dd 7b dd 84  dd 89 dd 8e dd 93 dd 9c  |.q.v.{..........|
00001cd0  dd a1 dd a6 dd ab dd b0  dd 6c dd b5 dd de 52 e0  |.........l....R.|
00001ce0  f4 00 de 7c e0 f4 00 de  9c e0 f4 00 de c0 e0 f4  |...|............|
00001cf0  00 de ee e0 f4 df 48 ed  fc 00 df 1c e0 f4 df 48  |......H........H|
00001d00  ec fc 00 df 52 e0 f0 df  4d 18 fc 00 df 70 e0 f0  |....R...M....p..|
00001d10  df 48 ed fc df 4d 18 fc  00 df 8e e0 f0 df 4d 18  |.H...M........M.|
00001d20  fc df 48 ec fc 00 df ac  e0 f8 00 df c1 e0 f8 00  |..H.............|
00001d30  df d6 e0 fc 00 df e4 e0  f4 00 e0 0e e0 f0 00 e0  |................|
00001d40  2c 2b f4 00 e0 33 f8 f8  00 e0 3b f8 f8 00 e0 43  |,+...3....;....C|
00001d50  f8 f8 00 e0 4b f8 f8 00  e0 53 f8 f8 00 e0 5b f8  |....K....S....[.|
00001d60  f8 00 e0 63 f8 f8 00 e0  6b f8 f8 00 e0 e7 f8 f7  |...c....k.......|
00001d70  00 e0 73 00 f8 00 e0 7b  00 f8 00 e0 8e 10 dc e0  |..s....{........|
00001d80  83 f8 e4 00 e0 9b d8 e8  00 e0 a7 d8 f0 00 e0 b0  |................|
00001d90  08 d0 00 e0 c1 e0 ec e0  b0 08 d0 00 e0 ca 18 10  |................|
00001da0  00 e0 d1 50 10 00 e0 d8  88 10 00 e0 e0 90 60 00  |...P..........`.|
00001db0  e0 2c e6 f4 00 e0 ef d0  ec 00 00 00 00 08 00 10  |.,..............|
00001dc0  08 00 08 08 08 10 10 00  10 08 10 10 18 fc 18 04  |................|
00001dd0  18 0c 18 14 20 fc 20 04  20 0c 20 14 28 fc 28 04  |.... . . . .(.(.|
00001de0  28 0c 28 14 30 fc 30 04  30 0c 30 14 38 08 00 00  |(.(.0.0.0.0.8...|
00001df0  00 08 08 00 08 08 10 00  10 08 18 00 18 08 20 00  |.............. .|
00001e00  20 08 28 00 28 08 30 00  30 08 38 04 00 00 08 00  | .(.(.0.0.8.....|
00001e10  10 00 18 00 20 00 28 00  30 00 38 00 00 00 00 08  |.... .(.0.8.....|
00001e20  08 00 08 08 00 00 00 08  00 10 00 18 00 20 00 28  |............. .(|
00001e30  00 30 00 38 00 40 00 48  00 00 fe 08 fc 10 fa 18  |.0.8.@.H........|
00001e40  f8 20 f6 28 f4 30 f2 38  f0 40 ee 48 ec 50 ea 58  |. .(.0.8.@.H.P.X|
00001e50  e8 60 00 fd 01 00 01 fd  01 02 fd 01 03 04 fd 01  |.`..............|
00001e60  05 fd 01 06 fd 01 07 fd  01 08 09 0a 0b 0c 0d ec  |................|
00001e70  ec 0e 0f 10 11 12 13 14  15 16 eb ff 00 fd 01 30  |...............0|
00001e80  31 32 33 34 35 36 37 38  39 3a 3b 3c 3d ee ee 3e  |123456789:;<=..>|
00001e90  3f 40 41 42 43 44 45 46  fd 01 eb ff 00 fd 01 00  |?@ABCDEF........|
00001ea0  01 fd 01 02 fd 01 03 04  05 06 07 08 09 0a 0b 0c  |................|
00001eb0  0d ec ec 0e 0f 10 11 12  13 14 15 16 fd 01 eb ff  |................|
00001ec0  00 fd 01 5c 5d fd 41 5c  fd 01 5e 5f 60 61 62 fd  |...\].A\..^_`ab.|
00001ed0  41 61 fd 01 63 64 fd 01  65 66 fd 01 67 68 69 fd  |Aa..cd..ef..ghi.|
00001ee0  01 6a fd 01 6b 6c 6d 6e  58 59 5a 5b eb ff 00 fd  |.j..klmnXYZ[....|
00001ef0  02 17 18 fd 02 19 fd 02  1a 1b fd 02 1c fd 02 1d  |................|
00001f00  1e fd 02 1f fd 02 20 21  fd 02 22 23 fd 02 24 25  |...... !..”#..$%|
00001f10  26 27 28 29 2a 2b 2c ec  ec 2d eb ff 00 fd 03 70  |&’()*+,..-.....p|
00001f20  71 fd 43 70 fd 03 72 73  fd 43 72 fd 03 74 75 fd  |q.Cp..rs.Cr..tu.|
00001f30  43 74 fd 03 76 77 78 79  7a 7b 7c 7d 7e 7f 80 81  |Ct..vwxyz{|}~...|
00001f40  82 83 84 85 fd 02 eb ff  01 fd 01 86 ff 01 fd 02  |................|
00001f50  eb ff 06 74 4a 4b 4c 4d  4e 4f 50 51 52 53 54 55  |...tJKLMNOPQRSTU|
00001f60  56 57 58 59 5a 5b 5c 5d  5e 5f 60 61 62 63 64 65  |VWXYZ[\]^_`abcde|
00001f70  06 74 ff 30 31 ff 32 33  34 35 36 37 38 39 3a 3b  |.t.01.23456789:;|
00001f80  3c 3d 3e 3f 40 41 42 43  44 45 46 47 48 49 06 74  |<=>?@ABCDEFGHI.t|
00001f90  ff 66 67 ff ff 68 69 ff  6a 6b 6c 6d 6e 6f 70 71  |.fg..hi.jklmnopq|
00001fa0  72 73 74 75 76 77 78 79  7a 7b 7c 7d 01 fd 00 a0  |rstuvwxyz{|}....|
00001fb0  a4 a1 a5 a2 a6 a3 ee a3  ee a3 ee a3 ee fd 02 eb  |................|
00001fc0  ff 01 fd 00 a7 aa a8 ab  a9 ac ec ad ec ad ec ad  |................|
00001fd0  ec ad fd 02 eb ff 02 fd  00 9d 9e 9f 9e 9e 9e 9e  |................|
00001fe0  fd 02 eb ff 00 fd 00 87  88 fd 40 87 fd 00 89 8a  |..........@.....|
00001ff0  8b 8c 8d 8e 8f 90 91 fd  40 8f fd 00 92 93 94 95  |........@.......|
00002000  96 97 98 99 9a 9b 9c fd  40 9a fd 02 eb ff 06 74  |........@......t|
00002010  ff ff ff ff ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
00002020  ff ff ff ff ff ff ff ff  ff ff ff ff 00 fd 03 ae  |................|
00002030  af b0 ff 03 fd 81 bb bc  b9 ba ff 03 fd 81 b3 b4  |................|
00002040  b1 b2 ff 03 fd c1 bc bb  ba b9 ff 03 fd 41 b6 b5  |.............A..|
00002050  b8 b7 ff 03 fd 41 ba b9  bc bb ff 03 fd 01 b1 b2  |.....A..........|
00002060  b3 b4 ff 03 fd 01 b9 ba  bb bc ff 03 fd 01 b5 b6  |................|
00002070  b7 b8 ff 03 fd 00 bd be  bf c0 ff 03 fd 00 c1 c2  |................|
00002080  c3 c4 ff 04 fd 00 e0 df  e4 e4 e9 ef ef ff 04 fd  |................|
00002090  00 de da e0 dd fe e2 e7  dd e3 ff 04 fd 00 e3 e2  |................|
000020a0  e6 e1 dc fe ef ef ff 04  fd 00 de e2 e2 dc c7 ff  |................|
000020b0  05 fd 00 e4 ea da e3 f0  e4 ea e2 e2 e5 dd e3 c7  |................|
```

[9] [10] [11] [12]

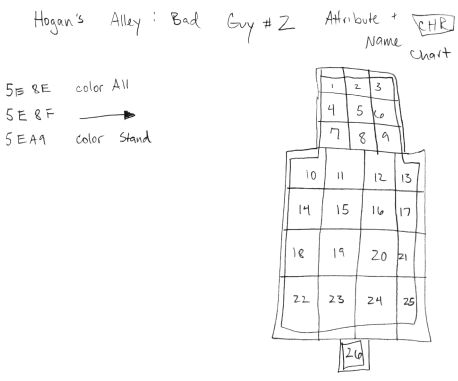
## 9. Bad Guy #1 Attribute and Name CHR Chart..



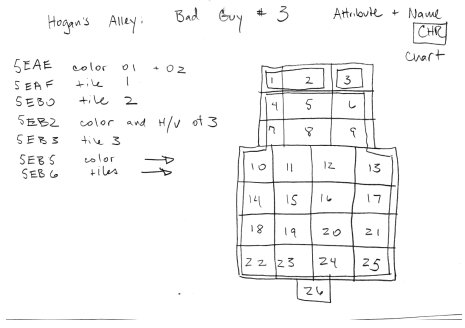

## 10. CHR and PRG markers for Bad Guy #1 Attribute and Name CHR Chart.

| Hex | PRG | PRG (-4010) | Desc |
|---|---|---|---|
| 01 | 5E64 | 1E54 | Color |
| 00 | 5E65 | 1E55 | Tile 1 of Andy Warhol |
| 01 | 5E66 | 1E56 | Tile 2 of Andy Warhol |
| FD | 5E67 | 1E57 | ??? |
| 01 | 5E68 | 1E58 | Color and H/V symmetry bits |
| 02 | 5E69 | 1E59 | Tile 3 of Andy Warhol |
| FD | 5E6A | 1E5A | ??? |
| 01 | 5E6B | 1E5B | Color |
| 03 | 5E6C | 1E5C | Tile 4 of Andy Warhol |
| 04 | 5E6D | 1E5D | Tile 5 of Andy Warhol |
| FD | 5E6E | 1E5E | ??? |
| 01 | 5E6F | 1E5F | H/V symmetry bits |

## 11. Bad Guy #2 Attribute and Name CHR Chart




## 12. Bad Guy #3 Attribute and Name CHR Chart (with scan error).




```
000020c0  ff 05 fd 00 e4 e6 f0 dd  e3 ff 02 fd 02 d3 d0 d0  |................|
000020d0  ff 02 fd 02 d8 d0 d0 ff  02 fd 02 d5 d0 d0 d0 ff  |................|
000020e0  04 fd 02 d1 d0 d0 ff 03  fd 01 c8 c9 ca cb ff 04  |................|
000020f0  fd 00 f0 da e6 e4 dd ff  0c 09 0b 0a aa 7b 9b dd  |.............{..|
00002100  57 be a5 77 da 6b 6e 96  ab e5 9e df f9 ee db ba  |W..w.kn.........|
00002110  66 76 b5 9a 7d 67 a9 af  d9 e6 6d 5e f5 9f 97 fb  |fv..}g....m^....|
00002120  5d f6 e7 f7 ad 69 59 fa  ed de 79 a7 ef 7e b6 56  |]....iY...y..~.V|
00002130  bd 5b b9 a8 40 08 a8 80  07 a8 c0 06 58 40 00 58  |.[..@.......X@.X|
00002140  80 01 58 c0 02 93 86 21  3c 94 86 21 7c bf eb 02  |..X....!<..!|...|
00002150  3c bf eb 02 7c bf eb 02  bc 01 01 03 1e 01 0b 70  |<...|..........p|
00002160  18 00 00 00 00 00 00 00  00 78 00 00 00 00 00 00  |.........x......|
00002170  00 00 00 0b 00 00 01 3c  78 01 05 00 00 01 10 00  |.......<x.......|
00002180  00 02 00 00 e0 00 3f 18  00 f8 00 04 00 00 00 00  |......?.........|
00002190  00 00 e0 00 00 00 01 07  00 80 02 00 04 80 05 00  |................|
000021a0  04 00 e0 18 00 f8 e8 d9  22 7b f6 ac d4 2c 2b f5  |........"{...,+.|
000021b0  00 d0 36 00 f4 be cb 40  f0 f2 cf c7 4a f4 f1 21  |..6....@....J..!|
```

```
000021c0  c4 54 09 f1 ac c0 5e 2b  f0 62 bd 68 59 ef 40 ba  |.T....^+.b.hY.@.|
000021d0  72 91 ee 03 05 07 09 0b  0d 0f 11 13 15 0b 0a 09  |r...............|
000021e0  08 06 04 02 01 c8 f8 00  ff 30 48 00 20 70 88 00  |.........0H. p..|
000021f0  20 a8 c8 00 20 a0 b8 58  78 00 30 00 0b 48 70 00  | ... ..Xx.0..Hp.|
00002200  0b 88 a8 00 0b 10 10 10  68 03 08 50 01 03 08 50  |........h..P...P|
00002210  1a e2 2a e2 3a e2 4a e2  5a e2 6a e2 8a e2 72 e2  |..*.:.J.Z.j...r.|
00002220  8a e2 82 e2 6a e2 8a e2  7a e2 92 e2 a2 e2 9a e2  |....j...z.......|
00002230  a2 e2 aa e2 b2 e2 c2 e2  ba e2 ca e2 d2 e2 ca e2  |................|
00002240  d2 e2 da e2 e2 e2 da e2  ea e2 f2 e2 0a e3 f2 e2  |................|
00002250  fa e2 12 e3 02 e3 f2 e2  fa e2 6a e2 7a e2 72 e2  |..........j.z.r.|
00002260  82 e2 fa e2 0a e3 02 e3  12 e3 42 2c 01 01 48 64  |..........B,..Hd|
00002270  00 00 42 64 01 01 48 2c  01 00 92 2c 03 02 48 64  |..Bd..H,...,..Hd|
00002280  00 00 92 64 03 02 48 2c  01 00 90 e8 00 03 89 74  |...d..H,.......t|
00002290  01 01 3a 6c 00 01 80 94  00 00 3a 94 00 01 80 6c  |..:l......:....l|
000022a0  01 00 3a ac 00 02 c8 ac  00 00 90 4c 00 03 28 04  |..:........L..(.|
000022b0  01 00 95 64 00 04 80 9c  00 00 95 9c 00 04 80 64  |...d...........d|
000022c0  01 00 90 a8 00 05 df f4  00 01 3a 1c 00 01 38 1c  |..........:...8.|
000022d0  00 00 90 18 00 02 4f 64  00 01 38 dc 00 03 a8 dc  |......Od..8.....|
000022e0  01 00 90 70 00 04 af d0  00 01 90 d0 00 04 91 7c  |...p...........||
000022f0  01 01 90 30 00 01 77 8c  00 01 42 9c 01 03 b8 d4  |...0..w...B.....|
00002300  00 00 42 d4 01 03 b8 9c  01 00 92 9c 03 04 b8 d4  |..B.............|
00002310  00 00 92 d4 03 04 b8 9c  01 00 01 01 01 01 01 01  |................|
00002320  01 02 01 02 01 02 01 02  02 02 02 02 02 02 3c 36  |..............<6|
00002330  30 2a 24 00 80 aa 20 05  0b 14 ff 25 20 15 20 15  |0*$... ....% . .|
00002340  12 20 18 15 18 14 12 20  16 12 18 14 10 15 12 09  |. ..... ........|
00002350  14 11 08 13 10 07 12 09  06 aa 17 16 17 aa c0 80  |................|
00002360  40 20 40 00 00 20 40 05  10 20 00 01 20 00 00 01  |@ @.. @.. .. ...|
00002370  20 00 00 01 20 00 05 06  07 0e 0f aa b6 6d db aa  | ... ........m..|
00002380  88 e3 01 e4 70 e4 83 e4  c8 ec c8 f4 c8 fc c8 04  |....p...........|
00002390  c8 0c d0 ec d0 f4 d0 fc  d0 04 d0 0c d8 ec d8 f4  |................|
000023a0  d8 fc d8 04 d8 0c e0 ec  e0 f4 e0 fc e0 04 e0 0c  |................|
000023b0  e8 ec e8 f4 e8 fc e8 04  e8 0c f0 ec f0 f4 f0 fc  |................|
000023c0  f0 04 f0 0c f8 ec f8 f4  f8 fc f8 04 f8 0c 00 ec  |................|
000023d0  00 f4 00 fc 00 04 00 0c  08 ec 08 f4 08 fc 08 04  |................|
000023e0  08 0c 10 ec 10 f4 10 fc  10 04 10 0c 18 ec 18 f4  |................|
000023f0  18 fc 18 04 18 0c 20 ec  20 f4 20 fc 20 04 20 0c  |...... . . . . .|
00002400  aa c0 ec c0 f4 c0 fc c0  04 c0 0c c8 ec c8 f4 c8  |................|
00002410  fc c8 04 c8 0c d0 ec d0  f4 d0 fc d0 04 d0 0c d8  |................|
00002420  ec d8 f4 d8 fc d8 04 d8  0c e0 ec e0 f4 e0 fc e0  |................|
00002430  04 e0 0c e8 ec e8 f4 e8  fc e8 04 e8 0c f0 ec f0  |................|
00002440  f4 f0 fc f0 04 f0 0c f8  ec f8 f4 f8 fc f8 04 f8  |................|
00002450  0c 00 ec 00 f4 00 fc 00  04 00 0c 08 ec 08 f4 08  |................|
00002460  fc 08 04 08 0c 10 ec 10  f4 10 fc 10 04 10 0c aa  |................|
00002470  f4 f4 f4 fc f4 04 fc f4  fc fc fc 04 04 f4 04 fc  |................|
00002480  04 04 aa d8 ec d8 f4 d8  fc d8 04 d8 0c e0 ec e0  |................|
00002490  f4 e0 fc e0 04 e0 0c e8  ec e8 f4 e8 fc e8 04 e8  |................|
000024a0  0c f0 ec f0 f4 f0 fc f0  04 f0 0c f8 ec f8 f4 f8  |................|
000024b0  fc f8 04 f8 0c 00 ec 00  f4 00 fc 00 04 00 0c 08  |................|
000024c0  ec 08 f4 08 fc 08 04 08  0c 10 ec 10 f4 10 fc 10  |................|
000024d0  04 10 0c 18 ec 18 f4 18  fc 18 04 18 0c 20 ec 20  |............. . |
000024e0  f4 20 fc 20 04 20 0c aa  20 64 18 2b fe 2c ff ff  |. . . .. d.+.,..|
000024f0  ff 27 fe fe ff fe ff fe  ff 27 fe 28 2b fe fe fe  |.'.......'.(+...|
00002500  2c ff ff 20 85 15 fe ff  ff ff ff fe ff ff ff fe  |,.. ............|
00002510  ff fe ff fe ff fe ff ff  fe ff ff 20 a5 15 fe ff  |........... ....|
00002520  ff ff ff 25 fe 28 ff fe  fe fe ff fe ff fe ff ff  |...%.(..........|
00002530  fe ff ff 20 c5 17 fe ff  ff ff ff ff ff fe ff fe  |... ............|
00002540  ff fe ff fe ff fe ff ff  fe ff ff ff ff ff 20 e4 18  |.............. ..|
00002550  2b fe 2c ff ff ff fe fe  26 ff fe ff fe ff 25 fe  |+.,.....&.....%.|
00002560  26 ff 2b fe fe fe fe 28  21 03 56 2a 21 1b 01 fe  |&.+....(!.V*!...|
00002570  21 25 17 27 fe 28 2b fe  fe 28 2b fe fe 28 2b fe  |!%.'.(+..(+..(+.|
00002580  2c 27 fe 24 0a 1b 11 18  15 26 21 45 10 fe ff fe  |,'.$.....&!E....|
00002590  ff fe ff fe ff fe ff fe  ff fe ff fe ff 21 65 10  |.............!e.|
000025a0  fe fe fe ff fe ff fe ff  fe ff fe ff 25 fe 26 ff  |............%.&.|
000025b0  21 85 0f fe ff fe ff fe  ff fe ff fe ff fe ff ff  |!...............|
000025c0  fe ff 21 a4 10 2b fe 29  fe 29 fe 29 fe 29 fe fe  |..!..+.).).).)..|
```

```
000025d0  26 ff 2b fe 2c 22 07 17  10 0a 16 0e ff 0a ff ff  |&.+.,".........|
000025e0  10 0a 15 15 0e 1b 22 ff  ff ff ff ff ff ff ff 22  |......"........"|
000025f0  47 17 10 0a 16 0e ff 0b  ff ff 0c 12 1d 22 ff ff  |G.........."..|
00002600  ff ff ff ff ff ff ff ff  ff 22 87 12 10 0a 16 0e  |.........".....|
00002610  ff 0c ff ff 1c 18 1e 19  ff 1c 11 18 1d ff 22 eb  |..............".|
00002620  04 1d 18 19 e5 23 25 16  2d 01 09 08 04 ff 17 12  |.....#%.-.......|
00002630  17 1d 0e 17 0d 18 ff 0c  18 2e 15 1d 0d 2f 23 c0  |............./#.|
00002640  60 00 23 e0 48 ff 23 e8  48 af 23 f1 47 55 00 7f  |`.#.H.#.H.#.GU..|
00002650  c6 00 28 3f c5 01 ca 75  e6 95 e6 b9 e6 dd e6 01  |..(?...u........|
00002660  e7 25 e7 49 e7 b5 e7 d9  e7 e2 e7 ed e7 0e e8 32  |.%.I...........2|
00002670  e8 6d e7 91 e7 3f 00 18  0f 15 11 0f 0f 30 30 0f  |.m...?.......00.|
00002680  0f 21 21 0f 0f 30 27 0f  0f 30 0f 0f 0f 30 10 00  |.!!..0'..0...0..|
00002690  3f 18 48 0f 00 3f 00 20  01 30 29 0f 01 30 10 0f  |?.H..?. .0)..0..|
000026a0  01 3c 11 0f 01 30 27 0f  01 30 10 00 01 30 27 0f  |.<...0'..0...0'.|
000026b0  01 06 27 0f 01 30 36 0f  00 3f 00 20 01 30 29 0f  |..'..06..?. .0).|
000026c0  01 30 10 0f 01 3c 11 0f  01 06 27 0f 01 30 10 00  |.0...<....'..0..|
000026d0  01 30 27 0f 01 06 27 0f  01 30 36 0f 00 3f 00 20  |.0'...'..06..?. |
000026e0  01 30 29 0f 01 30 10 0f  01 3c 11 0f 01 30 36 0f  |.0)..0...<...06.|
000026f0  01 30 10 00 01 30 27 0f  01 06 27 0f 01 30 36 0f  |.0...0'...'..06.|
00002700  00 3f 00 20 0f 30 29 0f  0f 30 10 0f 0f 17 08 10  |.?. .0)..0......|
00002710  0f 00 30 16 0f 30 10 00  0f 30 27 01 0f 06 27 01  |..0..0...0'...'.|
00002720  0f 39 36 0f 00 3f 00 20  0f 30 29 0f 0f 30 10 0f  |.96..?. .0)..0..|
00002730  0f 13 0f 31 0f 0c 21 0c  0f 30 10 00 0f 30 27 01  |...1..!..0...0'.|
00002740  0f 06 27 01 0f 39 36 0f  00 3f 00 20 01 30 29 0f  |..'..96..?. .0).|
00002750  01 30 10 0f 01 06 10 30  01 18 37 16 01 30 10 00  |.0.....0..7..0..|
00002760  01 30 27 0f 01 06 27 0f  01 30 36 0f 00 3f 00 20  |.0'...'..06..?. |
00002770  13 30 29 0f 13 30 10 0f  13 17 08 10 13 00 30 16  |.0)..0........0.|
00002780  13 30 10 00 13 30 27 0f  13 06 27 0f 13 39 36 0f  |.0...0'...'..96.|
00002790  00 3f 00 20 0c 30 29 0f  0c 30 10 0f 0c 29 0a 31  |.?. .0)..0...).1|
000027a0  0c 18 36 12 0c 30 10 00  0c 30 27 0f 0c 06 27 0f  |..6..0...0'...'.|
000027b0  0c 39 36 0f 00 3f 00 20  0f 30 29 0f 0f 30 10 0f  |.96..?. .0)..0..|
000027c0  0f 17 08 10 0f 0f 0f 0f  0f 30 10 00 0f 30 16 01  |.........0...0..|
000027d0  0f 22 30 0f 0f 25 0f 0f  00 3f 00 60 0f 3f 03 01  |."0..%...?.`.?..|
000027e0  30 00 3f 00 60 0f 3f 11  03 30 30 30 00 3f 00 0d  |0.?.`.?..000.?..|
000027f0  22 30 29 0f 22 30 10 0f  22 07 16 0f 22 3f 10 01  |"0)."0.."...."?..|
00002800  22 3f 14 01 22 3f 18 01  22 3f 1c 01 22 00 3f 00  |"?.."?.."?.."?.?.|
00002810  10 16 30 29 0f 16 30 10  0f 16 08 16 35 16 08 06  |..0)..0.....5...|
00002820  0f 3f 10 01 16 3f 14 01  16 3f 18 01 16 3f 1c 01  |.?...?...?...?..|
00002830  16 00 3f 00 20 01 30 30  01 01 30 36 0f 01 06 27  |..?. .00..06...'|
00002840  0f 01 30 27 0f 01 30 10  00 01 30 27 0f 01 06 27  |..0'..0...0'...'|
00002850  0f 01 30 36 0f 00 f7 f8  ea ec fc f1 fc f0 f3 eb  |..06............|
00002860  ea f6 f3 eb f2 ec ed ee  fc f0 e9 ef f2 ec e9 ef  |................|
00002870  ea ec fa f8 fc f0 e9 eb  ea ec e9 eb f2 ec f7 f8  |................|
00002880  ea f9 fc f1 fc 20 f3 eb  ea 21 f4 fb f5 13 27 c0  |..... ...!....'.|
00002890  60 00 27 e0 60 00 00 20  67 52 2a 20 88 11 1c 11  |`.'.`.. gR* ....|
000028a0  18 18 1d ff 0a 17 0d 22  1c ff 18 17 15 22 ff 20  |.......".....". |
000028b0  a7 52 2a 21 e5 16 0a 17  0d 22 e5 0a ff ff 0a 17  |.R*!....."......"|
000028c0  0d 22 e5 0b ff ff 0a 17  0d 22 e5 0c 23 26 15 19  |."........"..#&..|
000028d0  18 19 0e ff ff ff 0f 2f  0f 15 0a 1a ff ff ff 0c  |......./........|
000028e0  18 15 2f ff 23 c0 60 00  23 e0 60 00 23 e1 06 44  |../.#.`.#.`.#..D|
000028f0  11 88 22 cc 33 23 e9 06  44 11 88 22 cc 33 00 20  |..".3#..D..".3. |
00002900  00 70 fd 20 30 70 fd 20  40 d5 fe 20 41 d5 fe 20  |.p. 0p. @.. A.. |
00002910  5e d5 fe 20 5f d5 fe 20  62 d3 c2 20 83 d1 c5 20  |^.. _.. b.. ... |
00002920  7d d3 dc 20 9c d1 de 20  64 58 ce 20 6e 44 d0 20  |}.. ... dX. nD. |
00002930  84 58 fe 20 8e 44 fc 20  a4 58 d5 20 ae 44 fc 20  |.X. .D. .X. .D. |
00002940  ce 44 d2 20 8d 83 cf cf  d1 20 92 83 e3 e3 e4 22  |.D. ..... .....".|
00002950  44 58 d5 22 64 58 fe 22  84 58 fe 22 66 04 d3 d6  |DX."dX.".X."f...|
00002960  d6 c7 22 6e 04 d3 d6 d6  c7 22 76 04 d3 d6 d6 c7  |..."n...."v.....|
00002970  22 86 04 d4 d7 d7 c8 22  8e 04 d4 d7 d7 c8 22 96  |"......"......".|
00002980  04 d4 d7 d7 c8 22 a4 58  c9 22 c3 5a ca 22 a9 83  |....."."X."."Z."..|
00002990  cb cc cd 22 af 82 d8 d9  22 b6 83 e0 e1 e2 20 42  |..."...."..... B|
000029a0  01 c0 20 63 01 c1 20 5d  01 da 20 7c 01 db 22 a3  |.. c.. ]..  |.."."|
000029b0  01 c6 22 c2 01 c4 22 bc  01 df 22 dd 01 dd 23 60  |.."..."..."...#`|
000029c0  70 fd 23 90 70 fd 23 c0  4b aa 23 cb 02 a2 a8 23  |p.#.p.#.K.#....#|
000029d0  cd 44 aa 23 d7 42 aa 23  df 42 aa 23 e1 46 af 23  |.D.#.B.#.B.#.F.#|
```

```
000029e0  e7 49 aa 23 eb 42 5a 23  f0 59 55 23 f3 02 51 54  |.I.#.BZ#.YU#..QT|
000029f0  00 90 20 e0 50 c0 50 e0  a0 10 80 10 a0 60 d0 40  |.. .P.P.....`.@|
00002a00  d0 60 20 90 00 01 26 c0  60 82 27 60 70 fd 27 90  |.` ...&.`.'`p.'.|
00002a10  70 fd 27 e8 48 5f 27 f0  50 55 22 c0 60 82 23 60  |p.'.H_'.PU".`.#`|
00002a20  70 fd 23 90 70 fd 23 e8  48 5f 23 f0 50 55 23 f3  |p.#.p.#.H_#.PU#.|
00002a30  02 51 54 00 20 e0 43 89  21 e0 43 89 22 c0 43 89  |.QT. .C.!.C."C.|
00002a40  22 e0 43 89 22 ac 42 89  22 e3 4a ff 22 f3 4d ff  |".C."B."J."M.|
00002a50  23 c0 69 aa 23 eb 01 5a  00 40 04 89 04 b8 00 20  |#.i.#..Z.@..... |
00002a60  fc fc fc fc fc fc fc fc  fc fc fc fc fc b0 b3 b3  |................|
00002a70  b3 b3 b4 fc fc fc fc fc  fc fc fc fc fc fc fc fc  |................|
00002a80  c0 00 20 a5 a5 a5 a6 a8  a8 a8 a8 a8 a8 a9 ab ae  |.. .............|
00002a90  b1 f4 fb fc f1 b5 b7 b9  bc a8 a8 a8 a8 a8 a8 be  |................|
00002aa0  a5 a5 a5 00 00 00 c8 00  20 fd fd fd a7 00 00 00  |........ .......|
00002ab0  00 00 00 aa ac af b2 f5  13 fc f0 b6 b8 ba bd 00  |................|
00002ac0  01 02 00 00 00 bf fd fd  fd d0 00 20 fd fd fd a7  |........... ....|
00002ad0  fc 1c 0c 18 1b 0e aa ad  b1 16 12 1c 1c c3 00 b5  |................|
00002ae0  bb bd fc fc 1d 18 19 fc  bf fd fd fd 00 00 00 00  |................|
00002af0  a0 eb a8 eb a8 eb b0 eb  c1 eb c1 eb c1 eb c1 eb  |................|
00002b00  c1 eb c1 eb d2 eb e3 eb  e3 eb e3 eb e3 eb e3 eb  |................|
00002b10  e3 eb b0 eb c1 eb c1 eb  c1 eb c1 eb c1 eb c1 eb  |................|
00002b20  d2 eb a8 eb a8 eb eb eb  f3 eb f3 eb f3 eb f3 eb  |................|
00002b30  f3 eb f3 eb f3 eb f3 eb  f3 eb f6 eb ff eb 0c ec  |................|
00002b40  17 ec 22 ec 2d ec 39 ec  46 ec 55 ec 64 ec 73 ec  |..".-.9.F.U.d.s.|
00002b50  82 ec 8f ec 17 ec 22 ec  9b ec a6 ec b2 ec be ec  |......".........|
00002b60  ca ec d6 ec f3 eb f3 eb  df ec ed ec df ec df ec  |................|
00002b70  fb ec fb ec fb ec fb ec  fb ec fb ec fb ec fb ec  |................|
00002b80  02 ed 10 ed 1f ed 2e ed  45 ed 5c ed 73 ed 89 ed  |........E.\.s...|
00002b90  f3 eb f3 eb f3 eb f3 eb  f3 eb f3 eb f3 eb 95 ed  |................|
00002ba0  cb ff 82 8a 7e c9 ff 00  cb 89 82 8a 88 c9 89 00  |....~...........|
00002bb0  c3 89 81 7f c6 80 84 81  8a 88 7f c6 80 82 81 89  |................|
00002bc0  00 c3 89 81 83 c6 ff 84  84 8a 88 83 c6 ff 82 84  |................|
00002bd0  89 00 c3 89 81 85 c6 86  84 87 8a 88 85 c6 86 82  |................|
00002be0  87 89 00 cb 89 82 8a 88  c9 89 00 cb ff 82 8a 8b  |................|
00002bf0  c9 ff 00 d6 ff 00 ca ff  c2 fd 81 9d c9 ff 00 c8  |................|
00002c00  ff 82 91 92 c2 fd 82 9e  9f c8 ff 00 c8 ff 85 91  |................|
00002c10  92 fd 9c 9e c9 fd 00 c8  fd 85 95 96 94 fc 9e c9  |................|
00002c20  fd 00 c8 fd 85 93 fd 94  fc 9e c9 fd 00 c8 fd 86  |................|
00002c30  95 96 94 10 9e fd c8 e6  00 c8 fd 87 93 fd 94 1e  |................|
00002c40  9e fd e7 c7 ff 00 c3 fd  c5 ff 87 97 98 94 17 9e  |................|
00002c50  fd e7 c7 ff 00 c3 fd c5  ff 87 99 ff 94 fc 9e fd  |................|
00002c60  e7 c7 ff 00 c3 fd c5 ff  87 97 98 94 1c 9e fd e7  |................|
00002c70  c7 ff 00 c3 fd c5 ff 87  99 ff 94 11 9e fd e7 c7  |................|
00002c80  ff 00 c8 fd 87 95 96 94  18 9e fd e7 c7 ff 00 c8  |................|
00002c90  fd 86 93 fd 94 19 9e fd  c8 e8 00 c8 ff 85 97 98  |................|
00002ca0  fd fd 9e c9 fd 00 c8 ff  86 99 ff fd fd 9e a0 c8  |................|
00002cb0  ff 00 c8 ff 86 97 98 fd  fd 9e a0 c8 ff 00 c8 ff  |................|
00002cc0  86 99 ff fd fd 9e a1 c8  a2 00 c8 ff 86 9a 9b fd  |................|
00002cd0  fd 9e a3 c8 ff 00 ca ff  83 fd fd a4 c9 ff 00 cb  |................|
00002ce0  ff 85 90 ff 8c 8d 8f c4  8d 82 8f 8d 00 cb ff c2  |................|
00002cf0  90 83 8e 8d 8f c4 8d 82  8f 8d 00 cb ff 81 90 ca  |................|
00002d00  ff 00 cb ff 84 90 ff 8c  8d c4 9c 83 8d 8f 8d 00  |................|
00002d10  cb ff 8b 90 ff 8c 8d fc  14 fc fc 8d 8f 8d 00 cb  |................|
00002d20  ff 8b 90 ff 8c 8d fc 0e  18 fc 8d 8f 8d 00 c3 ff  |................|
00002d30  83 8c 8d 8f c3 8d 8d 8f  8d 90 ff 8c 8d fc 0e 1e  |................|
00002d40  fc 8d 8f 8d 00 c3 ff 83  8c 8d 8f c3 8d 8d 8f 8d  |................|
00002d50  90 ff 8c 8d fc 19 1d fc  8d 8f 8d 00 c3 ff 83 8c  |................|
00002d60  8d 8f c3 8d 8d 8f 8d 90  90 8e 8d fc fc 1a fc 8d  |................|
00002d70  8f 8d 00 c3 ff 83 8c 8d  8f c3 8d 87 8f 8d 90 ff  |................|
00002d80  8c 8d 8f c4 8d 82 8f 8d  00 cd ff 83 8c 8d 8f c4  |................|
00002d90  8d 82 8f 8d 00 d6 ff 00  00 ed ed 12 ee 3d ee 66  |.............=.f|
00002da0  ee 8c ee b3 ee c0 ee cf  ee f4 ee 1b ef 46 ef 6b  |.............F.k|
00002db0  ef 98 ef c5 ef ec ef 12  f0 1f f0 45 f0 6a f0 95  |...........E.j..|
00002dc0  f0 ae f0 d4 f0 e1 f0 0c  f1 35 f1 5b f1 82 f1 8f  |.........5.[....|
00002dd0  f1 9e f1 c3 f1 ea f1 15  f2 3a f2 67 f2 94 f2 bb  |.........:.g....|
00002de0  f2 e1 f2 ee f2 14 f3 39  f3 64 f3 7d f3 23 c0 44  |.......9.d.}.#.D|
```

```
00002df0  aa 23 c8 44 aa 23 d0 44  aa 23 d8 44 aa 23 e0 44  |.#.D.#.D.#.D.#.D|
00002e00  aa 23 e8 44 5a 27 f4 42  55 23 f0 01 50 27 f0 01  |.#.DZ'.BU#..P'..|
00002e10  50 00 27 c5 43 ff 27 cd  43 ff 27 d5 43 ff 27 dd  |P.'.C.'.C.'.C.'.|
00002e20  43 ff 27 e5 43 ff 27 ed  43 5f 23 f0 01 55 27 f0  |C.'.C.'.C_#..U'.|
00002e30  01 55 23 f3 02 51 54 27  f3 02 51 54 00 23 c0 43  |.U#..QT'..QT.#.C|
00002e40  ff 23 c8 43 ff 23 d0 43  ff 23 d8 43 ff 23 e0 43  |.#.C.#.C.#.C.#.C|
00002e50  ff 23 e8 43 5f 23 f3 42  55 27 f3 42 55 27 f0 01  |.#.C_#.BU'.BU'..|
00002e60  50 23 f0 01 50 00 23 c3  45 aa 23 cb 45 aa 23 d3  |P#..P.#.E.#.E.#.|
00002e70  45 aa 23 db 45 aa 23 e3  45 aa 23 eb 45 5a 27 f0  |E.#.E.#.E.#.EZ'.|
00002e80  01 55 23 f0 01 55 27 f4  02 51 54 00 27 c0 42 aa  |.U#..U'..QT.'.B.|
00002e90  27 c8 42 aa 27 d0 42 aa  27 d8 42 aa 27 e0 42 aa  |'.B.'.B.'.B.'.B.|
00002ea0  27 e8 42 5a 27 f4 42 55  23 f2 02 51 54 27 f2 02  |'.BZ'.BU#..QT'..|
00002eb0  51 54 00 23 f2 42 55 27  f2 42 55 23 f6 01 50 00  |QT.#.BU'.BU#..P.|
00002ec0  23 f6 01 55 27 f1 02 51  54 23 f1 02 51 54 00 23  |#..U'..QT#..QT.#|
00002ed0  c3 45 ff 23 cb 45 ff 23  d3 45 ff 23 db 45 ff 23  |.E.#.E.#.E.#.E.#|
00002ee0  e3 45 ff 23 eb 45 5f 27  f1 42 55 23 f1 42 55 27  |.E.#.E_'.BU#.BU'|
00002ef0  f6 01 50 00 27 c1 45 aa  27 c9 45 aa 27 d1 45 aa  |..P.'.E.'.E.'.E.|
00002f00  27 d9 45 aa 27 e1 45 aa  27 e9 45 5a 27 f6 01 55  |'.E.'.E.'.EZ'..U|
00002f10  23 f2 02 51 54 27 f2 02  51 54 00 27 c6 42 aa 27  |#..QT'..QT.'.B.'|
00002f20  ce 42 aa 27 d6 42 aa 27  de 42 aa 27 e6 42 aa 27  |.B.'.B.'.B.'.B.'|
00002f30  ee 42 5a 23 f2 42 55 27  f2 42 55 27 f0 02 51 54  |.BZ#.BU'.BU'..QT|
00002f40  23 f0 02 51 54 00 23 c1  47 ff 23 c9 47 ff 23 d1  |#..QT.#.G.#.G.#.|
00002f50  47 ff 23 d9 47 ff 23 e1  47 ff 23 e9 47 5f 27 f0  |G.#.G.#.G.#.G_'.|
00002f60  42 55 23 f0 42 55 27 f4  01 50 00 27 c0 01 ff 27  |BU#.BU'..P.'...'|
00002f70  c8 01 ff 27 d0 01 ff 27  d8 01 ff 27 e0 01 ff 27  |...'...'...'...'|
00002f80  e8 01 5f 27 f4 01 55 27  f7 01 51 23 f0 01 54 23  |.._'..U'..Q#..T#|
00002f90  f7 01 51 27 f0 01 54 00  27 c1 46 ff 27 c9 46 ff  |..Q'..T.'.F.'.F.|
00002fa0  27 d1 46 ff 27 d9 46 ff  27 e1 46 ff 27 e9 46 5f  |'.F.'.F.'.F.'.F_|
00002fb0  27 f7 01 55 23 f0 01 55  23 f7 01 55 27 f0 01 55  |'..U#..U#..U'..U|
00002fc0  23 f4 01 50 00 23 c0 44  aa 23 c8 44 aa 23 d0 44  |#..P.#.D.#.D.#.D|
00002fd0  aa 23 d8 44 aa 23 e0 44  aa 23 e8 44 5a 23 f4 01  |.#.D.#.D.#.DZ#..|
00002fe0  55 27 f0 02 51 54 23 f0  02 51 54 00 23 c4 42 aa  |U'..QT#..QT.#.B.|
00002ff0  23 cc 42 aa 23 d4 42 aa  23 dc 42 aa 23 e4 42 aa  |#.B.#.B.#.B.#.B.|
00003000  23 ec 42 5a 27 f0 42 55  23 f0 42 55 27 f6 02 51  |#.BZ'.BU#.BU'..Q|
00003010  54 00 27 f6 42 55 23 f2  01 50 27 f2 01 50 00 27  |T.'.BU#..P'..P.'|
00003020  c7 01 ff 27 cf 01 ff 27  d7 01 ff 27 df 01 ff 27  |...'...'...'...'|
00003030  e7 01 ff 27 ef 01 5f 23  f2 01 55 27 f2 01 55 23  |...'.._#..U'..U#|
00003040  f5 02 51 54 00 23 c0 45  ff 23 c8 45 ff 23 d0 45  |..QT.#.E.#.E.#.E|
00003050  ff 23 d8 45 ff 23 e0 45  ff 23 e8 45 5f 23 f5 42  |.#.E.#.E.#.E_#.B|
00003060  55 27 f2 01 50 23 f2 01  50 00 23 c5 43 aa 23 cd  |U'..P#..P.#.C.#.|
00003070  43 aa 23 d5 43 aa 23 dd  43 aa 23 e5 43 aa 23 ed  |C.#.C.#.C.#.C.#.|
00003080  43 5a 27 f2 01 55 23 f2  01 55 27 f6 02 51 54 23  |CZ'..U#..U'..QT#|
00003090  f6 02 51 54 00 27 c0 42  aa 27 c8 42 aa 27 d0 42  |..QT.'.B.'.B.'.B|
000030a0  aa 27 d8 42 aa 27 e0 42  aa 27 e8 42 5a 00 27 c2  |.'.B.'.B.'.BZ.'.|
000030b0  42 aa 27 ca 42 aa 27 d2  42 aa 27 da 42 aa 27 e2  |B.'.B.'.B.'.B.'.|
000030c0  42 aa 27 ea 42 5a 27 f6  42 55 23 f6 42 55 23 f4  |B.'.BZ'.BU#.BU#.|
000030d0  02 51 54 00 23 f4 42 55  27 f0 01 50 23 f0 01 50  |.QT.#.BU'..P#..P|
000030e0  00 23 c5 43 ff 23 cd 43  ff 23 d5 43 ff 23 dd 43  |.#.C.#.C.#.C.#.C|
000030f0  ff 23 e5 43 ff 23 ed 43  5f 27 f0 01 55 23 f0 01  |.#.C.#.C_'..U#..|
00003100  55 27 f3 02 51 54 23 f3  02 51 54 00 27 c0 43 ff  |U'..QT#..QT.'.C.|
00003110  27 c8 43 ff 27 d0 43 ff  27 d8 43 ff 27 e0 43 ff  |'.C.'.C.'.C.'.C.|
00003120  27 e8 43 5f 27 f3 42 55  23 f3 42 55 23 f0 01 50  |'.C_'.BU#.BU#..P|
00003130  27 f0 01 50 00 27 c3 45  aa 27 cb 45 aa 27 d3 45  |'..P.'.E.'.E.'.E|
00003140  aa 27 db 45 aa 27 e3 45  aa 27 eb 45 5a 23 f0 01  |.'.E.'.E.'.EZ#..|
00003150  55 27 f0 01 55 23 f4 02  51 54 00 23 c0 42 aa 23  |U'..U#..QT.#.B.#|
00003160  c8 42 aa 23 d0 42 aa 23  d8 42 aa 23 e0 42 aa 23  |.B.#.B.#.B.#.B.#|
00003170  e8 42 5a 23 f4 42 55 27  f2 02 51 54 23 f2 02 51  |.BZ#.BU'..QT#..Q|
00003180  54 00 27 f2 42 55 23 f2  42 55 27 f6 01 50 00 27  |T.'.BU#.BU'..P.'|
00003190  f6 01 55 23 f1 02 51 54  27 f1 02 51 54 00 27 c3  |..U#..QT'..QT.'.|
000031a0  45 ff 27 cb 45 ff 27 d3  45 ff 27 db 45 ff 27 e3  |E.'.E.'.E.'.E.'.|
000031b0  45 ff 27 eb 45 5f 23 f1  42 55 27 f1 42 55 23 f6  |E.'.E_#.BU'.BU#.|
000031c0  01 50 00 23 c1 45 aa 23  c9 45 aa 23 d1 45 aa 23  |.P.#.E.#.E.#.E.#|
000031d0  d9 45 aa 23 e1 45 aa 23  e9 45 5a 23 f6 01 55 27  |.E.#.E.#.EZ#..U'|
000031e0  f2 02 51 54 23 f2 02 51  54 00 23 c6 42 aa 23 ce  |..QT#..QT.#.B.#.|
000031f0  42 aa 23 d6 42 aa 23 de  42 aa 23 e6 42 aa 23 ee  |B.#.B.#.B.#.B.#.|
```

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00003200  42 5a 27 f2 42 55 23 f2  42 55 23 f0 02 51 54 27  |BZ'.BU#.BU#..QT'|
00003210  f0 02 51 54 00 27 c1 47  ff 27 c9 47 ff 27 d1 47  |..QT.'.G.'.G.'.G|
00003220  ff 27 d9 47 ff 27 e1 47  ff 27 e9 47 5f 23 f0 42  |.'.G.'.G.'.G_#.B|
00003230  55 27 f0 42 55 23 f4 01  50 00 23 c0 01 ff 23 c8  |U'.BU#..P.#...#.|
00003240  01 ff 23 d0 01 ff 23 d8  01 ff 23 e0 01 ff 23 e8  |..#...#...#...#.|
00003250  01 5f 23 f4 01 55 23 f7  01 51 27 f0 01 54 27 f7  |._#..U#..Q'..T'.|
00003260  01 51 23 f0 01 54 00 23  c1 46 ff 23 c9 46 ff 23  |.Q#..T.#.F.#.F.#|
00003270  d1 46 ff 23 d9 46 ff 23  e1 46 ff 23 e9 46 5f 23  |.F.#.F.#.F.#.F_#|
00003280  f7 01 55 27 f0 01 55 27  f7 01 55 23 f0 01 55 27  |..U'..U'..U#..U'|
00003290  f4 01 50 00 27 c0 44 aa  27 c8 44 aa 27 d0 44 aa  |..P.'.D.'.D.'.D.|
000032a0  27 d8 44 aa 27 e0 44 aa  27 e8 44 5a 27 f4 01 55  |'.D.'.D.'.DZ'..U|
000032b0  23 f0 02 51 54 27 f0 02  51 54 00 27 c4 42 aa 27  |#..QT'..QT.'.B.'|
000032c0  cc 42 aa 27 d4 42 aa 27  dc 42 aa 27 e4 42 aa 27  |.B.'.B.'.B.'.B.'|
000032d0  ec 42 5a 23 f0 42 55 27  f0 42 55 23 f6 02 51 54  |.BZ#.BU'.BU#..QT|
000032e0  00 23 f6 42 55 27 f2 01  50 23 f2 01 50 00 23 c7  |.#.BU'..P#..P.#.|
000032f0  01 ff 23 cf 01 ff 23 d7  01 ff 23 df 01 ff 23 e7  |..#...#...#...#.|
00003300  01 ff 23 ef 01 5f 27 f2  01 55 23 f2 01 55 27 f5  |..#.._'..U#..U'.|
00003310  02 51 54 00 27 c0 45 ff  27 c8 45 ff 27 d0 45 ff  |.QT.'.E.'.E.'.E.|
00003320  27 d8 45 ff 27 e0 45 ff  27 e8 45 5f 27 f5 42 55  |'.E.'.E.'.E_'.BU|
00003330  23 f2 01 50 27 f2 01 50  00 27 c5 43 aa 27 cd 43  |#..P'..P.'.C.'.C|
00003340  aa 27 d5 43 aa 27 dd 43  aa 27 e5 43 aa 27 ed 43  |.'.C.'.C.'.C.'.C|
00003350  5a 23 f2 01 55 27 f2 01  55 23 f6 02 51 54 27 f6  |Z#..U'..U#..QT'.|
00003360  02 51 54 00 23 c0 42 aa  23 c8 42 aa 23 d0 42 aa  |.QT.#.B.#.B.#.B.|
00003370  23 d8 42 aa 23 e0 42 aa  23 e8 42 5a 00 23 c2 42  |#.B.#.B.#.BZ.#.B|
00003380  aa 23 ca 42 aa 23 d2 42  aa 23 da 42 aa 23 e2 42  |.#.B.#.B.#.B.#.B|
00003390  aa 23 ea 42 5a 23 f6 42  55 27 f6 42 55 27 f4 02  |.#.BZ#.BU'.BU'..|
000033a0  51 54 00 ff ff ff ff ff  ff ff ff ff ff ff ff ff  |QT..............|
000033b0  ff ff ff ff ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
*
00003700  07 f0 00 00 00 d4 00 c8  00 bd 00 b2 00 a8 00 9f  |................|
00003710  00 96 00 8d 00 85 00 7e  00 76 00 70 01 ab 01 93  |.......~.v.p....|
00003720  01 7c 01 67 01 52 01 3f  01 2d 01 1c 01 0c 00 fd  |.|.g.R.?.-......|
00003730  00 ee 00 e1 03 57 03 27  02 f9 02 cf 02 a6 02 80  |.....W.'........|
00003740  02 5c 02 3a 02 1a 01 fc  01 df 01 c4 05 4d 05 01  |.\.:.........M..|
00003750  04 b9 04 75 03 f8 03 bf  03 89 00 69 00 63 00 5e  |...u.......i.c.^|
00003760  00 58 00 53 00 4a 03 06  0c 18 30 12 24 09 04 08  |.X.S.J....0.$...|
00003770  10 20 40 18 30 0c a9 00  f0 0a a9 08 d0 06 a9 0c  |. @.0...........|
00003780  d0 02 a9 04 85 f4 a9 40  85 f5 86 f6 84 f7 a0 00  |.......@........|
00003790  b1 f6 91 f4 c8 98 c9 04  d0 f6 60 aa 20 d1 f9 86  |..........`. ...|
000037a0  e6 b9 c8 fc a8 b9 c8 fc  85 e5 b9 c9 fc 85 f8 b9  |................|
000037b0  ca fc 85 f9 b9 cb fc 85  fa b9 cc fc 85 fb b9 cd  |................|
000037c0  fc 85 fc b9 ce fc 85 fd  b9 cf fc 85 fe b9 d0 fc  |................|
000037d0  85 ff a9 01 85 d8 85 d9  85 da 85 db a9 00 85 f3  |................|
000037e0  85 d0 85 d1 85 d2 85 d3  60 a9 7f 8d 01 40 8d 05  |........`....@..|
000037f0  40 86 e9 84 ea 60 ff ff  ff ff ff ff ff ff ff ff  |@....`..........|
00003800  10 00 18 10 01 18 00 01  88 06 02 40 05 02 c0 a5  |...........@....|
00003810  f9 f0 3e c6 d8 d0 3a a2  00 a9 23 8d 12 06 a9 2e  |..>...:...#.....|
00003820  8d 10 06 a4 d0 e6 d0 b1  f8 f0 18 4c 1c f9 98 10  |...........L....|
00003830  09 20 44 f9 a4 d0 e6 d0  b1 f8 20 50 f9 d0 09 a0  |. D....... P....|
00003840  10 d0 07 a9 00 4c d7 f9  a4 e9 8c 00 40 a5 dc 85  |.....L......@...|
00003850  d8 a5 fb f0 29 c6 d9 d0  25 a2 01 a4 d1 e6 d1 b1  |....)...%.......|
00003860  fa 10 09 20 44 f9 a4 d1  e6 d1 b1 fa 20 64 f9 d0  |... D....... d..|
00003870  04 a0 10 d0 02 a4 ea 8c  04 40 a5 dd 85 d9 a5 fd  |.........@......|
00003880  f0 4f c6 da d0 4b a2 02  a9 9b 8d 10 06 a9 92 8d  |.O...K..........|
00003890  12 06 a4 d2 e6 d2 b1 fc  4c 1c f9 98 10 21 20 44  |........L....! D|
000038a0  f9 a4 e4 f0 04 a9 ff d0  0b 18 69 fe 0a 0a c9 3c  |..........i....<|
000038b0  90 02 a9 3c 8d 08 40 85  e7 a4 d2 e6 d2 b1 fc 20  |...<..@........ |
000038c0  68 f9 d0 04 a0 00 f0 02  a4 e7 8c 08 40 a5 de 85  |h...........@...|
000038d0  da a5 ff f0 2c c6 db d0  28 a2 03 a9 ee 8d 10 06  |....,...(.......|
000038e0  a9 e5 8d 12 06 a4 d3 e6  d3 b1 fe 4c 1c f9 98 10  |...........L....|
000038f0  09 20 44 f9 a4 d3 e6 d3  b1 fe 20 02 f9 a5 df 85  |. D....... .....|
00003900  db 60 a8 a5 f3 c9 02 f0  12 b9 00 f8 8d 0c 40 b9  |.`............@.|
00003910  01 f8 8d 0e 40 b9 02 f8  8d 0f 40 60 a8 c9 ff f0  |....@.....@`....|
00003920  09 29 c0 c9 c0 f0 0f 6c  10 06 b5 e0 f0 13 d6 e0  |.).....l........|
00003930  b5 d4 95 d0 d0 0b 98 29  3f 95 e0 d6 e0 b5 d0 95  |.......)?.......|
```

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00003940  d4 6c 12 06 29 07 18 65  e5 a8 b9 66 f7 95 dc 60  |.l..)..e...f...`|
00003950  a2 00 a8 b9 01 f7 f0 0b  9d 02 40 b9 00 f7 09 08  |..........@.....|
00003960  9d 03 40 60 a2 04 d0 ea  a2 08 d0 e6 a9 c0 8d 17  |..@`............|
00003970  40 20 ff f9 20 aa fb 20  48 fc 20 fc fa a9 00 85  |@ .. .. H. .....|
00003980  f0 4c 8d f9 a9 f8 8d 13  06 8d 11 06 60 85 f1 85  |.L..........`...|
00003990  f2 60 04 84 84 c4 04 7f  72 20 a2 96 a0 f9 20 76  |.`......r .... v|
000039a0  f7 a9 00 85 c1 a9 10 8d  0c 40 a5 f3 29 b0 09 02  |.........@..)...|
000039b0  85 f3 a5 c1 29 03 a8 b9  92 f9 8d 00 40 e6 c1 a5  |....)........@...|
000039c0  c1 c9 18 d0 0b a5 f3 29  fd 85 f3 a9 10 8d 00 40  |.......).......@|
000039d0  60 a9 00 85 f3 85 c8 8d  08 40 8d 11 40 85 e6 85  |`........@..@...|
000039e0  e4 a9 10 8d 00 40 8d 04  40 8d 0c 40 60 a9 01 a2  |.....@..@..@`...|
000039f0  bf a0 1f 20 d9 fa a5 f3  29 f0 09 04 85 f3 60 a5  |... ....).....`.|
00003a00  f0 4a b0 cd 4a b0 93 4a  b0 e3 4a b0 0d a5 f3 4a  |.J..J..J..J....J|
00003a10  4a b0 9f 4a b0 32 4a b0  2f 60 a5 e6 29 90 f0 12  |J..J.2J./`..)...|
00003a20  a9 00 85 e6 8d 08 40 a9  10 8d 00 40 8d 04 40 8d  |......@....@..@.|
00003a30  0c 40 a9 02 a2 1e a0 6f  20 d9 fa a5 f3 29 f0 09  |.@.....o ....)..|
00003a40  08 85 f3 60 3f 7f 0f 08  e6 eb a5 eb c5 c6 d0 f3  |...`?...........|
00003a50  a9 00 85 eb a5 ed aa 29  0f 8d 0e 40 8a 38 e9 10  |.......)...@.8..|
00003a60  aa 29 f0 f0 18 86 ed a5  ef aa 29 0f 09 30 8d 0c  |.).........)..0..|
00003a70  40 8a 38 e9 10 aa 29 f0  f0 1a 86 ef 60 e6 ec a4  |@.8...).....`...|
00003a80  ec a5 f3 29 04 d0 06 be  b8 fa 4c 90 fa be ce fa  |...).......L.....|
00003a90  f0 16 d0 d1 e6 ee a4 ee  a5 f3 29 04 d0 05 be c5  |..........).....|
00003aa0  fa d0 d7 be d0 fa d0 d2  a9 10 8d 0c 40 a5 f3 29  |............@..)|
00003ab0  f3 85 f3 60 9f 7f 60 20  1e 1b a5 64 53 14 13 82  |...`..` ...dS...|
00003ac0  31 22 21 80 00 6f 1d 1c  38 37 26 84 83 f2 ef 00  |1"!..o..87&.....|
00003ad0  1f 10 2a 20 3b 10 29 20  3b 85 c6 86 ed 84 ef a2  |..* ;.) ;.......|
00003ae0  44 a0 fa 20 7e f7 a9 00  85 eb 85 ec 85 ee 60 a5  |D.. ~.........`.|
00003af0  f3 29 bf 85 f3 a9 10 8d  00 40 d0 06 a5 f2 29 08  |.)........@....).|
00003b00  d0 ed a5 f2 4a b0 1a 4a  b0 23 4a b0 06 a5 c8 4a  |....J..J.#J....J|
00003b10  b0 13 60 a2 41 a0 fb 20  76 f7 a5 f3 29 bd 85 f3  |..`.A.. v...)...|
00003b20  60 a9 01 85 c8 a2 3d a0  fb 20 82 f7 60 a9 10 8d  |`.....=.. ..`...|
00003b30  04 40 a9 00 85 c8 a5 f3  29 df 85 f3 60 94 94 90  |.@......)...`...|
00003b40  20 9b 82 70 10 b2 a4 a0  f0 60 a2 45 a0 fb 20 82  | ..p.....`.E.. .|
00003b50  f7 a9 00 85 c3 85 c9 85  c5 a9 02 85 c8 a5 f3 09  |................|
00003b60  20 85 f3 60 a5 c5 d0 e1  e6 c3 a5 c3 c9 04 d0 f3  | ..`............|
00003b70  a9 00 85 c3 a9 a0 8d 06  40 e6 c9 a5 c9 c9 09 d0  |........@.......|
00003b80  e2 85 c5 a9 f6 8d 05 40  60 dd 7f ff 7a 1d 7f dd  |.......@`...z...|
00003b90  7a a2 89 a0 fb 20 76 f7  a2 8d a0 fb 20 82 f7 a5  |z.... v..... ...|
00003ba0  f3 29 9f 85 f3 a9 00 85  c8 60 20 f2 fb a5 f0 0a  |.).......` .....|
00003bb0  b0 df 0a b0 0d 0a b0 92  a5 f3 0a 0a b0 1a 0a b0  |................|
00003bc0  a3 60 a2 ee a0 fb 20 76  f7 a9 00 85 c1 85 c2 a5  |.`.... v........|
00003bd0  f3 29 fd 09 40 85 f3 60  e6 c1 a5 c1 c9 07 d0 f7  |.)..@..`........|
00003be0  a9 00 85 c1 a9 a0 8d 02  40 e6 c2 a5 c2 60 b7 a5  |........@....`..|
00003bf0  a0 80 a5 f0 29 10 d0 07  a5 f3 29 10 d0 13 60 a2  |....).....)...`.|
00003c00  27 a0 fc 20 7a f7 a5 f3  09 10 85 f3 a9 00 85 c7  |'.. z...........|
00003c10  60 e6 c7 a5 c7 c9 06 d0  f7 a2 2b a0 fc 20 7a f7  |`.........+.. z.|
00003c20  a5 f3 29 ef 85 f3 60 07  7f 50 08 07 7f 4d 08 a0  |..)...`..P...M..|
00003c30  08 a9 ef 4c b9 fc a0 00  a9 01 d0 6c a0 04 a9 10  |...L.......l....|
00003c40  d0 54 a0 09 a9 bf d0 4e  a5 f1 4a b0 e9 4a b0 34  |.T.....N..J..J.4|
00003c50  4a b0 1f 4a b0 22 4a b0  e3 4a b0 34 4a b0 1f 4a  |J..J."J..J.4J..J|
00003c60  b0 28 a5 f2 0a b0 c8 0a  b0 d8 a5 e6 d0 01 60 4c  |.(............`L|
00003c70  0f f8 a0 02 a9 04 d0 1e  a0 03 a9 08 d0 18 a0 06  |................|
00003c80  a9 40 d0 1b a0 01 a9 01  d0 15 a0 07 a9 80 d0 0f  |.@..............|
00003c90  a0 05 a9 20 d0 09 20 9b  f7 a2 b9 a0 b9 d0 10 20  |... .. ........ |
00003ca0  9b f7 a2 c0 a0 c0 d0 07  20 9b f7 a2 86 a0 86 20  |........ ...... |
00003cb0  e9 f7 a9 00 85 e4 4c 0f  f8 20 9b f7 a2 b8 a0 b8  |......L.. ......|
00003cc0  20 e9 f7 e6 e4 4c 0f f8  0a 13 1c 25 2e 37 40 49  | ....L.....%.7@I|
00003cd0  52 5b 08 a0 fd 00 00 00  00 00 00 00 a6 fd bc fd  |R[..............|
00003ce0  d1 fd e6 fd 08 87 fe a8  fe d0 fe f6 fe 08 52 fe  |..............R.|
00003cf0  66 fe 79 fe f6 fe 08 5e  fd 00 00 82 fd 95 fd 08  |f.y....^........|
00003d00  ef fd 0f fe 33 fe 47 fe  00 95 ff 00 00 9c ff e6  |....3.G.........|
00003d10  fd 08 ff fe 27 ff 68 ff  8a ff 00 33 fd 45 fd 56  |....'.h....3.E.V|
00003d20  fd 00 00 00 2c fd 30 fd  00 00 00 00 80 3c 3e 00  |....,.0......<>.|
00003d30  80 4a 1c 81 06 02 06 02  82 32 02 83 06 85 08 81  |.J.......2......|
00003d40  02 84 08 06 00 81 2e 02  2e 02 82 24 02 83 2e 85  |...........$....|
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00003d50  2e 81 02 84 2e 2e 83 46  44 42 40 84 3e 3c c4 84  |.......FDB@.><..|
00003d60  02 ff c8 80 08 32 ff 81  02 0c 2e 28 82 32 2e 81  |.....2.....(.2..|
00003d70  2c 02 86 02 81 02 4a 1e  02 24 02 28 02 2a 2c 86  |,.....J..$.(.*,.|
00003d80  02 00 c6 81 3c 02 02 3c  02 02 3c 3c 02 38 46 38  |....<..<..<<.8F8|
00003d90  02 36 46 36 ff c9 81 06  06 03 06 09 06 06 06 ff  |.6F6............|
00003da0  c3 80 10 64 ff 00 82 02  02 20 26 20 26 2a 02 84  |...d..... & &*..|
00003db0  1e 86 1c 48 82 1c 02 48  42 02 2a 00 82 02 02 38  |...H...HB.*....8|
00003dc0  3e 38 3e 42 02 84 36 86  34 56 82 34 02 56 52 02  |>8>B..6.4V.4.VR.|
00003dd0  42 82 02 02 38 3e 38 3e  42 02 84 36 86 34 56 82  |B...8>8>B..6.4V.|
00003de0  34 02 56 52 02 42 c6 82  06 03 06 09 03 06 ff 82  |4.VR.B..........|
00003df0  02 81 04 86 02 85 30 81  2e 02 2e 02 82 02 81 04  |......0.........|
00003e00  02 02 04 08 0a 0c 85 04  81 2a 26 24 80 04 00 82  |.........*&$....|
00003e10  02 81 24 86 02 85 2a 81  26 02 26 02 82 02 81 24  |..$...*.&.&....$|
00003e20  02 02 80 24 24 81 26 28  2a 85 24 80 24 24 81 20  |...$$.&(*.$.$$. |
00003e30  1c 80 24 c2 81 34 02 02  02 81 38 3a 3c 85 3e 81  |..$..4....8:<.>.|
00003e40  02 02 42 02 42 02 ff c2  85 06 06 82 06 03 06 06  |..B.B...........|
00003e50  03 ff 81 02 02 5e 1a 16  10 0c 08 32 2e 02 02 32  |.....^.....2...2|
00003e60  02 02 08 02 0c 00 81 02  02 16 10 0c 08 32 2e 28  |.............2.(|
00003e70  24 02 02 20 02 02 2a 02  2a 85 38 81 02 38 3c 85  |$.. ..*.*.8..8<.|
00003e80  40 50 52 81 42 02 46 81  12 02 2a 02 04 0c 85 0e  |@PR.B.F...*.....|
00003e90  0c 81 08 84 02 81 32 30  2e 2a 02 12 02 04 0c 85  |......20.*......|
00003ea0  0e 0c 08 81 32 02 04 00  81 0c 02 2a 02 24 2a 26  |....2......*.$*&|
00003eb0  2a 2e 2e 04 2e 32 84 02  81 32 30 2e 24 02 0c 02  |*....2...20.$...|
00003ec0  24 2a 2e 26 2e 04 2e 04  32 30 2e 2a 02 24 84 02  |$*.&....20.*.$..|
00003ed0  85 34 81 34 38 3c 85 3e  81 02 3c 3e 42 02 52 85  |.4.48<.>..<>B.R.|
00003ee0  02 4e 81 54 02 58 85 34  81 02 02 3c 85 3e 4e 81  |.N.T.X.4...<.>N.|
00003ef0  42 02 02 42 02 34 c8 81  06 03 06 03 06 06 ff 82  |B..B.4..........|
00003f00  02 81 06 85 02 32 0c 81  32 02 2a 32 02 2e 02 02  |.....2..2.*2....|
00003f10  02 28 2e 28 82 02 81 0a  85 02 06 10 81 06 02 2e  |.(.(............|
00003f20  06 02 32 85 02 62 00 82  02 80 2e 2e 85 02 80 2c  |..2..b.........,|
00003f30  2c 81 24 28 80 2c 2c 81  2e 2c 80 2a 2a 81 4a 20  |,.$(.,,..,.**.J |
00003f40  2a 02 28 02 02 02 20 28  20 82 02 80 32 32 85 02  |*.(... ( ...22..|
00003f50  80 30 30 81 28 2c 80 30  30 81 32 30 80 2e 2e 81  |.00.(,.00.20....|
00003f60  1e 24 2e 02 2c 85 02 60  85 46 82 46 81 3c 85 44  |.$..,..`.F.F.<.D|
00003f70  44 42 42 85 40 81 38 40  38 85 4a 4a 85 48 82 48  |DBB.@.8@8.JJ.H.H|
00003f80  81 3a 85 46 82 46 81 3c  84 02 c7 81 09 03 03 06  |.:.F.F.<........|
00003f90  03 06 ff 84 02 c5 84 02  ff 86 02 00 82 3c 02 84  |.............<..|
00003fa0  02 82 44 02 84 02 82 46  84 02 82 48 83 02 86 4a  |..D....F...H...J|
00003fb0  ff ff ff ff ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
*
00003ff0  ff ff ff ff 4c 6c f9 4c  84 f9 88 c0 00 c0 00 c0  |....Ll.L........|
00004000
```

## 14. Warhol CHR Tiles: #01, #02

#03, #04

*chr:*

```
00000000  00 00 01 03 07 0f 1f 1f  00 00 01 02 04 08 10 10  |................|[14]
00000010  00 7c ff ff ff ff ff ff  00 7c 83 00 00 00 00 00  |.|.......|......|
00000020  00 00 00 80 c0 e0 f0 f8  00 00 00 80 40 20 10 08  |............@ ..|
00000030  3f 3f 7f 7f 7d 7c 7d 7f  20 20 40 42 47 47 47 47  |??..}|}.  @BGGGG|
```

```
00000040  ff ff ff ff ff 7f 1f f7  00 00 00 00 80 e0 fc ff  |................|
00000050  fc fc fc fe fe fe fe fe  04 04 04 02 02 02 02 02  |................|
00000060  5b 73 21 00 00 00 00 00  4f 5f 2f 0f 0f 07 07 03  |[s!.....O_/.....|
00000070  ff f7 e7 c3 00 00 00 00  ff ff ff ff ff ff ff ff  |................|
00000080  ff ff de 88 00 00 00 00  c1 e1 fe f8 f0 c0 c0 c0  |................|
00000090  00 00 00 01 01 03 07 07  00 00 00 01 01 03 07 07  |................|
000000a0  00 60 f0 f0 f8 ff ff ff  3f 7f ff ff ff ff ff ff  |.`......?.......|
000000b0  02 07 07 0f 3f ff ff ff  fe ff ff ff ff ff ff ff  |....?...........|
000000c0  00 00 80 c0 e0 f0 f0 f8  00 00 80 c0 e0 f0 f0 f8  |................|
000000d0  07 0f 0f 1f 1f 1f 1f 1f  07 0f 0f 1f 1f 1f 1f 1f  |................|
000000e0  f8 f8 f8 fc fc fc fc fc  f8 f8 f8 fc fc fc fc fc  |................|
000000f0  1f 1f 1f 0e 0d 07 07 03  1f 1f 1f 0f 0f 07 07 03  |................|
00000100  ff ff 7f ff cc f8 f0 f0  ff ff ff ff ff ff ff ff  |................|
00000110  fe fd ff ff 1f 1f 19 00  ff ff ff ff ff ff ff ff  |................|
00000120  bc dc e8 f8 f8 f0 f0 e0  fc fc f8 f8 f8 f0 f0 e0  |................|
00000130  03 01 01 01 01 03 03 03  03 01 01 01 01 03 03 03  |................|
00000140  f0 e0 e0 f8 fc ff ff ff  ff ff ff ff ff ff ff ff  |................|
00000150  00 00 00 01 21 f1 fb ff  ff ff ff ff ff ff ff ff  |....!...........|
00000160  60 c0 c0 80 80 80 80 00  e0 c0 c0 80 80 80 80 00  |`...............|
00000170  00 00 00 01 02 04 04 08  00 00 00 01 03 07 07 0f  |................|
00000180  00 1c e3 80 00 00 00 00  00 1c ff ff ff ff ff ff  |................|
00000190  00 00 00 80 40 20 00 10  00 00 00 80 c0 e0 e0 f0  |....@ ..........|
000001a0  08 10 10 13 13 17 1f 0f  0f 1f 1f 1f 1e 1e 1f 0f  |................|
000001b0  00 00 c0 e0 f0 ff ff ff  ff ff ff 3f 1f 1f ff ff  |...........?....|
000001c0  18 08 0c 0a 08 f8 f8 f8  f8 f8 fc fe fe ff 0f 0f  |................|
000001d0  07 07 07 07 07 03 01 01  07 07 03 00 00 00 00 00  |................|
000001e0  ff ff ff ff ff ff ff e3  df ce 80 00 00 00 00 1c  |................|
000001f0  f0 ff f0 e0 e0 c0 c0 c0  0f 0f 00 00 00 00 00 00  |................|
00000200  00 00 01 01 03 07 07 07  00 00 01 01 03 07 07 07  |................|
00000210  3c bf bf bf bf 9f df ef  33 f8 f8 fc ff ff ff ff  |<.......3.......|
00000220  7d fd fd f9 fb fb f3 f7  83 07 07 1f ff ff ff ff  |}...............|
00000230  00 80 c0 e0 f0 f0 f0 f0  00 80 c0 e0 f0 f0 f0 f0  |................|
00000240  0f 0f 1f 1f 1f 1f 1f 1f  0f 0f 1f 1f 1f 1f 1f 1f  |................|
00000250  f0 e0 c0 c0 80 80 80 80  ff ff ff ff ff ff ff ff  |................|
00000260  0f 07 03 03 13 f9 91 81  ff ff ff ff ff ff ff ff  |................|
00000270  f8 f8 fc fc fc fc fc fc  f8 f8 fc fc fc fc fc fc  |................|
00000280  1f 1f 0f 0f 0f 07 07 03  1f 1f 0f 0f 0f 07 07 03  |................|
00000290  c0 c1 e0 f8 ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
000002a0  83 c3 87 1f ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
000002b0  fc f8 f8 f8 f8 f0 f0 e0  fc f8 f8 f8 f8 f0 f0 e0  |................|
000002c0  03 01 01 01 01 03 03 03  03 01 01 01 01 03 03 03  |................|
000002d0  e0 c0 c0 c0 c0 c0 80 00  e0 c0 c0 c0 c0 c0 80 00  |................|
000002e0  ef ef ef ce de dc 30 80  ff ff ff fe ff ff 7f ff  |......0.........|
000002f0  60 60 60 e0 c0 30 00 00  7f 3f 3e 3e 7c f0 f0 f0  |```..0...?>>|...|
00000300  00 00 01 03 07 0f 1f 1f  00 00 01 02 04 08 10 10  |................|
00000310  00 7c ff ff ff ff ff ff  00 7c 83 00 00 00 00 00  |.|.......|......|
00000320  00 00 00 80 c0 e0 f0 f8  00 00 00 80 40 20 10 08  |............@ ..|
00000330  3f 3f 7f 7f 7d 7c 7d 7f  20 20 40 42 47 47 47 47  |??..}|}. @BGGGG|
00000340  ff ff ff ff ff 7f 1f f7  00 00 00 00 80 e0 fc ff  |................|
00000350  fc fc fc fe fe fe fe fe  04 04 04 02 02 02 02 02  |................|
00000360  5b 73 21 00 00 00 00 00  4f 5f 2f 0f 0f 07 07 03  |[s!.....O_/.....|
00000370  ff f7 e7 c3 00 00 00 00  ff ff ff ff ff ff ff ff  |................|
00000380  ff ff de 88 00 00 00 00  c1 e1 fe f8 f0 c0 c0 c0  |................|
00000390  00 00 00 01 01 03 07 07  00 00 00 01 01 02 04 04  |................|
000003a0  00 60 f0 f0 f8 ff ff ff  3f 7f 9f 1f 0f 07 00 00  |.`......?.......|
000003b0  02 07 07 0f 3f ff ff ff  fe fd fc f8 f0 c0 00 00  |....?...........|
000003c0  00 00 80 c0 e0 f0 f0 f8  00 00 80 40 20 10 10 08  |...........@ ...|
000003d0  07 0f 0f 1f 1f 1f 1f 1f  04 08 08 10 10 10 10 10  |................|
000003e0  f8 f8 f8 fc fc fc fc fc  08 08 08 04 04 04 04 04  |................|
000003f0  1f 1f 1f 0e 0d 07 07 03  10 10 11 0b 0f 06 04 02  |................|
00000400  ff ff 7f ff cc f8 f0 f0  00 80 c0 b3 7f 3f 1f 1f  |.............?..|
00000410  fe fd ff ff 1f 1f 19 00  03 07 06 e0 f0 f6 ff ff  |................|
00000420  bc dc e8 f8 f8 f0 f0 e0  e4 74 38 18 08 10 10 20  |.........t8.... |
00000430  03 01 01 01 01 03 03 03  02 01 01 01 01 02 02 03  |................|
00000440  f0 e0 e0 f8 fc ff ff ff  1f 3f 3f 1f 07 03 00 ff  |.........??.....|
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00000450  00 00 00 01 21 f1 fb ff  ff ff ff ff ff df 0e ff  |....!...........|
00000460  60 c0 c0 80 80 80 80 00  a0 40 40 80 80 80 80 00  |`........@@.....|
00000470  01 80 f0 80 50 40 70 01  01 80 f0 80 50 40 70 01  |....P@p.....P@p.|
00000480  01 03 03 07 07 07 07 07  00 00 00 00 00 00 07 07  |................|
00000490  c1 e7 ff ff ff ff ff ff  00 00 00 00 00 00 ff ff  |................|
000004a0  07 0f 7f ff 09 13 12 18  07 00 00 00 0f 0c 0d 1f  |................|
000004b0  ff ff ff ff c3 00 42 00  ff 00 00 00 ff 99 5a 18  |......B.......Z.|
000004c0  0e 09 09 08 01 6b f3 f6  17 37 37 37 3e 14 0c 09  |.....k...777>...|
000004d0  c3 3c 24 c3 c3 e7 ff 00  ff 3c 3c ff 3c 18 00 ff  |.<$......<<.<...|
000004e0  1f 1f 1f 1f 3f 3f 3f 3f  00 00 00 00 00 00 00 00  |....????........|
000004f0  47 08 31 18 c0 e0 f3 ff  b8 f7 de e7 7f 5f 4c 4f  |G.1..........._LO|
00000500  7f 7f 7f 7f 7f ff fe fe  00 01 01 02 02 02 03 0b  |................|
00000510  f1 f1 f1 fb fb 75 b1 59  4f 4e 4e 4c 6e af ee ee  |.....u.YONNLn...|
00000520  8f 8f 8f df df af 8f 9f  f2 72 72 32 76 f4 72 71  |.........rr2v.rq|
00000530  fe fe fe fe fe ff ff ff  00 80 80 40 40 40 48 50  |...........@@@HP|
00000540  fe fc fd f8 fc fc 7e 7f  05 07 07 07 03 03 01 01  |......~.........|
00000550  5b 2b 0b 9f 3e 7c ff ff  ec fc fc ec cd c7 46 46  |[+..>|........FF|
00000560  df df bf 3f 7f ff ff ff  31 31 71 f1 b2 22 62 e2  |...?....11q..”b.|
00000570  ff ff ff ff ff ff fe fe  20 20 20 20 40 40 40 80  |........    @@@.|
00000580  7f 7f ff ff ff 7f 5f 1f  01 02 02 04 18 00 00 00  |......_.........|
00000590  ff ff ff ff ff ff ff ff  0c 0c 08 0c 0c 08 0c 0c  |................|
000005a0  ff ff ff ff ff ff ff ff  20 20 20 20 20 20 20 20  |........        |
000005b0  fe fc fc f8 f8 f8 f8 f8  80 40 20 10 08 00 00 00  |.........@ .....|
000005c0  00 00 03 07 07 0f 0f 0f  00 00 00 00 00 00 00 00  |................|
000005d0  00 ff ff ff ff ff cf 83  00 00 00 00 00 00 30 7c  |..............0||
000005e0  1f 1f 1c 1f 13 03 01 00  00 00 03 03 0e 1c 0e 0f  |................|
000005f0  00 00 00 e7 ff e7 c3 00  ff ff ff ff 18 18 3c ff  |..............<.|
00000600  f8 f8 38 f8 c8 c0 80 00  00 00 c0 c0 70 38 70 f0  |..8.........p8p.|
00000610  00 00 00 00 00 00 00 00  07 07 03 03 03 03 01 01  |................|
00000620  00 3c 7e 00 3c 7e 7e 7e  ff c3 81 ff c3 81 81 81  |.<~.<~~~........|
00000630  00 0f 1f 1f 1f 3f 3f 3f  00 00 00 00 00 00 00 00  |.....???........|
00000640  f3 fb ff ff ff ff ff ff  0c 04 12 1f 1f 00 01 01  |................|
00000650  cf df ff ff ff ff ff ff  30 20 48 f8 f8 80 c0 c0  |........0 H.....|
00000660  00 f0 f8 f8 f8 fc fc fc  00 00 00 00 00 00 00 00  |................|
00000670  7f 7f 7f 7f 7f ff ff ff  00 01 01 02 02 02 02 0a  |................|
00000680  ff ff ff ff ff ff ff ff  01 01 01 03 07 00 00 00  |................|
00000690  ff ff ff ff ff ff ff ff  c0 e0 60 20 00 80 00 08  |..........` ....|
000006a0  fe fe fe fe fe ff ff ff  00 80 80 40 40 40 48 50  |...........@@@HP|
000006b0  ff ff ff ff ff ff 7f 7f  04 04 05 00 00 00 00 01  |................|
000006c0  ff ff ff ff ff ff ff ff  10 08 08 88 0c 06 06 04  |................|
000006d0  ff ff ff ff ff ff ff ff  10 10 10 30 30 20 20 20  |...........00   |
000006e0  ff ff ff ff ff ff fe fe  20 20 20 20 40 40 40 80  |........    @@@.|
000006f0  18 14 20 c0 00 00 04 fc  e7 ea de 3e fc fc fc fc  |.. ........>....|
00000700  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000710  00 00 00 00 00 00 00 3c  00 00 00 00 00 00 00 00  |.......<........|
00000720  01 03 07 0f 0f 08 00 00  00 00 00 00 07 0f 0f 0f  |................|
00000730  ff ff ff ff ff 00 00 00  00 00 00 00 ff ff ff ff  |................|
00000740  08 08 08 09 00 68 f0 f0  1f 3f 3f 3f 3f 1f 0f 0f  |.....h...????...|
00000750  00 00 00 c3 24 00 00 00  ff ff ff ff ff ff ff ff  |....$...........|
00000760  3f 7f ff ff ff ff ff 7f  00 00 00 00 00 00 80 40  |?..............@|
00000770  87 88 b0 98 80 c0 e0 ff  7f 7f 7f 7f 7f 3f 1f 00  |.............?..|
00000780  e1 11 0d 19 01 03 07 ff  fe fe fe fe fe fc f8 00  |................|
00000790  fc fe ff ff ff ff ff fe  00 00 00 00 00 00 01 02  |................|
000007a0  7f 7f 7f 7f 7f ff ff ff  20 10 08 04 02 01 02 02  |........ .......|
000007b0  ff ff ff ff ff ff ff ff  00 00 00 00 01 01 a1 1f  |................|
000007c0  ff ff ff ff ff ff ff ff  00 00 00 00 80 80 85 f8  |................|
000007d0  fe fe fe fe fe ff ff ff  04 08 10 20 40 80 48 50  |........... @.HP|
000007e0  ff ff ff ff ff ff 7f 7f  04 04 04 00 00 00 00 01  |................|
000007f0  ff ff ff ff ff ff ff ff  1f 01 01 01 01 01 01 01  |................|
00000800  ff ff ff ff ff ff ff ff  f8 80 80 80 80 80 80 80  |................|
00000810  ff ff ff ff ff ff fe fe  20 20 20 20 40 40 40 80  |........    @@@.|
00000820  7f 3f 3f 1f 1f 1f 1f 1f  01 02 02 04 18 00 00 00  |.??.............|
00000830  ff ff ff ff ff ff ff ff  01 01 01 00 00 00 00 00  |................|
00000840  ff ff ff ff ff ff ff ff  80 80 80 00 00 00 00 00  |................|
00000850  fe fc fc f8 f8 f8 f8 f8  80 40 20 10 08 00 00 00  |.........@ .....|
```

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00000860  ff bd ff ff ff ff ff ff  00 00 00 00 00 00 00 00  |................|
00000870  01 04 00 10 00 00 00 00  01 07 0f 1f 1f 3f 3f 3f  |.............???|
00000880  54 00 00 02 00 00 00 00  ff ff ff ff fd fd fd fd  |T...............|
00000890  08 10 00 00 00 00 02 00  2f 37 3b 3b 3b 3b 3b 39  |......../7;;;;;9|
000008a0  00 00 00 00 00 00 00 00  fd fd fd fd fc fe fe fe  |................|
000008b0  00 00 10 08 00 00 80 00  fc fc f4 ec ec ec cc 5c  |...............\|
000008c0  04 02 00 03 00 02 00 80  3c 3e 3f 3f 3c 3b 7f ff  |........<>??<;..|
000008d0  80 00 00 20 00 80 00 00  ff 7f 3f 3f 1f 9e 9e ce  |... ......??....|
000008e0  00 00 00 00 20 00 00 00  5c 5c 5c 1c 3c 7c 7c ff  |.... ...\\\.<||.|
000008f0  00 00 00 00 00 00 00 00  1f 3f 3f 7f 7f 7f 7f 7f  |.........??.....|
00000900  00 00 00 00 00 00 02 04  fc fc fc fc fe fe fe fc  |................|
00000910  00 00 80 20 00 00 00 10  ef ef ef 6f 4f 4f 1f 1f  |... .......oOO..|
00000920  00 00 00 00 04 10 00 00  7f 7f 7f 7f 7e 70 6f 7f  |............~po.|
00000930  10 00 42 90 01 40 00 04  f0 e1 c7 9f 3f fe fe fc  |..B..@......?...|
00000940  00 08 04 23 00 00 00 00  0f 0f 07 23 70 7c ff ff  |...#.......#p|..|
00000950  00 00 18 00 40 20 00 10  fe fe fe e6 de 3e 9e de  |....@ .......>..|
00000960  00 00 00 00 00 00 00 00  7f 7f 7f 7f 7f 7f 7f 7f  |................|
00000970  08 00 00 00 00 02 00 08  fa f6 fe fe fe fe fc f8  |................|
00000980  80 00 00 00 00 00 00 80  ff 7f 7f 7f 7f ff ff ff  |................|
00000990  00 08 00 00 00 00 00 00  ce ee f6 fe fe fe fe fe  |................|
000009a0  00 40 20 10 00 00 00 0f  7f 7f 3f 1f 0f 0f 0f 0f  |.@ .......?.....|
000009b0  00 00 20 00 00 80 00 ff  f1 f7 e7 cf df bf 7f ff  |.. ............|
000009c0  00 40 00 10 00 00 00 ff  7f 7f bf df ef ff ff ff  |.@..............|
000009d0  00 18 18 00 00 00 00 00  18 00 00 18 18 18 18 18  |................|
000009e0  00 00 00 00 00 00 00 00  18 18 18 18 18 18 18 18  |................|
000009f0  00 00 00 00 00 00 18 18  18 18 18 18 18 18 00 00  |................|
00000a00  0f 07 0f 3f 3f 3f 3f 3f  0c 18 30 30 30 30 30 30  |...?????..000000|
00000a10  3f 3f 3f 3f 3f 3f 3f 3f  30 30 30 30 30 30 30 30  |????????00000000|
00000a20  3f 3f 3f 3f 3f 7f 1f 3f  30 30 30 30 30 60 60 c0  |?????..?00000``.|
00000a30  ff ff ff ff ff ff ff ff  c0 c0 c0 c0 c0 c0 c0 c0  |................|
00000a40  f0 f8 fc fc fc fc fc fc  00 00 00 00 00 00 00 00  |................|
00000a50  fc fc fc fc fc fc fc fc  00 00 00 00 00 00 00 00  |................|
00000a60  fc fc fc fc fc fe fe ff  00 00 00 00 00 00 00 00  |................|
00000a70  0f 1f 3f 3f 3f 3f 3f 3f  0f 1f 3f 3f 3f 3f 3f 3f  |..??????..??????|
00000a80  3f 3f 3f 3f 3f 3f 3f 3f  3f 3f 3f 3f 3f 3f 3f 3f  |????????????????|
00000a90  3f 3f 3f 3f 3f 7f 7f ff  3f 3f 3f 3f 3f 7f 7f ff  |?????...?????...|
00000aa0  c0 f8 fc f0 f0 f0 f0 f0  f0 e0 f0 fc fc fc fc fc  |................|
00000ab0  f0 f0 f0 f0 f0 f0 f0 f0  fc fc fc fc fc fc fc fc  |................|
00000ac0  f0 f0 f0 f0 f0 f8 fe ff  fc fc fc fc fc fe f8 fc  |................|
00000ad0  fc fc fc fc fc fc fc fc  ff ff ff ff ff ff ff ff  |................|
00000ae0  69 fd d5 d5 d5 d5 d5 d5  00 00 00 00 00 00 00 00  |i...............|
00000af0  9c b0 b0 bc 9e 86 86 bc  00 00 00 00 00 00 00 00  |................|
00000b00  73 c3 c3 f3 7b 18 1b f3  00 00 00 00 00 00 00 00  |s...{...........|
00000b10  07 1f 3f 1f 07 02 22 3a  00 07 1f 27 38 3d 1d 05  |..?...":...'8=..|
00000b20  c0 f0 f8 f0 d0 10 18 38  00 c0 f0 c8 38 f8 f0 d0  |.......8....8...|
00000b30  3f 3f 3f 1f 07 22 1a 07  10 1c 11 25 38 1d 05 00  |???.."......%8...|
00000b40  f8 f8 f8 f0 d0 18 30 c0  10 50 50 98 38 f0 c0 00  |......0..PP.8...|
00000b50  00 00 27 4f 4f 9e ff 9e  00 00 18 30 3e 65 00 6d  |..'OO......0>e.m|
00000b60  00 00 88 1c 1c 3e fe 3e  00 00 70 e8 e8 dc 1c dc  |.....>.>..p.....|
00000b70  9e 9e 9e 7f 4f 27 00 00  69 65 61 3f 30 1a 00 00  |....O'..iea?0...|
00000b80  3e 3e 3e fc 1c 88 00 00  dc dc dc e8 e8 70 00 00  |>>>..........p..|
00000b90  01 01 00 08 19 3e 3c be  00 02 07 07 06 09 5b 45  |.....><.......[E|
00000ba0  c0 f0 f8 fc 7c 3e 1e 1e  00 c0 70 78 b8 dc ec f0  |....|>....px....|
00000bb0  9f bf cf 47 43 24 18 06  64 4a 34 39 3e 1f 07 00  |...GC$..dJ49>...|
00000bc0  20 c0 f0 e0 c0 00 00 00  fc 78 80 40 00 80 00 00  | ........x.@....|
00000bd0  40 30 18 1d 0f 3f ff 1f  00 10 08 15 0b 39 e0 18  |@0...?.......9..|
00000be0  40 c0 c1 c6 dc f8 f0 f8  40 80 81 46 54 68 50 18  |@.......@..FThP.|
00000bf0  0f 07 0f 1f 39 61 01 01  0c 04 09 17 29 61 01 01  |....9a......)a..|
00000c00  fe f8 f0 f8 dc 8c 82 00  06 18 00 68 54 88 82 00  |...........hT...|
00000c10  00 00 00 00 08 04 02 1f  00 00 00 00 00 00 00 00  |................|
00000c20  00 00 00 00 00 10 20 60  00 00 00 00 00 00 00 00  |...... `........|
00000c30  07 03 07 09 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000c40  c0 c0 e0 b0 88 40 00 00  00 00 00 00 00 00 00 00  |.....@..........|
00000c50  00 00 20 7e 20 20 00 00  00 00 7e 21 7f 7e 00 00  |.. ~  ....~!.~..|
00000c60  00 20 30 f8 fc fe ff 00  00 00 00 00 00 00 00 00  |. 0.............|
```

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00000c70  3c 7e 7e 3c 18 00 18 00  00 00 00 00 00 00 00 00  |<~~<............|
00000c80  00 00 00 1f 01 01 01 1f  00 00 00 00 1e 1e 1e 00  |................|
00000c90  00 00 00 fc 08 08 08 fc  00 00 00 00 fc fc fc 08  |................|
00000ca0  1f 1f 1f 1f 01 01 01 1f  0e 08 0e 00 1e 1e 1e 00  |................|
00000cb0  fc fc fc fc 08 08 08 fc  a8 a8 48 08 fc fc fc 00  |..........H.....|
00000cc0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
00000d00  38 4c c6 c6 c6 64 38 00  00 00 00 00 00 00 00 00  |8L...d8.........|
00000d10  18 38 18 18 18 18 7e 00  00 00 00 00 00 00 00 00  |.8....~.........|
00000d20  7c c6 0e 3c 78 e0 fe 00  00 00 00 00 00 00 00 00  ||..<x...........|
00000d30  7e 0c 18 3c 06 c6 7c 00  00 00 00 00 00 00 00 00  |~..<..|.........|
00000d40  1c 3c 6c cc fe 0c 0c 00  00 00 00 00 00 00 00 00  |.<l.............|
00000d50  fc c0 fc 06 06 c6 7c 00  00 00 00 00 00 00 00 00  |......|.........|
00000d60  3c 60 c0 fc c6 c6 7c 00  00 00 00 00 00 00 00 00  |<`....|.........|
00000d70  fe c6 0c 18 30 30 30 00  00 00 00 00 00 00 00 00  |....000.........|
00000d80  7c c6 c6 7c c6 c6 7c 00  00 00 00 00 00 00 00 00  ||..|..|.........|
00000d90  7c c6 c6 7e 06 0c 78 00  00 00 00 00 00 00 00 00  ||..~..x.........|
00000da0  38 6c c6 c6 fe c6 c6 00  00 00 00 00 00 00 00 00  |8l..............|
00000db0  fc c6 c6 fc c6 c6 fc 00  00 00 00 00 00 00 00 00  |................|
00000dc0  f8 cc c6 c6 c6 cc f8 00  00 00 00 00 00 00 00 00  |................|
00000dd0  fe c0 c0 fc c0 c0 fe 00  00 00 00 00 00 00 00 00  |................|
00000de0  3e 60 c0 ce c6 66 3e 00  00 00 00 00 00 00 00 00  |>`...f>.........|
00000df0  7e 18 18 18 18 18 7e 00  00 00 00 00 00 00 00 00  |~.....~.........|
00000e00  c6 ee fe fe d6 c6 c6 00  00 00 00 00 00 00 00 00  |................|
00000e10  c6 e6 f6 fe de ce c6 00  00 00 00 00 00 00 00 00  |................|
00000e20  7c c6 c6 c6 c6 c6 7c 00  00 00 00 00 00 00 00 00  ||.....|.........|
00000e30  fc c6 c6 ce f8 dc ce 00  00 00 00 00 00 00 00 00  |................|
00000e40  78 cc c0 7c 06 c6 7c 00  00 00 00 00 00 00 00 00  |x..|..|.........|
00000e50  7e 18 18 18 18 18 18 00  00 00 00 00 00 00 00 00  |~...............|
00000e60  c6 c6 c6 c6 c6 c6 7c 00  00 00 00 00 00 00 00 00  |......|.........|
00000e70  c6 c6 c6 ee 7c 38 10 00  00 00 00 00 00 00 00 00  |....|8.........|
00000e80  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000e90  00 00 7c 00 7c 00 00 00  00 00 00 00 00 00 00 00  |..|.|...........|
00000ea0  c6 c6 c6 fe c6 c6 c6 00  00 00 00 00 00 00 00 00  |................|
00000eb0  18 18 18 18 18 3c 7e ff  18 18 18 18 18 3c 7e ff  |.....<~......<~.|
00000ec0  ff ff ff ff ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
00000ed0  00 00 00 00 00 00 00 00  ff ff ff ff ff ff ff ff  |................|
00000ee0  ff ff ff ff ff ff ff ff  00 00 00 00 00 00 00 00  |................|
00000ef0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00000f00  fc c6 c6 c6 fc c0 c0 00  00 00 00 00 00 00 00 00  |................|
00000f10  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
*
00001000  ff ff ff ff ff ff ff ff  c7 b3 39 39 39 9b c7 ff  |..........999...|
00001010  ff ff ff ff ff ff ff ff  e7 c7 e7 e7 e7 e7 81 ff  |................|
00001020  ff ff ff ff ff ff ff ff  83 39 f1 c3 87 1f 01 ff  |.........9......|
00001030  ff ff ff ff ff ff ff ff  81 f3 e7 c3 f9 39 83 ff  |.............9..|
00001040  ff ff ff ff ff ff ff ff  e3 c3 93 33 01 f3 f3 ff  |...........3....|
00001050  ff ff ff ff ff ff ff ff  03 3f 03 f9 f9 39 83 ff  |.........?...9..|
00001060  ff ff ff ff ff ff ff ff  c3 9f 3f 03 39 39 83 ff  |..........?.99..|
00001070  ff ff ff ff ff ff ff ff  01 39 f3 e7 cf cf cf ff  |.........9......|
00001080  ff ff ff ff ff ff ff ff  83 39 39 83 39 39 83 ff  |.........99.99..|
00001090  ff ff ff ff ff ff ff ff  83 39 39 81 f9 f3 87 ff  |.........99.....|
000010a0  c7 93 39 39 01 39 39 ff  ff ff ff ff ff ff ff ff  |..99.99.........|
000010b0  03 39 39 03 39 39 03 ff  ff ff ff ff ff ff ff ff  |.99.99..........|
000010c0  c3 99 3f 3f 3f 99 c3 ff  ff ff ff ff ff ff ff ff  |..???...........|
000010d0  07 33 39 39 39 33 07 ff  ff ff ff ff ff ff ff ff  |.39993..........|
000010e0  01 3f 3f 03 3f 3f 01 ff  ff ff ff ff ff ff ff ff  |.??.??..........|
000010f0  01 3f 3f 03 3f 3f 3f ff  ff ff ff ff ff ff ff ff  |.??.???.........|
00001100  c1 9f 3f 31 39 99 c1 ff  ff ff ff ff ff ff ff ff  |..?19...........|
00001110  39 39 39 01 39 39 39 ff  ff ff ff ff ff ff ff ff  |999.999.........|
00001120  81 e7 e7 e7 e7 e7 81 ff  ff ff ff ff ff ff ff ff  |................|
00001130  ff 70 3f 3f 3f 3f ff ff  ff ff ff ff ff ff ff ff  |.p????..........|
00001140  39 33 27 0f 07 23 31 ff  ff ff ff ff ff ff ff ff  |93'..#1.........|
00001150  9f 9f 9f 9f 9f 9f 81 ff  ff ff ff ff ff ff ff ff  |................|
00001160  39 11 01 01 29 39 39 ff  ff ff ff ff ff ff ff ff  |9...)99.........|
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00001170  39 19 09 01 21 31 39 ff  ff ff ff ff ff ff ff ff  |9...!19.........|
00001180  83 39 39 39 39 39 83 ff  ff ff ff ff ff ff ff ff  |.99999..........|
00001190  03 39 39 39 39 03 3f 3f  ff ff ff ff ff ff ff ff  |.999.??.........|
000011a0  39 39 39 39 11 83 c7 ff  ff ff ff ff ff ff ff ff  |9999............|
000011b0  03 39 39 31 07 23 31 ff  ff ff ff ff ff ff ff ff  |.991.#1.........|
000011c0  87 33 3f 83 f9 39 83 ff  ff ff ff ff ff ff ff ff  |.3?..9..........|
000011d0  81 e7 e7 e7 e7 e7 e7 ff  ff ff ff ff ff ff ff ff  |................|
000011e0  39 39 39 39 39 39 83 ff  ff ff ff ff ff ff ff ff  |999999..........|
000011f0  ff 81 81 81 81 81 81 ff  00 00 00 00 00 00 00 00  |................|
00001200  f7 e7 e7 e7 e4 f4 ff ff  ff ff ff ff ff ff ff ff  |................|
00001210  ff ff ff ff 1c 0c ff ff  ff ff ff ff ff ff ff ff  |................|
00001220  99 99 99 c3 e7 e7 e7 ff  ff ff ff ff ff ff ff ff  |................|
00001230  e7 e7 f7 ff ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
00001240  39 39 39 29 01 11 39 ff  ff ff ff ff ff ff ff ff  |999)..9.........|
00001250  ff ff ff 7f 7f 3f 1f 07  00 00 00 00 00 00 00 00  |.....?..........|
00001260  ff ff ff fe fe fc f8 e0  00 00 00 00 00 00 00 00  |................|
00001270  07 1f 3f 7f 7f ff ff ff  00 00 00 00 00 00 00 00  |..?.............|
00001280  e0 f8 fc fe fe ff ff ff  00 00 00 00 00 00 00 00  |................|
00001290  e7 e7 e7 e7 e7 e7 e7 e7  00 00 00 00 00 00 00 00  |................|
000012a0  00 00 00 00 00 00 00 00  00 00 00 ff ff 00 00 00  |................|
000012b0  0f 0f 0f 0f 0f 0f 0f 0f  00 00 00 00 00 00 00 00  |................|
000012c0  f0 f0 f0 f0 f0 f0 f0 f0  00 00 00 00 00 00 00 00  |................|
000012d0  c3 bd 66 5e 5e 66 bd c3  ff ff ff ff ff ff ff ff  |..f^^f..........|
000012e0  ff ff ff ff 93 93 f7 ff  ff ff ff ff ff ff ff ff  |................|
000012f0  ff ff ff ff 9f 9f ff ff  ff ff ff ff ff ff ff ff  |................|
00001300  00 01 0e 18 20 40 40 80  00 01 0f 1f 3f 7f 7f ff  |.... @@.....?...|
00001310  00 c0 30 08 04 02 00 01  00 c0 f0 f8 fc fe fe ff  |..0.............|
00001320  00 01 01 01 01 01 01 00  00 01 01 01 01 01 01 00  |................|
00001330  80 00 0c 3e 3f 7f ff ff  ff ff ff f3 e1 e1 ff ff  |...>?...........|
00001340  01 00 00 00 00 ff ff ff  ff ff ff ff ff ff f0 f0  |................|
00001350  80 80 c0 a0 80 88 88 84  80 80 c0 e0 e0 f8 f8 fc  |................|
00001360  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00001370  7f 7f 7f 7f 7f 3f 1f 1e  7d 7c 38 00 00 00 00 01  |.....?..}|8.....|
00001380  ff ff ff fe fe fc fc 3c  f0 e0 00 00 00 00 00 c0  |.......<........|
00001390  04 f8 00 00 00 00 00 00  fc f8 00 00 00 00 00 00  |................|
000013a0  00 00 01 01 03 07 07 07  00 00 01 01 03 07 07 07  |................|
000013b0  3c bf bf bf bf 9f df ef  33 f8 f8 fc ff ff ff ff  |<.......3.......|
000013c0  7d fd fd f9 fb fb f3 f7  83 07 07 1f ff ff ff ff  |}...............|
000013d0  00 80 c0 e0 f0 f0 f8 f8  00 80 c0 e0 f0 f0 f8 f8  |................|
000013e0  0f 0f 1f 1f 1f 1f 1f 1f  0f 0f 1f 1f 1f 1f 1f 1f  |................|
000013f0  f0 e0 c0 c0 80 80 80 80  ff ff ff ff ff ff ff ff  |................|
00001400  0f 07 03 03 13 f9 91 81  ff ff ff ff ff ff ff ff  |................|
00001410  f8 f8 fc fc fc fc fc fc  f8 f8 fc fc fc fc fc fc  |................|
00001420  1f 1f 0f 0f 0f 07 07 03  1f 1f 0f 0f 0f 07 07 03  |................|
00001430  c0 c1 e0 f8 ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
00001440  83 c3 87 1f ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
00001450  fc f8 f8 f8 f8 f0 f0 e0  fc f8 f8 f8 f8 f0 f0 e0  |................|
00001460  03 01 01 01 01 03 03 03  03 01 01 01 01 03 03 03  |................|
00001470  ff ff ff ff ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
*
00001490  e0 c0 c0 c0 c0 c0 80 00  e0 c0 c0 c0 c0 c0 80 00  |................|
000014a0  00 00 00 00 00 00 00 01  00 00 00 00 00 00 00 00  |................|
000014b0  00 0f 3f 7f ff ff fc f8  00 00 00 00 00 00 03 07  |..?.............|
000014c0  00 f0 fc fe ff ff ff 3f  00 00 00 00 00 00 00 c0  |.......?........|
000014d0  00 00 00 00 00 00 00 80  00 00 00 00 00 00 00 00  |................|
000014e0  01 01 01 01 01 00 00 00  00 00 00 00 00 01 00 00  |................|
000014f0  f0 f0 c0 fe 3f 3e 1c 00  0f 0f 3f 3f e1 c1 e3 ff  |....?>....??....|
00001500  0f 0f 03 7f fc 7c 38 00  f0 f0 fc fc 87 83 c7 ff  |.....|8.........|
00001510  80 80 80 80 80 00 00 00  00 00 00 00 00 80 00 00  |................|
00001520  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00001530  00 03 07 00 03 07 07 07  7f 7c 38 3f 3c 38 18 18  |.........|8?<8..|
00001540  00 c0 e0 00 c0 e0 e0 e0  fe 3e 1c fc 3c 1c 18 18  |.........>..<...|
00001550  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00001560  00 0f 1f 1f 1f 3f 3f 3f  00 00 00 00 00 00 00 00  |.....???........|
00001570  f3 fb ff ff ff ff ff ff  0c 04 12 1f 1f 00 01 01  |................|
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00001580  cf df ff ff ff ff ff ff  30 20 48 f8 f8 80 c0 c0  |........0 H.....|
00001590  00 f0 f8 f8 f8 fc fc fc  00 00 00 00 00 00 00 00  |................|
000015a0  7f 7f 7f 7f 7f ff ff ff  00 01 01 02 02 02 02 0a  |................|
000015b0  ff ff ff ff ff ff ff ff  01 01 01 03 07 00 00 00  |................|
000015c0  ff ff ff ff ff ff ff ff  c0 e0 60 20 00 80 00 08  |..........` ....|
000015d0  fe fe fe fe fe ff ff ff  00 80 80 40 40 40 48 50  |...........@@@HP|
000015e0  ff ff ff ff ff ff 7f 7f  04 04 05 00 00 00 00 01  |................|
000015f0  ff ff ff ff ff ff ff ff  10 08 08 88 0c 06 06 04  |................|
00001600  ff ff ff ff ff ff ff ff  10 10 10 30 30 20 20 20  |...........00   |
00001610  ff ff ff ff ff ff fe fe  20 20 20 20 40 40 40 80  |........    @@@.|
00001620  7f 7f ff ff ff 7f 5f 1f  01 02 02 04 18 00 00 00  |......_.........|
00001630  ff ff ff ff ff ff ff ff  0c 0c 08 0c 0c 08 0c 0c  |................|
00001640  ff ff ff ff ff ff ff ff  20 20 20 20 20 20 20 20  |........        |
00001650  fe fc fc f8 f8 f8 f8 f8  80 40 20 10 08 00 00 00  |.........@ .....|
00001660  00 00 00 00 00 00 00 03  00 00 00 00 00 00 00 00  |................|
00001670  00 00 00 00 00 00 00 c0  00 00 00 00 00 00 00 00  |................|
00001680  1f 3f 7f ff ff 80 00 00  00 00 00 00 7f ff ff ff  |.?..............|
00001690  f8 fc fe ff ff 01 00 00  00 00 00 00 fe ff ff ff  |................|
000016a0  00 00 00 00 00 06 0f 1f  01 03 03 03 03 01 00 00  |................|
000016b0  80 80 80 9c 02 80 00 00  ff ff ff ff ff ff ff ff  |................|
000016c0  01 01 01 39 40 01 00 00  ff ff ff ff ff ff ff ff  |...9@...........|
000016d0  00 00 00 00 00 60 f0 f8  80 c0 c0 c0 c0 80 00 00  |.....`..........|
000016e0  3f 7f ff ff ff ff ff 7f  00 00 00 00 00 00 80 40  |?..............@|
000016f0  87 88 b0 98 80 c0 e0 ff  7f 7f 7f 7f 7f 3f 1f 00  |.............?..|
00001700  e1 11 0d 19 01 03 07 ff  fe fe fe fe fe fc f8 00  |................|
00001710  fc fe ff ff ff ff ff fe  00 00 00 00 00 00 01 02  |................|
00001720  7f 7f 7f 7f 7f ff ff ff  20 10 08 04 02 01 02 02  |........ .......|
00001730  ff ff ff ff ff ff ff ff  00 00 00 00 01 01 a1 1f  |................|
00001740  ff ff ff ff ff ff ff ff  00 00 00 00 80 80 85 f8  |................|
00001750  fe fe fe fe fe ff ff ff  04 08 10 20 40 80 48 50  |........... @.HP|
00001760  ff ff ff ff ff ff 7f 7f  04 04 04 00 00 00 00 01  |................|
00001770  ff ff ff ff ff ff ff ff  1f 01 01 01 01 01 01 01  |................|
00001780  ff ff ff ff ff ff ff ff  f8 80 80 80 80 80 80 80  |................|
00001790  ff ff ff ff ff ff fe fe  20 20 20 20 40 40 40 80  |........    @@@.|
000017a0  7f 3f 3f 1f 1f 1f 1f 1f  01 02 02 04 18 00 00 00  |.??.............|
000017b0  ff ff ff ff ff ff ff ff  01 01 01 00 00 00 00 00  |................|
000017c0  ff ff ff ff ff ff ff ff  80 80 80 00 00 00 00 00  |................|
000017d0  fe fc fc f8 f8 f8 f8 f8  80 40 20 10 08 00 00 00  |.........@ .....|
000017e0  d5 6a 35 1a 0c 06 02 00  2a 15 0a 05 03 01 01 01  |.j5.....*.......|
000017f0  df df df 00 fb ff ff 07  20 20 20 ff 04 07 07 ff  |........  ......|
00001800  df df df 07 ff ff ff 07  27 27 27 ff 07 07 07 ff  |........'''.....|
00001810  df df df 1f c0 fb fb 00  3f 3f 3f ff 3f 04 04 ff  |........???.?...|
00001820  08 08 ff 80 80 80 ff ff  ff ff ff ff ff ff ff ff  |................|
00001830  df df df 00 fb ff ff ff  20 20 20 ff 04 ff ff ff  |........   .....|
00001840  ff ff ff ff 00 fb fb 00  ff ff ff ff ff 04 04 ff  |................|
00001850  df df df 00 fb fb fb e0  20 20 20 ff 04 e4 e4 ff  |........   .....|
00001860  ff ff ff e0 fb fb fb e0  e0 e0 e0 ff e4 e4 e4 ff  |................|
00001870  ff ff ff f8 03 fb fb 00  f8 f8 f8 ff fc 04 04 ff  |................|
00001880  55 aa 55 00 fb fb fb 00  aa 55 aa ff 04 04 04 ff  |U.U......U......|
00001890  df df df 00 fb fb fb 00  20 20 20 ff 04 04 04 ff  |........   .....|
000018a0  ff 00 ff 00 ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
000018b0  55 aa 54 a8 50 20 40 80  aa 54 a8 50 a0 c0 80 00  |U.T.P @..T.P....|
000018c0  04 02 01 01 01 01 01 01  38 7c fe fe fe fe fe fe  |........8|......|
000018d0  01 01 01 01 01 01 01 01  fe fe fe fe fe fe fe fe  |................|
000018e0  c7 83 01 01 01 01 01 01  fb fd fe fe fe fe fe fe  |................|
000018f0  01 01 01 01 11 01 01 01  fe fe fe fe fe fe fe fe  |................|
00001900  ff ff c3 81 81 c3 ff ff  ff 00 c3 81 81 c3 00 ff  |................|
00001910  ff ff c0 c0 c0 c0 c0 c0  ff 80 80 80 80 80 80 80  |................|
00001920  c0 c0 c0 c0 c0 c0 c0 c0  80 80 80 80 80 80 80 80  |................|
00001930  ff ff 00 00 00 00 00 00  ff 00 ff ff ff ff ff ff  |................|
00001940  00 00 00 00 00 00 00 ff  ff ff ff ff ff ff ff ff  |................|
00001950  ff ff 03 03 03 03 03 03  ff 02 fe fe fe fe fe fe  |................|
00001960  03 03 03 03 03 03 03 03  fe fe fe fe fe fe fe fe  |................|
00001970  ff ff 03 03 03 03 03 03  ff 02 02 02 02 02 02 02  |................|
00001980  03 03 03 03 03 03 03 03  02 02 02 02 02 02 02 02  |................|
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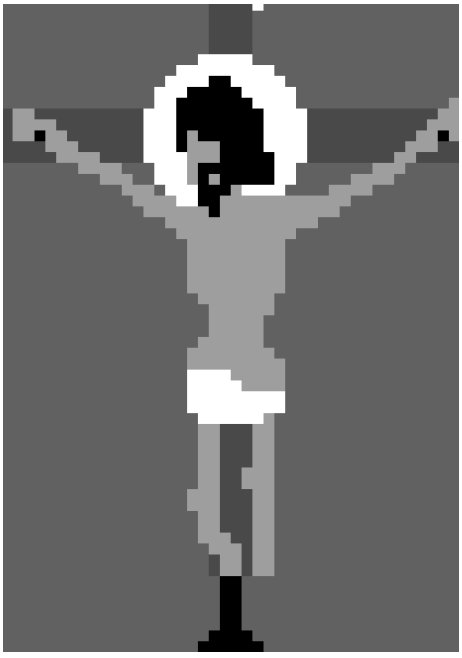
00001990  ff ff 00 00 00 00 00 00  ff 00 00 00 00 00 00 00  |................|
000019a0  ff ff 03 03 03 03 03 03  fe 02 02 02 02 02 02 02  |................|
000019b0  03 03 03 03 03 03 03 03  02 02 02 02 02 02 02 02  |................|
000019c0  01 01 01 01 01 01 01 01  ff ff ff ff ff ff ff ff  |................|
000019d0  00 00 00 00 ff 3f 0f 03  ff ff ff ff 00 00 00 00  |.....?..........|
000019e0  00 00 00 00 ff ff ff ff  ff ff ff ff 00 00 00 00  |................|
000019f0  ff 3f 0f 03 00 00 00 00  00 00 00 00 00 00 00 00  |.?..............|
00001a00  ff ff ff ff 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00001a10  c1 c1 c0 c0 00 00 00 00  3e 3e 3e 3e 3e 3e 3e 3e  |........>>>>>>>>|
00001a20  00 00 00 00 00 00 00 00  3e 3e 3e 3e 3e 3e 3e 3e  |........>>>>>>>>|
00001a30  f8 c0 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00001a40  00 00 00 00 ff fc e0 00  ff ff ff ff 00 00 00 00  |................|
00001a50  ff 00 00 00 00 00 00 00  00 ff ff ff ff ff ff ff  |................|
00001a60  ff 00 00 00 0f 18 17 17  00 ff ff ff ff ff ff ff  |................|
00001a70  17 17 17 17 17 17 17 17  ff ff ff ff ff ff ff ff  |................|
00001a80  ff 00 00 00 ff 00 ff ff  00 ff ff ff ff ff ff ff  |................|
00001a90  ff 00 00 01 e1 31 d1 d1  00 ff ff ff ff ff ff ff  |.....1..........|
00001aa0  d1 d1 d1 d1 d1 d1 d1 d1  ff ff ff ff ff ff ff ff  |................|
00001ab0  ff 00 00 ff ff 80 80 ff  00 ff ff ff 00 7f 7f ff  |................|
00001ac0  ff 80 80 ff ff 82 82 fc  00 7f 7f ff 01 7f 7f ff  |................|
00001ad0  fd 89 8a f2 f4 a4 a8 c8  06 7e 7d fd 1b 7b 77 f7  |.........~}..{w.|
00001ae0  fd 01 02 f2 f4 24 28 c8  02 fe fd fd 1b fb f7 f7  |.....$(.........|
00001af0  d0 90 a0 20 41 41 83 82  6f ef df df be be 7c 7d  |... AA..o.....|}|
00001b00  ff fc f0 e0 c0 c0 81 83  fc f3 ef df bf bf 7e 7c  |..............~||
00001b10  06 05 0d 0b 1b 17 37 2f  f9 fb f3 f7 e7 ef cf df  |......7/........|
00001b20  6f 5f df bf bf 7f 7f ff  9f bf 3f 7f 7f ff ff ff  |o_........?.....|
00001b30  ff 00 00 00 00 00 ff 00  00 ff ff ff ff ff 00 ff  |................|
00001b40  ff 3f 0f 07 03 03 81 c1  3f cf f7 fb fd fd 7e 3e  |.?......?.....~>|
00001b50  60 a0 b0 d0 d8 e8 ec f4  9f df cf ef e7 f7 f3 fb  |`...............|
00001b60  f6 fa fb fd fd fe fe ff  f9 fd fc fe fe ff ff ff  |................|
00001b70  bf 80 40 4f 2f 24 14 13  40 7f bf bf d8 df ef ef  |..@O/$..@.......|
00001b80  0b 09 05 04 82 82 c1 41  f6 f7 fb fb 7d 7d 3e be  |.......A....}}>.|
00001b90  ff 00 00 ff ff 01 01 ff  00 ff ff ff 00 fe fe ff  |................|
00001ba0  ff 01 01 ff ff 41 41 3f  00 fe fe ff 80 fe fe ff  |.....AA?........|
00001bb0  bf 91 51 4f 2f 25 15 13  60 7e be bf d8 de ee ef  |..QO/%..`~......|
00001bc0  ff 00 00 80 87 8c 8b 8b  00 ff ff ff ff ff ff ff  |................|
00001bd0  8b 8b 8b 8b 8b 8b 8b 8b  ff ff ff ff ff ff ff ff  |................|
00001be0  ff 00 00 00 f0 18 e8 e8  00 ff ff ff ff ff ff ff  |................|
00001bf0  e8 e8 e8 e8 e8 e8 e8 e8  ff ff ff ff ff ff ff ff  |................|
00001c00  00 00 00 00 00 00 04 04  7f bf df ef f7 fb fd fe  |................|
00001c10  00 00 40 40 40 48 48 48  7f bf df ef f7 fb fd fe  |..@@@HHH........|
00001c20  04 04 04 04 04 04 04 04  ff ff ff ff ff ff ff ff  |................|
00001c30  ff ff ff ff ff ff ff ff  ff ff 83 ff 83 ff ff ff  |................|
00001c40  05 04 07 0f 1f 3f 7f 00  ff fc ff ff ff ff ff 00  |.....?..........|
00001c50  48 48 48 48 48 48 48 48  ff ff ff ff ff ff ff ff  |HHHHHHHH........|
00001c60  49 4b 48 4f 5f 40 7f ff  ff ff f8 ff ff c0 ff ff  |IKHO_@..........|
00001c70  ff ff ff ff ff ff ff ff  ff 01 fd fd fd fd fd fd  |................|
00001c80  ff ff ff ff ff ff ff ff  fd fd fd fd 01 ff 00 00  |................|
00001c90  ff ff 00 ff ff 00 ff ff  ff ff 00 ff ff 00 ff ff  |................|
00001ca0  ff 00 ff ff ff ff ff 00  ff 00 ff ff ff ff ff 00  |................|
00001cb0  fe fe 00 fd fd 00 fb fb  fe fe 00 fd fd 00 fb fb  |................|
00001cc0  fb 00 f7 f7 ef ef ef 00  fb 00 f7 f7 ef ef ef 00  |................|
00001cd0  df df bf bf bf 7f 7f 7f  df df bf bf bf 7f 7f 7f  |................|
00001ce0  00 00 00 00 00 00 00 ff  ff ff ff ff ff ff ff ff  |................|
00001cf0  ff ff ff ff ff ff ff ff  82 82 82 82 82 82 82 82  |................|
00001d00  00 00 00 00 00 00 ff ff  ff ff ff ff ff ff ff 00  |................|
00001d10  ff ff 7f 7f 3f 1f 0f 03  03 01 00 00 00 00 00 00  |....?...........|
00001d20  ff ff ff ff ff ff ff ff  00 ff 00 00 00 00 00 00  |................|
00001d30  ff ff ff ff ff ff ff ff  ff 80 bf bf bf bf bf bf  |................|
00001d40  ff ff ff ff ff ff ff ff  bf bf bf bf 80 ff 00 00  |................|
00001d50  ff ff ff ff ff ff ff ff  00 00 ff 00 ff 00 00 00  |................|
00001d60  ff ff ff ff ff ff ff ff  ff 00 ff ff ff ff ff ff  |................|
00001d70  ff ff ff ff ff ff ff ff  ff ff ff ff 00 ff 00 00  |................|
00001d80  fe fe 00 fe fe 00 fe fe  fe fe 00 fe fe 00 fe fe  |................|
00001d90  fe 00 fe fe fe fe fe 00  fe 00 fe fe fe fe fe 00  |................|
```

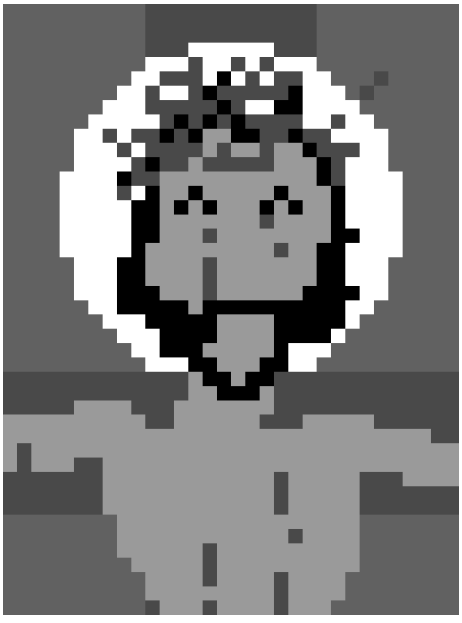
```
00001da0  00 00 00 00 00 00 20 20  fe fd fb f7 ef df bf 7f  |......  ........|
00001db0  00 00 02 02 02 12 12 12  fe fd fb f7 ef df bf 7f  |................|
00001dc0  20 20 20 20 20 20 20 20  ff ff ff ff ff ff ff ff  |        ........|
00001dd0  a0 20 e0 f0 f8 fc fe 00  ff 3f ff ff ff ff ff 00  |. .......?......|
00001de0  12 12 12 12 12 12 12 12  ff ff ff ff ff ff ff ff  |................|
00001df0  92 d2 12 f2 fa 02 fe ff  ff ff 1f ff ff 03 ff ff  |................|
00001e00  7f 7f 00 bf bf 00 df df  7f 7f 00 bf bf 00 df df  |................|
00001e10  df 00 ef ef f7 f7 f7 00  df 00 ef ef f7 f7 f7 00  |................|
00001e20  fb fb fd fd fd fe fe fe  fb fb fd fd fd fe fe fe  |................|
00001e30  ff ff ff ff ff ff ff ff  41 41 41 41 41 41 41 41  |........AAAAAAAA|
00001e40  ff ff fe fe fc f8 f0 c0  c0 80 00 00 00 00 00 00  |................|
00001e50  00 00 00 00 00 00 00 00  00 00 00 7c 7c 00 00 00  |...........||...|
00001e60  03 03 03 03 03 03 03 03  fc fc fc fc fc fc fc fc  |................|
00001e70  ff ff ff 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00001e80  c0 c0 c0 c0 c0 c0 c0 c0  3f 3f 3f 3f 3f 3f 3f 3f  |........????????|
00001e90  ff ff f0 e8 e7 e7 e8 f0  ff ff ff ff ff ff ff ff  |................|
00001ea0  ef e7 e7 e7 e8 f0 ff ff  ff ff ff ff ff ff ff ff  |................|
00001eb0  ff ff 0f 17 e7 e7 17 0f  ff ff ff ff ff ff ff ff  |................|
00001ec0  f7 e7 e7 e7 17 0f ff ff  ff ff ff ff ff ff ff ff  |................|
00001ed0  ff ff ef e7 e7 e7 e8 f0  ff ff ff ff ff ff ff ff  |................|
00001ee0  ff ff f7 e7 e7 e7 17 0f  ff ff ff ff ff ff ff ff  |................|
00001ef0  ff ff 0f 1f ff ff 1f 0f  ff ff ff ff ff ff ff ff  |................|
00001f00  f7 e7 e7 e7 e7 f7 ff ff  ff ff ff ff ff ff ff ff  |................|
00001f10  ff ff f7 e7 e7 e7 f7 ff  ff ff ff ff ff ff ff ff  |................|
00001f20  ff ff ff ff f8 f0 ff ff  ff ff ff ff ff ff ff ff  |................|
00001f30  ff ff f0 f8 ff ff f8 f0  ff ff ff ff ff ff ff ff  |................|
00001f40  ff ff c0 c0 cf cf c0 c0  ff ff ff ff ff ff ff ff  |................|
00001f50  cc ce cf cf cf cf ff ff  ff ff ff ff ff ff ff ff  |................|
00001f60  ff ff ff ff 1f 0f ff ff  ff ff ff ff ff ff ff ff  |................|
00001f70  ff ff f0 e8 e7 e7 ef ff  ff ff ff ff ff ff ff ff  |................|
00001f80  ff ff 0f 17 e7 e7 f7 ff  ff ff ff ff ff ff ff ff  |................|
00001f90  f7 e7 e7 e7 14 0c ff ff  ff ff ff ff ff ff ff ff  |................|
00001fa0  ff ff f0 f8 ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
00001fb0  ff ff 7f 3f 3f 3f 30 7f  ff ff ff ff ff ff ff ff  |...???0.........|
00001fc0  ff ff ff ff ff ff ff ff  ff ff ff ff ff ff ff ff  |................|
00001fd0  00 00 00 00 00 00 00 00  ff ff ff ff ff ff ff ff  |................|
00001fe0  ff ff ff ff ff ff ff ff  00 00 00 00 00 00 00 00  |................|
00001ff0  00 00 00 00 00 00 00 00  00 00 00 00 00 00 00 00  |................|
00002000 15 16 17
```

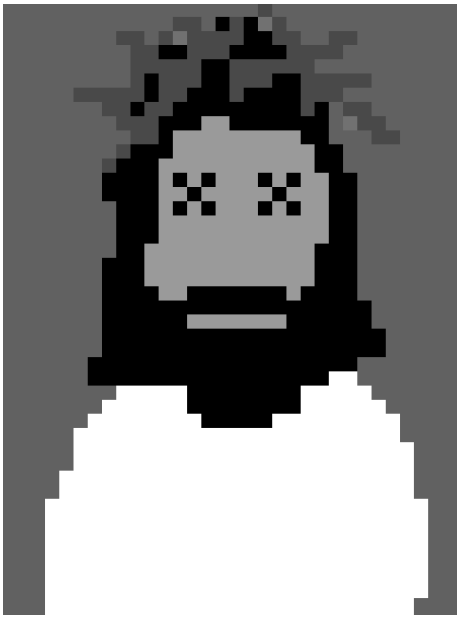
**15.** Thompson, Seth. *Cory Arcangel on Game Modification*. Originally appeared in *Outside the Box: New Cinematic Experiences*, 2005.

~~"I Shot Andy Warhol" was one of those projects that pretty much thought of itself. I was in Chicago in 2001, and I met the gentleman who patented light gun technology, and he explained to me that the way a light gun works is that the TV throws the light into the gun and the gun doesnt throw the light into the TV. And so then I knew that I could change all the graphics and all the colors in (a) light gun game, and it wouldnt have any effect on the way it was played. And my favorite light gun game, of course, was "Hogans Alley", and so then at that point I knew I wanted to do a hack of "Hogans Alley". Then alls I needed was an idea, and of course, the idea that was most obvious, out of all the ones I could think of was "I Shot Andy Warhol". One, because of the pun on the title. Two, because he dealt with iconography, and pop star status, and that translates really well into Nintendo graphics, which are very small therefore all the characters need to be icons. And three, because, the third part of the game was actually a part where you needed to shoot soup cans.~~ And so it seemed to be so obvious that if I didn't do it, I'd regret it forever."

**16.** Unused character sketches.







**17.** Character research.

# *On and On*

2013

Requirements: Applescript, Facebook, and Spotify.

An Applescript bot which will broadcast to Facebook (through Spotify) that the user listens to Far East Movement's "Like a G6" on repeat, every night from 7pm - 5am.

"TBD" -TBD

1. "Like a G6" is a 2010 song written and performed by Far East Movement, The Cataracs, and Dev, with the latter two being credited as featured artists.

It is the lead single from Far East Movement's third studio album "Free

```
repeat
  set myhour to get the (hours of (current date))
  -- play between 9pm and 5am every day
  delay 1
  -- delay so we dont burn up the processor
  if myhour >= 21 or myhour < 5 then
    tell application "Spotify"
      activate
      set repeating to true
      -- "Like a G6" by Far East Movement.[1 2 3]
      play track "spotify:track:4DvhkX2ic4zWkQeWMwQ2qf" in
      context "spotify:album:1TuKgkCGIxiIns9Bc5XKRC"
      set x to 214
      -- Almost the duration of Like A G6. We don't wanna get
      to the ~end~ cause Spotify might throw a "commercial"
      which throws Applescript into a tailspin. This could be
      overcome with some tricky code, aka nested "trys", but
      I found a hack which is to just ~quit~ Spotify and
      restart, as Spotify doesn't seem to throw commercials the
      first thing out of the gate. It's a bit unglamorous, though
      makes for a pretty small script. :/
      delay x
      quit
    end tell
  end if
end repeat
--don't manually change, play, pause, it will mess this all up. ;(
```

*Wired", and production was handled by The Cataracs. For the chorus, Dev samples a verse from her own single "Booty Bounce", which was also written and produced by the Cataracs.*

*"Like a G6" peaked at number-one on the U.S. Billboard Hot 100 for three nonconsecutive weeks. The song also topped the charts in New Zealand and South Korea, and reached the top ten in Australia, Canada, Belgium, the Netherlands, Thailand, the United Kingdom, Sweden, Swizerland and Slovakia.*

**2.** Arcangel, Cory. *Don't Hold It Against Me.* Originally appeared in the *Summer issue* of Artforum, 2011.

Listening to Britney Spears' recent single "Hold It Against Me" --- which launched this past January at number one on the Billboard Hot 100 chart-one can't help but think that aspects of its production and structural composition betray the year of its release. The song is essentially one long crescendo, overlaid on a classic verse-chorus-verse-chorus-bridge-chorus format. The chorus builds in each iteration until finally it re-appears, accompanied by a beat, with only about thirty seconds left in a song a little shy of four minutes. The entire song is constructed around this moment, and the effect of the rhythm entering is exacerbated by the production techniques-synth washes, digital piano, and thirty-second-note drum rolls familiar from the legendary Roland TR-909 drum machine-that have been used to tease us repeatedly about the climax's impending entrance by continually building to nonevents. Although it's frustrating and maddening, this withholding of gratification, which the song presents over and over, is what ultimately keeps us listening. And these elaborate endurance-taxing crescendos, as well as the technical means used to amplify their tension, are all in fact taken from a single vernacular, one that is hardly contemporary: 1990s Euro-trance. Along with several other artists-including Kelly Rowland, Taio Cruz, Flo Rida, and Lady Gaga --- Spears is appropriating this specific musical style. The former Mouseketeer and early tabloid flameout is, moreover, bringing its hallmarks to the US charts. Why? More important, why now?

Euro-trance is a US term for a style of house music that originated in the early '90s in Europe. Like a lot of dance music, the genre is split into infinite slightly ill-fitting subcategories such as vocal trance and progressive trance. The music shares with house a bass drum on every beat, aka "four to the floor," but it's further from disco and soul than house is. Instead, the music is infused with a kind of sped-up New Age sensibility: Like New Age music,

it embraces the more enthusiastic end of electronic music production. In other words, it is a bit overblown, dramatic, and tacky-and I mean this in a positive sense. Crucially, what we hear in many recent US singles is not an exact copy of Euro-trance but rather a distorted or Photoshopped 2011 version of what we remember Euro-trance to have been. History is not really advancing: It's the act of upgrading from an iPhone 3G to 4G that gives us pleasure, not our having arrived anywhere useful. When we hear Britney making Euro-trance we are hearing the illusion of progress.

In 2002, Eminem rapped, "Nobody listens to techno," yet it was in fact hip-hop where Euro-trance influences first started to appear in US pop. The "crunk" that typifies Lil Jon's production style is bathed in elements of Euro-trance, a style he says he grew familiar with in Atlanta strip clubs. The 2004 Usher song "Yeah!," for example-produced by Lil Jon (and featuring him and Ludacris)-is anchored by three notes played through a buzz-saw synth keyboard patch: a sound that had not yet been heard in hip-hop but which was all too common in Euro-trance. Hip-hop is still a place for such sounds. During the summer of 2010 in New York, it was hard to not hear the single "Salute," by Harlem-based group the Diplomats, blaring out of car windows. Similar to "Yeah!," it features a short trance-style keyboard sample laid over a more traditional hip-hop beat.

The cultural phenomenon that is Lady Gaga is easily decoded when explained by her emergence in tandem with the US market's embrace of Euro-trance-which, to my mind, has come about for several reasons. Such music had little presence in the US mainstream for some twenty years (with the brief exception of Cher's 1998 single "Believe") and so sounds new to a large audience. High-octane producers-in Gaga's case RedOne, who started working in Sweden in the 1990s-have begun to collaborate with homegrown artists and to make use of classic songwriting forms. What's more, the genre is returning with all the wrong turns and embarrassing offshoots of the past twenty years (hip house!) edited out; and it is being married with contemporary production techniques-including Auto-Tune, heavily "side-chained" compression, and new waveform editing software enabling thicker percussion sounds-that give the music a fresh feeling. Gaga's success is partly due to her appearing at the right time to take advantage of these factors. After all, she was the first US artist to drop several massive Euro-trance-style dance hits, seemingly all at once, and all deadly catchy.

The most frequent criticism of Gaga is that her music sounds like everything else-often extraordinarily or eerily so. I would argue that this is exactly the point. We live in an age of quotation, appropriation, recycling, and repetition. Gaga's music does sound like Ace of Base, Alice Deejay (whose "Better Off Alone" is in my opinion the high point of classic Euro-trance), Madonna, and countless others. After all, there is no reason pop music needs four beats to a measure, a verse and chorus, or any of the structures we associate with it: Taste is all that-however directionlessly-guides the eternal development of such structures, so each slight variation or recontextualization has the potential to be met with mass acclaim. If only everything could be, as Britney puts it in her newest single "Till the World Ends," "sicker than the remix."

---

**3.** *2 Chainz, Adam Lambert, Alan Jackson, Alice In Chains, Alicia Keys, All-American Rejects, American Idiot, American Idol, Avenged Sevenfold, AxeWound, Axwell, Backstreet Boys, Bad Meets Evil, Beach Boys, Big Sean, Black Sabbath, Bleed From Within, Bob Marley, Boyzone, Brandon Flowers, Bring Me*

*the Horizon, Buckcherry, Bullet For My Valentine, Cage the Elephant, Capital Cities, Carly Rae Jepsen, Cassadee Pope, Chas and Dave, Cher Lloyd, Children of Bodom, Coco Jones, Conan O'Brien, Cory Arcangel, Crossfaith, Cypress Hill, Dan- gerkids, David Foster, David Nail, Dawes, Deftones, Device, Demi Lovato, Dimebag Darrell, Disturbed, Drake, Drake White, Eminem, Escape the Fate, Far East Movement, Five Finger Death Punch, Florence and The Ma- chine, Freddie Mercury, Fresh Beat Band, Gallows, Genesis, Goo Goo Dolls, Grace Potter and the Nocturnals, Green Day, Greg Bates, Greyson Chance, Guns N Roses, Hot Chelle Rae, Il Volo, Imagine Dragons, Incubus, Jackie Evancho, Jake Bugg, Janis Joplin, Jessie J, Job for a Cowboy, Justin Bieber, Kacey Musgraves, Kasabian, Katy Perry, Kelly Clarkson, Kid Cudi, Killers, KoRn, Lady Gaga, Lana Del Rey, Lifehouse, Lil Wayne, Linkin Park, Lionel Richie, Little Big Town, Machine Gun Kelly, Mariah Carey, Marilyn Manson, Mika, Mindless Behav- ior, Miss May I, Modestep, Motown The Musical, Murderdolls, N*E*R*D, Nas, New Kids on the Block, Ne-Yo, Nicki Minaj, Of Mice and Men, OMG Girlz, Orianthi, P!nk, Pantera, Paul Weller, Peter Tosh, Phillip Phillips, The Pierces, Pixie Lott, PSY, Queen, Queen Extravaganza, Red Hot Chili Peppers, Rick James, Rolling Stones, Ronnie Wood, Sade, SafetySuit, The Saturdays, Shania Twain, Silversun Pickups, Skylar Grey, Slaughterhouse, Slipknot, Soundgarden*

# Space Invader

2004

Requirements: Atari 2600, Space Invader cartridge, CRT television, 4K EEPROM, 2600 2K/4K PCB (Assembled w/Socket).

Credz: Code by Alex Galloway of the Radical Software Group

A mod of Atari game Space Invaders where all the invaders - except one - have been deleted.

"Everything bad that can happen to a person has happened to me" - Paris Hilton [1] [2]

**1.** *Diddy / Lakes*, 2013 (1920x1080 H.264/MPEG-4 Part 10 looped digital file [from lossless Quicktime Animation master], media player, 70" flatscreen, armature, various cables) Collection of: Whitney Museum of American Art, Photo: Sacha Maric

bin:

```
00000000  85 2b a5 84 30 00 29 0f  aa ca 10 fd b1 f8 aa b1  |.+..0.).........|
00000010  ee 85 1b b1 f0 85 1c b1  f2 85 1b b1 f4 85 1c b1  |................|
00000020  f6 85 1b 8a 85 1c 85 1b  c6 89 88 48 68 48 68 b1  |...........HhHh.|
00000030  f8 aa b1 ee 85 1b b1 f0  85 1c b1 f2 85 1b b1 f4  |................|
00000040  85 1c b1 f6 85 1b 8a 85  1c 85 1b a5 89 c9 04 90  |................|
00000050  04 a9 00 b0 03 ea a9 02  8d 1f 00 88 10 ae c8 84  |................|
00000060  1b 84 1c 84 2b 84 1b 84  1c 85 02 c6 89 a5 89 c9  |....+...........|
00000070  04 90 04 a9 00 b0 03 ea  a9 02 85 1f a4 80 a5 02  |................|
00000080  05 03 0a 30 06 ea ea ea  ea 10 07 a5 82 19 dc fc  |...0............|
00000090  85 82 85 2c 88 c6 8c 10  09 a9 00 85 25 85 26 4c  |...,........%.&L|
000000a0  09 f1 20 e9 fd 84 80 b9  92 00 85 f8 a2 f4 46 f8  |.. ...........F.|
000000b0  90 07 b9 d6 fc 65 8b d0  04 48 68 a9 00 95 fa e8  |.....e...Hh.....|
000000c0  e8 30 eb c6 89 a5 89 c9  04 90 04 a9 00 b0 03 ea  |.0..............|
000000d0  a9 02 85 1f a5 c8 29 38  4a 4a 4a c5 80 d0 16 a5  |......)8JJJ.....|
000000e0  c8 29 07 0a aa a5 c8 2a  2a 2a 29 03 a8 b9 1e fd  |.).....***).....|
000000f0  95 ee 4c fa f0 a2 05 ca  10 fd 85 2b 20 b2 fd a2  |..L........+ ...|
00000100  06 ca 10 fd a0 09 4c 00  f0 c6 8e 30 06 20 b2 fd  |......L....0. ..|
00000110  4c 09 f1 24 98 70 03 4c  b2 f1 a5 dd 85 06 a9 01  |L..$.p.L........|
00000120  85 8e a9 00 85 ef 85 f1  85 f3 a9 ab 85 ee a9 b4  |................|
00000130  85 f0 a9 bd 85 f2 a9 11  85 02 85 2b 85 f4 a5 85  |...........+....|
00000140  85 20 29 0f a8 88 10 fd  85 10 c6 89 a5 89 c9 04  |. ).............|
00000150  a9 02 90 01 4a 85 1f 85  02 85 2a a0 00 a5 85 10  |....J.....*.....|
00000160  02 a5 85 29 0f aa ca ca  ca 10 fd b1 ee 85 1b ea  |...)............|
00000170  b1 f0 85 1b b1 f2 85 1b  c6 f4 30 12 a5 f4 4a 90  |..........0...J.|
00000180  08 c8 a9 20 4a d0 fd f0  e2 20 e9 fd 10 dd a9 00  |... J.... ......|
00000190  85 1b 85 02 a5 02 0a 29  80 05 82 85 82 85 2c 20  |........)......, |
000001a0  e9 fd 85 2b 85 02 85 02  c6 8e 30 06 20 b2 fd 4c  |...+......0. ..L|
000001b0  a8 f1 24 98 10 03 4c 82  f2 20 e9 fd 85 2b 85 02  |..$...L.. ...+..|
000001c0  a5 df 85 06 a5 86 85 20  29 0f a8 88 10 fd 85 10  |....... ).......|
```

```
000001d0  85 02 a5 e0 85 07 a5 87  85 21 29 0f a8 88 10 fd  |.........!).....|
000001e0  85 11 85 02 85 2a 20 e9  fd a9 00 2c 82 02 10 02  |.....* ....,....|
000001f0  a9 05 85 05 a9 00 50 02  a9 05 85 04 a5 98 29 10  |......P.......).|
00000200  f0 02 a9 0a 85 f4 a5 98  29 20 f0 02 a9 0a 85 f6  |........) ......|
00000210  a5 aa 4a 85 02 90 17 a6  c9 bd 16 fd 85 f8 a9 ff  |..J.............|
00000220  85 f9 a5 ca 29 08 d0 04  85 f4 85 f6 10 25 a9 00  |....).........%..|
00000230  85 f8 a5 ca 4a 4a 4a a5  aa 29 04 f0 08 a9 1e b0  |.a..JJJ..)......|
00000240  02 a9 14 85 f4 a5 aa 29  02 f0 08 a9 14 b0 02 a9  |........)........|
00000250  1e 85 f6 a2 09 a0 09 85  02 a9 00 85 0d b1 f4 85  |................|
00000260  1b b1 f6 85 1c 8a 4a a8  b1 f8 85 0d 8a 4a 90 0d  |......J......J..|
00000270  c6 89 a5 89 c9 04 a9 02  90 01 4a 85 1f ca 8a a8  |..........J.....|
00000280  10 d5 85 02 a9 00 85 04  85 05 85 0d 85 1f 85 1b  |................|
00000290  85 1c a5 e4 85 09 a5 81  85 10 a2 04 ca 10 fd 85  |................|
000002a0  11 85 2b a9 e0 85 21 85  02 85 2a a9 c0 85 1b 85  |..+...!...*.....|
000002b0  1c a2 04 a9 00 95 f3 ca  d0 fb 20 08 fe e8 20 08  |.......... ... .|
000002c0  fe a5 aa 29 81 d0 2f 24  02 50 06 a9 04 24 aa f0  |...)../$.P...$..|
000002d0  0b ca 24 03 50 20 a9 02  24 aa d0 1a 05 aa 85 aa  |..$.P ..$.......|
000002e0  85 c6 20 75 fe a9 06 20  7e fe a5 c7 d0 08 24 db  |.. u... ~.....$.|
000002f0  50 04 a9 02 95 f4 85 02  ad 84 02 d0 fb 85 1b 85  |P...............|
00000300  1c a9 c8 8d 95 02 a9 00  85 f1 aa a5 82 10 5f a5  |..............._.|
00000310  ca 4a 90 02 a2 04 b5 d1  c9 49 90 04 c9 58 90 01  |.J.......I...X..|
00000320  e8 e0 03 90 0c a9 09 85  ef a9 ff 85 f2 a9 7f d0  |................|
00000330  0a a9 ff 85 ef a9 01 85  f2 a9 f6 95 d1 b5 d3 a0  |................|
00000340  03 18 e5 9b 88 18 69 e0  10 fa 69 20 aa b9 13 fd  |......i...i ....|
00000350  85 f0 a4 ef 98 18 65 f2  a8 bd 4c ff 49 ff 31 f0  |......e...L.I.1.|
00000360  f0 f2 20 8f fd 88 20 8b  fd c8 c8 20 8b fd a5 ca  |.. ... .... ....|
00000370  4a b0 03 4c 29 f4 24 82  50 26 a5 c8 29 39 c9 39  |J..L).$.P&..)9.9|
00000380  f0 1e a9 39 85 c8 a2 01  a5 98 29 04 d0 01 ca a9  |...9......).....|
00000390  04 85 c6 4a 24 db 50 01  4a 95 f4 a9 05 20 8b fe  |...J$.P.J.... ..|
000003a0  a9 06 85 f0 c6 f0 10 03  4c cf f4 a6 f0 a5 82 3d  |........L......=|
000003b0  dc fc f0 f0 a0 01 a9 35  38 fd 31 fd 18 65 90 c9  |.......58.1..e..|
000003c0  52 b0 63 c5 d5 b0 07 69  0d c5 d5 90 01 88 84 ee  |R.c....i........|
000003d0  a6 ee a0 ff a5 9a 18 69  fd c8 69 10 d5 d7 90 f9  |.......i..i.....|
000003e0  84 ef a6 f0 b9 dc fc 35  92 f0 3b 55 92 95 92 a4  |.......5..;U....|
000003f0  ee b9 de fc a0 01 25 98  d0 01 88 bd 2b fd 99 f6  |......%.....+...|
00000400  00 a9 02 20 7e fe c6 91  d0 0a a5 aa 09 08 85 aa  |... ~...........|
00000410  a9 61 85 ca 20 ed fb 8a  0a 0a 0a 05 ef 85 c8 a9  |.a.. ...........|
00000420  f6 a4 ee 99 d5 00 4c a4  f3 4a b0 2d a5 c8 29 39  |......L..J.-..)9|
00000430  c9 39 f0 25 a5 9e c9 b4  f0 1f a5 98 4a b0 06 c6  |.9.%........J...|
00000440  9e d0 16 f0 08 e6 9e a5  9e c9 98 90 0c a9 b4 85  |................|
00000450  9e a9 00 85 cc a9 04 85  c6 ad 80 02 a8 0a 0a 0a  |................|
00000460  0a 85 ee 29 80 85 81 a5  db c9 90 d0 08 24 aa 50  |...).........$.P|
00000470  0e a4 ee 70 0a 29 02 f0  06 98 29 40 05 81 a8 a2  |...p.)....)@....|
00000480  01 a5 aa 3d 60 fd d0 18  24 ee 30 02 f6 9c 70 02  |...=`...$.0...p.|
00000490  d6 9c b5 9c c9 76 90 02  d6 9c c9 23 b0 02 f6 9c  |.....v.....#....|
000004a0  84 ee ca 10 dc a5 ca 4a  4a 4a b0 23 a5 dc 4a 90  |.......JJJ.#..J.|
000004b0  1e a5 aa 29 10 f0 0a e6  9b a5 9b c9 35 90 10 b0  |...).........5...|
000004c0  08 c6 9b a5 9b c9 21 b0  06 a5 aa 49 10 85 aa ad  |......!....I....|
000004d0  84 02 d0 fb a9 02 85 01  85 02 24 aa 30 13 f8 a2  |..........$.0...|
000004e0  01 b5 e8 18 75 f6 95 e8  b5 e6 75 f4 95 e6 ca 10  |....u.....u.....|
000004f0  f0 d8 85 02 a5 ca 29 07  d0 12 a5 c8 18 69 40 85  |......).....i@.|
00000500  c8 c9 40 b0 07 20 f1 fb  a9 30 85 c8 a9 02 85 02  |..@.. ...0......|
00000510  85 00 85 02 85 02 a9 30  8d 96 02 a9 00 85 02 85  |.......0........|
00000520  00 a5 ca 4a 90 23 a2 01  b5 d5 c9 79 d0 04 a9 f6  |...J.#.....y....|
00000530  95 d5 b5 d5 c9 ec b0 0c  b5 d5 69 fe c9 03 b0 02  |..........i.....|
00000540  a9 f6 95 d5 ca 10 e1 30  59 a5 ca 29 0f c9 0f f0  |.......0Y..)....|
00000550  05 20 fb fd 85 da a5 dc  29 04 4a 4a 4a a9 01 aa  |. ......).JJJ...|
00000560  90 01 0a 85 81 b5 d1 c9  ec b0 34 a5 dc 29 02 f0  |..........4..)..|
00000570  1f a5 da e0 00 f0 02 0a  0a 0a 90 14 10 0a b5 d3  |................|
00000580  c9 81 b0 0c f6 d3 d0 08  b5 d3 c9 17 90 02 d6 d3  |................|
00000590  b5 d1 18 65 81 95 d1 c9  6c 90 04 a9 f6 95 d1 ca  |...e....l.......|
000005a0  10 c3 c6 ca f0 03 4c 8c  f6 a5 c7 f0 04 e6 c7 e6  |......L.........|
000005b0  c7 24 e5 30 6d a5 aa 29  08 f0 2a 45 aa 85 aa a6  |.$.0m..)..*E....|
000005c0  99 bd 0f fd 85 90 e0 03  b0 02 e6 99 24 98 30 0f  |............$.0.|
000005d0  20 fa fe a5 aa 29 06 d0  0c a5 aa 09 01 85 aa a9  | ....).......... |
000005e0  40 85 ca d0 3a 24 98 10  0e 24 a7 30 22 a5 db c9  |@...:$...$.0"...|
000005f0  10 d0 1c a9 00 f0 31 a5  aa 29 01 f0 25 45 aa 85  |......1..)..%E..|
00000600  aa a9 50 85 d9 a9 05 85  c6 a5 c9 d0 4f e6 c9 a5  |..P.........O...|
00000610  e5 09 80 85 e5 a5 c7 d0  09 a9 bf 85 c7 10 03 4c  |...............L|
00000620  89 f6 a5 aa 29 06 f0 40  09 01 45 aa 85 aa a9 23  |....)..@..E....#|
```

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00000630  85 9c a9 75 85 9d a5 db  c9 10 d0 1e 24 a7 30 1a  |...u........$.0.|
00000640  a2 0a b4 90 b5 9f 95 90  94 9f ca 10 f5 20 3a ff  |............. :.|
00000650  a5 aa 49 40 85 aa 29 40  d0 02 c6 c9 a9 40 85 ca  |..I@..)@.....@..|
00000660  a9 b4 85 9e a9 00 85 cc  c6 c6 d0 1d a5 91 c9 07  |................|
00000670  90 17 20 fb fd 29 01 45  98 85 98 4a a9 98 90 02  |.. ..).E...J....|
00000680  a9 00 85 9e a9 04 20 8b  fe 4c 75 f8 a5 ca 4a b0  |...... ..Lu...J.|
00000690  03 4c db f7 ad 82 02 29  03 c9 02 d0 06 20 b2 fe  |.L.....)..... ..|
000006a0  4c 44 f7 ad 82 02 29 02  f0 09 a5 aa 85 ed 30 3e  |LD....).......0>|
000006b0  4c 47 f7 a9 b1 85 c7 24  aa 30 0e a5 aa 29 b0 09  |LG.....$.0...)..|
000006c0  80 85 ed 20 c0 fe 4c 44  f7 e6 ed a5 ed c9 0f 90  |... ..LD........|
000006d0  1d ad 82 02 4a a9 0d 90  02 a9 02 85 ed a5 98 29  |....J..........)|
000006e0  f3 85 98 a5 dc 18 69 91  f0 02 69 70 85 dc a5 aa  |......i...ip....|
000006f0  09 80 85 aa a5 dc 4a 4a  4a 4a 85 ec a8 b9 4b fd  |......JJJJ....K.|
00000700  85 db a5 98 29 cf 19 52  fd 85 98 a9 aa 85 e7 a9  |....)..R........|
00000710  a2 85 e9 a0 00 98 38 65  dc c9 0a 90 06 c8 e9 0a  |......8e........|
00000720  4c 19 f7 79 39 fd 85 e8  a5 dc c9 63 a9 aa 90 02  |L..y9......c....|
00000730  a9 a1 85 e6 a5 dc c9 10  b0 02 c6 e9 c9 09 b0 04  |................|
00000740  69 a1 85 e8 4c 75 f8 a5  ca 4a b0 03 4c db f7 a5  |i...Lu...J..L...|
00000750  c7 d0 f9 24 98 30 12 a5  aa 29 07 d0 0c a5 db 29  |...$.0...).....)|
00000760  10 f0 58 a5 d5 c9 ec b0  03 4c d8 f7 a5 db c9 14  |..X......L......|
00000770  f0 08 c9 90 d0 09 24 aa  50 21 24 0d 4c 9d f7 a5  |......$.P!$.L...|
00000780  db 10 0a c6 d9 d0 06 24  aa 50 14 70 1e 24 aa 70  |.......$.P.p.$.p|
00000790  16 a5 db 29 20 f0 04 24  0d 10 04 24 0c 30 39 a5  |...) ..$...$.09.|
000007a0  98 29 fb a2 00 10 0a 24  0d 30 2d a2 01 a5 98 09  |.).....$.0-.....|
000007b0  04 85 98 a0 00 20 af fb  4c d8 f7 a0 01 a2 01 a5  |..... ..L.......|
000007c0  98 39 de fc d0 01 ca b9  d5 00 c9 ec 90 07 b5 0c  |.9..............|
000007d0  30 03 20 af fb 88 10 e5  4c 75 f8 a5 aa 29 07 d0  |0. .....Lu...)..|
000007e0  f7 a8 a5 91 f0 f2 a9 eb  85 ee c5 d2 b0 ea 20 fb  |.............. .|
000007f0  fd 10 1a 29 03 0a 85 ee  a5 ea 4a 4a aa 8a 38 65  |...)......JJ..8e|
00000800  ee 29 07 aa bd dc fc 25  eb f0 f2 d0 2f a5 98 29  |.)......%..../..)|
00000810  04 f0 01 c8 a2 05 bd dc  fc 25 eb f0 10 a5 9a 18  |.........%......|
00000820  69 fd 18 7d 39 fd d9 9c  00 90 06 86 ee ca 10 e6  |i..}9...........|
00000830  e8 a5 ea 29 10 d0 05 a5  ee 30 01 aa 86 ef bd dc  |...).....0......|
00000840  fc 85 f0 a2 ff e8 e0 06  b0 2b b5 92 25 f0 f0 f5  |.........+..%...|
00000850  a9 3c 65 90 fd 31 fd 85  d2 38 e5 d1 c9 10 90 11  |.<e..1...8......|
00000860  c9 f1 b0 0d a4 ef a5 9a  79 39 fd 69 04 85 d4 d0  |........y9.i....|
00000870  04 a9 f6 85 d2 a5 aa 29  07 d0 7a 24 98 30 76 a0  |.......)..z$.0v.|
00000880  ff a5 91 f0 70 c8 d9 e4  fc 90 fa b9 f6 fc 85 ee  |....p...........|
00000890  b9 ed fc 85 ef a5 ca 29  3f 85 f0 18 65 ef c9 41  |.......)?...e..A|
000008a0  b0 53 a5 f0 f0 09 c5 ef  90 4b e5 ef 4c a4 f8 24  |.S.......K..L..$|
000008b0  8b a9 09 70 02 a9 ff 85  8b a9 01 20 7e fe a5 98  |...p....... ~...|
000008c0  29 02 f0 0f a5 9a 18 65  ee 85 9a c5 8d 90 26 a5  |).......e......&.|
000008d0  8d d0 0d a5 9a 38 e5 ee  85 9a c9 17 b0 17 a9 17  |.....8..........|
000008e0  85 9a a5 98 49 02 85 98  30 0b 24 aa 30 07 a5 90  |....I...0.$.0...|
000008f0  18 69 05 85 90 a9 05 85  8c a9 0b 38 e5 90 85 8e  |.i.........8....|
00000900  24 98 70 07 a5 8e 18 69  0c 85 8e a2 fb b5 97 d0  |$.p....i........|
00000910  0c c6 8c a5 8e 18 69 09  85 8e e8 d0 f0 a5 8e 10  |......i.........|
00000920  31 a5 98 29 40 f0 0d 45  98 85 98 a5 8e 18 69 0c  |1..)@..E......i.|
00000930  85 8e 10 1e a9 00 85 8e  a5 98 30 16 09 80 85 98  |..........0.....|
00000940  a4 8c a5 90 18 79 f2 ff  85 90 20 75 fe a9 06 20  |.....y.... u... |
00000950  7e fe a2 05 a9 00 15 92  ca 10 fb 85 eb a5 eb f0  |~...............|
00000960  2d 4a b0 18 20 ed fb a9  3a 85 c8 a2 05 56 92 ca  |-J.. ...:....V..|
00000970  10 fb a5 9a 69 10 85 9a  46 eb d0 e1 a2 06 ca bd  |....i...F.......|
00000980  dc fc 25 eb f0 f8 a9 82  38 fd 39 fd 85 8d a5 90  |..%.....8.9.....|
00000990  85 8f a2 04 b5 99 20 67  fd ca d0 f8 ad 82 02 29  |...... g.......)|
000009a0  08 a8 f0 02 a9 f7 09 07  85 ee a2 f8 b9 ff fc 45  |...............E|
000009b0  c7 25 ee 95 e5 c8 e8 30  f3 24 aa 30 04 a5 c7 d0  |.%.....0.$.0....|
000009c0  12 a5 c8 29 38 c9 30 d0  0a a5 dc 29 08 f0 04 a5  |...)8.0....)....|
000009d0  e3 85 e1 a5 de 85 06 a9  00 85 09 a5 e2 85 08 a5  |................|
000009e0  ca 4a a2 04 b0 02 a2 00  86 ef b5 d1 d5 d2 90 2b  |.J.............+|
000009f0  85 81 b5 d2 95 d1 a5 81  95 d2 b5 d3 85 81 b5 d4  |................|
00000a00  95 d3 a5 81 95 d4 a5 ca  4a 90 10 a5 98 29 0c 4a  |........J....).J|
00000a10  4a a8 a5 98 29 f3 19 1a  fd 85 98 b5 d4 a2 05 20  |J...)..........|
00000a20  67 fd a6 ef b5 d1 85 89  b5 d2 c9 ec b0 03 38 f5  |g.............8.|
00000a30  d1 85 8a b5 d3 a2 00 20  67 fd a2 04 20 7e fd 85  |....... g... ~..|
00000a40  02 85 2a ad 84 02 d0 fb  85 01 85 2c a2 00 a9 ea  |..*........,....|
00000a50  85 02 8d 96 02 85 2b 24  aa 30 09 a5 9e c9 b4 f0  |......+$.0......|
00000a60  03 4c 0d fb a2 07 a0 03  b9 e6 00 29 0f 85 f0 0a  |.L.........)....|
00000a70  0a 65 f0 69 54 95 f0 ca  b9 e6 00 4a 4a 4a 4a 85  |.e.iT......JJJJ.|
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00000a80  f0 0a 0a 65 f0 69 54 95  f0 ca 88 10 db 85 02 a5  |...e.iT.........|
00000a90  df 85 06 a9 02 85 0a a5  e0 85 07 a9 04 85 ee a9  |................|
00000aa0  ff 85 ef ea ea a2 05 ca  10 fd a4 f0 b1 ee 85 0d  |................|
00000ab0  a9 00 85 0e a4 f5 b1 ee  4a 4a 4a 4a 85 0f a4 f2  |........JJJJ....|
00000ac0  b1 ee 85 0d a4 f7 b1 ee  4a 4a 4a 4a 85 0f a4 f4  |........JJJJ....|
00000ad0  b1 ee 29 0f 85 81 a4 f1  b1 ee 0a 0a 0a 0a 05 81  |..)............|
00000ae0  85 0e a9 00 85 0d 85 0f  a4 f6 b1 ee 29 0f 85 81  |............)...|
00000af0  a4 f3 b1 ee 0a 0a 0a 0a  05 81 85 0e c6 ee 10 aa  |................|
00000b00  a5 89 18 69 f9 85 89 a9  00 85 0e f0 48 20 67 fd  |...i........H g.|
00000b10  20 7e fd 20 e9 fd a9 a0  85 ee a9 fc 85 ef a9 00  | ~. ............|
00000b20  85 04 85 02 85 2a a5 c8  29 39 c9 39 d0 0e a5 c8  |.....*..)9.9....|
00000b30  2a 2a 2a 2a 29 03 a8 b9  1e fd 85 ee 85 02 85 2b  |****).........+|
00000b40  20 e9 fd a0 09 85 02 b1  ee 85 1b 98 4a b0 03 20  | ...........J.. |
00000b50  e9 fd 88 10 f0 a9 00 85  02 85 1b a5 84 85 21 85  |..............!.|
00000b60  20 29 0f a8 88 10 fd 85  10 a9 06 85 11 85 02 85  | )..............|
00000b70  2a 85 04 85 05 a2 0a a9  fc 95 ef ca ca 10 fa 20  |*.............. |
00000b80  e9 fd a5 02 29 40 85 82  85 2c 85 2b a9 f0 85 21  |....)@...,.+...!|
00000b90  85 02 85 2a a5 e1 85 06  85 07 c6 8f 10 0b a0 05  |...*............|
00000ba0  a9 01 85 25 85 26 4c a5  f0 20 b2 fd 4c 9a fb 86  |...%.&L.. ..L...|
00000bb0  f2 be 38 fd b5 d5 c9 56  b0 04 c9 45 b0 2e a6 f2  |..8....V...E....|
00000bc0  a9 55 99 d5 00 bd e2 fc  2d 82 02 18 f0 02 a9 04  |.U......-.......|
00000bd0  69 05 75 9c 99 d7 00 a9  03 20 8b fe a5 db 29 80  |i.u...... ....).|
00000be0  f0 0a a5 aa 49 40 85 aa  a9 50 85 d9 60 a5 c8 29  |....I@...P..`..)|
00000bf0  39 c9 39 d0 08 a9 b4 85  9e a9 00 85 cc 60 00 00  |9.9..........`..|
00000c00  00 00 00 00 00 00 00 00  00 00 fe fe 7c fe 38 38  |............|.88|
00000c10  7c 38 38 10 b6 be 5d 6b  59 63 3c 4c 14 28 b6 be  ||88...]kYc<L.(..|
00000c20  5d 5b 24 85 66 64 28 10  90 88 88 44 42 42 ff db  |][$.fd(....DBB..|
00000c30  5a 18 09 11 11 22 42 42  ff db 7e 18 a5 a5 a5 99  |Z....”BB..~.....|
00000c40  99 a5 ff 5a 7e 3c 42 5a  5a 5a 99 a5 ff 5a 7e 3c  |...Z~<BZZZ...Z~<|
00000c50  c3 24 18 18 18 5a bd a5  81 81 24 42 24 a5 99 99  |.$...Z....$B$...|
00000c60  bd 5a 18 00 81 42 42 24  24 3c 7e eb 7e 3c 00 24  |.Z...BB$$<~.~<.$|
00000c70  5a 42 24 3c 7e d7 7e 3c  77 44 44 44 5c ff f3 f3  |ZB$<~.~<wDDD\...|
00000c80  7e 3c ee 22 22 22 3a ff  cf cf 7e 3c e7 42 7e 7e  |~<.”””:...~<.B~~|
00000c90  6b 3e 98 a4 42 01 c6 42  7e 7e 56 7c 19 25 42 80  |k>..B..B~~V|.%B.|
00000ca0  00 38 7c fe fe aa fe 7c  38 00 00 00 00 24 3c 76  |.8|....|8....$<v|
00000cb0  5c 28 00 00 00 00 00 01  24 95 48 c7 24 90 20 40  |\(......$.H.$. @|
00000cc0  5d bb b6 77 cc 2d 7e cd  da 6d 77 77 82 54 25 53  |]..w.-~..mww.T%S|
00000cd0  c3 54 93 a5 99 81 28 78  64 50 3c 8c 01 02 04 08  |.T....(xdP<.....|
00000ce0  10 20 40 80 00 00 00 00  00 00 00 00 00 20 20 15  |. @.......... . |
00000cf0  15 10 0b 07 07 04 01 01  01 01 01 01 01 01 01 0f  |................|
00000d00  0e 0f 00 02 00 04 02 34  52 cc f6 14 0f 00 e2 05  |.......4R.......|
00000d10  0a 0f 14 bd b4 ab 54 59  5e 63 00 08 04 0c aa b6  |......TY^c......|
00000d20  c0 cc 3c 7e 7e 7e 7e ff  ff ff c3 05 10 15 20 25  |..<~~~~....... %|
00000d30  30 00 09 12 1b 24 2d 36  01 00 10 20 30 40 50 60  |0....$-6... 0@P`|
00000d40  70 80 90 00 10 8b d1 bf  9d d1 d1 18 10 61 d1 32  |p............a.2|
00000d50  90 14 10 10 30 30 10 10  10 00 00 08 00 00 00 00  |....00..........|
00000d60  05 03 17 2b 23 75 b4 a0  ff 38 c8 e9 0f b0 fb 49  |...+#u...8.....I|
00000d70  ff e9 06 0a 0a 0a 0a 94  83 15 83 95 83 60 85 02  |.............`..|
00000d80  ea c8 95 20 ea 88 10 fd  95 10 60 c0 09 b0 22 86  |... ......`...”.|
00000d90  ee e8 20 fb fd 29 20 d0  02 ca ca e0 08 b0 09 a5  |.. ..) .........|
00000da0  ea c9 c0 90 03 20 aa fd  a6 ee b1 f0 3d 4c ff 91  |..... ......=L..|
00000db0  f0 60 c6 89 a5 89 30 0f  c9 04 a9 02 90 01 4a 85  |.`....0.......J.|
00000dc0  1f 85 02 85 2b 10 1d 18  65 8a 85 89 a9 00 85 02  |....+...e.......|
00000dd0  85 2b 85 1f a5 88 85 24  29 0f a8 88 10 fd 85 14  |.+.....$).......|
00000de0  a9 7c 85 8a 85 02 85 2a  60 c6 89 a5 89 c9 04 90  |.|.....*`.......|
00000df0  04 a9 00 b0 03 ea a9 02  85 1f 60 a5 ea 0a 0a 18  |..........`.....|
00000e00  65 ea 18 69 59 85 ea 60  a5 c7 d0 5c f6 cd b4 cb  |e..iY..`...\....|
00000e10  f0 56 c0 05 f0 04 c0 02  d0 24 b4 cd c0 08 d0 08  |.V.......$......|
00000e20  b5 cb c9 05 f0 46 d0 40  b9 ea ff 95 17 a9 0c 95  |.....F.@........|
00000e30  15 a9 cb c9 05 a9 04 90  02 a9 08 95 19 60 b9 44  |.............`.D|
00000e40  fd 85 ee a9 ff 85 ef b4  cf b1 ee d5 cd d0 18 c8  |................|
00000e50  b1 ee 30 14 c9 3f f0 14  95 17 c8 b1 ee 95 15 c8  |..0..?..........|
00000e60  b1 ee c8 94 cf 95 19 60  a9 00 95 cb a9 00 95 19  |.......`........|
00000e70  95 cd 95 cf 60 a5 ca 29  01 09 80 85 ca 60 c5 cb  |....`..).....`..|
00000e80  90 08 85 cb a9 00 85 cd  85 cf 60 c5 cc 90 08 85  |..........`.....|
00000e90  cc a9 00 85 ce 85 d0 60  d8 78 a2 00 8a 95 00 e8  |.......`.x......|
00000ea0  d0 fb ca 9a 20 b2 fe a9  c5 85 c7 a9 80 85 aa 4c  |.... ..........L|
00000eb0  d4 f4 a9 00 85 e6 85 e8  85 e7 85 e9 85 c7 a9 01  |................|
00000ec0  85 aa a9 00 85 90 85 99  85 c6 20 75 fe a9 03 85  |.......... u....|
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00000ed0  c9 a9 ff 85 8b a5 98 29  53 a4 ec 19 52 fd 19 59  |.......)S...R..Y|
00000ee0  fd 85 98 a5 e5 29 7f 85  e5 20 fa fe a2 0a b5 90  |.....)... ......|
00000ef0  95 9f ca 10 f9 a9 6e 85  a7 60 a2 00 a9 02 95 92  |......n..`......|
00000f00  ca 10 fb 85 eb 85 d7 85  d8 85 d3 85 d4 a9 f6 85  |................|
00000f10  d5 85 d6 85 d1 85 d2 a2  05 bd 61 fd 95 99 ca d0  |..........a.....|
00000f20  f8 8a 85 cb 85 cc a9 01  85 91 a9 42 05 98 85 98  |...........B....|
00000f30  a9 30 85 c8 a5 aa 29 f7  85 aa a2 1a a0 08 b9 22  |.0....)........"|
00000f40  fd 95 ab 88 10 02 a0 08  ca 10 f3 60 7f bf df ef  |...........`....|
00000f50  f7 fb fd fe e7 a5 a5 a5  e7 e7 42 42 66 42 e7 24  |..........BBfB.$|
00000f60  e7 81 e7 e7 81 e7 81 e7  81 81 e7 a5 a5 e7 81 e7  |................|
00000f70  24 e7 e7 a5 e7 24 24 81  81 81 81 e7 e7 a5 e7 a5  |$....$$.........|
00000f80  e7 81 81 e7 a5 e7 00 00  00 00 00 01 16 09 0a 02  |................|
00000f90  19 08 0a 03 1f 0c 08 04  16 0e 07 06 ff 01 18 0c  |................|
00000fa0  03 03 16 0c 03 05 14 0c  03 07 12 0c 03 09 10 0c  |................|
00000fb0  03 0b 0e 0c 03 0d 0d 0c  03 0f 10 0c 03 11 3f 01  |..............?.|
00000fc0  18 08 07 04 19 08 05 10  1c 08 02 30 1e 08 01 50  |...........0...P|
00000fd0  ff 01 18 03 0c 09 10 0a  08 11 12 0e 0f 19 16 0e  |................|
00000fe0  08 29 1a 0e 04 39 1d 0e  02 49 ff 10 0d 0a 08 07  |.)...9...I......|
00000ff0  06 05 06 07 03 04 05 06  00 00 98 fe 98 fe 98 fe  |................|
00001000 [2]
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**2.** *Smithsonian Institution Time-Based and Digital Art Working Group*, 2013 ( Part of a series of interviews on the care of time-based media and digital art. The interviewers for the this conversation were Crystal Sanchez and Claire Eckert.)

**SITBDAWG:** Please tell us about your background and your current work.
**CMA:** I'm a fine artist. My work ranges from video to performance to Internet stuff to composition. I work all over the spectrum. A substantial portion of my work is born digital; it does not exist outside of a computer. I have no training in fine art. My education is more in music, specifically classical guitar, and electronic composition - which may be relevant, because a composition is really a set of instructions that are realized by a third party. That's a pretty good metaphor for digital media.

**SITBDAWG:** How do you think about preservation issues in the work you do every day?

**CMA:** That's a great question. I know this is a horrible thing to say when you are talking about standards and best practices, but it changes. The way I have dealt with it has changed over the years. But I can start by talking about my most recent experience. I recently reorganized the way I work internally within my studio. When I make a file, I think about where it goes, how it is filed, how it is named, whether it is tied into a database, and maybe, if I have any energy left after considering the preceding items, what is the plan for preservation. I went from just having a laptop full of files that were a complete mess to a real system to file everything. I had to, because I just couldn't find anything anymore. When you work on the computer, you might make 100 files a day; over ten years, that's just hundreds of thousands of files. What a headache/nightmare! So what I've been working on lately is just getting organized. In that way, I'm thinking about the future. If I can't find something, it's as good as lost. I also finally went through the whole thing of getting a real back-up plan - offsite, onsite and in the Cloud, with daily back-ups. I have a mirrored raid, which has a hot copy workable copy that gets re-copied every night. Then that mirrored raid gets sent up both to the Cloud and to my house. Once a year, I take a copy to my parents' house. That's my current system.

**SITBDAWG:** Do you feel that's sufficient?

**CMA:** I hope so! But these things are really for emergencies. I did have one

data emergency, during Hurricane Sandy, and it came through for me then. But I can't say for sure it's sufficient, because I don't know what's around the corner and I don't want to jinx myself.

**SITBDAWG:** How did you get the knowledge or expertise that you needed to take care of your own archive?

**CMA:** I would say about 10 percent of it was just me being a computer nerd. Beyond that, I worked with a gentleman named Walter Forsberg. Many years ago he came to do a project with me as a conservation student and he blew my mind with the knowledge he dropped on me. His project was to come and do a collection assessment. This was when I was working in my apartment, and it was just a mess. He took a very small sliver of my collection of media and did an assessment, and said "This is what you should do." It was totally theoretical, but over time, I started to slowly piece together some of the things he had suggested. I also worked with Ben Fino-Radin and a few other archivists, who came to my studio and helped me to put together the raid.

**SITBDAWG:** It's interesting how you seem to have gone from not considering preservation too much in the beginning to making it somewhat of a priority in your process.

**CMA:** Well, it was always a priority in the sense that if I made something that was really good, I knew it was really good because I would be saving it all the time to as many hard drives as I could and hiding them all over my apartment. So I always had that kind of anxiety in me, and that was always the most accurate way for me to know when I was working on something really good - I would start to get really nervous that my computer would crash and I would lose it. So that had always been there. But it wasn't until I worked with all these wonderful people that I really tried to get some kind of action plan.

**SITBDAWG:** Do you always keep certain kinds of files in your archive?

**CMA:** I try to keep everything, but I suppose there's a kind of hierarchy. In every project folder, I have a folder called "originals" that is working stuff - unorganized files that I don't really care about. If it's something, it goes in the "master" folder, which is stuff I really care about. So I try to keep everything, but there is a hierarchy with respect to how much attention I actually pay to different things.

**SITBDAWG:** Do you think other artists are doing this - working with archivists and digital preservationists to come up with plans for archiving their own work? Is it the artist's job to think about that?

**CMA:** I'm not an outlying case. Everyone is on their computer all day now, no matter what you make. I don't know whose job it is, but I do think most artists are at least as savvy as I am. They might not have naming conventions, but certainly they take care of their files. It's just a part of life now, right? You have your laptop and it might have some MP3s that you really don't want to lose, so you take care of them. Digital maintenance is just becoming part of life. It's so boring, but it's just a part of life. I know artists are thinking about it because I get emails and phone calls from my artist friends asking me about hard drives and stuff like that all the time. They might not be working formally with preservationists and thinking specifically about standards, but everyone is thinking about it. I'm working on a project now on a grant from the Creative Capital Foundation to print out all my source code - to make little books of printouts for each project. It's called "The Source." It's a long-term archival project. So if everything else gets destroyed and we don't have electricity

anymore, there will probably be a couple of these books lying around somewhere.

**SITBDAWG:** That's an interesting approach; do you think printing out the source code could help in recreating the work later?

**CMA:** In theory. But it doesn't really matter, because printing out the source code is interesting in itself as another manifestation of the work. It could stand next to the work itself on equal footing. But that's just me as an artist talking, and an artist doesn't have to make sense.

**SITBDAWG:** After your work has been collected, are you ever asked to help in migrating the work forward for future installations?

**CMA:** Again, it's case-by-case, and it really depends on the institution. But I do like to be involved if I can. I have a work in the Whitney collection called Super Mario Clouds; they installed it a few years ago in a show, and yes, they had me come and help to install it. It is always installed a little differently. Also, when I do survey shows of my work, I tend to install older works in new ways. It keeps them fresh. The Super Mario Clouds piece is heavily tied to specific hardware [video game console].

**SITBDAWG:** How do you think about a piece like that over the long term?

**CMA:** I tend to think of all this stuff as performance, really. It's software being executed in real time. Yeah, the hardware is important now; but who knows if the hardware is going to work in 100 years? You might have to think about other ways to run it. That's similar to performance. Do you re-create a performance? Do you just show documentation? I think it's a similar kind of question. So that's how I think about these things now; as a kind of performance with systems and structures. People don't expect a performance to be happening always, and in the same way forever. They realize it's a temporary thing and when it does happen again, you have to approach it with maybe some different variables - different people, different machines, different software, etc. Who makes those decisions? Do you define them? Or do you let others make them? This is an abstract question. I would love to be involved as much as I can, as long as I'm around I guess.

**SITBDAWG:** Do you ever think about where your works will be in 150 years?

**CMA:** Yeah, it will probably just be one of my source code zines sitting in your library. Ha! And maybe somewhere there will be some correspondence related to it. Something like that. Then it will be up to [people at the time] to tackle it. But who knows really. I remember in school when I first learned that if you hear Bach played on the kind of instruments that existed in his own time, it sounds completely different than it does today. If you hear Bach played on a period organ, the sharps and flats are totally different than what we hear now. I heard Bach on a period organ once. OMG! It was nuts. Really frantic stuff. With media art, I think you'll have a similar situation, where things get skewed over time. It's a similar situation; Bach's scores are instructions that need to be executed on a machine. That's how I think about it. So maybe you can think about it in terms of a "historically informed performance," or something like that. I suspect in 200 years - if, God willing, someone actually wants to see my work - it might be a little bit different, maybe because of something that people have totally forgotten about. Like they totally forget that electricity was 60 hertz, so it will be played at the wrong speed or something. That's just what happens. And it happens with everything; paintings fade. It doesn't bother me. It's actually kind of interesting. Tony Conrad's Yellow

Movies are masterworks, in regards to these kinds of concerns.

**SITBDAWG:** You mentioned working with digital preservationists; do you think that is the best way for artists to acquire this kind of knowledge?

**CMA:** Well, I found it really helpful and illuminating and awesome. So yeah, I think that model is good. Or maybe something like a seminar would work, because archivists are going to throw down some knowledge that you never would have thought about. They are working at a level that is so much different from what I was ordinarily doing with my laptop. Walter would tell me "You need to have this many back-ups," and I would think that it seemed excessive. But he was right of course.

**SITBDAWG:** ~~Do you encounter professional standards in your work?~~

**CMA:** ~~Not really. There were a lot of things on your question sheet I had never even heard of. I never knew SMPTE stood for "Society of Motion . Picture and Television Engineers." That is a very cool-sounding Society. I didn't know about AAM or AIC. I just don't know about this stuff. ... Do you guys work at all with preserving performance art?~~

**SITBDAWG:** Yes, some of the SI Museums collect performance works.

**CMA:** ~~I feel it's all very similar. Just because I'm a computer guy doesn't make much difference. A lot of other contemporary artists have totally similar problems, and that's what makes it interesting sometimes. It's like I was saying earlier, the keys on the piano change at some point. A lot of the debate is about how much you can change a work from the way it was originally presented and still consider it authentic... I'd like to say leave that up to each individual artist. Each artist has their own individual vibe. Anything could be possible. What I would have said 10 years ago is probably different from what I'm saying now. I did an interview back then with the Guggenheim, and I don't quite remember what I said, but I can imagine some of it was different.~~ I was researching the composer Bruckner recently and there is something called the "Bruckner Problem" - which is that nobody really knows what the final versions of his symphonies were, because he kept updating them throughout his life. At different points in his life, he had different ideas about each symphony. So now people are arguing about which ones are the right ones. I would say that the story is the story; but most people still want to know which one is The One. It's a very human thing. It's all a performance. It's not real. It's a temporary manifestation of information. None of it is going to be around in the future.

# HP Pen Plotter Hello World

*2009*

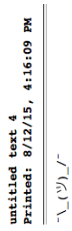
*Requirements: Perl, HPGL plotter and pens.*

*A Perl file which generates a Hewlet Packard Graphics Language file consisting of lines drawn between 0 & 100 random points. Originally programmed as a "Hello World" file in order to test my HP7476A pen plotter.*

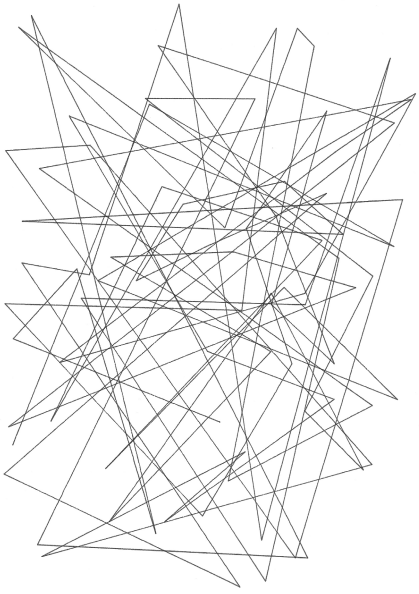
*"Grip it and Rip it" – John Daily*

**1.** Uuuuugh, wz so lazy on this on, didn't even code in the possibility 2 change the output file name. SMDH.

**2.**




**3.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



*Plotter.pl*

```
open (OUTFILE, ">Hello-World.hpgl") || die "Can't oupen output file.\n";[1] [2]

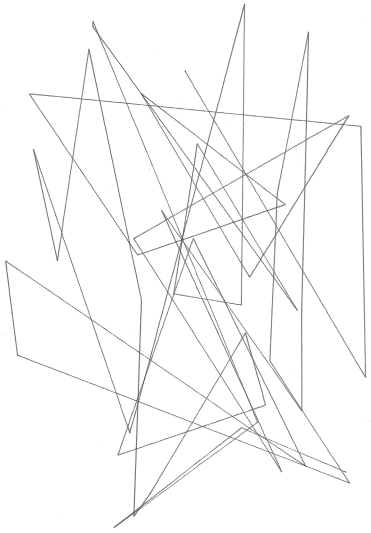
my $range = 100;
my $random_number_points = int(rand($range));
my $random_number_start_x = int(rand($range));
my $random_number_start_y = int(rand($range));

print OUTFILE "IN\n";
print OUTFILE "SC0,100,0,100;\n";
print OUTFILE "SP1;";
print OUTFILE "PA$random_number_start_x, $random_number_start_y\n";
print OUTFILE "VS40\n";

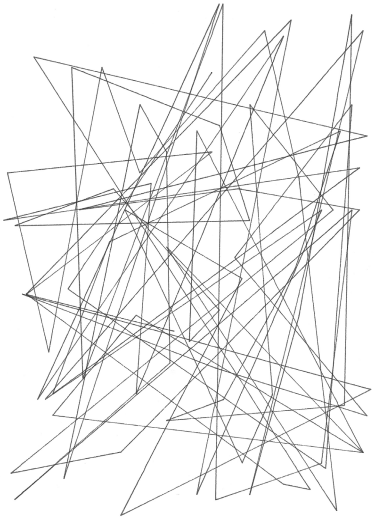
for ($count = $random_number_points; $count >= 1; $count--){
  my $range = 100;
  my $random_number = int(rand($range));
  my $random_number_2 = int(rand($range));
print OUTFILE "PD$random_number,$random_number_2\n";
  }

print OUTFILE "SP0\n";
print OUTFILE "PG\n"; [3] [4] [5] [6] [7] [8] [9] [10] [11] [12] [14] [15] [16]
```

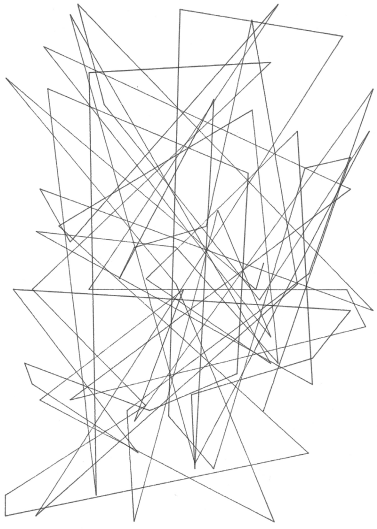
**4.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



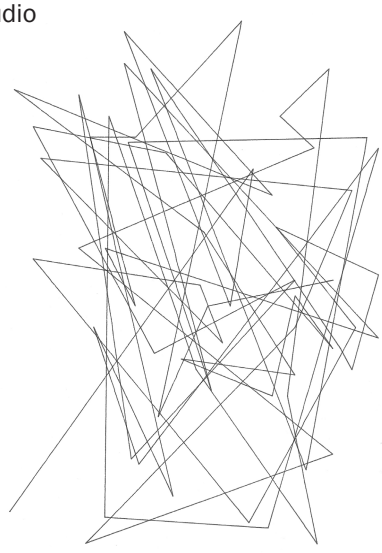
**5.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



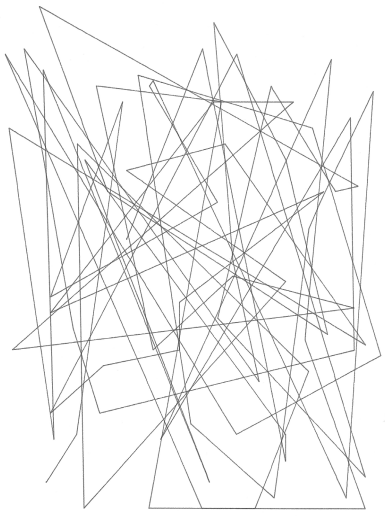
**6.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



**7.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio

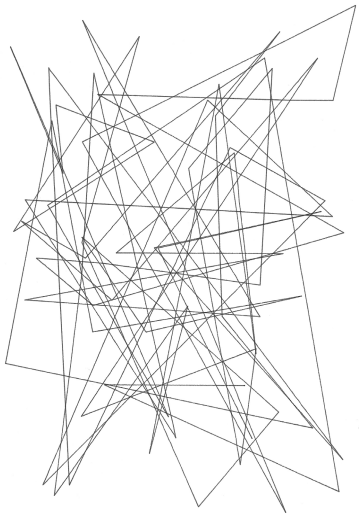


**8.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio

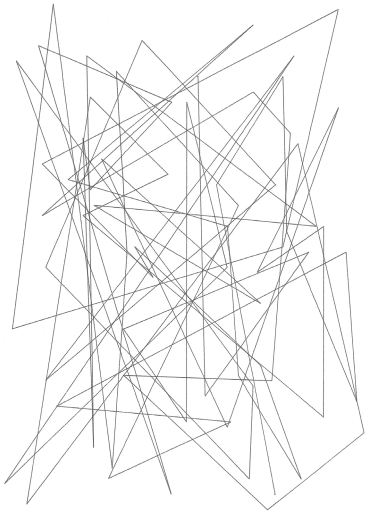


**9.** *nice pics*, 2002-ongoing (Image archive)

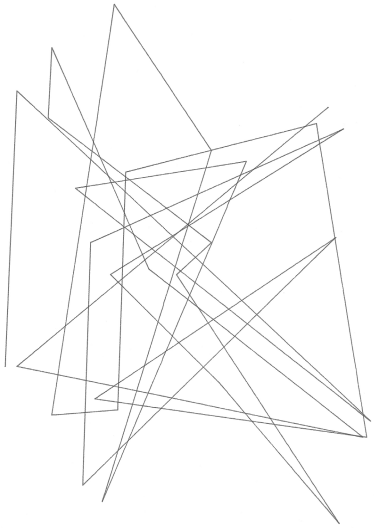
**10.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



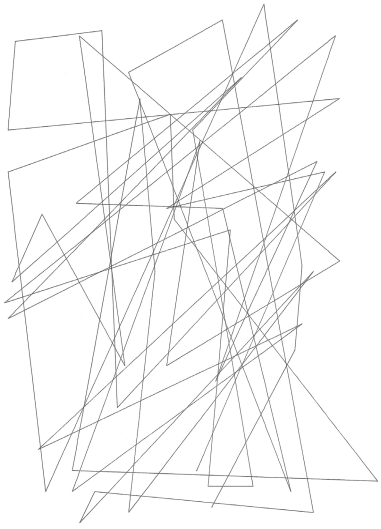
**11.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



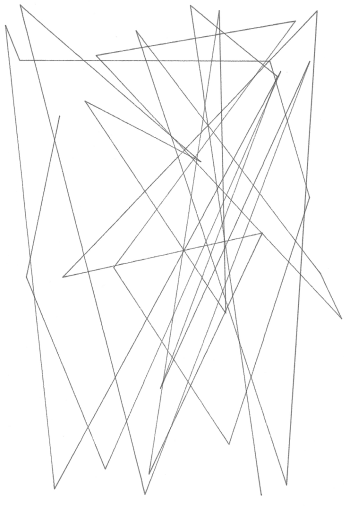
**12.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



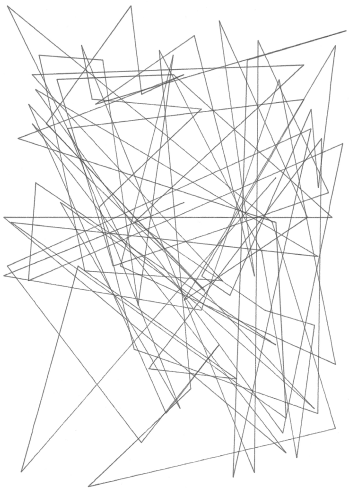
**15.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



**14.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio.



**16.** *Hello World*, 2011 ( Pen on custom watermarked paper) Photo: Arcangel Studio



Dooogle

[1] 2004

Requirements: Webserver, Pear::SOAP, Google API [2]

Creditsz: Code help by Michael Frumin, concept help by Michael Connor & Jackie Passmore.

*Search engine which only returns results for Doogie Howser. Originally performed at http://www.dooogle.com*

*"Move over Lucifer, I'm more ruthless, leave you toothless."*
*- Biggie*

**1.** Originally, the project was called "Doogle" as per "Google", though given http://www.doogle.com was already registered, I - obvz - went with http://www.dooogle.com. Anyway, therefore, sometimes it's seen as "Doogle", and others as "Dooogle". FYI.

**2.** The Google API this originally ran on was depreciated some time in the late aughts. I then had the site re-written in a newer API which was - again - depreciate a few years later. At that point, I canned the site which is it's current state. All in all, I think this had a good 7-8 years of "live".

*index.html*

```
<html>
 <head>
  <meta http-equiv="content-type" content="text/html;
  charset=UTF-8" >
  <title>Dooogle</title>
  <style>
   <!--
    body,td,a,p,.h{font-family:arial,sans-serif;}
   .h{font-size: 20px;}
   .q{color:#0000cc;}
   //-->
  </style>
  <script>
   <!--
   function sf(){document.f.q.focus();}
   // -->
  </script>
  <LINK REL="SHORTCUT ICON" HREF="http://www.dooogle.com/
  dooogle.ico">
 </head>
<body bgcolor=#ffffff text=#000000 link=#0000cc vlink=#551a8b
alink=#ff0000 onLoad=sf()>
<center>
  <img src="logo.gif" alt="Dooogle">
  <br>
  <br>
  <form action="doogle.php" name=f>
  <table cellspacing=0 cellpadding=0>
   <tr>
   <td width=25%> </td>
   <td align=center>
    <input maxLength=256 size=55 name=query value=""><br>
    <input type=submit value="Dooogle Search" name=dooogle>
    <input type=hidden value="0" name=start>
```

```
    </td>
    <td valign=top nowrap width=25%> </td>
    </tr>
  </table>
  </form>
  <br>
  <br>
  <font size=-1><a href=about.html>About Dooogle</a></font>
  <p><font size=-2>&copy;2009 Dooogle - Searching 4,285,199,774
  web pages</font></p>
  </center>
 <script type="text/javascript">
  var gaJsHost = (("https:" == document.location.protocol) ?
  "https://ssl." : "http://www.");
  document.write(unescape("%3Cscript src='" + gaJsHost +
  "google-analytics.com/ga.js' type='text/javascript'%3E%3C/
   script%3E"));
 </script>
 <script type="text/javascript">
    try {
    var pageTracker = _gat._getTracker("UA-12213123-1");
    pageTracker._setDomainName(".coryarcangel.com");
    pageTracker._trackPageview();
    } catch(err) {}
  </script>
 </body>
</html>
```

*doogle.php*

```
<?
extract($_GET);

 // This is example code of how to query the Google API using Web
 Services, SOAP, and PHP.

 // Author: Geoff Peters, January 6th 2004.

 // To run this script you need to obtain the Pear::SOAP package.
 You can obtain it from http://pear.php.net. The example shown
 uses Pear::SOAP version 0.7.5.

 // If you don't have administrative access to you web server,
 you can place the SOAP directory that contains the Pear::SOAP
 source files somewhere on your server, and then modify the PHP
 include path using ini_set to include this directory.

 // Initialize SOAP web services

ini_set("include_path", join(":", array(dirname(__FILE__)."/
PEAR", ini_get("include_path"))));
include("SOAP/Client.php");

$soapclient = new SOAP_Client('http://api.google.com/search/
beta2');
$soapoptions = array('namespace' => 'urn:GoogleSearch',
'trace' => 0);
?>
```

```
<html>
 <head>
  <LINK REL="SHORTCUT ICON" HREF="http://www.dooogle.com/dooogle.ico">
  <meta http-equiv="content-type" content="text/html;
  charset=UTF-8">
  <title>Dooogle Search: Doogie Howser</title>
  <style>
   <!--
    body,td,div,.p,a{font-family:arial,sans-serif }
    div,td{color:#000}
    .f,.fl:link{color:#6f6f6f}
    a:link,.w,a.w:link,.w a:link{color:#00c}
    a:visited,.fl:visited{color:#551a8b}
    a:active,.fl:active{color:#f00}
    .t a:link,.t a:active,.t a:visited,.t{color:#000}
    .t{background-color:#e5ecf9}
    .k{background-color:#36c}
    .j{width:34em}
    .h{color:#36c}
    .i,.i:link{color:#a90a08}
    .a,.a:link{color:#008000}
    .z{display:none}
    div.n {margin-top: 1ex}
    .n a{font-size:10pt; color:#000}
    .n .i{font-size:10pt; font-weight:bold}
    .q a:visited,.q a:link,.q a:active,.q {color: #00c; }
    .b{font-size: 12pt; color:#00c; font-weight:bold}
    .ch{cursor:pointer;cursor:hand}
    .e{margin-top: .75em; margin-bottom: .75em}
    .g{margin-top: 1em; margin-bottom: 1em}
    //-->
  </style>
<script>
<!--
function ss(w) {
 window.status = w;
 return true;
}
function cs() {
 window.status = '';
}
function ga(o, e) {
 if(document.getElementById) {
  a = o.id.substring(1);
  p = "";
  r = "";
  g = e.target;
  if(g) {
   t = g.id;
   f = g.parentNode;
   if(f) {
    p = f.id;
    h = f.parentNode;
    if(h) r = h.id;
   }
  } else {
   h = e.srcElement;
   f = h.parentNode;
```

```
  if(f) p = f.id;
  t = h.id;
 }
 if(t == a || p == a || r == a) return true;
 location.href = document.getElementById(a).href
}
}
//-->
</script>
 <style>
  <!--
   .fl:link{color:#7777CC}
   -->
 </style>
</head>
<body onload="document.gs.reset()" topmargin="2"
bgcolor="#ffffff" marginheight="2">
 <table border="0" cellpadding="0" cellspacing="0">
  <tbody>
   <tr>
    <td valign="top"><a href="http://www.dooogle.com/webhp?hl=en">
    <img src="logo_sm.gif" alt="Go to Dooogle Home" border="0"
    vspace="12"></a></td>
    <td>  </td>
    <td valign="top">
     <table border="0" cellpadding="0" cellspacing="0">
      <tbody>
       <tr>
        <td height="14" valign="bottom">
         <script>
         <!--
         function qs(el) {
          if(window.RegExp && window.encodeURIComponent) {
          var qe = encodeURIComponent(document.gs.q.value);
          if(el.href.indexOf("q=") != -1) {
           el.href = el.href.replace(new
           RegExp("q=[^&$]*"), "q=" + qe);
          }
          else {
           el.href += "&q=" + qe;
          }
         }
         return 1;
        }
        // -->
        </script>
        <table border="0" cellpadding="4" cellspacing="0">
         <tbody>
          <tr>
           <td class="q"><font size="-1"><font
          color="#000000"><b>Web</b></font></font></td>
          </tr>
         </tbody>
        </table>
       </td>
      </tr>
      <tr>
       <td>
```

```
      <table border="0" cellpadding="0" cellspacing="0">
       <tbody>
        <tr>
         <td nowrap>
          <form name="gs" method="get" action="doogle.php"><input
          name="query" value="whatever" type="hidden"><input name
          ="start" value="0" type="hidden"><input name="q" size=
          "41" maxlength="2048" value="Doogie Howser" type="text"
          ><font size="-1"> <input name="btnG" value="Search"
          type="submit"><span id="hf"></span>
          </font></form>
         </td>
         <td nowrap> </td>
        </tr>
       </tbody>
      </table>
     </td>
    </tr>
   </tbody>
  </table>
  <table border="0" cellpadding="0" cellspacing="0">
   <tbody>
    <tr>
     <td><font size="-1"></font></td>
    </tr>
    <tr>
     <td height="7"><img alt="" height="1" width="1"></td>
    </tr>
   </tbody>
  </table>
 </td>
</tr>
</tbody>
</table>
<?php
 if ($key == "")
 {
  /*
  You get a developer's key when you register to use Google's
  API.A developer's key is a unique string that identifies you to
  Google. You get a maximum of 1000 searches per day using your
  developer's key.
  */
  $key = 'Your Key Here'; // put your developer's key here.
 }
 if ($query != "")
 {

  // remove the slashes that are automatically added by PHP
  before each quotation mark

  $query = stripslashes($query);
  if ($ret = search($query, $key, $num))
  {
   $results = $ret->resultElements;
 ?>
<table border="0" cellpadding="0" cellspacing="0" width="100%">
 <tbody>
```

```
  <tr>
   <td bgcolor="#3366cc"><img alt="" height="1" width="1"></td>
  </tr>
 </tbody>
</table>
<table bgcolor="#e5ecf9" border="0" cellpadding="0"
cellspacing="0" width="100%">
 <tbody>
  <tr>
   <td bgcolor="#e5ecf9" nowrap><font size="+1"> <b>Web</b></
   font> </td>
    <td align="right" bgcolor="#e5ecf9" nowrap><font color=""
    size="-1">Results <b><?php print $ret->startIndex;?></
    b> - <b><?php print $ret->endIndex;?></b> of about <b><?php
    print $ret->estimatedTotalResultsCount;?></b> for <b>Doogie
    Howser</b>.  (<b><?php print $ret->searchTime;?></b> seconds)
    </font></td>
  </tr>
 </tbody>
</table>
<!--a-->
 <?php
 foreach($results as $res)
 {
  if (empty($res->title))
  {?><p class="g"><!--m--><a href="<?php
   print $res->URL; ?>"><?php
   print $res->URL; ?> <!--n--></p><?php
  }
  else
  {?><p class="g"><!--m--><a href="<?php
   print $res->URL; ?>"><?php
   print $res->title; ?></a><br /><font size="-1"><?php
   print $res->snippet; ?><br /><font color="#008000"><?php
   print $res->URL; ?> -  <?php
   print $res->cachedSize; ?> </font></font><!--n--></p><?php
  }
 }
}
}
?>
 <br clear="all">
<div class="n">
 <table align="center" border="0" cellpadding="0"
 cellspacing="0" width="1%">
  <tbody>
   <tr align="center" valign="top">
    <td nowrap valign="bottom"><font size="-1">Result Page: </
    font></td>
    <td>
     <?php
      $length = 10;
      $lenght2 = 20;
      $ii2 = ($start / 10) + 1;
      $ii3 = $ii2;
      $ii2 = $ii2 - 10;
      if ($ii2 < 0){$ii2 = 1;}
      global $flag_end;
```

```
 $flag_end = 0;
 if ($ii3 > 1){
 ?>
<a href="doogle.php?query=whatever&start=<?php echo
$start - 10;?>"><img src="nav_previous.gif" alt=""
border="0"><br><span class=b>Previous</span></a>
</td>
<td>
 <?php
  }
  else
 {
  ?>
 <img src="nav_first.gif" alt="" height="26" width="18"><br>
</td>
<td>
 <?php
  }
  for ($ii = $ii2; $ii < $length + $ii3; $ii++){
  if ($ii >= 99){$flag_end = 1; break; }z
  if ($ii3 == $ii){
  ?>
 <img src=nav_current.gif width=16 height=26 alt=""><br><span
 class=i><?php echo $ii ?></span>
</td>
<td>
 <?php
  }
  else
  {
  ?>
 <a href="doogle.php?query=whatever&start=<?php echo
 ($ii-1)*10?>"><img src="nav_page.gif" alt="" border="0"
 height="26" width="16"><br><?php echo $ii ?></a>
</td>
<td>
 <?php
  }
 }
 if ($flag_end == 0)
 {
 ?>
 <a href="doogle.php?query=whatever&start=<?php echo $start
 + 20;?>"><img src=nav_next.gif width=100 height=26 alt=""
 border=0><br><span class=b>Next</span></a>
 </td>
</tr>
<?php
 }
 else
 {
 ?>
 <a href="doogle.php?q=whatever&start=<?php echo $start +
 20;?>"><img src=nav_next_end.gif width=100 height=26 alt=""
 border=0><br><span class=b></span></a></td></tr>
<?php
 }
 ?>
```

```
 </tbody>
 </table>
</div>
<center>
 <br clear="all"><br>
 <table border="0" cellpadding="0" cellspacing="0" width="100%">
  <tbody>
   <tr>
    <td class="k"><img alt="" height="1" width="1"></td>
   </tr>
   <tr>
    <td align="center" bgcolor="#e5ecf9">
     <br>
     <table align="center" border="0" cellpadding="0"
     cellspacing="0">
      <form method="get" action="/search"></form>
      <tbody>
       <tr>
        <td nowrap>
         <font size="-1"><input name="q" size="31"
         maxlength="2048" value="Doogie Howser" type="text">
         <input name="btnG" value="Search" type="submit"><input
         name="hl" value="en" type="hidden"><input name="lr"
         value="" type="hidden"></font>
        </td>
       </tr>
      </tbody>
     </table>
     <br>
    </td>
   </tr>
   <tr>
    <td class="k"><img alt="" height="1" width="1"></td>
   </tr>
  </tbody>
 </table>
</center>
<center>
 <p></p>
 <hr class="z">
 <table border="0" cellpadding="2" cellspacing="0" width="100%">
  <tbody>
   <tr>
    <td align="center"> </td>
   </tr>
  </tbody>
 </table>
 <br><font class="p" size="-1">©2009 Dooogle</font>
</center>
<script type="text/javascript">
 var gaJsHost = (("https:" == document.location.protocol) ?
 "https://ssl." : "http://www.");
 document.write(unescape("%3Cscript src='" + gaJsHost + "google-
 analytics.com/ga.js' type='text/javascript'%3E%3C/script%3E"));
</script>
<script type="text/javascript">
 try {
 var pageTracker = _gat._getTracker("UA-12213123-1");
```

```
  pageTracker._setDomainName(".coryarcangel.com");
  pageTracker._trackPageview();
  } catch(err) {}
 </script>
</body>
</html>

<?php

// Does Google search with retry.
// Retry is useful because sometimes the connection will
// fail for some reason but will succeed when retried.

function search( $query, $key, &$num )
{
 $result = false;
 $max_retries = 5;
 $retry_count = 0;

 while( !$result && $retry_count < $max_retries )
 {
  $result = do_search( $start, $query, $key, $num );
   if( !$result )
  {
   print( "Attempt $retry_count failed.<br>\n");
  }
  $retry_count++;
 }
 if( !$result )
 {
  print("<br>Sorry, connection to Google failed after retrying
  several times. Please check that the Google Developer's Key
  you entered was correct. To obtain a developer's key or for
  more information on the Google API, visit <a href=\"http://www.
  google.com/apis/\">Google API home page</a>.<br>\n");
 }
 return $result;
}

 // Calls the Google API and retrieves the estimated number of
 // search results for that query into $num.

function do_search( $start, $query, $key, &$num )
{
 global $soapclient;
 global $soapoptions;

 // Note that we pass in an array of parameters into the Google
 search. The parameters array has to be passed by reference. The
 parameters are well documented in the developer's kit on the
 Google site http://www.google.com/apis

 $query = "Doogie Howser";   // Wasss up
 $start = $_GET['start'];
 global $_GET;
 global $start;
 $start = $_GET['start'];
 $start2 = $start;
```

```
$length = 1000;
$i = 0;
for ($ii = 0; $ii < $length; $ii++)
{
if ($start == $ii) {$start = $i;}
$i = $i + 1;
}
if(empty($start)) {
  $start =  0;
}

//print "START IS FINALLY: $start<BR><BR>\n";

$params = array(
                'key' => $key, // the Developer's key
                'q' => $query, // the search query
                'start' => $start,      // the point in the
                search results should Google start
                'maxResults' => 10, // the number of search
                results (max 10)
                'filter' => false, // should the results be
                filtered?
                'restrict' => '',
                'safeSearch' => false,
                'lr' => '',
                'ie' => '',
                'oe' => ''
        );

// Here's where we actually call Google using SOAP
doGoogleSearch is the name of the remote procedure call.

$ret = $soapclient->call('doGoogleSearch', $params,
$soapoptions);

if (PEAR::isError($ret))
{
 print("<br>An error #" . $ret->getCode() . " occurred!<br>");
 print(" Error: " . $ret->getMessage() . "<br>\n");
 return false;
}
else

// We have proper search results

{

 // Results from the Google search are stored in the object
 $ret  The following block of code prints out the structure and
 contents of the object to the screen: print("\n<br><pre>");

 $num = $ret->estimatedTotalResultsCount;
}
 return $ret;
}
?>
```

*about.html:*

```
<html>
 <head>
  <LINK REL="SHORTCUT ICON" HREF="http://www.doooogle.com/
   dooogle.ico">
  <meta http-equiv="content-type" content="text/html;
  charset=UTF-8">
  <title>Google</title>
  <style>
   <!--
    body,td,a,p,.h{font-family:arial,sans-serif;}
    .h{font-size: 20px;}
    .q{color:#0000cc;}
    //-->
  </style>
  <script>
   <!-- function sf(){document.f.q.focus();} // -->
  </script>
 </head>
 <body bgcolor=#ffffff text=#000000 link=#0000cc vlink=#551a8b
 alink=#ff0000 onLoad=sf()>
  <center>
   <img src="logo.gif" alt="Dooogle"><br>
   <br>
   <form action="/grab2" name=f>
   </form>
   <p> Dooogle concept by:</p>
   <p> Cory Arcangel<br>
    Michael Connor<br>
    Jackie Passmore
   </p>
   <p>Dooogle is an Eyebeam R + D project.  Programmed in Sept
     + Nov by Cory Arcangel with help<br>from Michael Frumin

  </center>
 </body>
</html>[3] [4]
```

*logo.gif*

*logo sm.gif*

nav_current.gif

logo.gif

logo_sm.gif

nav_current.gif

nav_first.gif

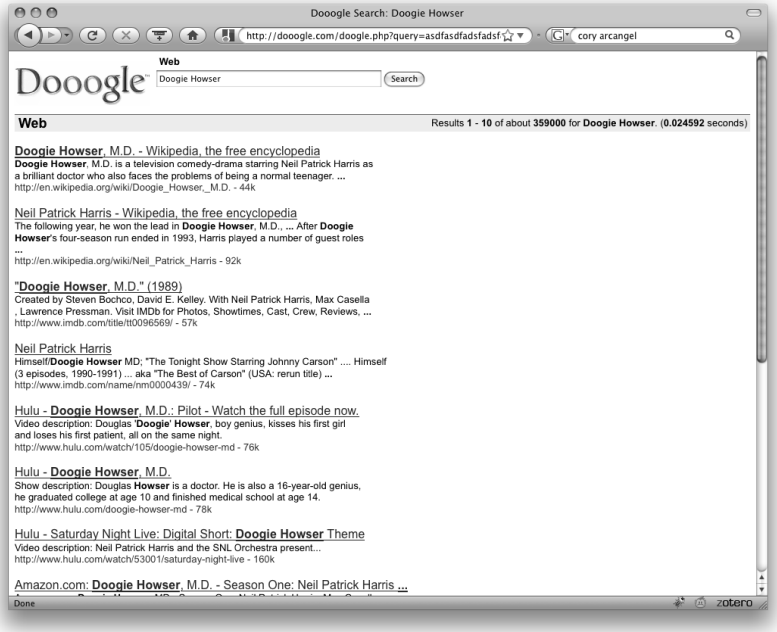
nav_next.gif

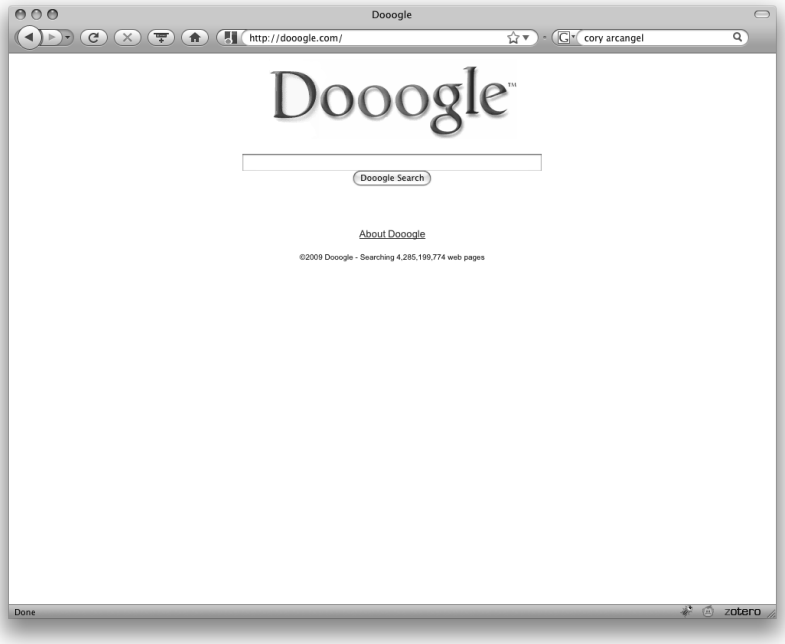
nav_next_end.gif

nav_page.gif

nav_previous.gif

dooogle.ico


Dooogle Search: Doogie Howser
http://dooogle.com/doogle.php?query=asdfasdfadsfadsf
cory arcangel
Dooogle
Web
Doogie Howser
Search
Web
Results 1 - 10 of about 359000 for Doogie Howser. (0.024592 seconds)
Doogie Howser, M.D. - Wikipedia, the free encyclopedia
Doogie Howser, M.D. is a television comedy-drama starring Neil Patrick Harris as a brilliant doctor who also faces the problems of being a normal teenager. ...
http://en.wikipedia.org/wiki/Doogie_Howser,_M.D. - 44k
Neil Patrick Harris - Wikipedia, the free encyclopedia
The following year, he won the lead in Doogie Howser, M.D., ... After Doogie Howser's four-season run ended in 1993, Harris played a number of guest roles ...
http://en.wikipedia.org/wiki/Neil_Patrick_Harris - 92k
"Doogie Howser, M.D." (1989)
Created by Steven Bochco, David E. Kelley. With Neil Patrick Harris, Max Casella , Lawrence Pressman. Visit IMDb for Photos, Showtimes, Cast, Crew, Reviews, ...
http://www.imdb.com/title/tt0096569/ - 57k
Neil Patrick Harris
Himself/Doogie Howser MD; "The Tonight Show Starring Johnny Carson" .... Himself (3 episodes, 1990-1991) ... aka "The Best of Carson" (USA: rerun title) ...
http://www.imdb.com/name/nm0000439/ - 74k
Hulu - Doogie Howser, M.D.: Pilot - Watch the full episode now.
Video description: Douglas 'Doogie' Howser, boy genius, kisses his first girl and loses his first patient, all on the same night.
http://www.hulu.com/watch/105/doogie-howser-md - 76k
Hulu - Doogie Howser, M.D.
Show description: Douglas Howser is a doctor. He is also a 16-year-old genius, he graduated college at age 10 and finished medical school at age 14.
http://www.hulu.com/doogie-howser-md - 78k
Hulu - Saturday Night Live: Digital Short: Doogie Howser Theme
Video description: Neil Patrick Harris and the SNL Orchestra present...
http://www.hulu.com/watch/53001/saturday-night-live - 160k
Amazon.com: Doogie Howser, M.D. - Season One: Neil Patrick Harris ...
Done
zotero

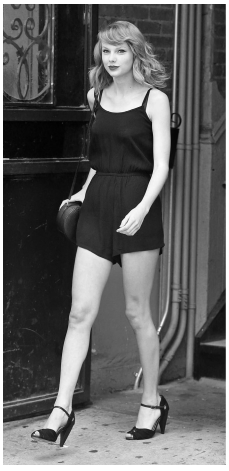

Dooogle
http://dooogle.com/
cory arcangel
Dooogle
Dooogle Search
About Dooogle
©2009 Dooogle - Searching 4,285,199,774 web pages
Done
zotero

# 3.

The New York Times

*What Taylor Swift Can Teach You About Rompers*

*By Molly Young. Aug. 12, 2015*



*As with any style traditionally worn by babies — pigtails, overalls, pinafores — a romper carries the risk of making an adult look as if she recently escaped from her playpen.*

*It's a tricky item. In the case of children, there's an obvious utility: It's easier to get a wriggling tot into one piece of clothing than two. Adults with normal muscle control don't have to worry about basic maneuverability when dressing themselves, and yet rompers are everywhere. What's the appeal?*

*To start with the obvious: It's summer. And a romper is, by definition, recreational clothing (unless your job description includes romping). Snapping oneself into a playsuit allows a woman all sorts of conveniences.*

*"It provides a huge 'no flashing' benefit," said Alexandra Amarotico, a 26-year-old photographer who lives in Hell's Kitchen and has worn a romper four out of the last eight days, by her count. "It's an especially nice perk in summer because your romper can be even shorter than your dresses on a hot day."*

*Yael Aflalo, founder of the eco-friendly label Reformation, is a fan, too. "Rompers are great because you can make them work for day or night, and they let you show off your legs without feeling overexposed," she said.*

*Taylor Swift and Karlie Kloss have both been seen loping around town in rompers from the store. To thwart the "big baby" look, Ms. Aflalo advised a light hand with finishing touches. "Keep your accessories simple," she said. "I like a lace-up flat for day and a chic heel for night."*

*Along with daytime looks (onesies that could be lifted straight from the 1962 film adaptation of "Lolita"), Ms. Swift made a case for the formal romper at last year's MTV Video Music Awards and again at a pre-Grammy gala this year. It's not an unprecedented move: Jerry Hall and Bianca Jagger wore rompers in the '70s, during an era when leisure wear oozed silkily into evening wear.*

*Still, the best pro-romper argument may be the simplest one, which is that it cuts morning-outfit deliberation time in half. Why make two choices, top and bottom, when you can make one?*

# 4.

# Six

# Sixty-six

[1]2004

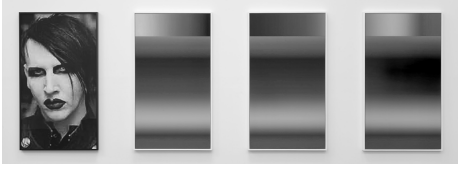
Requirements: Osx, perl, the "lame" mp3 encoder/decoder, the "normailze" binary Cory Arcangel (special thx to the Radical Software Group)

Script to compress an mp3 recursively (666) times.

"....." - Jazz

**1.** Actually, the official title of this work is, "Iron Maiden's The Number of the Beast compressed over and over as an MP3 666 times", but, I don't know, I thought I would re-name it RN for this zine.

**2.** *Manson*, 2016 (Inkjet on Angelica Universal Photomatte 230) Location: Lisson Gallery (installation and full view) Photo: Jack Hems



666.pl

```
for ($count=1; $count<=666; $count++){

  if ($count == 1){
    `lame --decode
     Iron_Maiden_The_Number_of_the_Beast_original.mp3
     Iron_Maiden_The_Number_of_the_Beast.aif`;
  }

  `lame -h Iron_Maiden_The_Number_of_the_Beast.aif
  Iron_Maiden_The_Number_of_the_Beast_$count.mp3`;

  `lame --decode
  Iron_Maiden_The_Number_of_the_Beast_$count.mp3
  Iron_Maiden_The_Number_of_the_Beast.aif`;

  `normalize Iron_Maiden_The_Number_of_the_Beast.aif`;
}
```

**3.** Arcangel, Cory. *On C*. Originally appeared in *A Couple Thousand Short Films about Glenn Gould*, Film and Video Umbrella, 2008.

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# ON COMPRESSION

Cory Arcangel
2k7 – 2k8

ABSTRACT: JPEGs look the way they do because of quantization and their use of the Discrete Cosine Transform (DCT). The DCT is a technique for converting a signal into elementary frequency components. It is widely used in image compression. Here we will go through some examples to explain how the DCT works. The text is kind of a summary, and if you want to bring the noise, all the math is in the end notes.

# 4.

## 1. LOSSY VS. LOSSLESS

The whole point of digital image compression is to be able to reconstruct an image without having to send all the data. This is because data, especially in large amounts, is expensive and slow to transport. Either over cable lines, phone lines, or wirelessly, it is all slow. To this day, the most efficient and cheapest way to transport large amounts of data is by mailing a hard-drive to the destination, and I don't mean emailing, I mean the kind of mailing that involves the post office. So compression is valuable because the less we need to send the cheaper and faster it is. There are two kinds of compression. One is called Lossy, and the other is called Lossless. Lossless compression does not lose any information from the original source. How can this be? Well, let's say we wanted to send this: 'a a a a a a a a a b a' and we were going to send it over the phone by voice. As opposed to having to send all the information by reading out each letter one at a time, we could just tell someone '9a's, one b, and one a' and they would know we meant 'a a a a a a a a a b a' and we have saved ourselves a bit of breath. In computer language it means we have stored all the information using less space. To generalize a bit, if you have ever opened a 'zip' file, your computer has seen '9a's, one b, and one a' and translated it to 'a a a a a a a a a b a'. This is Lossless compression. On the other hand, Lossy compression actually loses data. Lossy compression, therefore, can not be used for text, or any application where all the information must remain intact. It is used for images, music, and video. This is because, believe it or not, our eyes and ears are pretty crap, and we don't usually notice missing bits here and there. Lossy compression works by getting rid of the information which isn't so important to us. To generalize a bit again, if we tried to send 'a a a a a a a a a b a' using Lossy compression over the phone, we would just get lazy and say '11a's'. In this article, we are going to focus on the Discrete Cosine Transform, aka the DCT, a math formula used in Lossy compression. The reason I'm interested in this Transform is because, when used with quantization, it is what gives JPEGs that 'JPEG look'. By 'JPEG look' I mean those crappy compressed blocky images you need to squint your eyes to understand that are all over the internet. And in case you haven't noticed, this look is everywhere else as well (ads, digital cameras, digital video, etc.) If the '80s gave us 'hot' colors and 'rad' graphics, and the '90s gave us slick vector design, then

the 00's are giving us compressed blocky images.

JPEGs are everywhere today because they have become a standard, or a universally agreed upon set of rules. Today JPEG is a nickname for a file type, but JPEG originated as a shorthand for the group that proposed the standard, the Joint Photographic Experts Group. This standard was created in Geneva in 1992 when members of the CCITT and the ISO/IEC (now together known as JPEG) got together in Geneva and released the technical document ISO/IEC IS 10918-1 / ITU-T Recommendation T.81. This paper recommended 'REQUIREMENTS AND GUIDELINES' of the 'DIGITAL COMPRESSION AND CODING OF CONTINUOUS-TONE STILL IMAGES'. These guidelines, through third party development, eventually became known as JPEG files.

## 2. THE GUY BEHIND THE GUY BEHIND THE GUY

As mentioned earlier, the heart of JPEG is the DCT formula, and the DCT relies on cosines. The easiest way to think of cosines is to imagine yourself walking counterclockwise around a circle. This circle is centered on the X and Y axis, and has a radius of 1. Radius is the length from the center of the circle to the edge. A cosine of the angle in respect to the positive horizontal axis (aka, the length in our case because we are on a unit circle (radius = 1)) is our position on the x axis as we walk around the circle if we started at X = 1. We must also remember that the length around a circle with a radius of 1 is 2pi. So, cos(0) is 1, because we haven't gone anywhere; we are still standing at the beginning, at X = 1, cos(pi) is -1, because we have travelled halfway around the circle to X = -1, and cos(2pi) is 1, because since we have travelled all the way around our circle, we have ended up back at the beginning (Figure 1). It is this cyclical pattern which is useful in compression (Figure 2). To see the DCT in action we will start with the 1D DCT (Figure 3) formula and use it to compress the input 3,2,1 (Figure 4). DCT-based compression has four steps. First the DCT formula creates basis functions, then it compares the input data to those basis functions, creating what are called DCT coefficients, then those coefficients are quantized, and the last step is decompression, where all this is done in reverse to recreate our data. The first step of our process can be seen in Figure 5.[1] These are the basis functions for our input, which

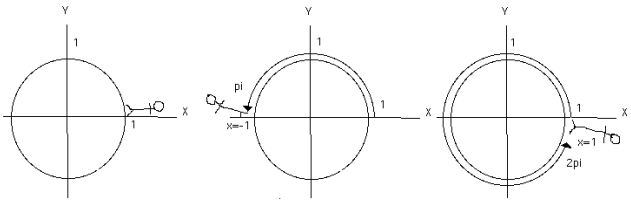



Figure 1: cosine of 0, pi, and 2pi

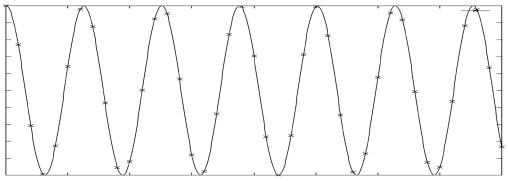


Figure 2: Cosine curve of x = 0 to 40

consist of cosine curves of increasing frequency. They can be thought of as building blocks. Every combination of 3 digits can be recreated by adding these blocks together in different proportions. The second step in the process is comparing our input to our three basis functions to generate three DCT coefficients. Our DCT coefficients represent how much of each basis function is present in our input. In our example, our three DCT coefficients generated by the 1D DTC are 3.46410, 1.41421,

$$F(u) = \sum_{x=0}^{N-1} w(i) f[x] cos \frac{(2x+1)u\pi}{2N}$$

if i = 0, $w = \sqrt{1/N}$, and if i $\neq$ 0, w = $\sqrt{2/N}$

Figure 3: 1D DCT formula. w(i) is a weighting factor fyi

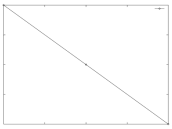
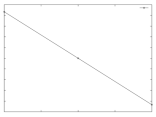
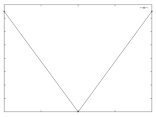


Figure 4: Our 1D DCT example input

(a) Basis function 1



(b) Basis function 2



(c) Basis function 3

Figure 5: Basis Functions for a DCT of length 3

and 0.[2] From these values we can see that our input contains elements of our first and second basis function, but none of the third. This should make sense since our input numbers are a straight line, so they do not contain any data which is similar to the curve in the third basis function. If our DCT formula in this example takes in 3 digits as input and we end up with 3 digits as output, how does this help us save space? The third step, quantization, is the key to this question. Quantization is basically a way to discard DCT coefficients. In this case we would discard our third DCT coefficient because it doesn't help us describe our input. So when we get to the last step in the process which is reversing all of this in order to reconstruct our original input, we will use only 2 DCT coefficients to do this.[3] The same information now takes only two-thirds of the space!

3. 2D

To work on an image as opposed to a string of input, we need to use the 2D DCT formula (Figure 6). This is basically the same as the 1D formula, except it works on a matrix. The input we'll compress in this example is in Figure 7. So again our first step is generating the

$$F(u,v) = \sum_{x=0}^{N-1} \sum_{y=0}^{N-1} w(i,j) f[x,y] cos \frac{(2x+1)u\pi}{2N} cos \frac{(2y+1)u\pi}{2N}$$

if i or j = 0, $w = \sqrt{1/N}$, and if i or j $\neq$ 0, w = $\sqrt{2/N}$

Figure 6: 2D DCT formula

(a) Input Image

$$\begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

(b) Input matrix

Figure 7: Our input matrix

basis functions (Figure 8).[4] As in Figure 8, our basis functions with the lower cosine frequencies are on the top left and the basis functions with the higher cosine frequencies are on the bottom right. Next, we compare our input image to our basis functions to generate our DCT coefficients. Then, we're left with 9 DCT coefficients (Figure 9).[5] These numbers tell us our input only contains three of our nine basis functions, and one can see the graphic similarities between the basis functions on the left side of Figure 8, and our input in Figure 7. All the other basis functions do not relate. The third step is quantization. This happens by taking the DCT coefficient matrix (Figure 9) and dividing it by a quantization matrix, then rounding to the nearest integer. An example matrix is used in Figure 10. The result, when reversed (Figure 11), gets rid of one of our DCT coefficients. If we complete step four by using the quantized coefficients to reconstruct our input, we clearly have quite a big difference (Figure 12).[6] Where did that grey bar come from? EXACTLY!! We have saved a ton of space, because now we only need to transmit '250, 250, and 7 0s' to recreate our input, but our image no longer looks how it was supposed to! This is because we have discarded the high frequency basis functions, so we can no longer create sharp contrasts. But it's similar, we get the idea, and this is probably good enough.

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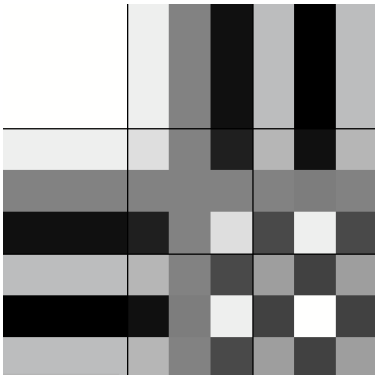


Figure 8: The 9 DCT basis functions for a 3 by 3 matrix

$$\begin{bmatrix} 255.00000 & 0 & 0 \\ 312.30994 & 0 & 0 \\ 180.31223 & 0 & 0 \end{bmatrix}$$

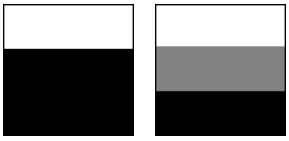
Figure 9: Our 9 DCT coefficients

$$\begin{bmatrix} 255.00000 & 0 & 0 \\ 312.30994 & 0 & 0 \\ 180.31223 & 0 & 0 \end{bmatrix} / \begin{bmatrix} 10 & 50 & 400 \\ 50 & 50 & 400 \\ 400 & 400 & 400 \end{bmatrix} = \begin{bmatrix} 25 & 0 & 0 \\ 6 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

Figure 10: Quantization table

$$\begin{bmatrix} 25 & 0 & 0 \\ 6 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix} * \begin{bmatrix} 10 & 50 & 400 \\ 50 & 50 & 400 \\ 400 & 400 & 400 \end{bmatrix} = \begin{bmatrix} 250 & 0 & 0 \\ 250 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

Figure 11: Reverse Quantization



(a) Our input

(b) Our input reconstructed by using the quantization table in Figure 10

Figure 12: Reconstructing our input for our 2D 3 x 3 matrix

## 4. THE JOINT PHOTOGRAPHIC EXPERTS

The only difference between what we just did and a JPEG, is that a JPEG always splits the image into 8 x 8 blocks and then these 8 x 8 blocks are run through the 2D DCT. 8 x 8 blocks are used because they are small enough to have consistent spatial qualities. Even at high rates of compression, we can still make out the original image. The basis functions for a JPEG are shown in Figure 13. Also, JPEGs don't specify what quantization matrix is used. Photoshop's quantization matrix is different from Canon, etc. etc., so actually one has very little control of the discarded information. Awesome. In Figure 14 and Figure 15 we can see a sample JPEG compressed with a sample quantization matrix. Take a close look — we are recreating the image only using the top left basis function of Figure 13. Hopefully you can see now that heavily compressed JPEGs are really a bunch of 8 by 8 squares composed of only the first few low frequency basis functions of an 8 x 8 2D DCT (Figure 13). We get a 90 percent reduction in file size because we only need to send a few DCT coefficients down the line, but we get an image which is only a shadow of its former self. Welcome to the future.

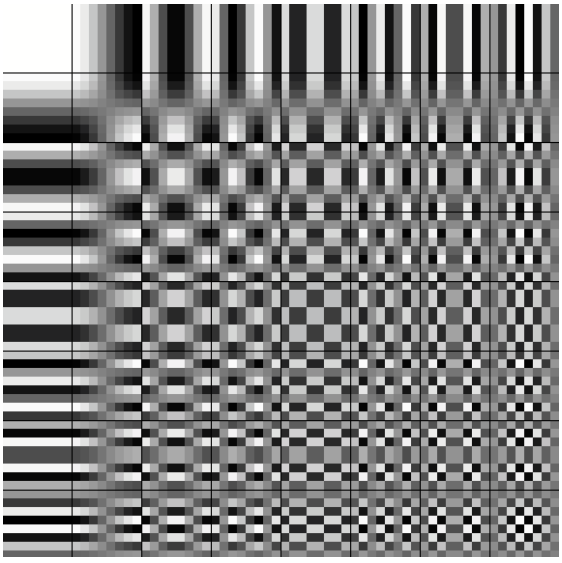


Figure 13: Our Basis functions for a JPEG

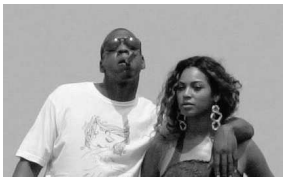


Figure 14: Our JPEG input

229 *Cory Arcangel*

$$\begin{bmatrix} 51 & 101 & 151 & 201 & 251 & 301 & 351 & 401 \\ 101 & 151 & 201 & 251 & 301 & 351 & 401 & 451 \\ 151 & 201 & 251 & 301 & 351 & 401 & 451 & 501 \\ 201 & 251 & 301 & 351 & 401 & 451 & 501 & 551 \\ 251 & 301 & 351 & 401 & 451 & 501 & 551 & 601 \\ 301 & 351 & 401 & 451 & 501 & 551 & 601 & 651 \\ 351 & 401 & 451 & 501 & 551 & 601 & 651 & 701 \\ 401 & 451 & 501 & 551 & 601 & 651 & 701 & 751 \end{bmatrix}$$

Figure 15: Our JPEG quantization table

Figure 16: Our compressed JPEG using the above input and quantization table (Figure 14 and 15)

## NOTES

[1] $\left[cos\frac{(2*0+1)0\pi}{2*3} \quad cos\frac{(2*1+1)0\pi}{2*3} \quad cos\frac{(2*2+1)0\pi}{2*3}\right] = \begin{bmatrix}1 & 1 & 1\end{bmatrix}$

$\left[cos\frac{(2*0+1)1\pi}{2*3} \quad cos\frac{(2*1+1)1\pi}{2*3} \quad cos\frac{(2*2+1)1\pi}{2*3}\right] = \begin{bmatrix}.86603 & 6.1232e-17 & -.86603\end{bmatrix}$

$\left[cos\frac{(2*0+1)2\pi}{2*3} \quad cos\frac{(2*1+1)2\pi}{2*3} \quad cos\frac{(2*2+1)2\pi}{2*3}\right] = \begin{bmatrix}.5 & -1 & .5\end{bmatrix}$

[2] $3.46410 = \sum_{x=0}^{2}\sqrt{1/3} * \begin{bmatrix}3 & 2 & 1\end{bmatrix} * \begin{bmatrix}1 & 1 & 1\end{bmatrix}$

$1.41421 = \sum_{x=0}^{2}\sqrt{2/3} * \begin{bmatrix}3 & 2 & 1\end{bmatrix} * \begin{bmatrix}.86603 & 6.1232e-17 & -.86603\end{bmatrix}$

$0.00000 = \sum_{x=0}^{2}\sqrt{2/3} * \begin{bmatrix}3 & 2 & 1\end{bmatrix} * \begin{bmatrix}.5 & -1 & .5\end{bmatrix}$

FYI: $3.46410 = (\sqrt{1/3} * 3 * 1) + (\sqrt{1/3} * 2 * 1) + (\sqrt{1/3} * 1 * 1)$

[3] $\sqrt{1/3} * \begin{bmatrix}1 & 1 & 1\end{bmatrix} * 3.46410 + \sqrt{2/3} * \begin{bmatrix}.86603 & 6.1232e-17 & -.86603\end{bmatrix} * 1.41421 = \begin{bmatrix}3 & 2 & 1\end{bmatrix}$

[4]
$$\begin{bmatrix} cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*2+1)0\pi}{2*3} \\ cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*2+1)0\pi}{2*3} \\ cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*2+1)0\pi}{2*3} \end{bmatrix} \begin{bmatrix}1 & 1 & 1\\ 1 & 1 & 1\\ 1 & 1 & 1\end{bmatrix}$$

$$\begin{bmatrix} cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*2+1)1\pi}{2*3} \\ cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*2+1)1\pi}{2*3} \\ cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*2+1)1\pi}{2*3} \end{bmatrix} = \begin{bmatrix}.86603 & 6.1232e-17 & -.86603\\ .86603 & 6.1232e-17 & -.86603\\ .86603 & 6.1232e-17 & -.86603\end{bmatrix}$$

$$\begin{bmatrix} cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*0+1)0\pi}{2*3} * cos\frac{(2*2+1)2\pi}{2*3} \\ cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*1+1)0\pi}{2*3} * cos\frac{(2*2+1)2\pi}{2*3} \\ cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*2+1)0\pi}{2*3} * cos\frac{(2*2+1)2\pi}{2*3} \end{bmatrix} = \begin{bmatrix}.5 & -1 & .5\\ .5 & -1 & .5\\ .5 & -1 & .5\end{bmatrix}$$

$$\begin{bmatrix} cos\frac{(2*0+1)1\pi}{2*3} * cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*0+1)1\pi}{2*3} * cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*0+1)1\pi}{2*3} * cos\frac{(2*2+1)0\pi}{2*3} \\ cos\frac{(2*1+1)1\pi}{2*3} * cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*1+1)1\pi}{2*3} * cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*1+1)1\pi}{2*3} * cos\frac{(2*2+1)0\pi}{2*3} \\ cos\frac{(2*2+1)1\pi}{2*3} * cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*2+1)1\pi}{2*3} * cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*2+1)1\pi}{2*3} * cos\frac{(2*2+1)0\pi}{2*3} \end{bmatrix} = \begin{bmatrix}8.6603e-01 & 8.6603e-01 & 8.6603e-01\\ 6.1232e-17 & 6.1232e-17 & 6.1232e-17\\ -8.6603e-01 & -8.6603e-01 & -8.6603e-01\end{bmatrix}$$

$$\begin{bmatrix} cos\frac{(2*0+1)1\pi}{2*3} * cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*0+1)1\pi}{2*3} * cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*0+1)1\pi}{2*3} * cos\frac{(2*2+1)1\pi}{2*3} \\ cos\frac{(2*1+1)1\pi}{2*3} * cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*1+1)1\pi}{2*3} * cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*1+1)1\pi}{2*3} * cos\frac{(2*2+1)1\pi}{2*3} \\ cos\frac{(2*2+1)1\pi}{2*3} * cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*2+1)1\pi}{2*3} * cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*2+1)1\pi}{2*3} * cos\frac{(2*2+1)1\pi}{2*3} \end{bmatrix} =$$

$$\begin{bmatrix} 7.5000e-01 & 5.3029e-17 & -7.5000e-01 \\ 5.3029e-17 & 3.7494e-33 & -5.3029e-17 \\ -7.5000e-01 & -5.3029e-17 & 7.5000e-01 \end{bmatrix}$$

$$\begin{bmatrix} cos\frac{(2*0+1)1\pi}{2*3}*cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*0+1)1\pi}{2*3}*cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*0+1)1\pi}{2*3}*cos\frac{(2*2+1)2\pi}{2*3} \\ cos\frac{(2*1+1)1\pi}{2*3}*cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*1+1)1\pi}{2*3}*cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*1+1)1\pi}{2*3}*cos\frac{(2*2+1)2\pi}{2*3} \\ cos\frac{(2*2+1)1\pi}{2*3}*cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*2+1)1\pi}{2*3}*cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*2+1)1\pi}{2*3}*cos\frac{(2*2+1)2\pi}{2*3} \end{bmatrix} =$$

$$\begin{bmatrix} 4.3301e-01 & -8.6603e-01 & 4.3301e-01 \\ 3.0616e-17 & -6.1232e-17 & 3.0616e-17 \\ -4.3301e-01 & 8.6603e-01 & -4.3301e-01 \end{bmatrix}$$

$$\begin{bmatrix} cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*2+1)0\pi}{2*3} \\ cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*2+1)0\pi}{2*3} \\ cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*0+1)0\pi}{2*3} & cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*1+1)0\pi}{2*3} & cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*2+1)0\pi}{2*3} \end{bmatrix} =$$

$$\begin{bmatrix} .5 & .5 & .5 \\ -1 & -1 & -1 \\ .5 & .5 & .5 \end{bmatrix}$$

$$\begin{bmatrix} cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*2+1)1\pi}{2*3} \\ cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*2+1)1\pi}{2*3} \\ cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*0+1)1\pi}{2*3} & cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*1+1)1\pi}{2*3} & cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*2+1)1\pi}{2*3} \end{bmatrix} =$$

$$\begin{bmatrix} 4.3301e-01 & 3.0616e-17 & -4.3301e-01 \\ -8.6603e-01 & -6.1232e-17 & 8.6603e-01 \\ 4.3301e-01 & 3.0616e-17 & -4.3301e-01 \end{bmatrix}$$

$$\begin{bmatrix} cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*0+1)2\pi}{2*3}*cos\frac{(2*2+1)2\pi}{2*3} \\ cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*1+1)2\pi}{2*3}*cos\frac{(2*2+1)2\pi}{2*3} \\ cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*0+1)2\pi}{2*3} & cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*1+1)2\pi}{2*3} & cos\frac{(2*2+1)2\pi}{2*3}*cos\frac{(2*2+1)2\pi}{2*3} \end{bmatrix} =$$

$$\begin{bmatrix} 0.25000 & .5 & 0.25 \\ -.5 & 1 & -.5 \\ 0.25000 & -.5 & 0.25 \end{bmatrix}$$

$$^{5}\ 255.00000 = \sum_{x=0}^{2}\sum_{y=0}^{2} sqrt(1/3)*\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}*sqrt(1/3)*\begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$0 = \sum_{x=0}^{2}\sum_{y=0}^{2} sqrt(1/3)*\begin{bmatrix} .86603 & 6.1232e-17 & .86603 \\ .86603 & 6.1232e-17 & .86603 \\ .86603 & 6.1232e-17 & .86603 \end{bmatrix}*sqrt(2/3)*\begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$0 = \sum_{x=0}^{2}\sum_{y=0}^{2} sqrt(1/3)*\begin{bmatrix} .5 & -1 & .5 \\ .5 & -1 & .5 \\ .5 & -1 & .5 \end{bmatrix}*sqrt(2/3)*\begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$312.30994 = \sum_{x=0}^{2}\sum_{y=0}^{2} sqrt(2/3)*\begin{bmatrix} 8.6603e-01 & 8.6603e-01 & 8.6603e-01 \\ 6.1232e-17 & 6.1232e-17 & 6.1232e-17 \\ -8.6603e-01 & -8.6603e-01 & -8.6603e-01 \end{bmatrix}*$$

$$sqrt(1/3)*\begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$0 = \sum_{x=0}^{2} \sum_{y=0}^{2} sqrt(2/3) * \begin{bmatrix} 7.5000e-01 & 5.3029e-17 & -7.5000e-01 \\ 5.3029e-17 & 3.7494e-33 & -5.3029e-17 \\ -7.5000e-01 & -5.3029e-17 & 7.5000e-01 \end{bmatrix} * sqrt(2/3) * \begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$0 = \sum_{x=0}^{2} \sum_{y=0}^{2} sqrt(2/3) * \begin{bmatrix} 4.3301e-01 & -8.6603e-01 & 4.3301e-01 \\ 3.0616e-17 & -6.1232e-17 & 3.0616e-17 \\ -4.3301e-01 & 8.6603e-01 & -4.3301e-01 \end{bmatrix} * sqrt(2/3) * \begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$180.31223 = \sum_{x=0}^{2} \sum_{y=0}^{2} sqrt(2/3) * \begin{bmatrix} .5 & .5 & .5 \\ -1 & -1 & -1 \\ .5 & .5 & .5 \end{bmatrix} * sqrt(1/3) * \begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$0 = \sum_{x=0}^{2} \sum_{y=0}^{2} sqrt(2/3) * \begin{bmatrix} 4.3301e-01 & 3.0616e-17 & -4.3301e-01 \\ -8.6603e-01 & -6.1232e-17 & 8.6603e-01 \\ 4.3301e-01 & 3.0616e-17 & -4.3301e-01 \end{bmatrix} * sqrt(2/3) * \begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$0 = \sum_{x=0}^{2} \sum_{y=0}^{2} sqrt(2/3) * \begin{bmatrix} 0.25000 & .5 & 0.25000 \\ -.5 & 1 & -.5 \\ 0.25000 & -.5 & 0.25000 \end{bmatrix} * sqrt(2/3) * \begin{bmatrix} 255 & 255 & 255 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{bmatrix}$$

$$^{6} \sqrt{1/3} * 250 * \sqrt{1/3} * \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix} + \sqrt{1/3} * 0 * \sqrt{2/3} * \begin{bmatrix} .86603 & 6.1232e-17 & .86603 \\ .86603 & 6.1232e-17 & .86603 \\ .86603 & 6.1232e-17 & .86603 \end{bmatrix} +$$

$$\sqrt{1/3} * 0 * \sqrt{2/3} * \begin{bmatrix} .5 & -1 & .5 \\ .5 & -1 & .5 \\ .5 & -1 & .5 \end{bmatrix} + \sqrt{2/3} * 250 * \sqrt{1/3} * \begin{bmatrix} 8.6603e-01 & 8.6603e-01 & 8.6603e \\ 6.1232e-17 & 6.1232e-17 & 6.1232e \\ -8.6603e-01 & -8.6603e-01 & -8.6603e \end{bmatrix}$$

$$\sqrt{2/3} * 0 * \sqrt{2/3} * \begin{bmatrix} 7.5000e-01 & 5.3029e-17 & -7.5000e-01 \\ 5.3029e-17 & 3.7494e-33 & -5.3029e-17 \\ -7.5000e-01 & -5.3029e-17 & 7.5000e-01 \end{bmatrix} + \sqrt{2/3} * 0 *$$

$$\sqrt{2/3} * \begin{bmatrix} 4.3301e-01 & -8.6603e-01 & 4.3301e-01 \\ 3.0616e-17 & -6.1232e-17 & 3.0616e-17 \\ -4.3301e-01 & 8.6603e-01 & -4.3301e-01 \end{bmatrix} + \sqrt{2/3} * 0 * \sqrt{1/3} * \begin{bmatrix} .5 & .5 & .5 \\ -1 & -1 & -1 \\ .5 & .5 & .5 \end{bmatrix} +$$

$$\sqrt{2/3} * 0 * \sqrt{2/3} * \begin{bmatrix} 4.3301e-01 & 3.0616e-17 & -4.3301e-01 \\ -8.6603e-01 & -6.1232e-17 & 8.6603e-01 \\ 4.3301e-01 & 3.0616e-17 & -4.3301e-01 \end{bmatrix} + \sqrt{2/3} * 0 *$$

$$\sqrt{2/3} \qquad * \qquad \begin{bmatrix} 0.25000 & .5 & 0.25000 \\ -.5 & 1 & -.5 \\ 0.25000 & -.5 & 0.25000 \end{bmatrix}$$

Special thanks to Danny Comer for helping with these concepts.

# Colors (Personal Edition)

*2009*

*Requirements: OSX, Open Frameworks*

*An OSX app which plays a quicktime movie one horizontal line of pixels at a time.* [1]

*"When you're too relaxed it's not good to create"*

*- David Guetta*

1. Arcangel, Cory *Unknown*. Email correspondence, Redacted.

*We considered archiving X-code too, but because there is no installation package we cannot do this.*

X code is free from the Mac App store: https://developer.apple.com/xcode/ .

Also the project is written in the Open Frameworks framework: http://www.openframeworks.cc/

*I was hoping you would be able to supply us with the source code in a format that we can easily open and not tied down to an app? Or maybe you know an easy way to export it from X-code?*

For free text versions of the code, see the attached: colors-2006-004-source-master-ih/app/src/ These .cpp and .h files can be opened in a text editor to be read.

*Also, we would appreciate any thoughts you may have about how best to preserve your work for the future.*

Yes, all the above gets very complicated, but I think, luckily this project is quite easy in terms of future preservation. The "code" that runs the project translates into English: Play the movie *Colors* one line of horizontal pixels at a time, starting from the top line, and working to the bottom. This single line of horizontal pixels will be stretched vertically to cover the entire screen. When the last line of horizontal pixels is reached, loop back to the top line.

I am happy for the code to re-written completely for any modern computer / operating system.

Thanks and best, please let me know if you have any questions – Cory

*main.cpp:*

```
#include "ofMain.h"
#include "testApp.h"

int main( ) {

 // this is my "app" :

 testApp APP;

 // this kicks off the running of my app
 // can be OF_WINDOW or OF_FULLSCREEN
 // pass in width and height too:

 run(1024,768, OF_FULLSCREEN, &APP);

 return 0;

  // that's all folks!
```

```
}
```

*testApp.cpp:*

```
#ifndef _TEST_APP
#define _TEST_APP

#include "ofMain.h"
#include "ofAux.h"
#include "qtVideoPlayer.h"
#include "qtVideoGrabber.h"

class testApp : public ofSimpleApp{

 public:

   testApp();
   virtual void idle();
   virtual void init();
   virtual void draw();
   virtual void keyDown  (char c);
   virtual void mouseMove( float x, float y );
   virtual void mouseDrag( float x, float y, int button  );
   virtual void mouseDown( float x, float y, int button );
   virtual void mouseUp  ( float x, float y, int button );


   ofImgTex          * IT;
   unsigned char     * myBuffer;
   ofImgTex          * IT2;
   unsigned char     * myBuffer2;
   qtVideoPlayer     * QTPLAYER;
   qtVideoGrabber    * QTGRABBER;


   float inc;
   float mousePos;

   // <CORY>
   int colors_horz_counter;
   // </CORY>

};

#endif //
```

*testApp.h:*

```
#include "testApp.h"

testApp::testApp(){ }

void testApp::init(){

 ofSeedRandom();

 // QUICKTIME VIDEO
```

```
 QTPLAYER = new qtVideoPlayer("../../../colorsall.mov");
 myBuffer = new unsigned char[QTPLAYER->w * QTPLAYER->h * 4];
 IT = new ofImgTex(ofNextPow2(QTPLAYER->w), 1, GL_RGBA);
 inc  = 1.0;
 GLint sync = 1;

 CGLSetParameter(CGLGetCurrentContext(), kCGLCPSwapInterval,
 &sync);

 // <CORY>
 // mousePos = 20;

 colors_horz_counter = ((QTPLAYER->h)/2);

 printf("movieduration %f \n", QTPLAYER->getMovieDurationAPI());
 printf("movietime %f \n" , QTPLAYER->getMovieTimeAPI());
 printf("movietimescale %f \n",
 QTPLAYER->getMovieTimeScaleAPI());
 printf("movieheight %i \n", QTPLAYER->h);

 // Only works on OSX, couldt get glutSetCursor(GLUT_CURSOR_NONE)
 in Fullscreen more to work, possibly a bug with GLUT, all
 other SetCursors works though, GLUT_CURSOR_NONE works with
 non fullscreen though......
 http://www.idevgames.com/forum/archive/index.php/t-1321.html

 #ifdef TARGET_OSX
  CGDisplayHideCursor(0);
 #endif


glutSetCursor(GLUT_CURSOR_NONE);

 // </CORY>

}

void testApp::idle(){

 ofSetBgColor(0.0, 0.0, 0.0, 1.0);

 // UPDATE VIDEO

 QTPLAYER->grabFrame();
 QTPLAYER->fillBufferWithVideoData(myBuffer);

 unsigned char * pointerTo;
 pointerTo =  myBuffer;
 pointerTo += QTPLAYER->w * 4 * colors_horz_counter;
 IT->loadImageData(pointerTo, QTPLAYER->w , 1, GL_RGBA);

 if (QTPLAYER->getMoviePct() == 1)
 {
  QTPLAYER->setMoviePct(0);
  colors_horz_counter = colors_horz_counter + 1;

  //Start over
```

```
    if (colors_horz_counter ==
    (QTPLAYER->h-1)){colors_horz_counter =1;}
    printf("looped %i \n", colors_horz_counter);
  }

    // glutSetCursor(GLUT_CURSOR_NONE);

}

void testApp::draw(){

  ofSetupScreen();

  glColor4f(1.0, 1.0, 1.0, 1.0);
  int w , h;
  ofGetWindowSize(&w,&h);
  IT->renderTexture(0, h, w, -h);
}

void testApp::keyDown  (char c){ }

void testApp::mouseMove( float x, float y ){ }

void testApp::mouseDrag( float x, float y, int button){ }

void testApp::mouseDown( float x, float y, int button ){ }

void testApp::mouseUp  ( float x, float y, int button ){ }
```

## 2.

The New York Times

*U.S.A. Basketball Is Already Cruising in Rio. Now, to Take the Court.*

*By Andrew Kehaug. Aug 06, 2016*

*RIO DE JANEIRO — Every four years, the same questions tend to surface before the Summer Olympics: Will the host city be ready? Is Usain Bolt still the world's fastest man? And what sort of cushy digs will the United States basketball players find for themselves?*

*The Games are underway, Bolt is back to defend his sprinting titles, and once again, the men's and women's basketball players from the United States are avoiding the athletes' village. Carmelo Anthony, Kevin Durant, Diana Taurasi and the rest of their high-profile teammates are staying on a luxury cruise ship, docked at a pier on the other side of the city.*

*If the team's lodging seems standoffish, that is by design. U.S.A. Basketball, the organization that oversees the national men's and women's teams, has shunned the athletes' village since 1992. The team stayed on a ship at the 2004 Games in Athens, then used hotels in Beijing in 2008 and London in 2012.*

*"The boat we're staying on is very nice, very secluded," said Angel McCoughtry, who is playing in her second Olympics. "Let's be honest — how can our men's and women's teams stay in the village? They would get bombarded, especially the men's team. They won't have peace."*

*The players, particularly the men, are exceedingly well paid as professionals. But other highly compensated athletes seemingly have no qualms about mixing with the other Olympians in the village. Bolt, probably the biggest star of these Games, checked into the village the other day. Michael Phelps, the world's most famous swimmer, ran into Novak Djokovic, the top-ranked men's tennis player in the world, in the village and asked for a selfie.*

*The United States women's gymnastics team, the showpiece of the American delegation, is also in the village. In fact, a majority of the 554 American athletes stay there.*

*Jerry Colangelo, the director of U.S.A. Basketball, said keeping the basketball players in seclusion was a matter of security.*

*"Our players are probably the most recognizable athletes in the world," he said, explaining the "extra precaution" being taken.*

*"We have our own idea of how to do that," Colangelo said. "We can't just throw them in with — once the International Olympic Committee decided they wanted pro players, to allow pro players to play, we have to protect them. They're very valuable assets."*

*Fans are kept at a distance behind a guarded fence with metal detectors, but they have been sticking their cellphones through the fencing to take photographs of the ship — the Silver Cloud, part of the Silversea Cruises fleet, which can accommodate 296 people.*

*U.S.A. Basketball officials are circumspect when asked about the accommodations. Reporters are invited to tour the athletes' village, but not the ship, bobbing in place at the Pier Mauá.*

*There are 46 N.B.A. players and 26 W.N.B.A. players at these Games representing many countries. Several who do not play for the United States seemed to be enjoying life at the village last week.*

*Andrew Bogut, a couple of months removed from playing in the N.B.A. finals with the Golden State Warriors, was sitting in the village on Thursday, decked in a Team Australia warm-up suit, eating food from McDonald's with two teammates. Leandro Barbosa and Nene are staying there, too, along with all the other Brazilian Olympians. Manu Ginobili of Argentina posted on Twitter a view from his room in the village. Pau Gasol, Ricky Rubio, Jose Calderon and the other players of Spain snapped photographs around the village grounds all week.*

*Tina Charles, who won a gold medal with the United States women's team in 2012, said the team's accommodations meant that "you're not able to interact with athletes, you're not able to see them every day, build relationships, build friendships that way."*

*Maya Moore, appearing at her second Games, said she understood the pros and cons, but she said the ship made it easier to focus.*

*"There is a level of socialization that happens in the village that takes energy," she said. "Over the course of two weeks, it can wear on you, even if it's a little bit." The Plaza Mauá, on the city's eastern waterfront, where the ship is docked, was revamped as one of the legacy projects of these Games, with new museums and areas for outdoor activities. Warehouses along the pier are now used as event and party spaces.*

*Taurasi, one of the women's team captains, lightheartedly described the ship as having "a nice, 19th-century Russian décor."*

*Jimmy Butler, a member of the men's team, said there were a pool, a gym, social rooms and conference rooms. Players can order room service anytime.*

*"Same thing we'd do in a hotel,"*

*Butler said. "It just floats."*

*Correction: August 7, 2016 — An earlier version of this article misstated the name of the ship on which the United States basketball players are staying in Rio. It is the Silver Cloud, not the Sea Cloud.*

# What a mis-under -standing !

2009-11

*Requirements: Perl*

*A perl file which will grab the New Yorker caption this cartoon image everyweek and post it to a new tumblr blog with the caption "What a misunderstanding!".*

"¯_(ツ)_/¯ - (ノ°◇°)ノ ┻━┻)"

**1.** TUESDAY, APR 22ND, 14, http://www.what-a-misunderstanding.com/post/83522320167

What a misunderstanding!

**2.** MONDAY, JUL 16TH, 12, http://www.what-a-misunderstanding.com/post/27338907909/what-a-misunderstanding

What a misunderstanding!

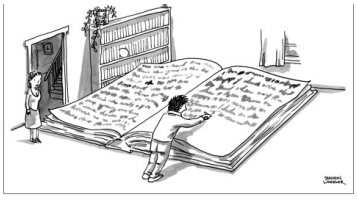
**3.** MONDAY, MAY 24TH, 10 http://www.what-a-misunderstanding.com/post/628558715/what-a-misunderstanding

What a misunderstanding!

**4.** MONDAY, JAN 25TH, 10 http://www.what-a-misunderstanding.com/post/352866138/what-a-misunderstanding

What a misunderstanding!

**5.** MONDAY, JUN 11TH, 12 http://www.what-a-misunderstanding.com/post/24890853534/what-a-misunderstanding



What a misunderstanding!

*what-a-misunderstanding.txt*

```
use WWW::Tumblr;
use Time::localtime;
use Image::Grab qw(grab);
use File::Compare;
use Data::Dumper;
use LWP::Simple;

# Grab image from New Yorker Site, and save it to disk with the
file name as current date / time.

$date_today = sprintf("%02d%02d%02d%02d%02d%02d",
  (localtime - > year + 1900) % 100, localtime - > mon + 1,
  localtime - > mday,
  localtime - > hour, localtime - > min
);

my $url = 'http://contest.newyorker.com/CaptionContest.aspx';
$content = get $url;

# find mysterious image

$content = ~m / img src(.*) ContestSubmit1_ContestImage / i;
$urlbit = $1;
print "\n";

# find img out of that text

$urlbit = ~m /= \"(.*).jpg/i;
$urlbit2 = $1;

# find real URL

$imgurl = $urlbit2.".jpg";
print "\n".$imgurl."\n";

#grab image

$pic = new Image::Grab;
$pic - > url($imgurl);
$pic - > grab;

open(IMAGE, ">$date_today.jpg") || die "image.jpg: $!"; 1 2 3 4 5
binmode IMAGE; #for MSDOS derivations.
print IMAGE $pic - > image;
close IMAGE;

# Now that we have downloaded the image from the New Yorker site,
we need to check and see if this is a double issue(aka have we
downloaded this before ? ).

# If this is not the same file, update last lastdownload.txt and
# upload to tumblr,else delete the duplicate file.

if(compare("@last_down_load_filename[0].jpg", "$date_today.jpg")
!= 0) {
```

```
  #update lastdownload.txt

  open(MYFILE, '>lastdownload.txt');
  print MYFILE "$date_today";
  close(MYFILE);

  # Upload the new yorker image to tumblr with the caption
  # "What a misunderstanding!".

  my $t = WWW::Tumblr - > new;

  #The email and pwd you use to log in to Tumblr

  $t - > email('XXXXXXXXXXXXXX');
  $t - > password('XXXXXXXXXXXXXXXXXXXXXXXX');
  $t - > write(
    type => 'photo',
    data => "$date_today.jpg",
    caption => 'What a misunderstanding!',
  );

  print $t - > authenticate or die $t - > errstr;
}

# delete duplicate file.

else {
  system("rm $date_today.jpg");

  # Debugging

  print
    "Cron newyorker.pl run, but the New Yorker is currently on a
     double issue, therefore we did not upload to blog.";
}6 7 8 9 10 11 12 13 14
```

---

**6.** *Hello world,*

*Thank you for letting me fulfil so many of my dreams. I will be forever grateful to have experienced and accomplished all that I have with the help of the team around me and my beloved fans. Thank you to all my peers in the business for building a new movement that took the world by storm and I was lucky enough to be in the middle of it. Thank you to all my partners through the years who believed in what I have created and wanted to amplify my work to a truly global presence.*

*First and foremost thank you to my brother and partner Ash, its truly been a crazy run and its only been possible through our collaborative efforts, yin and yang, brother to brother manager to artist. I will always appreciate this road with you no matter where it leads from here. I could write so much more but our journey is far from finished.*

*Thank you to everyone at At Night, a special thanks to everyone who has been a part of the team since day one and without your hard dedicated work I wouldn't be here. Thank you especially to Carl Vernersson, Filip Holm, Marcus*

---

*Lindgren, Victor Lee, Panos Ayassotelis and Diana Baron.*

*Thank you to everyone at At Night, a special thanks to everyone who has been a part of the team since day one and without your hard dedicated work I wouldn't be here. Thank you especially to Carl Vernersson, Filip Holm, Marcus Lindgren, Victor Lee, Panos Ayassotelis and Diana Baron.*

*Thank you to the teams of Johnny Tenander, Per Sundin, Max Hole, Neil Jacobson and Joakim Johansson in no particular order. Your loyalty and hard work on the label and publishing fronts have allowed me to always feel like we have had someone backing us in your court, and that has given me the musical confidence I've needed. Thank you.*

*Thank you Robb Harker, Malik Adunni, David Brady, Andrew Mckeough, Rob Woo and Felix Alfonzo - you helped introduce touring to me in as much of a functional way possible for a kid my age and my road could have been alot darker if it wasnt for your personal support at such a crucial point. Thank you Semi Baddredine for all your personal support, talks and help in me growing up. I have a weird feeling i could be dead If it wasn't for you and I will always love and support you.*

*Thank you to Ciara Davy, Michael "Curly" Jobson and the MJM team, Harry Bird and Charlie Alves for making my touring years amazing during the best of times and durable during the worst. I hope we will find a way to keep on working together.*

*Thank you to all artists, musicians and songwriters who have helped me develop musically and personally, the list is long but there is no one I've worked with where I haven't learnt something.*

*A huge thank you to all my friends in the industry. Thank you Jesse Waits at XS for having been such a huge friend to me and a rock in stormy waters. Also huge thanks in no particular order to Jonathan Schwartz, Austin Leeds, Pete Moutso, Dave Grutman, Noah Tepperberg, Jason Strauss, Sean Christie, Carlos Correal, Rob Fernandez, Eddie Dean, Adam Russakoff, Mike Satsky, Trecia Laird, Lisa Pillette, Marcella Barrett, Zoe Stainsby, Joe Bellioti, Yann and Romain Pissenem, John and Paul in Ibiza, Fricko, Sean, Marcus, Awat, Lucas, Ludde, Calle, Johannes, Filip, Levan, Otto, Oliver, my brothers David and Anton, my sister Linda, My parents Anki and Klas. Thank you to all the ones I didn't include in this moment. There has been too many people to mention in one sitting that had an impact on me in this industry and Im sorry I'm forgetting some of you.*

*<u>But last but not least thank you to every fan who has ever bought a ticket or snuck in, bought a song or downloaded it, commented on posts or hated at them. Its your thoughts and ideas about the music that helped me evolve and I do owe everything I have to you.</u>*

*My path has been filled with success but it hasn't come without its bumps. I've become an adult while growing as an artist, I've come to know myself better and realize that there's so much I want to do with my life. I have strong interests in different areas but there's so little time to explore them.*

*Two weeks ago, I took the time to drive across the U.S. with my friends and team, to just look and see and think about things in a new way. It really helped me*

*realize that I needed to make the change that I'd been struggling with for a while.*

*My choices and career have never been driven by material things, although I'm grateful for all the opportunities and comforts my success has availed me. I know I am blessed to be able to travel all around the world and perform, but I have too little left for the life of a real person behind the artist.*

*I will however never let go of music - I will continue to speak to my fans through it, but I've decided this 2016 run will be my last tour and last shows. Let's make them go out with a bang!*

*One part of me can never say never, I could be back ...but I won't be right back.*

*Yours forever,*

*Tim Bergling / Avicii*

*P.S. I've got a new phone so you can text me re all this +46769436383. Please bare with me I might not be super quick to reply . X*

---

**7.** Arcangel, Cory. *Consumer Reports.* Originally appeared at Artnews.com, 2015.

*One September week with Arcangel is spent in Stavanger, Norway, where the artist engages in more than a little bit of Skrillex-related consumption. Arcangel Surfwear work gets accomplished, tweets get fav'd, and an impressive work by Takeshi Murata gets hung inside of the artist's home.*

*And, taking things back to Skrillex, if you ever wanted to learn the secret to contemporary drum and bass music production, please keep reading! —John Chiaverina*

**MONDAY**

**8:22 a.m.**
Gmail. Decide it's a personal day thus I won't look at any art / business / admin related emails.

Got two emails from Jacob Ciocci. Jacob has been my primary net trash dealer for—almost twenty years (yes, twenty). His links are always of the highest quality. He sends me two videos. One is a link to Katy Perry falling off her Segway at Burning Man (http://jezebel.com/i-can-t-stop-watching-this-video-of-katy-perry-at-burni-1729058001), and the other is a mash-up of a high-school professor entering class (https://youtu.be/X3elVe9MIh8). The Katy Perry video reminds me that I have a half-finished code somewhere for a single serving website which only shows videos of people falling off stages.

Check Nytimes. I notice from the article titled "On Beyoncé's Birthday, a 'Bey Day' Celebration Fit for a Queen," it was / is (?) Beyoncé's birthday. I wonder if the Nytimes will mention the truther movement about Beyonce's age. I start scrolling through the article looking for a mention. I google "Beyonce real age." Am immediately horrified to see a—high ranking!—search result which implies Solange is Beyonce's daughter. Uuuugh. Am reminded that the only truther movement I ever got really into was the American Pickers truther scene.

More Nytimes. I can't resist clicking on an article titled "How the Co-op Crumbles." ( http://nyti.ms/1Ur6Zk7) It's something about co-ops and condos. I didn't even know there was a difference. All the talk of real estate and lawsuits makes me miss New York.

Scroll through Twitter. Am OCD about my timeline and reading every message I missed since last time I was on Twitter. I fav a ton of tweets (https://twitter.com/cory_arcangel/likes). Reply to a Dragan Espenschied tweet (https://twitter.com/despens/status/640806955397828608) regarding the the formal salutation "Master," e-commerce airline HTML dialogue boxes, and old school hip-hop. He replies, with a link to the Wikipedia entry for Master (https://en.wikipedia.org/wiki/Master_(form_of_address)/). Vaguely remember I had an idea years ago to make a Wikipedia entry for actual celtic frost; Frost_(Celtic).

**10:12 a.m.**
I leave the apartment without my phone. This is a new trick. It's a life saver. Highly recommended.

**2:00 p.m.**
Back home. Skype my friend Olia Lialina about a show we are cooking up for the Western Front in Vancouver.

**2:30 p.m.**
My wife and I hired an art installer to help us hang some work in our APT. We hang a bonkers Takeshi Murata (https://www.salon94.com/artists/detail/takeshi-murata/2194). I think about his recent survey show at Kunsthall Stavanger (https://kunsthallstavanger.no/en/). For my money, his body of work exhibits the perfect combination of consistency and forward momentum. Humbled to be able to live with such a masterpiece. Send myself an email that I need to make him something in return (it was a trade).

**9:37 p.m.**
Call my family. My mom tells me to check out her new stuff on Etsy (https://www.etsy.com/shop/StatementMArcangel) . One of her pillows was recently featured in HGTV magazine, and her shop has been on fire ever since. Note I'm very impressed with Etsy. It's kinda like eBay, mixed with an SEO ponzi scheme. I email myself a note that we need to make her brand a website. Reminds me that I also need to update my own website (it's been a year).

**9:46 p.m.**
Continue watching Spy, the Melissa McCarthy movie, from the previous night. Make it through about another twenty minutes. Fall asleep.

**TUESDAY**

**9:12 a.m.**
Continue reading The Cuckoo's Calling (http://robert-galbraith.com/us/books/the-cuckoos-calling/) by Robert Galbraith (aka J.K. Rowling) on my Kindle. Somehow the font size has expanded considerably since the last time I touched the device. It's now set to like 70 words a page. I struggle with re-sizing it. I touch—several times—the magnifying glass, which to my disappointment is for searches, not re-sizing. Remember I still need to read the Nytimes article about the toxic office culture at Amazon. Amuse myself for a second with the idea that Jeff Bezos being such a terror has somehow led to my current font issues.

**10:23 a.m.**
Arrive at my desk-share. Gmail. My gmail is divided between personal emails and art / business / admin emails. Depending on the day and time, I hide one or the other section. Put on my head phones, and google for a recent Ed DMX article about aughts acid jams (http://www.beatsandbeyond.com/featured/talking-acid-dmx-krew.html). Start listening in preparation for the shock and stress of un-hiding 4 days of art / business / admin emails.

**11:55 a.m.**
An email concerning the future of Arcangel Surfware (http://www.arcangelsurfware.biz/) — the non-aspirational lifestyle, merchandise, and publishing imprint I

am currently CEO of—contains a link to Skrillex's 2008 Myspace project Twipz (https://myspace.com/twipz/music/songs). Make mental note that the only picture of Sonny Moore on the Myspace page was taken with a fisheye lens. Try to remember what happened to my fisheye lens. Briefly wonder if Bruce Nauman ever made any fisheye videos. Try to think of fisheye ideas for my art game; can't think of anything. Make a mental note to watch the recent Skrillex & Diplo Charlie Rose interview (https://youtu.be/Eb85hwOotts). Tweet a link to the Twipz Myspace.

**12:32 a.m**.
Reward myself for inbox zero by listening to Selena Gomez & The Scene's "Love You Like A Love Song" (https://youtu.be/EgT_us6AsDg) several times in a row on YouTube. Each time, I have to click through the same exact pre-roll ad.

**1:22 p.m.**
Spend an hour editing various to-do lists. After editing, I go through items one by one (production & creative stuff, logistics, blah, blah, blah).

**2:58 p.m.**
Listen to Kate NV – Rewind on SoundCloud (https://soundcloud.com/apr-music/rewind). Curious after seeing her play on Saturday night at the Perkapella festival. Find her on SoundCloud, follow her, and listen to her feed. See a suggested link to Le1f (https://soundcloud.com/l31f-1) and follow as well. Only recently realized SoundCloud is a social network.

**7:23 p.m.**
Troubleshoot the LAN and wireless at Kunsthall Stavanger (https://kunsthallstavanger.no/), where I am currently the volunteer A/V tech and systems admin. I recently set it up, and—of course—it broke. Think the error was a combination of conflicting DHCP address ranges between two routers, bad Internet service, and a misplaced wire. Fix it (I think).

**9:43 p.m.**
Skype my friend Tony Conrad (http://thequietus.com/articles/18457-tony-conrad-interviewed) to discuss something we are cooking up.

**10:32 p.m.**
Scroll through Twitter on my phone. Send myself links to a Nytimes article on Frank Stella's upcoming Whitney show (http://nyti.ms/1UCcdUV), top twenty tracks on the Planet Mu ( http://www.dummymag.com/lists/planet-mu-20th-anniversary-best-tracks-according-to-mike-paradinas?linkId=16886005) record label, as well as links to new records by Janet Jackson, JK Flesh (https://soundcloud.com/jk-flesh/sets/nothing-is-free-ep?linkId=16886266), Airbird and Napolian (http://www.factmag.com/2015/09/08/joel-ford-debut-lp-airbird-napolian/), and Siren (http://www.comolasgrecas.com/en/siren-with-mr-reed-away-ep-compost-records-2015/).

**WEDNESDAY**

**9:11 a.m.**
More Twitter on my phone. Send myself a link to recent show of prints by Woody Vasulka (https://www.facebook.com/axlecontemporary/posts/1016492965056953). Make a mental note to try to get one.

**10:00 a.m.**
At the gym. It's called Fresh. I love going to this gym because of the music they pipe in over the PA. The best part is—prolly cause of some intense music licensing laws in Norway (?)—the tracks seem to be all covers. Not cover "versions," but instead, pitch perfect re-creations of the original tracks. So good, in fact, it took me a few weeks to even notice. Heard a cover of Jeremih Feat. YG – Don't Tell 'Em (https://www.youtube.com/watch?v=9ycBvqm9LFQ). Note they forgot the "hey"s on the upbeats in the pre-chorus. Get lost in an internal

dialogue about intangibles in pop-music. My intuition tells me that the tiny differences in these tracks are important, as they represent the difference between a hit track and otherwise. Not so sure though. Think about an article by Duncan Watts about pop hits and 6 degrees of separation (https://www.princeton.edu/~mjs3/salganik_dodds_watts06_full.pdf).

**1:30 p.m.**
At my desk share. Gmail. Load up in tabs all the stuff I sent myself from Twitter. Start smashing through my to-do lists while clicking one-by-one through 20 years of Planet Mu tracks on YouTube.

**1:47 p.m.**
All the tabs start to make me nervous, so I close them all, though I do sneak a peak at the Frank Stella article. I notice he compares Jeff Koons—one of my favs—to the Franklin Mint. Kind of an amazing comment, and the best summary of Koons' work I have ever read. It seems it's a beef though, but it really depends on your reading of Koons' work.

**8:17 p.m.**
Walk by a BMW blasting music from some serious bass bins. Make a mental note that the sound I most associate with such vehicles is rattling plastic. Wonder how I can make that work for my art game; can't think of anything.

**9:00 p.m.**
Skype with Arcangel Surfware HQ in Brooklyn. To-do list talk about our upcoming New York Art Book Fair booth & exhibition veers to a conversation about Zac Efron's new EDM movie. Also learn that Wynne Greenwood is having a show at the New Museum. Tweet about her show (https://twitter.com/cory_arcangel/status/641697881863405569).

**10:19 p.m.**
Scroll through Twitter, but I'm too tired to take it seriously so I stop. Finally get around to the Skrillex / Diplo Charlie Rose interview. After the Charlie Rose interview, YouTube auto-plays a Skrillex and Diplo interview on Hot 97 ( https://www.youtube.com/watch?v=SnahnEF9WbQ). Stop watching when Diplo mentions a track he produced with Tiesto and Busta Rhymes. Find it. It's gold ( https://www.youtube.com/watch?v=j6SSTMpIRFI). Back to the Hot 97 interview in anticipation of hearing what they say about Paris Hilton DJ'ing (which the title promises). Skrillex lets slip some insane production knowledge—the key to post-jungle drum and bass drum sounds is stacking 909 samples. I had no idea 909s were involved in that era of music. Fall asleep.

**THURSDAY**

**8:45 a.m.**
Twitter. Fav a bunch of tweets. Bbbornaa sums up my life (https://twitter.com/bbornaa/status/641807407388168192) . Am reminded that Jayson Musson (https://twitter.com/therealhennessy) is one of the best comedy writers I follow—and he's an artist! Get lost in Katie Notopoulos Buzzfeed land (https://www.buzzfeed.com/katienotopoulos). Check out a video to some kinda cryptic LA ( https://twitter.com/axlrose/status/641738128412307456) fire stuff Axl Rose tweets. Watch Jacob Ciocci's trailer (http://www.artnews.com/2015/09/09/here-is-the-trailer-for-jacob-cioccis-upcoming-show-at-interstate-projects/) for his upcoming show at Interstate Projects. Note that he is really going for it!

**10:12 a.m.**
Fresh again. This time I hear a cover version of Avicii – The Nights (https://youtu.be/UtF6Jej8yb4). Think about how this is the second or third EDM song going around lately which mentions "fatherhood." So weird. Hear some very off-brand drum and bass remake of

Kanye West's – Bound 2 ( https://youtu.be/BBAtAM7vtgc ), which aside from a wrong note in the piano intro—incredibly—has stacked 909s as drum sounds. Feel blessed my surf session with Skrillex last night is already changing the way I experience the world.

**12:12 p.m.**
Desk share again. Gmail. More to-do list shuffling. Accidentally budgeted about half the time I needed to do everything and am in a cold-sweat panic. No tabs, etc, etc.

**5:16 p.m.**
Get to DHL 16 minutes after it closed. Uuuugh.

**6:23 p.m.**
Hanne, my wife, emails me this gif (https://33.media.tumblr.com/ecd763a93b1eeceb0d 6d4a3c0fef8158/tumblr_ntpn7v3jvT1smqfiko1_400.gif ) (via Antoine Catala). Am reminded that in the mid-aughts she had the best trash internet delicious feed: kick_out_the_internet_jams.

**7:52 p.m.**
Given that I had both a to-do list and logistical meltdown, I give up on the day and waste a ton of time on my computer. Twitter. Notice Nick DeMarco posted images from his Yuppie Dystopia (https://twitter.com/nickdemarco/status/642028425687998464) series. Check the are.na Yuppie Dystopia (https://www.are.na/nick-demarco/yuppie-dystopia) page for additional updates I might have missed. Spend the rest of the evening screwing with the CSS on http://arcangelsurfware.biz/. Get distracted and somehow make it over to a Pitchfork review ( http://pitchfork.com/reviews/albums/21001-repentless/) of Slayer's new record. Am slightly amused by the combination of these two brands. End up at this picture (http://i.kinja-img.com/gawker-media/image/upload/s--JzN7QsME--/c_fit,fl_progressive,q_80,w_636/1884691lc6jbcjpg.jpg). Fall asleep.

**FRIDAY**
**10:21 a.m.**
Twitter. Notice Skrillex beefing (https://twitter.com/Skrillex/status/642203069728452608) with "emailing." Feel guilty I spend so much time on email. Briefly consider what an outsized presence he has been in my life this week. Get lost in Key and Peele think-piece land (http://www.newyorker.com/culture/culture-desk/so-long-lcarpetron-its-been-real-key-peele). Watched the first episode of the 7th season of On Cinema at the Cinema (http://www.adultswim.com/videos/on-cinema/).

**4:00 p.m.**
On the bus. With phone, but with data turned off. That's my other new trick. It's also a life saver. Bonnie Tyler's – I Need a Hero (https://youtu.be/OBwS66EBUcY ) comes on the radio, but because of bad reception keeps cutting out to pure digital silence. The effect on an otherwise quiet electric bus is rattling.

**4:45 p.m.**
Barely get to DHL in time. Send some office documents to Arcangel Surfware HQ in Brooklyn. I could have scheduled a pick-up but I wanted to visit because the DHL in Stavanger is in the Forus industrial park. Forus is massive and hosts hundreds of just-in-time petroleum industry manufacturing companies (Stavanger is the oil capital of Norway). Spend some time wandering around daydreaming about how I could go about convincing some of these companies to make stuff for me. Walk by a massive glass building titled "Metall Produksjon." Feel like a kid staring in the window of a candy shop.

**5:15 p.m.**
Take another bus on the way home. Hear Maroon 5 on the radio. Spend a considerable about of time

conceptualizing Maroon 5's musical & cultural position—arrive somewhere between the Bee Gees, fedoras, and Instagram ab culture.

**7:12 p.m.**
Remember I want to get into Second Life this fall. Send myself an email about it. More Twitter. Retweet about Petra Cortright's show ( https://twitter.com/petcortright/status/641673911663366145). It looks so sick.

**8:51 p.m.**
Watch a reality TV show about a Norwegian hair metal band from the late '80s that I have never heard of, but everyone in Norway seems to know. Am intrigued that every country has their own hair metal bands. Think about the term "knowledge gap" and wonder if it applies here. Random Surfs—so exhausted don't make it far in any direction. Watch Little Britain for the first time. Check out the new remix (https://youtu.be/q37fZSZyRSs) of Wet (http://www.thefader.com/2015/08/28/wet-cory-arcangel-surfware-merch). Spend five minutes with The Cuckoo's Calling. Large font; low battery. Fall asleep.

**7.** TUESDAY, MAY 13TH, 14 http://www.what-a-misunderstanding.com/post/85628418807

*What a misunderstanding!*

**8.** MONDAY, AUG 01ST, 11 http://www.what-a-misunderstanding.com/post/8344472437/what-a-misunderstanding

*What a misunderstanding!*

**9.** MONDAY, SEP 05TH, 11 http://www.what-a-misunderstanding.com/post/9838571561/what-a-misunderstanding

*What a misunderstanding!*

**10.** Arcangel, Cory. *What a misunderstanding.* Originally appeared in *Intersubjectivity Vol. 1: Language and Misunderstanding,* Sternberg Press, 2016.

The first German computer freak I had the pleasure of meeting was an exchange

student who spent a few days hanging in one of the computer labs at my college. I spent a great deal of time in my school's computer labs. It was in these dark and terminal-lined spaces that I acquired both programming skills and a feel for other aspects of computer culture—Mountain Dew, trench coats, lack of vitamin D, etc., etc. And as anyone who has hung around LINUX and command line culture will tell you, knowledge in these environments often comes in indirect ways. Most of my learning was done through half conversations and overheard tutorials. During one of these computer lab sessions I struck up a conversation with said German exchange student, who was at the terminal next to me. I'd love to give you his name, but I never got it. But what I did get was that he was an IRC fanatic. And one afternoon, he casually explained to me not only the concept of IRC, but more importantly the concept of IRC bot wars.

In the United States in the 1980s, computer culture was pretty widely dispersed among several competing brands of computers. But for whatever reason, in most of Europe, there was one and only one computer—the Commodore 64. This common denominator—the highest-selling single model of home computer of all time—fostered a robust computer culture. I didn't know anyone growing up who had an Apple IIGS, the computer my family had. Meanwhile, in Europe, kids my age were joining Commodore 64 (intro) gangs, and having massive hockey-arena-filling computer programming parties. Sigh.

IRC stands for Internet Relay Chat. It's a protocol for transferring TXT from computer to computer. In other words—chatting. Anyone can download an IRC client and start chatting in any of millions of IRC chat rooms. Sounds simple. It is. The first person to establish a chat is an https://en.wikipedia.org/wiki/IRC_channel_operator IRC channel operator, aka the boss. If he disappears, the next person in line moves up and becomes the channel operator. So, this exchange student proceeded to casually explain to me—while never taking his eyes off his terminal—that a popular pastime at the time on IRC was DDoS (distributed denial of service) channel takeovers. Something like this: Via a custom programmed bot, Nerd A would establish a chat room and become operator; his/her friend, let's call them Nerd B, would then find a way to DDoS Nerd A's bot off the channel it just established and gain control of the chat room via their own bot; Nerd A would then find a way to DDoS Nerd B's bot; and on and on and on. At the time, I had never even conceived that so much energy could be funneled towards the virtual. I was still listening to 4-track indie rock! And here I was being told that bored computer freaks around the world were playing ball-busting bot wars carried out through network pipes and data transfer protocols. WTF!

It took me around seven to eight years to get around to it, but in the mid aughts, I started programming my own bots. By then, I was living in New York, and had started to identify as a fine artist—kinda. My bots were Tinguely-ish, minimal, and aimed at a broad online audience. My first bot was an America Online Instant Messenger bot called *Slim Thug Status Bot*, 2005 (CA-2005-007), which allowed a user to ask a virtual Slim Thug if his album Already Platinum had gone platinum yet. His only reply was "no." The bot only ran for one day, and because it was so poorly programmed it crashed the server it was running on. In my defense—in terms of both concept and execution—it was an early work.

The code you see published here was my second bot, a Tumblr bot titled *What a Misunderstanding!*, 2009–14 (CA-2009-046). It ran once a week at the Tumblr http://what-a-misunderstanding.com from 2009 until 2014 (barring

downtime). When run, it would scrape the New Yorker Cartoon Caption Contest webpage, copy the cartoon image, automatically caption it with the phrase "What a misunderstanding!" and post the resulting combination. The project came out of an earlier collaboration with Dexter Sinister. That same year, I submitted a Cartoon Caption Contest in which I ran a blank cartoon with the caption, "What a misunderstanding!" in an edition of their 2009 First / Last newspaper project. This bot also continued the informal crowdsource tradition of "universal" New Yorker captions. The first was Charles Lavoie's 2006 masterpiece, "Christ, what a asshole!" More recently, Frank Chimero continued the concept with his 2015, "Hi, I'd like to add you to my professional network on LinkedIn." It's a family of creative content that I could not be more pleased to be in.

I'm not sure if people use Tumblr anymore, but when I first programmed What a Misunderstanding!, Tumblr was a BIG FUCKING DEAL. In 2013, Tumblr hysteria reached a peak. David Karp, Tumblr's then twenty-six-year-old founder was on the cover of Forbes magazine. The magazine hyped up his recent young Internet tycoon "rite of passage"—the purchase of a "proper swank pad." In his case, a "1,700-square-foot, $1.6 million loft, which he's currently remodeling … in the world's hipster capital, Williamsburg, Brooklyn." Soon thereafter, Yahoo purchased Tumblr for 1.1 billion dollars. I like to think What a Misunderstanding! contributed in small part to both Tumblr's value and, by extension, Karp's "swank pad." Though, with that said, an inspection of the What a Misunderstanding! archives would reveal that the bot spent most of 2013 in a state of disrepair. In 2012 Twitter updated an API the bot ran on, which had the effect of breaking the bot, and it seems I didn't get around to updating the code till a few weeks shy of 2013. My bad. ¯_(ツ)_/¯

I had a few more brain-bending run-ins with German computer nerds around the turn of the century. In 2001 alone, I saw Wolfgang Staehle's masterpiece webcam paintings (?) at Postmasters Gallery and a performance by the legendary home computer folk band Bodenständig 2000 in Munich at Lothringer13. These experiences were both formative. In a way, it could just have easily been Finnish, Swedish, or French computer nerds who warped my life, but for whatever reason, my dice kept coming up German. So much so that, even though one would expect—given that I am both a NY artist and that my work borrows so heavily from the city's recent contemporary art history—my loyalty would lie with my home town, the romance and nostalgia that usually is focused on New York of the '70s and '80s for me is focused on the other side of the globe. If I had to choose between seeing some no wave band at ABC No Rio in 1987 or chilling with some German Commodore 64 computer nerds in some faceless Bavarian suburb the same year, TBH, I'd have to go with the nerds.

*What a misunderstanding!*

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A version of Dragan Espenschied's essay *The Storage is You* was originally published in the exhibition catalog for "Be the first of your friends" at ESPACE Louis Vuitton München

;-)

1 Actually, this is a lie, we havn't gotten around to publishing issues 9 & 10 as zines yet, so enjoy ;-)