

中道星見 - NAKAMICHI 'Loonette-Hoshimi' a.k.a. 'Stargazing'

Nakamichi **Loonette-Hoshimi** screams in textual decompression realm.



Happy to share statistics for my latest&strongest Nakamichi, even though it is primarily targeting textual data, it struggles with XML such, on English texts it should give better compression.
I see no faster RAM2RAM decompressor (with such ratio) in Dr. Mahoney's roster, as Kanye West sings *'My reign is as far as your eyes can see, it's amazing so amazing...'*, no?

The following stats (except Nakamichi's) are taken from 'Large Text Compression Benchmark' web-page maintained by Dr. Matt Mahoney (Last update: Feb. 9, 2015):

Program	Compression Options	Compressed size		Decompressor size (zip)	Total size enwik9+prog	Time (ns/byte)			Note
		enwik8	enwik9			Comp	Decomp	Mem Alg	
cmix v6		15,738,922	124,172,611	161,908 s	124,334,519	280749	282137	30882 CM	66 (i7-3770, 31.4 GB memory, Linux Mint 14)
lzhm 1.0	-d29 -x	25,002,070	202,237,199	191,600 s	202,428,799	1096	6.6	7800 LZ77	70 (Core i7 Gulftown 3.3 Ghz, win64)
cabarc 1.00.0601	-m lzx:21	28,465,607	250,756,595	51,917 xd	250,808,853	1619	15	20 LZ77	
bzip2 1.0.2	-9	29,008,736	253,977,839	30,036 x	254,007,875	379	129	8 BWT	
bit 0.1		31,186,930	271,705,328	35,400 x	271,740,728	535	83	35 ROLZ	
crush 1.00	cx	31,731,711	279,491,430	2,489 s	279,493,919	948	2.9	148 LZ77	60 (i7-3770K, 4.8 GHz, 16 GB Corsair Vengeance LP 1800 MHz CL9, Corsair Force GS 240 GB SSD)
xeloz 0.3.5.3	c889	32,441,272	283,621,211	18,771 s	283,639,982	1079	8	230 LZ77	48 (Dell Latitude E6510 laptop Core i7 M620, 2.66 GHz, 4 GB, Ubuntu Linux 64-bit)
zhuff 0.97 beta	-c2	34,907,478	308,530,122	63,209 x	308,593,331	24	3.5	32 LZ77	48
Nakamichi 'Loonette-Hoshimi'		34,968,896		1,000,000,000/(370)=2702702		3.8		LZSS Asus laptop with Core 2 Q9550s @2883MHz, HDD Samsung HM641JI, windows 7. 1,000,000,000/(249*1024*1024)=3.8	
etincelle a3		35,776,971	314,801,710	44,103 x	314,845,813	29	18	976 ROLZ	26 (Gateway M-7301U laptop with 2.0 GHz dual core Pentium T3200 (1MB L2 cache), 3 GB RAM, Vista SP1, 32 bit)
doboz 0.1		36,367,430	322,415,409	83,591 x	322,499,000	533	3.4	1200 LZ77	48
gzip 1.3.5	-9	36,445,248	322,591,995	38,801 x	322,630,796	101	17	1.6 LZ77	
pkzip 2.0.4	-ex	36,556,552	323,403,526	29,184 xd	323,432,710	171	50	2.5 LZ77	
ulz	c5	37,652,826	332,626,591	47,809 x	332,674,400	1077	9	43 LZ77	26
pucrunch	-d -c0	39,199,165	350,265,471	34,359 s	350,299,830	2649	463	2 LZ77	
zstd		40,024,854	354,602,693	91,253 s	354,693,946	7.7	3.8	1.6 LZ77	48
lzop v1.01	-9	41,217,688	366,349,786	54,438 x	366,404,224	289	12	1.8 LZ77	
lzss 0.02	cx	42,874,387	380,192,378	48,114 x	380,240,492	107	2.3	145 LZSS	63 (i7-3770, 4.7 GHz, Corsair Vengeance LP 1600 MHz CL9 16 GB RAM, Samsung 840 Pro 512 GB SSD, windows 7 SP1)
lzf 1.02	cx	45,198,298	406,805,983	48,359 x	406,854,342	68	2.2	151 LZ77	68 (i7-3770K @ 4.8GHz, 8GB 2133 MHz CL11 DDR3, 512GB Samsung 840 Pro SSD, Windows 7 Ultimate SP1)
lzw3-a		48,009,194	438,253,704	4,750 x	438,258,454	38	17	2 LZ77	
lvz 0.1.0		54,950,847	488,436,027	10,385 x	488,446,412	4	2.6	3 LZ77	48

Note1 (console dump showing decompression speed, run 3 times for charm):

```
D:\_KAZE\GETCC_General_English_Texts_Compression_Corpus>timer32.exe Nakamichi_Loonette_Hoshimi_XMM_PREFETCH_4096.exe enwik8.Nakamichi
Nakamichi 'Loonette-Hoshimi', written by Kaze, based on Nobuo Ito's LZSS source, babealicious suggestion by m^2 enforced, muffinesque suggestion by Jim Dempsey enforced.
Decompressing 34968896 bytes ...
RAM-to-RAM performance: 247 MB/s.
```

```
Kernel Time = 0.265 = 11%
User Time = 0.343 = 15%
Process Time = 0.608 = 26% Virtual Memory = 1148 MB
Global Time = 2.283 = 100% Physical Memory = 131 MB
```

```
D:\_KAZE\GETCC_General_English_Texts_Compression_Corpus>timer32.exe Nakamichi_Loonette_Hoshimi_XMM_PREFETCH_4096.exe enwik8.Nakamichi
Nakamichi 'Loonette-Hoshimi', written by Kaze, based on Nobuo Ito's LZSS source, babealicious suggestion by m^2 enforced, muffinesque suggestion by Jim Dempsey enforced.
Decompressing 34968896 bytes ...
RAM-to-RAM performance: 249 MB/s.
```

```
Kernel Time = 0.234 = 12%
User Time = 0.327 = 16%
Process Time = 0.561 = 28% Virtual Memory = 1148 MB
Global Time = 1.948 = 100% Physical Memory = 131 MB
```

```
D:\_KAZE\GETCC_General_English_Texts_Compression_Corpus>\timer32.exe Nakamichi_Loonette_Hoshimi_XMM_PREFETCH_4096.exe enwik8.Nakamichi
Nakamichi 'Loonette-Hoshimi', written by Kaze, based on Nobuo Ito's LZSS source, babealicious suggestion by m^2 enforced, muffinesque suggestion by Jim Dempsey enforced.
Decompressing 34968896 bytes ...
RAM-to-RAM performance: 240 MB/s.
```

```
Kernel Time = 0.156 = 6%
User Time = 0.343 = 15%
Process Time = 0.499 = 22% Virtual Memory = 1148 MB
Global Time = 2.243 = 100% Physical Memory = 131 MB
```

```
D:\_KAZE\GETCC_General_English_Texts_Compression_Corpus>sha1sum.exe enwik8
57b8363b814821dc9d47aa4d41f58733519076b2 enwik8
```

Note2 (console dump showing compression speed, it proves to be second only to cmix, ha-ha):

```
D:\_KAZE\GETCC_General_English_Texts_Compression_Corpus>\timer32 Nakamichi_Loonette_Hoshimi_XMM_PREFETCH_4096.exe enwik8
Nakamichi 'Loonette-Hoshimi', written by Kaze, based on Nobuo Ito's LZSS source, babealicious suggestion by m^2 enforced, muffinesque suggestion by Jim Dempsey enforced.
Compressing 100000000 bytes ...
/; Each rotation means 64KB are encoded; Done 100%
NumberOfFullLiterals (lower-the-better): 2159
Legend: MatchLengths: 4=Tiny, 8=Short, 12=Medium, 16=Long; windowSizes: 2/3/4=Short/Medium/Long
NumberOf(Tiny)Matches[Short]window (4)[2]: 1303911
NumberOf(Short)Matches[Short]window (8)[2]: 880360
NumberOf(Medium)Matches[Short]window (12)[2]: 364733
NumberOf(Long)Matches[Short]window (16)[2]: 500917
NumberOf(Tiny)Matches[Medium]window (4)[3]: 1620518
NumberOf(Short)Matches[Medium]window (8)[3]: 1213941
NumberOf(Medium)Matches[Medium]window (12)[3]: 706216
NumberOf(Long)Matches[Medium]window (16)[3]: 485247
NumberOf(Short)Matches[Long]window (8)[4]: 1253628
NumberOf(Medium)Matches[Long]window (12)[4]: 1398714
NumberOf(Long)Matches[Long]window (16)[4]: 894384
RAM-to-RAM performance: 370 bytes/s.
```

```
Kernel Time = 18.626 = 0%
User Time =264311.963 = 97%
Process Time =264330.590 = 97% Virtual Memory = 225 MB
Global Time =269948.081 = 100% Physical Memory = 130 MB
```

Note3 (authors):

cmix v1 is a free, open source (GPL) file compressor by Byron Knoll, Apr. 16, 2014.
lzhalpha 2 is a free, open source (MIT license) file compressor and library by Richard Geldreich Jr., Aug. 21, 2010.
cabarc 1.00.0601 is a command line archiver available for free download by Microsoft, Mar. 18, 1997 (SDK released Jan. 8, 2002).
bzip2 1.0.2 is an open source command line single file compressor by Julian Seward, released Dec. 30, 2001.
bit 0.1 is a free, closed source file compressor by Osman Turan, Dec. 19, 2007.
crush 0.01 is a free, experimental file compressor by Ilia Muraviev, May 17, 2011.
xeloz 0.3.5.3 is a free, open source (MIT license) file compressor by xezz, Sept. 7, 2014.
zhuff 0.1 is a free file compressor for Windows by Yann Collet, Dec. 13, 2009.
Nakamichi 'Loonette-Hoshimi' is an open source FREE command line single file compressor by Kaze, released Feb. 25, 2015.
etincelle alpha 3 is a free file compressor by Yann Collet, Mar. 26, 2010.
dobox 0.1 is a free, open source file compressor by Attila T. Áfra, Mar. 18, 2011.
gzip 1.3.5 is an open source single file command line compressor by Jean-loup Gailly and Mark Adler, Sept. 30, 2002.

pkzip 2.04e is a commercial (free trial) command line archiver by PKWARE Inc. written Jan 25, 1993.
ulz 0.01 (discussion) is a free, experimental file compressor by Ilya Muraviev, Feb. 1, 2010.
pucrunch is a free, open source file compressor by Pasi Ojala, last updated Mar. 8, 2002.
zstd is a free, open source (BSD) file compressor by Yann Collet, Jan. 25, 2015.
lzop v1.01 is a free, open source (GPL) command line file compressor by Markus F.X.J. Oberhumer, Apr. 27, 2003.
lzss 0.01 (withdrawn) is a free, experimental file compressor by Ilya Muravyov, Aug. 1, 2008.
lzf v1.00 (discussion) is a free, experimental file compressor by Ilya Muravyov, Oct. 29, 2013.
lzw3-a is one of a series of public domain (open source) memory to memory compressors by Ross Williams in 1991.
lzv 0.1.0 is a free, experimental file compressor for windows by Valéry Croizier, Jan. 1, 2014.

Note4 (download Nakamichi's source&executable):

<http://www.sanmayce.com/Hayabusa/index.html>

http://www.sanmayce.com/Hayabusa/Nakamichi_Loonette_Intel15_Hoshimi_FULL.zip

Another Kanye's song goes '*Flashing lights lights lights let's go let's go she don't believe in shooting stars but she believe in shoes and cars...*', quite the opposite is Loonette - she is all-stars.



Enfun!
Kaze, 2015-Feb-28

```

File #24: 3,791,137 Sherlock_Holmes_Complete.txt
          1,441,243 Sherlock_Holmes_Complete.txt.Nakamichi
          1,345,242 Sherlock_Holmes_Complete.txt.zip
          1,593,669 Sherlock_Holmes_Complete.txt.lzturbo12-19.lzt
          1,079,586 Sherlock_Holmes_Complete.txt.lzturbo12-39.lzt

File #24: Ratio: 2.6:1 [XXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #24: Ratio: 2.8:1 [XXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #24: Ratio: 2.3:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #24: Ratio: 3.5:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

File #26: 4,612,608 Webster_Bible.tar
          1,531,507 Webster_Bible.tar.Nakamichi
          1,378,457 Webster_Bible.tar.zip
          1,656,134 Webster_Bible.tar.lzturbo12-19.lzt
          1,122,782 Webster_Bible.tar.lzturbo12-39.lzt

File #26: Ratio: 3.0:1 [XXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #26: Ratio: 3.3:1 [XXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #26: Ratio: 2.7:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #26: Ratio: 4.1:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

File #27: 4,999,168 Sahih_Bukhari.tar
          1,413,028 Sahih_Bukhari.tar.Nakamichi
          1,274,728 Sahih_Bukhari.tar.zip
          1,490,821 Sahih_Bukhari.tar.lzturbo12-19.lzt
          935,699 Sahih_Bukhari.tar.lzturbo12-39.lzt

File #27: Ratio: 3.5:1 [XXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #27: Ratio: 3.9:1 [XXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #27: Ratio: 3.3:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #27: Ratio: 5.3:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

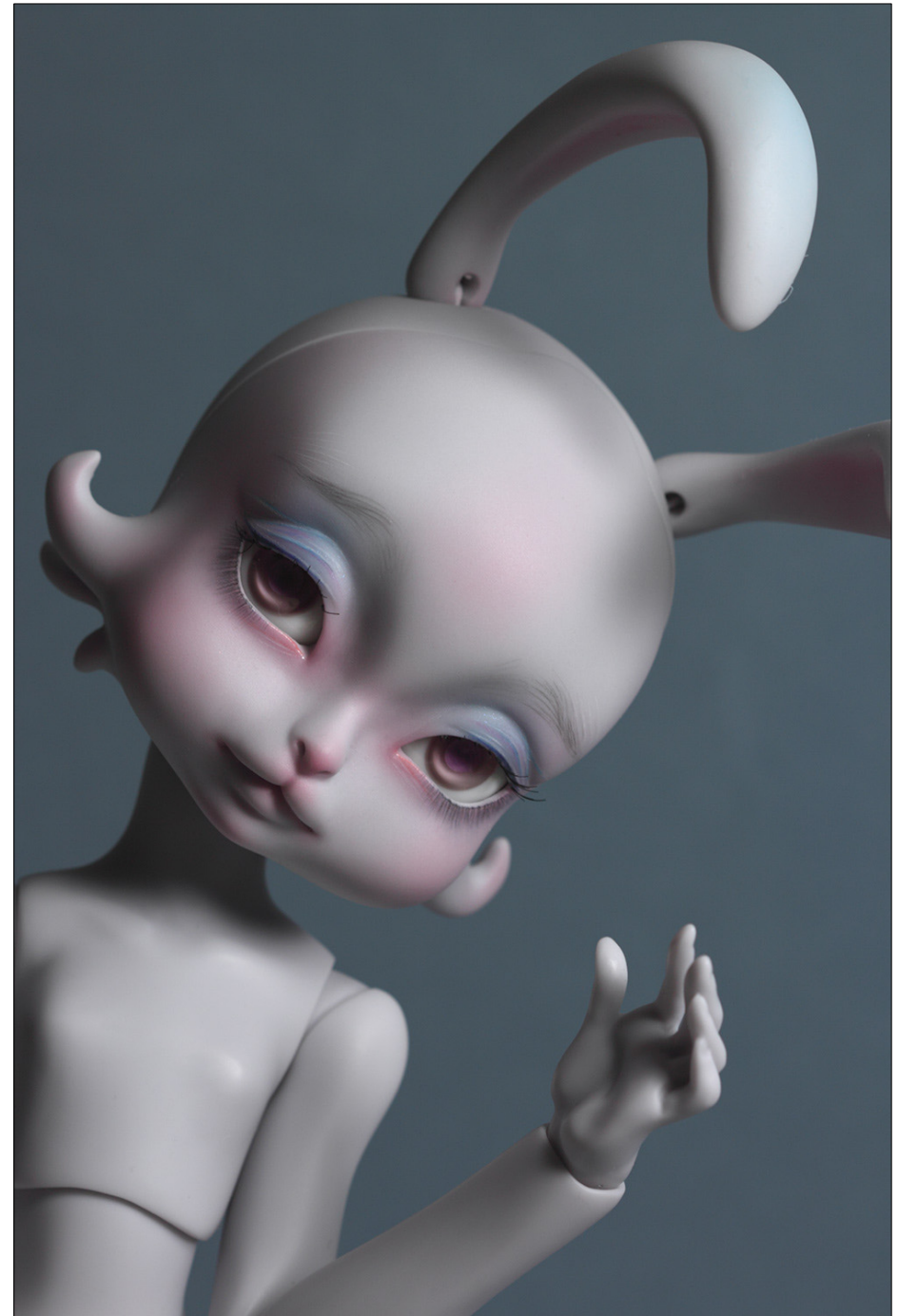
File #28: 5,582,655 shaks12.txt
          2,144,067 shaks12.txt.Nakamichi
          1,934,787 shaks12.txt.zip
          2,292,406 shaks12.txt.lzturbo12-19.lzt
          1,584,881 shaks12.txt.lzturbo12-39.lzt

File #28: Ratio: 2.6:1 [XXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #28: Ratio: 2.8:1 [XXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #28: Ratio: 2.4:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #28: Ratio: 3.5:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

File #29: 5,870,592 Hitler_5_ebooks.tar
          2,181,648 Hitler_5_ebooks.tar.Nakamichi
          2,056,570 Hitler_5_ebooks.tar.zip
          2,411,789 Hitler_5_ebooks.tar.lzturbo12-19.lzt
          1,610,026 Hitler_5_ebooks.tar.lzturbo12-39.lzt

File #29: Ratio: 2.6:1 [XXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #29: Ratio: 2.8:1 [XXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #29: Ratio: 2.4:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #29: Ratio: 3.6:1 [XXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

```



File #30: 6,158,974 Dictionary_of_Mythology_-An_A-Z_of_Themes_Legends_and_Heroes_(2007)-_J_Coleman.txt
2,259,290 Dictionary_of_Mythology_-An_A-Z_of_Themes_Legends_and_Heroes_(2007)-_J_Coleman.txt.Nakamichi
2,171,050 Dictionary_of_Mythology_-An_A-Z_of_Themes_Legends_and_Heroes_(2007)-_J_Coleman.txt.zip
2,584,500 Dictionary_of_Mythology_-An_A-Z_of_Themes_Legends_and_Heroes_(2007)-_J_Coleman.txt.lzturbo12-19.lzt
1,630,570 Dictionary_of_Mythology_-An_A-Z_of_Themes_Legends_and_Heroes_(2007)-_J_Coleman.txt.lzturbo12-39.lzt

File #30: Ratio: 2.7:1 [XXXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #30: Ratio: 2.8:1 [XXXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #30: Ratio: 2.3:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #30: Ratio: 3.7:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

File #32: 10,192,446 dickens
3,792,071 dickens.Nakamichi
3,681,828 dickens.zip
4,377,543 dickens.lzturbo12-19.lzt
2,861,165 dickens.lzturbo12-39.lzt

File #32: Ratio: 2.6:1 [XXXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #32: Ratio: 2.7:1 [XXXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #32: Ratio: 2.3:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #32: Ratio: 3.5:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

File #34: 14,613,183 The_Book_of_The_Thousand_Nights_and_a_Night.txt
5,379,322 The_Book_of_The_Thousand_Nights_and_a_Night.txt.Nakamichi
5,198,949 The_Book_of_The_Thousand_Nights_and_a_Night.txt.zip
6,132,254 The_Book_of_The_Thousand_Nights_and_a_Night.txt.lzturbo12-19.lzt
3,982,547 The_Book_of_The_Thousand_Nights_and_a_Night.txt.lzturbo12-39.lzt

File #34: Ratio: 2.7:1 [XXXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #34: Ratio: 2.8:1 [XXXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #34: Ratio: 2.3:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #34: Ratio: 3.6:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

File #35: 33,258,496 Agatha_Christie_89-ebooks_TXT.tar
10,854,012 Agatha_Christie_89-ebooks_TXT.tar.Nakamichi
11,173,195 Agatha_Christie_89-ebooks_TXT.tar.zip
13,165,715 Agatha_Christie_89-ebooks_TXT.tar.lzturbo12-19.lzt
7,955,038 Agatha_Christie_89-ebooks_TXT.tar.lzturbo12-39.lzt

File #35: Ratio: 3.0:1 [XXXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #35: Ratio: 2.9:1 [XXXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #35: Ratio: 2.5:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #35: Ratio: 4.1:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0

File #36: 100,000,000 enwik8
34,968,896 enwik8.Nakamichi
35,102,891 enwik8.zip
41,924,186 enwik8.lzturbo12-19.lzt
25,330,833 enwik8.lzturbo12-39.lzt

File #36: Ratio: 2.8:1 [XXXXXXXXXXXXXXXXXXXXX] Nakamichi 'Loonette-Hoshimi'
File #36: Ratio: 2.8:1 [XXXXXXXXXXXXXXXXXXXXX] 7za.exe -tgzip -mx9
File #36: Ratio: 2.3:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -19 -b256 -p0
File #36: Ratio: 3.9:1 [XXXXXXXXXXXXXXXXXXXXX] lzturbo.exe -39 -b256 -p0



With files getting bigger
'Loonette-Hoshimi' gets
momentum, usually after the
10MB mark it keeps up with
GZIP for English texts.

6,906,816 UF-ENG-001world-2009-0.22.SRT.txt
2,250,280 UF-ENG-001world-2009-0.22.SRT.txt.Nakamichi
2,144,385 UF-ENG-001world-2009-0.22.SRT.txt.zip
44,894,190 The_Project_Gutenberg_EBook_of_Webster's_Unabridged_Dictionary_pgwh04.txt
12,248,064 The_Project_Gutenberg_EBook_of_Webster's_Unabridged_Dictionary_pgwh04.txt.Nakamichi
11,063,288 The_Project_Gutenberg_EBook_of_Webster's_Unabridged_Dictionary_pgwh04.txt.zip
59,416,161 Encyclopedia_of_Language_and_Linguistics.txt
18,943,135 Encyclopedia_of_Language_and_Linguistics.txt.Nakamichi
17,546,530 Encyclopedia_of_Language_and_Linguistics.txt.zip
132,728,832 New_Shorter_Oxford_English_Dictionary_fifth_edition.tar
29,601,087 New_Shorter_Oxford_English_Dictionary_fifth_edition.tar.Nakamichi
25,418,601 New_Shorter_Oxford_English_Dictionary_fifth_edition.tar.zip

中道星見 - НАКАДМОЦАНО 'Loonette-Hoshimi' a.k.a. 'Stargazing'

Rabid (far-out) LZSS decompressor: <http://www.sannayce.com/Hayabusai/index.html>

```
unsigned int Decompress (char* ret, char* src, unsigned int srcSize) {
    char* retLOCAL = ret; char* srcLOCAL = src;
    char* srcENDLOCAL = src+srcSize;
    unsigned int DMDORDrrio; unsigned int DMDORDrrioDumbo;
    while (srcLOCAL < srcENDLOCAL) {
        DMDORDrrio = *(unsigned int*)srcLOCAL;

#i fndef _N_GP
#i fdef _N_prefetch_4096
        _mm_prefetch((char*)(srcLOCAL + 64*64), _MM_HINT_T0);

#endi f
#endi f
// 1stLSB | 2ndLSB | 3rdLSB |
// 00|L|L|xxxx|xxxxxxx|xxxxx|x|
// [10]t | 160]t | 240]t |
// L = 00b means 04 MatchLength, (1+L)<2)
// L = 01b means 08 MatchLength, (1+L)<2)
// L = 10b means 12 MatchLength, (1+L)<2)
// L = 11b means 16 MatchLength, (1+L)<2)
// 00 = 00b means 16reral
// 00 = 00b MatchOffset, 0xffffffff>(3-00), 2 bytes long i.e. sliding window is 2*8-1L-00=(1+00)*8-4=12 or 408
// 00 = 00b MatchOffset, 0xffffffff>(3-00), 3 bytes long i.e. sliding window is 3*8-1L-00=(1+00)*8-4=20 or 108
// 00 = 11b MatchOffset, 0xffffffff>(3-00), 4 bytes long i.e. sliding window is 4*8-1L-00=(1+00)*8-4=28 or 25608
        DMDORDrrio = DMDORDrrio & 0xffffffff >> ((3-(DMDORDrrio & 0x03))<<3) );
        i f ( DMDORDrrio & 0x03) == 0x00 ) {
            #i fdef _N_GP
            memcpy(retLOCAL, (const char *) ( (uint64_t)(srcLOCAL+1) ), 16);
            #endi f
            #i fdef _N_XMM
            memcpyCopy120bit( (const char *) ( (uint64_t)(retLOCAL-(DMDORDrrio>>4) ) , retLOCAL );
            #endi f
            retLOCAL+= (DMDORDrrio>>4);
            srcLOCAL+= (DMDORDrrio>>4)+1;
        } else {
            #i fdef _N_GP
            memcpy(retLOCAL, (const char *) ( (uint64_t)(retLOCAL-(DMDORDrrio>>4) ), 16);
            #endi f
            #i fdef _N_XMM
            memcpyCopy120bit( (const char *) ( (uint64_t)(retLOCAL-(DMDORDrrio>>4) ) , retLOCAL );
            #endi f
            retLOCAL+= 1+(DMDORDrrio&0x03); // 4|3|2
            retLOCAL+= (1+(DMDORDrrio>>2)&0x03)<<2; // 4|8|12|16
        }
    }
    return (unsigned int)(retLOCAL - ret);
}
```

```
; Nakamichi 'Loonette-Hoshimi' decompression loop, 74-14+2=98 bytes long;
; mark_description "Intel(R) C++ Intel(R) 64 Compiler XE for applications running on Intel(R) 64,
; version 15.0.0.108 Build 201401";
; mark_description "-O3 -QxSSE2 -D_N_XMM -D_N_prefetch_4096 -FACS";

.b7.3::
00014 41 0f 18 8a 00    prefetch0 BYTE PTR [4096+*10]
10 00 00
0001c b8 ff ff ff ff    mov eax, -1
00021 41 8b 12         mov edx, DMDORD PTR [r10]
00026 89 d1           mov ecx, edx
00029 83 f1 03         xor ecx, 3
00029 c1 e1 03         shl ecx, 3
0002c d3 e8           shr eax, cl
0002e 23 d0           and edx, eax
00030 89 d0           mov eax, edx
00032 83 e0 03         and eax, 3
00035 75 18           jne .b7.5
.b7.4::
00037 f3 41 0f 6f 42   movdqu xmm0, xmmword ptr [r+r10]
01
0003d c1 ea 04         shr edx, 4
00040 f3 41 0f 7f 01   movdqu xmmword ptr [r9], xmm0
00045 4c 03 ca         add r9, rdx
00048 ff c2           inc edx
0004a 4c 03 d2         add r10, rdx
0004d eb 22           jmp .b7.6
.b7.5::
0004f 89 d1           mov ecx, edx
00051 83 e2 0c         and edx, 12
00054 c1 e9 04         shr ecx, 4
00057 ff c0           inc eax
00059 83 c2 04         add edx, 4
0005c 48 77 d9         neg rcx
0005f 49 03 c9         add rcx, r9
00062 4c 03 d0         add r10, rax
00065 f3 0f 6f 01     movdqu xmm0, xmmword ptr [rcx]
00069 f3 41 0f 7f 01   movdqu xmmword ptr [r9], xmm0
0006e 4c 03 ca         add r9, rdx
.b7.6::
00071 4d 3b d0         cmp r10, r8
00074 72 9e           jb .b7.3
```

Decompressor	Compressed Size	Decompression Speed (1 thread)
memcpy()O	213,401,856	2757 MB/s
LZ4	117,123,927	902 MB/s
Nakamichi 'Tengui'	107,251,997	788 MB/s
Nakamichi 'Loonette'	772,777,777	777 MB/s
7-zip ZIP	97,581,200	73404856/3,026/10/4/10/4= 86 MB/s

Note: Results were obtained on laptop with Core 7 Q9510S @833MHz and 4GB RAM running windows 7. Testdatafile is: Autobiography_411-ebooks.col\section.tar

02/23/2015 03:33 PM	33,258,496 Agatha.ChrisTie.89-ebooks.TXT.tar
02/23/2015 03:52 PM	33,277,220 Agatha.ChrisTie.89-ebooks.TXT.tar.method0.zpaq
02/23/2015 03:52 PM	11,709,902 Agatha.ChrisTie.89-ebooks.TXT.tar.method1.zpaq
02/23/2015 03:52 PM	9,557,649 Agatha.ChrisTie.89-ebooks.TXT.tar.method2.zpaq
02/23/2015 03:56 PM	6,056,509 Agatha.ChrisTie.89-ebooks.TXT.tar.method3.zpaq
02/23/2015 03:03 PM	10,854,012 Agatha.ChrisTie.89-ebooks.TXT.tar.Nakamichi
02/23/2015 03:10 PM	6,475,761 Agatha.ChrisTie.89-ebooks.TXT.tar.tange10
02/23/2015 03:12 PM	11,173,343 Agatha.ChrisTie.89-ebooks.TXT.tar
02/23/2015 03:51 AM	99,469 Nakamichi_Loonette_Hoshimi.c
02/23/2015 05:51 AM	118,764 Nakamichi_Loonette_Hoshimi_XMM_PREFETCH_4096.exe

Note: Method 2 uses a suffix array to find matches (default 20+64 MB block), which finds better matches and is slower but no speed penalty at decompression.

D:\Nakamichi_Loonette_Intel15_Hoshimi\Nakamichi_Loonette_Hoshimi_XMM_PREFETCH_4096.exe
Agatha.ChrisTie.89-ebooks.TXT.tar.Nakamichi /test
Nakamichi 'Loonette-Hoshimi', written by kaze. Based on Nobuo Ito's LZSS source,
babealicious suggestion by mw2 enforced, mufnnesque suggestion by jim Dempsey enforced.
Decompressing 10854012 bytes ...
RAM-to-RAM performance: **320 MB/s**.
Memory pool starting address: 0000000000E6080 ... 64 byte aligned, OK
Copying a 512MB block 1024 times i.e. 512GB READ + 512GB WRITTEN ...
memcpy()O: (512MB block): 5242808 copied in 194229 clocks or 2.699MB per clock
RAM-to-RAM performance vs memcpy()O ratio (bigger-the-better): 11%









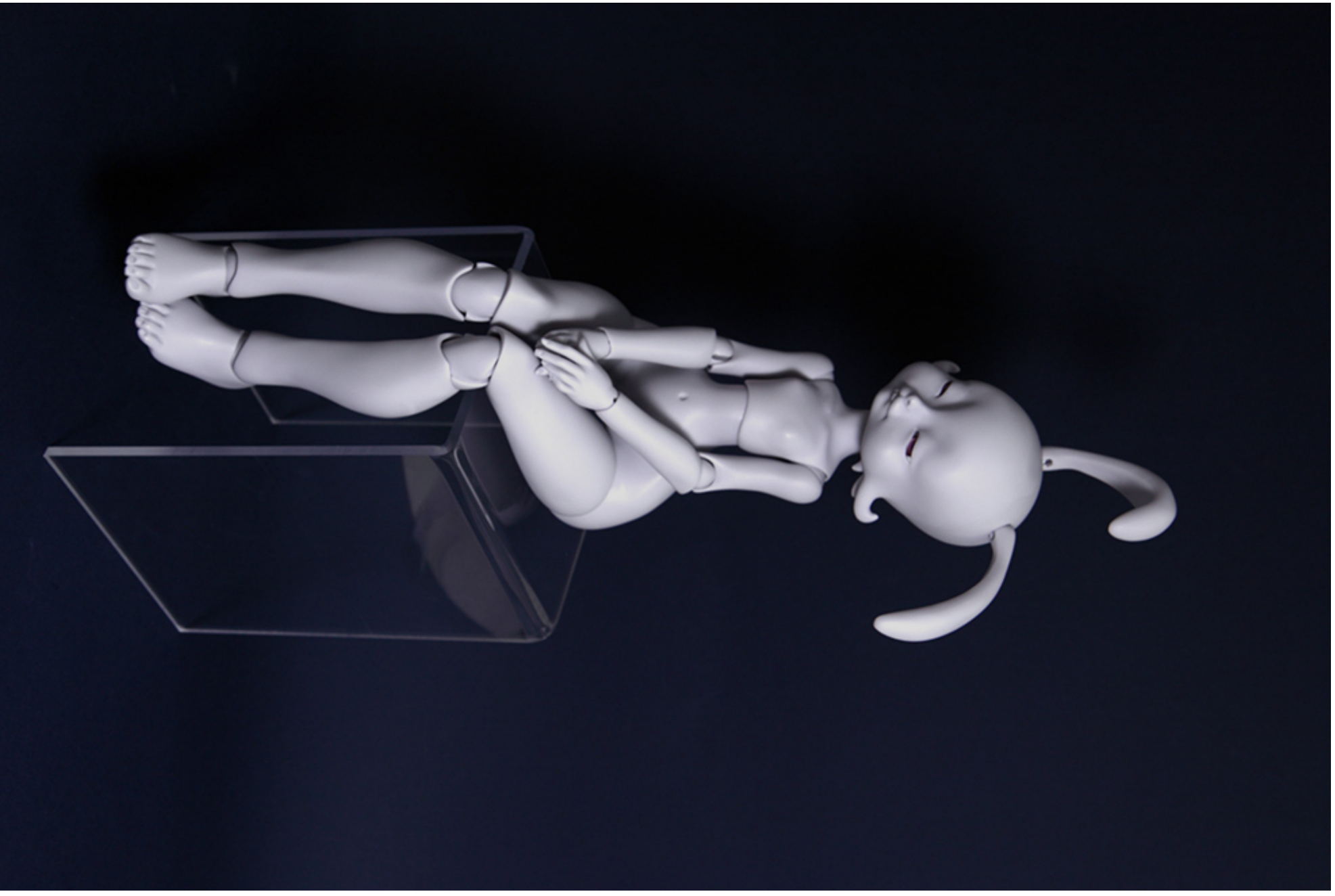




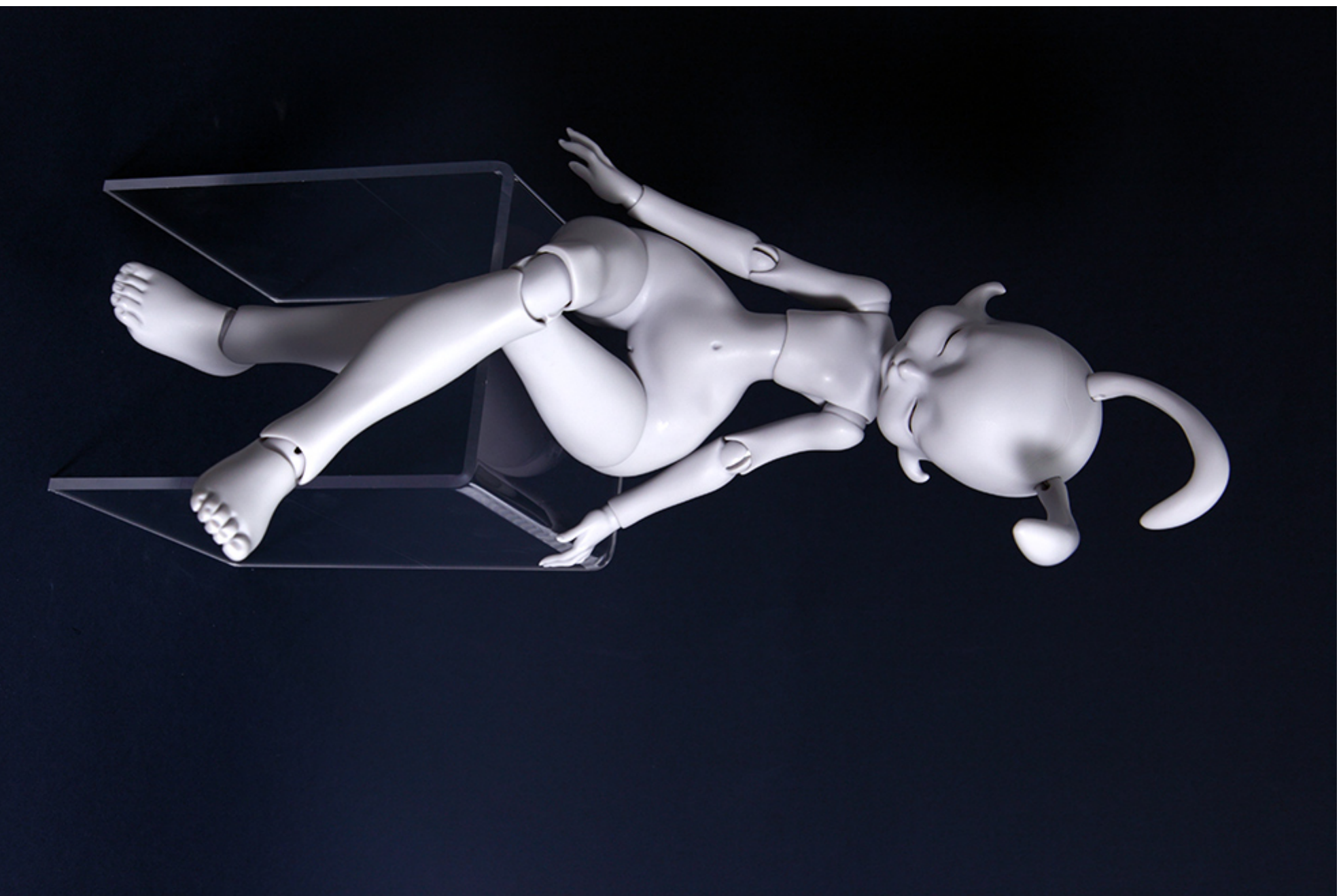














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