

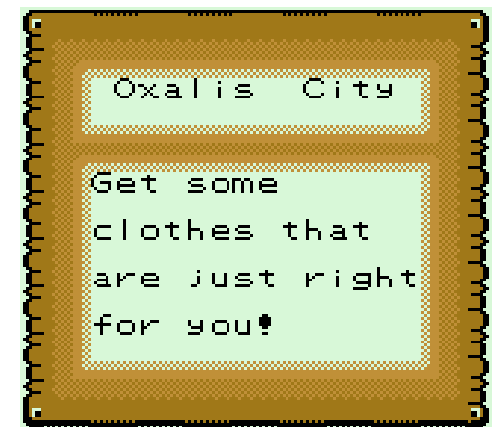
Pokémon Crystal Source Code



<https://github.com/kanzure/pokecrystal>

Prism (Why?)

<http://www.rijon.com/prism/>



Goals

- Must compile back to the original ROM (byte-exact)
- Must be commented and understandable
- Must separate code/data
- No “dump-and-run”
- Eventually: don't require the original ROM
- Have fun

IsInArray

```
2831 IsInArray: ; 30e1
2832 ; searches an array at hl for the value in a.
2833 ; skips (de - 1) bytes between reads, so to check every byte, de should be 1.
2834 ; if found, returns count in b and sets carry.
2835     ld b,0
2836     ld c,a
2837 .loop\@
2838     ld a,[hl]
2839     cp a,$FF
2840     jr z,.NotInArray\@
2841     cp c
2842     jr z,.InArray\@
2843     inc b
2844     add hl,de
2845     jr .loop\@
2846 .NotInArray\@
2847     and a
2848     ret
2849 .InArray\@
2850     scf
2851     ret
2852 ; 0x30f4
```

Multiply

```
2877 INCBIN "baserom.gbc", $3105, $3119-$3105
2878
2879 Multiply: ; 0x3119
2880 ; function to do multiplication
2881 ; all values are big endian
2882 ; INPUT
2883 ; ffb4-ffb6 = multiplicand
2884 ; ffb7 = multiplier
2885 ; OUTPUT
2886 ; ffb3-ffb6 = product
2887     INCBIN "baserom.gbc", $3119, $3124 - $3119
2888 ; 0x3124
```

AddNTimes

```
2866 AddNTimes: ; 0x30fe
2867 ; adds bc n times where n = a
2868     and a
2869     ret z
2870 .loop
2871     add hl, bc
2872     dec a
2873     jr nz, .loop
2874     ret
2875 ; 0x3105
```

Map scripts

```
171 CyndaquilPokeBallScript: ; 0x78c73
172     checkbitl $001a
173     iftrue LookAtElmPokeBallScript
174     spriteface $2, $0
175     refreshscreen $0
176     pokepic CYNDAQUIL
177     cry CYNDAQUIL
178     closetext
179     pokepicyesorno
180     loadfont
181     2writetext TakeCyndaquilText
182     yesorno
183     iffalse DidntChooseStarterScript
184     disappear $4
185     setbitl $001b
186     2writetext ChoseStarterText
187     keptextopen
188     waitbutton
189     pokenamemem CYNDAQUIL, $0
190     2writetext ReceivedStarterText
191     playsound $0002
192     waitbutton
193     keptextopen
194     givepoke CYNDAQUIL, 5, BERRY, 0
195     loadmovesprites
196     checkcode $9
197     if_equal $3, ElmDirectionsScript
198     applymovement $0, AfterCyndaquilMovement
199     2jump ElmDirectionsScript
200 ; 0x78cb5
```

Compiling

- rgbds
- rgbasm
- z80asm.hs (in progress)
- Custom preprocessor in awk (deprecated)
- Custom preprocessor in python

gbz80disasm

- Custom disassembler
- Written in python
- Symbol files
- Stops at the end of functions
- Could be used for other gb/gbc games

crystal.py

- Grab bag of wonderful tools
- Parsers of all sorts:
 - Scripts
 - Encoded text
 - Asm output, for bulk disassembling all scripts associated with maps
 - Automatic asm insertion into main.asm
- Almost complete unit testing coverage

png.py

- ROM has compressed graphics
- Decompression: yep
- Compression: definitely
- png support: yes
- 2bpp
- Things:
 - Tilesets
 - Palettes
 - Backpics & frontpics
 - Sprites
 - Icons... etc.

Music parser and dumper

```
157 _Music_PokemonCenter_Ch2: ; 0xed671
158     vibrato $10, $25
159     stereopanning $ff
160     callchannel _Music_PokemonCenter_sub_0xed6d1
161     stereopanning $0f
162     notetype $0c, $a5
163     octave3
164     note $a3
165     note $53
166     stereopanning $ff
167     callchannel _Music_PokemonCenter_sub_0xed6e4
168     note $31
169     note $75
170     stereopanning $0f
171     notetype $0c, $a5
172     octave3
173     note $a3
174     note $53
175     stereopanning $ff
176     callchannel _Music_PokemonCenter_sub_0xed6d1
177     stereopanning $0f
178     notetype $0c, $a5
179     octave3
180     note $a3
181     note $53
182     stereopanning $ff
183     callchannel _Music_PokemonCenter_sub_0xed6e4
184     note $37
```

Bugcatcher

- IRC bot
- Yells at you
- Uses quotes from trainers inside the game

```
15:07 -!- bugcatcher [~bugcatcher@131.252.130.248] has joined #bugcatcher-testing
15:07 <@kanzure> bugcatcher: hello
15:07 <bugcatcher> kanzure, I guess it's impossible to swim all the way to JOHTO.
15:07 <@kanzure> bugcatcher:
15:07 <bugcatcher> kanzure, You're too much!
15:07 <@kanzure> bugcatcher:
15:07 <bugcatcher> kanzure, This is a good time to brag about my PIKACHU!
```

vba-clojure / vba-linux

- Fork of vba-rerecording, which is a fork of vba
- JVM bindings
- Clojure!
- Jython!
- Cool functions: warp to any map, breakpoints, watchpoints, screenshots, animated gifs

Jython tool – keyboard optimizer

- I like typing fast
- Never really sure which way to go to type a letter
- Represent keyboard as graph, find shortest sequence of possible button presses to type string.



Weird stuff

- HTTP client (not disassembled)
- SMTP client (not disassembled)

Having fun, 1



Having fun, oops



Progress (Red)

<http://diyhpl.us/~bryan/irc/pokered/result2.gif>

Thank you.

<https://github.com/kanzure/pokecrystal>

irc: nucleus.kafuka.org #skeetendo

irc: #aha

me:

<http://heybryan.org/>

<https://github.com/kanzure>