

Allan “dwangoAC” Cecil, keeper of TASBot, he/him
Sauraen, Triforce% director, he/him
MLink, human speedrunner, he/him



a.k.a., TASBot glitches the future into OoT

Why hack?

Why hack?

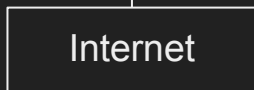
				
				
				
				

Why “Arbitrary” (not Remote) Code Execution?

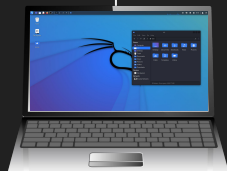
Target



Internet



You



Remote Code Execution



Arbitrary Code Execution

TASBot



ACE to beat games quickly

SNES Super Mario World "game end glitch" by Masterjun in 02:36.40

This movie has been obsoleted!

Obsoleting Movie



[Watch on YouTube](#)

[Author notes](#)

[Discuss](#)

☆ 8.19 / 10



Published on 1/8/2012

"Thank you for playing *Super Mario World*! Unfortunately, this trial copy will only let you play for 2.5 minutes."

This is a completely new type of *Super Mario World* TAS. It beats the game by getting the "THE END" screen in the second level (Yoshi's Island 3). This happens because a glitch allowing Yoshi to eat "nothing" enables players to [manipulate memory and code](#) into bringing up the final screen of the game.

The heated discussion about the categorical separation regarding this movie and the recently published "[no save corruption](#)" TAS invoked the creation of the "Corrupts Memory" category.

The credits glitch has been [verified on console](#) using a modified version of this TAS made with the [lsnes](#) emulator.

ACE to beat games quickly

NES Super Mario Bros. 3 "game end glitch" by Lord Tom & Tompa in 02:54.98



This movie has been obsoleted!

Obsoleting Movie



Watch on YouTube

Author notes

Discuss

☆ 8.38 / 10



Published on 4/29/2014

Super Mario Bros. 3 is a very famous game for the NES. There are normally two main ways to beat it: the quick way [using warp whistles to skip worlds](#), and the longer way which [goes through all the worlds](#). However, thanks to some esoteric memory corruption involving glitched pipe travel, it's possible to jump right into the princess's room in under three minutes! Bowser is never seen in this run at all.

This run gets to World 7-1 as quickly as possible to perform the glitch, and some unusual moves are done with enemy spawns and positions to get the glitch to work. See the [authors' comments](#) for some more details.

The encodes feature commentary by the author as soft subtitles.

Watch this run [on a real NES](#).

ACE to beat games quickly, now by hand

Thanks to: slowfreq: \$5.00, Courier: \$5.00, goeiec Today's Top: Decondo: \$30.00, Eebras: \$17.05, zachtie: \$17.00, mikesike10



What is "Credits Warp"?

I'm attempting a glitch discovered by Jeffw356 called a "credits warp".

The idea is to set up the console's memory in just the right way, then perform a glitch which will cause the credits to play without defeating Bowser.

No one has ever executed this glitch on console before. If I do it, I will be the first. It should take around 5 minutes, which will be the console any% RTA world record.

Super Mario World
Any% (Credi... 158

6:00.9



SethBling, Jan. 21, 2015

Triforce%  <https://gettriforce.link>

Large-scale ACE payloads

Awesome Games
Done Quick 2014

1:42:39

prevent cancer
FOUNDATION



GAME : SUPER MARIO WORLD (TAS)
RUNNER : MASTERJUN
TASVIDEOS.ORG
ESTIMATE : 0:05:00

#AGDQ2014

AGDQ 2014

► Pong
Snake
THE END



Large-scale ACE payloads



Large-scale ACE payloads

TASBOT VS. COMMUNITY CHOICE
with Masterjun, micro500, Ilari, and p4plus2
Unknown 0:05:31

DWANGOAC
00:00

MAGFEST

skype™

© 2017 Microbendo

GAMES DONE QUICK

Make your donation at [GamesDoneQuick.com](https://gettriforce.link)

\$1,160,649

prevent cancer FOUNDATION

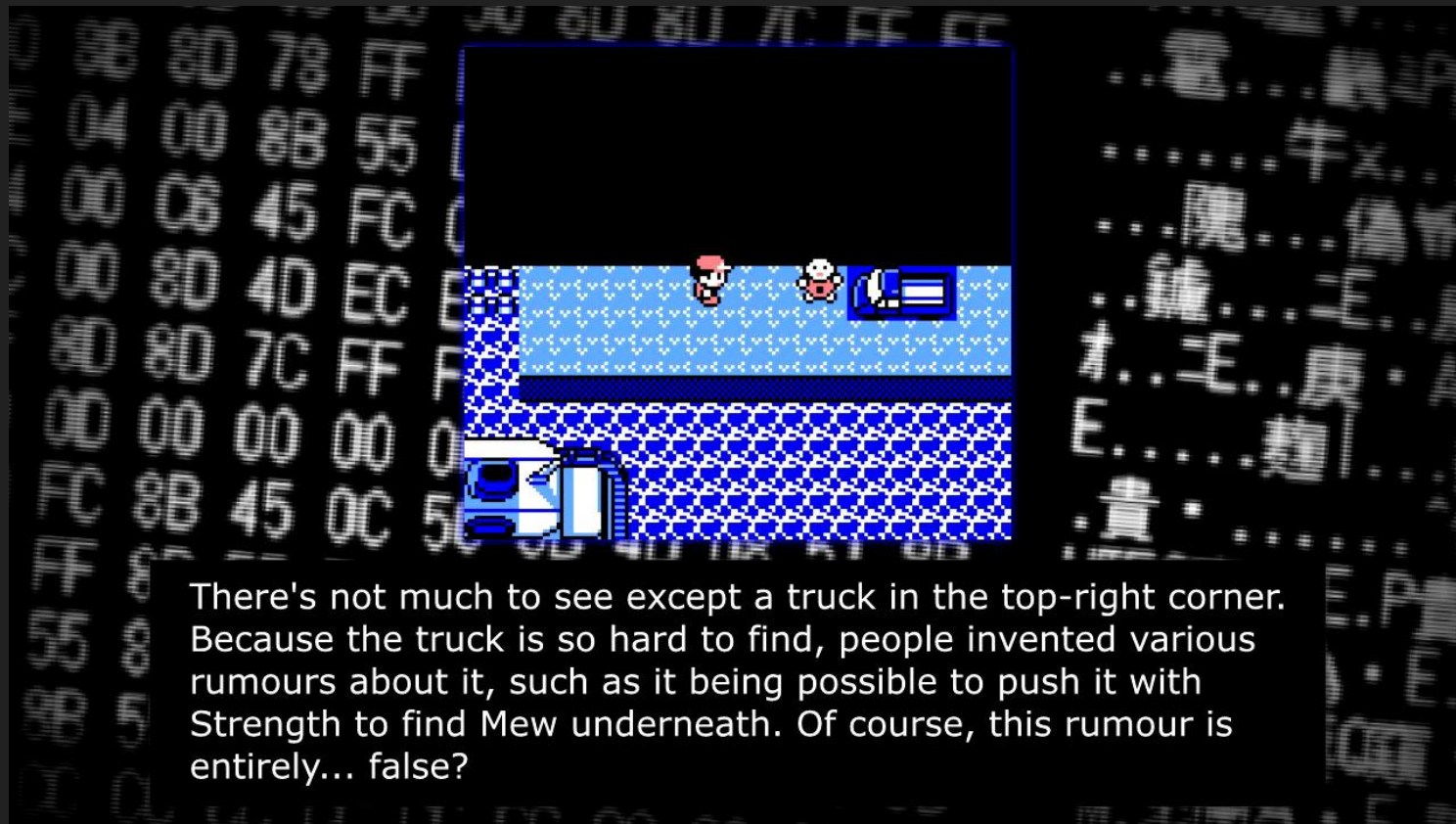
Jan. 16, 2017

Large-scale ACE payloads, now by hand



SethBling, Mar. 28, 2016

ACE for meaningful plot





@Sauraen 6 years ago

Amazing. Using ACE to recreate what "should have been" in the game is one of the best things to do with it IMHO. I'm just waiting for ACE in Ocarina of Time so we can program in a cutscene where Link gets the Triforce, and put two decades of rumors to rest.



48



Reply



14 replies





Exclusive property of HYRULE:



rule HYRULE:The Land of Zelda

Property of: HYRULE: The Land of Zelda



Feb. 4, 1999

Triforce%  <https://gettriforce.link>



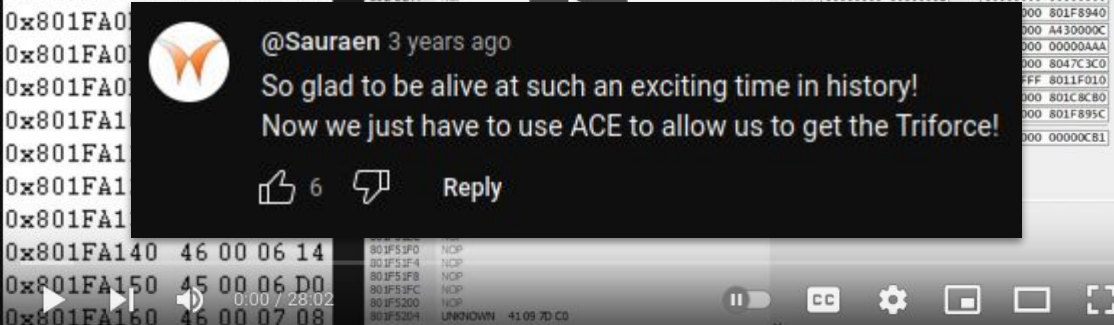
Address	Command	Parameters	Symbol
801F5150	J	0x801C8464	
801F5154	SWC1	F13, 0x0000 (S2)	
801F5158	LL	56, 0x2427 (S4)	
801F515C	LL	R0, 0x0000 (V0)	
801F5160	LWC1	F1, 0x8713 (AT)	
801F5164	UNKNOWN	00 00 52 0E	
801F5168	NOP		
801F516C	NOP		
801F5170	LUI	V1, 0xd70A	
801F5174	LUI	V1, 0xd70A	
801F5178	LUI	V1, 0xd70A	
801F517C	UNKNOWN	42 64 20 1D	
801F5180	LL	T9, 0xEDF4 (T3)	
801F5184	UNKNOWN	42 57 85 60	
801F5188	UNKNOWN	42 9C EB 3A	
801F518C	NOP		
801F5190	LL	56, 0x0000 (T8)	
801F5194	LB	57, 0xd474 (AT)	
801F5198	NOP		
801F519C	SLL	R0, S2, 0	
801F51A0	NOP		
801F51A4	NOP		

PC: 801F5150
View
R 801FA0B0

ME	V1	A1	P1	R1	S1	D0
GPR	FPR	COP0	RDRAM	SP	DP	
CPU General Purpose Registers						
R0	00000000	00000000	50	FFFFFFFF	801F33B0	
AT	00000000	80200000	51	00000000	801C84A0	
V0	FFFFFFFF	00000000	52	00000000	801DAA30	
V1	FFFFFFFF	00000000	53	00000000	00000000	
A0	00000000	801CA578	54	00000000	801D9C44	
A1	00000000	801F33B0	55	00000000	00000000	
A2	00000000	8011F04E	56	00000000	FFFFFFFF	
A3	FFFFFFFF	43080000	57	00000000	00000001	
T0	00000000	00000032	T8	00000000	00000000	
				000	801F8940	
				000	A430000C	
				000	00000AAA	
				000	8047C3C0	
				FFF	8011F010	
				000	801C8C80	
				000	801F895C	
				000	00000C81	

0x801FA0B0 80 1F 51 50
0x801FA0C0 80 1F 8A 08
0x801FA0D0 80 1F 51 50
0x801FA0E0 80 1F 8A 08
0x801FA0F0 80 1F 51 50
0x801FA100 80 1F 8A 08
0x801FA110 80 1F 51 50
0x801FA120 80 1F 8A 08
0x801FA130 80 1F 51 50
0x801FA140 46 00 06 14
0x801FA150 45 00 06 D0
0x801FA160 46 00 07 08

0x801F5150 NOP
0x801F5154 NOP
0x801F5158 NOP
0x801F515C NOP
0x801F5160 NOP
0x801F5164 UNKNOWN 41 09 7D CD



@Saurae 3 years ago

So glad to be alive at such an exciting time in history!
Now we just have to use ACE to allow us to get the Triforce!

6 likes Reply

Arbitrary Code Execution in Ocarina of Time



Fig

2.43K subscribers



Subscribed



4K



Share



Clip



127K views 3 years ago

This method was thought of and implemented by fasch and NatalyaHasDied.

Also initially worked on by MrCheeze, glitchesandstuff, and others

Nov. 20, 2019

Triforce% <https://gettriforce.link>

The Legend of Zelda: Ocarina of Time

1998

N64



Savestate

46:50.6

DWANGOAC

HE/HIM

SAURAEN

HE/HIM



GDDQ
#SGD02022

IN ABOUT
1 HOUR

spilovegeta, Keizaron, JHobz & Kungfufruitcun play
DAILY RECAP - FRIDAY

SUMMER GAMES DONE QUICK 2022

FRI JUL 01 2022 10:27 PM

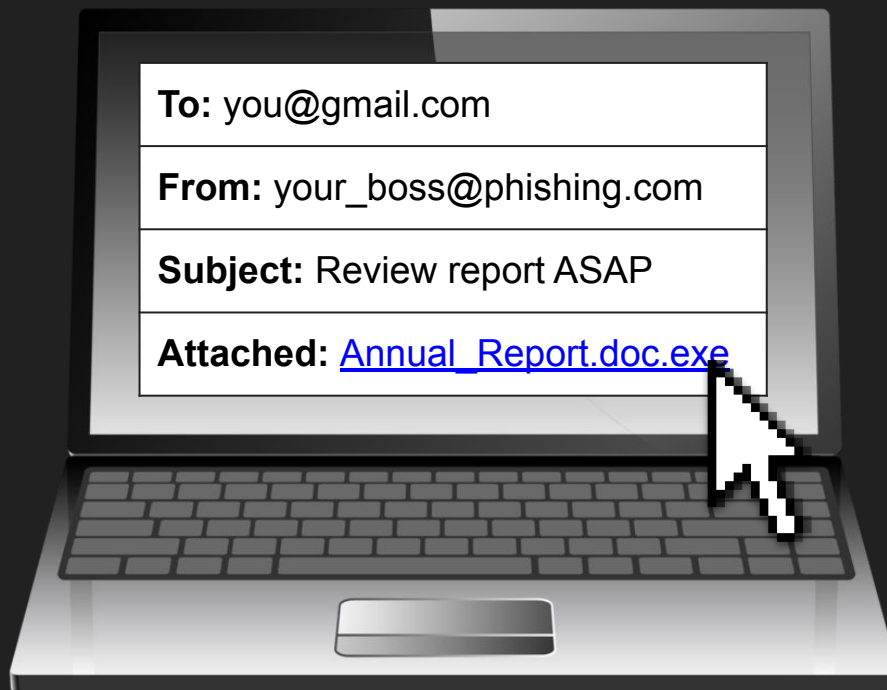


\$1,625,760
to DOCTORS WITHOUT BORDERS

Jul. 1, 2022

Triforce% <https://gettriforce.link>

Two components of ACE



I better look
at this...

Two components of ACE



Program Counter



1C7E80		8FA2FFE0	3C02800A	20422634	AC400000
1C7E80		3C1C0C04	239C75E4	AC5C000C	3C1C8040
1C7E90		239C2000	3C02801C	AC5C7E60	3C1C03E0
1C7EA0		239C0008	3C02801C	AC5C7E64	03E00008
1C7EB0		8FA2FFE0	00000000	00000000	00000000

Sufficient control of memory

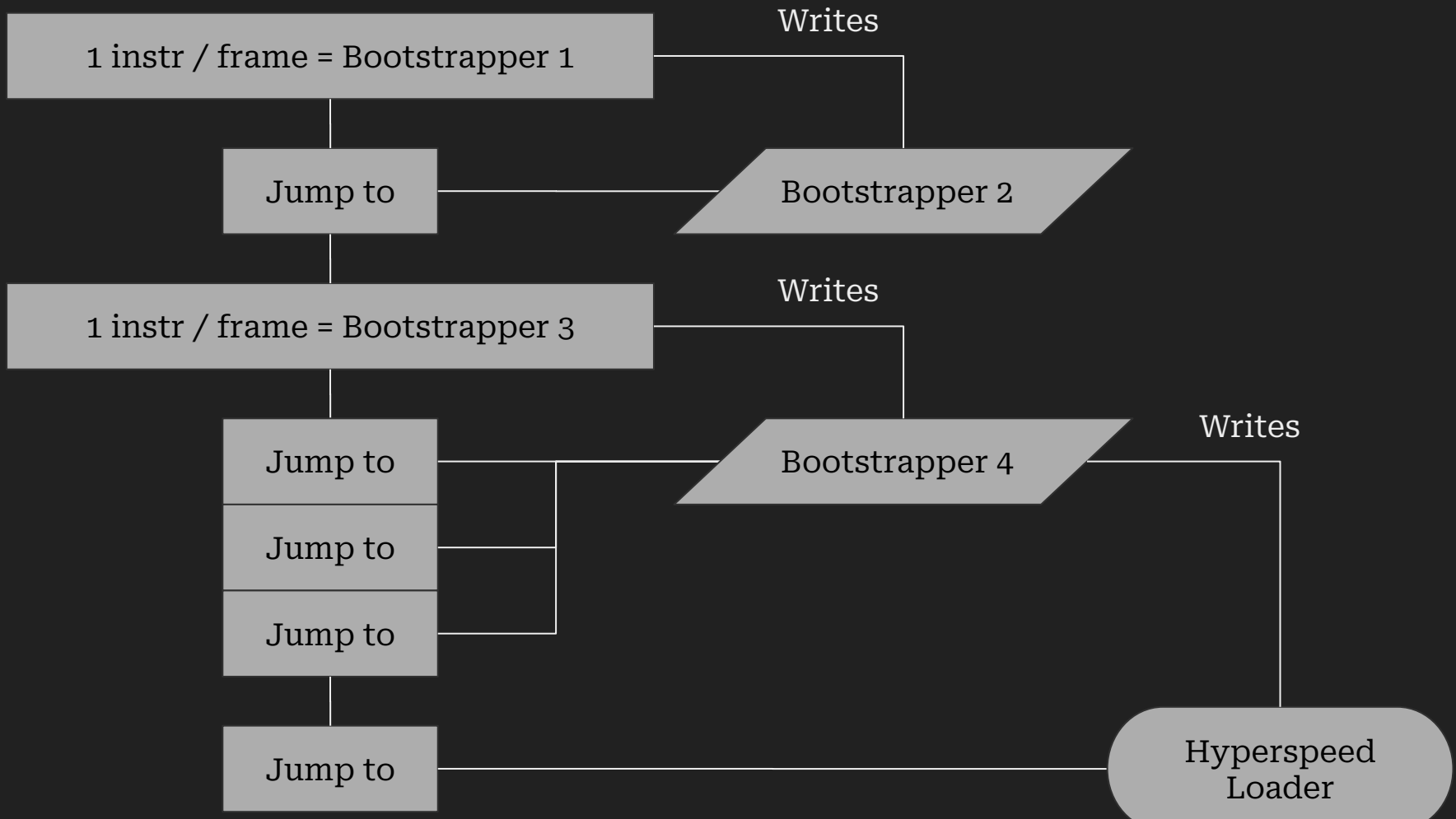
Rotation values
Link's name
Controller data

Breach separation of code & data

Use After Free bug
Stale Reference Manipulation

Speedrunning tricks
Heap manipulation

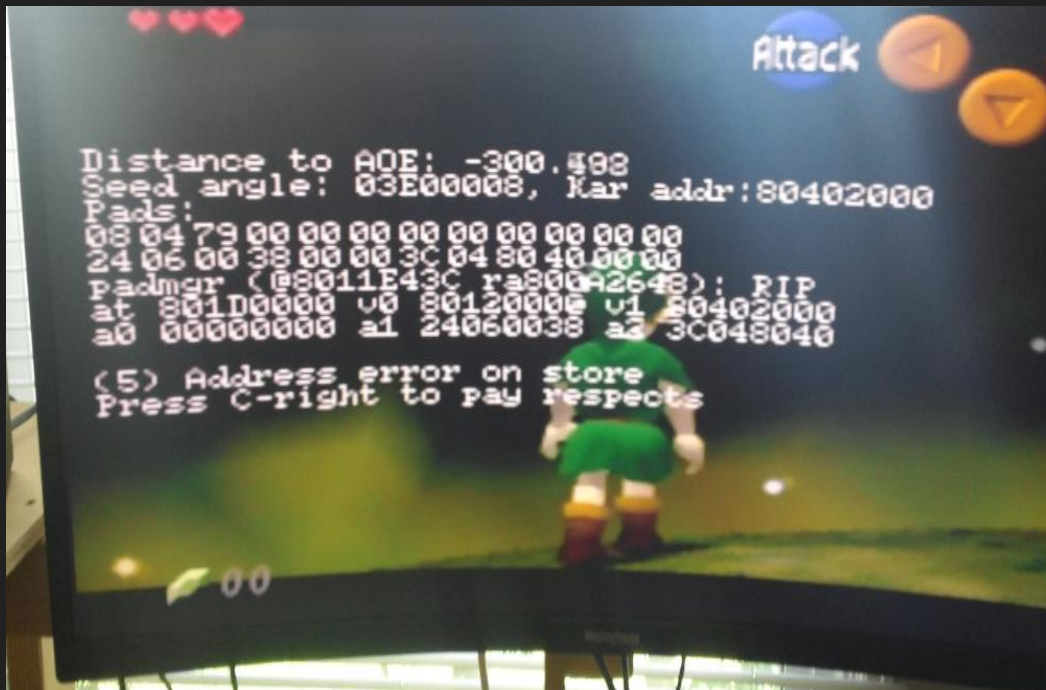
RGME slides



Demo 1

Hyperspeed
Loader

Debugger



Hyperspeed
Loader

Debugger

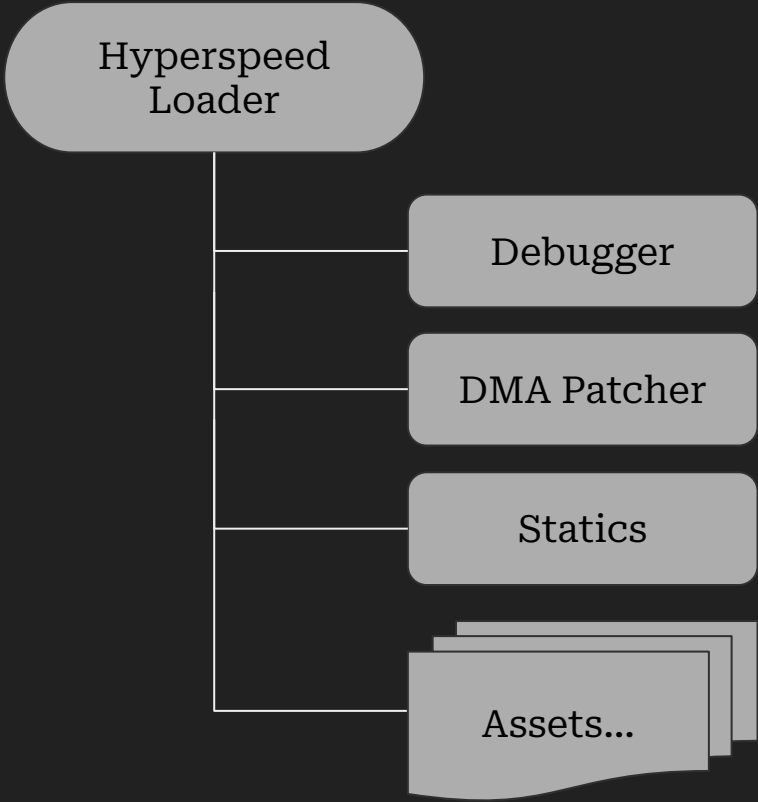
DMA Patcher

```
if(romStart & 0x80000000){  
    //Replaced whole existing ROM file with injection  
    //Debugger_Printf("DMA @%08X replacing file", vrom);  
    DmaPatcher_CopyRAM(ram, (const void*)copyStart, size);  
    return;  
}
```

```
if(vrom >= 0x04000000 && vrom < 0x04800000){  
    //New file not in ROM provided as injection  
    //Debugger_Printf("DMA %08X VROM RAM map", vrom);  
    DmaPatcher_CopyRAM(ram, InjectRomRamMap(vrom), size);  
    return;  
}
```

```
for(p=0; p<patcher.npatches; ++p){  
    if(patcher.patches[p].vrom == vrom){  
        //Debugger_Printf("DMA @%08X patching file", vrom);  
        DmaPatcher_ApplyPatch(ram, size, patcher.patches[p].patch);  
        return;  
    }  
}
```

Hyperspeed
Loader



```
graph TD; HL(Hyperspeed Loader) --- D(Debugger); HL --- DP(DMA Patcher); HL --- S(Statics); HL --- A[Assets...];
```

Debugger

DMA Patcher

Statics

Assets...

Statics

statics.c

```
void Statics_OneTime(){
    Statics_InterfaceCodePatches();
    Statics_Menu();
    Statics_Animation();
    Statics_Occupancy();
    Statics_Audio();
    Statics_Sound();
    osWriteback();
    osInvalICache();

    void Statics_Update(){
        if(sIsLiveR){
            Statics_UpdateOneTime();
        }
    }

    Statics_InventoryEditor();
    Statics_HandleEquipMedallionsToC();
    gSaveContext.naviTimer = 1;
}

void Statics_Player_Update(){
    Statics_TestShortcuts();
    Statics_LostWoods();
    Statics_PatchShop();
    Statics_MoveOddPotionToChild();
    Statics_FixWaterSpawn();
}

void Statics_Ge2DialogueGet(){
    asm(".set noat\n .set noreorder\n"
        "lui    $t0, %hi(gSaveContext)\n"
        "addiu   $t1, $t0, %lo(gSaveContext)\n"
        "lbu     $t2, 0x0F24($t1)\n"
        "srl     $t3, $t2, 6\n"
        "addiu   $t5, $t3, 0x0B50\n"
        "lw      $t4, 0($t5)\n"
        "li      $t4, 0\n"
        "sw      $t4, 0($t5)\n"
        "er");
}
```

Statics

scene.c

```
void Statics_TerminatorWarpToSacredRealm(){
    gGlobalContext.nextEntranceIndex = 0x006B;
    // Scene Draw Config 32
    void Patched_CoSSceneDrawConfig(GlobalContext* globalCtx) {
        u32 gameplayFrames = globalCtx->gameplayFrames;

        //OPEN_DISPS(globalCtx->state.gfxCtx, "", 0);

        // Platform waterfall side animation
        gSPSegment(POLY_XLU_DISP++, 0x08, Gfx_TexScroll(globalCtx->state.gfxCtx, 0, (gameplayFrames * 2) % 256, 64, 64));

        gDPPipeSync(POLY_OPA_DISP++);
        gDPSetEnvColor(POLY_OPA_DISP++, 128, 128, 128, 128);
    };
    Patched_CoSSceneDrawConfig(globalCtx);

    // Platform water floor animation
    gSPSegment(POLY_OPA_DISP++, 0x0A,
        Gfx_TwoTexScroll(globalCtx->state.gfxCtx, 0, 127 - gameplayFrames % 128, (gameplayFrames * 1) % 128, 32,
            32, 1, gameplayFrames % 128, (gameplayFrames * 1) % 128, 32, 32));
};

gEntranceCutsceneTable[30] = spirit_boss_entry;
```

```
u32 Patched_GetSpaceSize(GlobalContext* globalCtx){
    if (globalCtx->sceneNum == SCENE_GANON_DEMO
        && gSaveContext.sceneSetupIndex != 4) {
        return 1177600;
    } else if (globalCtx->sceneNum == SCENE_JYASINBOSS
        || globalCtx->sceneNum == SCENE_GANON_BOSS) {
```

```
void Patched_LoadItemIconMain(GlobalContext *globalCtx, u16 button, u16 num){
    }else if(item >= 0x5A){
        item = 0x35; //if invalid item, default to Frog
    }
}
```

```
void Statics_HandleEquipMedallionsToC(){
    static s16 lastCurX, lastCurY;
    PauseContext *pauseCtx = &gGlobalContext.pauseCtx;
    if(!pauseCtx->state) return;
    if(!(SAGES_CHARM_VAR & SAGES_CHARM_BIT)) return;

    //Enable C buttons on Quest Status subscreen
    //Have to set once every time the pause menu overlay gets reloaded
    if(pauseCtx->state >= 4 && pauseCtx->state <= 11 && sSubscreenButton
```

```
void Patched_LoadItemName(void *dest, u32 srcRom, u32 size){
    u8 item = (srcRom - 0x880000) >> 10;
    if(item >= 123) item -= 123; //Japanese / English
    for(u8 i=0; i<patchedItemNameCount; ++i){
        if(PatchedItemNameTable[i].item == item){
            bcopy(PatchedItemNameTable[i].ram_addr, dest, size);
        }
    }
}
```

```
void Patched_MagicBarY1(){
    asm(".set noat\n .set noreorder\n"
        //Starting at 800730EC + 0x34
        "lui      $t2, 0x8012\n"
        "addiu    $t2, $t2, 0xBA00\n"
        "lw       $t9, 0x0000($t2)\n"
        "bne      $at, $zero, lbl_magicbar1\n"
        "lh       $t3, 0x0AF4($t9)\n"
        "lh       $t3, 0x0AF8($t9)\n"
        "lbl_magicbar1:\n")
}
```

```
void Statics_LoadMsgInfoPatched(GlobalContext *globalCtx, u16 textId, s32 type){  
    if(!found){  
        //Text not found, default to Frog  
        // if(sIsLiveRun) Debugger_Printf("No text %04X glbl %04X -> frog",  
        //     textId, (u16)globalCtx->msgCtx.unk_E2F8);  
        tbl = messageTableAddresses[type];  
        baseSeg = tbl->segment;  
        tbl += 0xC;
```

```
s32 Statics_N64DDTextCallback(Font *message){  
    if(!(message->msgOffset & 0x80000000)) return 0; //Actual normal text  
    if(message->msgLength > 1000){  
        // if(sIsLiveRun) Debugger_Printf("Bad msg %08X %X -> frog",  
        //     message->msgOffset, message->msgLength);  
        //Something went wrong, default to Frog. Hope we're on US.  
        message->msgOffset = messageTableAddresses[1][0xC].segment  
            - messageTableAddresses[1][0x0].segment;
```



```
static s32 Patched_AudioDMA(OSIoMesg* mesg, u32 priority, s32 direction, u32 devAddr,
    void* ramAddr, u32 size, OSMesgQueue* reqQueue, s32 handleType)
{
    if(gFakeAudioContext.resetTimer > 0x10) return -1;

    size = (size + 0xF) & ~0xF;

    if(devAddr >= 0x04000000 && devAddr < 0x04800000){
        //Injected data
        osYieldThread();
        bcopy(InjectRomRamMap(devAddr), ramAddr, size);
        osSendMesg(reqQueue, NULL, OS_MESG_NOBLOCK);
        return 0;
    }
}
```

```
void Patched_PlayWarpSong(u16 song)
{
    if(song == 0x33 /* Bolero of Fire -> Overture of Sages */
        && (OVERTUREOFSAGES_VAR & OVERTUREOFSAGES_BIT)
        && gGlobalContext.sceneNum == SCENE_TOKINOMA){
        func_800F5E18(0, song, 0, 7, -1); // Main internal start sequence, on player 0
        Audio_SeqCmd1(1, 0); // Stop player 1
        //Audio_ClearBGMMute(0xD); // Was set by Audio_OcaSetInstrument
        D_801333D0 = 0;
        Audio_SetVolScale(0, 2, 0x7F, 1); // modified to fade back in after 1 frame
        Audio_SetVolScale(3, 2, 0x7F, 1);
    }
}
```

```
static const u8 PatchedEnv12Chirps[] = {
    0xC0, 0x3F, 0xC0, 0x00,
    0x00, 0x02, 0x00, //NATURE_IO_STREAM_0_TYPE(NATURE_STREAM_RUSHING_WATER),
    0x00, 0x03, 0x00, //NATURE_IO_STREAM_0_PORT3(0),
    0x01, 0x02, 0x00, //NATURE_IO_CRITTER_0_TYPE(NATURE_CRITTER_BIRD_CHIRP_1),
    0x01, 0x03, 0x50, //NATURE_IO_CRITTER_0_BEND_PITCH(80),
    0x01, 0x04, 0x00, //NATURE_IO_CRITTER_0_NUM_LAYERS(0),
    0x01, 0x05, 0x08, //NATURE_IO_CRITTER_0_PORT5(8),
    0x02, 0x02, 0x0A, //NATURE_IO_CRITTER_1_TYPE(NATURE_CRITTER_SMALL_BIRD_CHIRPS),
    0x02, 0x03, 0x50, //NATURE_IO_CRITTER_1_BEND_PITCH(80),
}
```

Statics

ocarina.c

```
static const DetectableSong LongOfTime_Detectable = {
    8, {0x7, 0x5, 0x7, 0x9, 0x2, 0x0, 0x4, 0x2} //Long
};

static const DetectableSong OvertureOfSages_Detectable = {
    6, {0xE, 0x5, 0x2, 0x9, 0xB, 0xE, -1, -1} //Sages
};

static const CanonSong OvertureOfSages_Canon = {{
    {0xE, 25, 100, 0, 0},
    {0xE, 35, 100, 4, 0},
    {0x5, 30, 100, 0, 0},
    {0x2, 35, 100, 0, 0},
```

```
Gfx* PatchOcaButtons(Gfx* gfx, u8 note, s16 x, u8 shadow){
    u8 mainButton = OcaNoteButtons[note];
    u8 decoration = OcaNoteDecorations[note];
    s16 y = (&VREG(45))[mainButton];
    const void* addr;
    s16 yoffset;
    LOAD_TILE_IA8(sOcaButtonAddr[sCurOcarinaBtnVal], 16, 16);
    gSPTextureRectangle(gfx++,
        x << 2, y << 2, (x + 16) << 2, (y + 16) << 2,
        G_TX_RENDERTILE, 0, 0, 0x0400, 0x0400);
    if(decoration){
        u8 pc = shadow ? 155 : 190;
        gSPTextureRectangle(gfx++,
            x << 2, y << 2, (x + 16) << 2, (y + 16) << 2,
            G_TX_RENDERTILE, pc, pc, 0x0400, 0x0400);
    }
}
```

```
"ori    $a3, $zero, 0x00FF\n"
"lbu    $t2, 0x0000($t1)\n" //sCurOcarinaBtnVal
"sb     $t2, 0x0000($a1)\n" //sCurOcarinaBtnIdx
"lui    $t0, 0x8010\n"
"sw     $at, 0x2220($t0)\n" //sCurOcaPitchCooked = 1.0f
"sb     $zero, 0x2228($t0)\n" //sCurOcaPitchRaw = 0
"lbu    $t4, 0x2B54($t0)\n" //sOcaMode
"ori    $t3, $zero, 0x0002\n" //2
"beq    $t4, $t3, plbl_done\n"
"lui    $t9, 0x8012\n"
"beq    $t2, $a3, plbl_afterbtns\n"
"lb     $t6, 0x1F21($t9)\n" //sCurOcaStick.y
"andi   $t5, $a2, 0x0010\n" //sCurOcarinaBtnPress & BTN_R
"bnel   $t5, $zero, plbl_postr\n"
"addiu  $t2, $t2, 0x0001\n" //++sCurOcarinaBtnVal
"plbl_postr:\n"
"andi   $t5, $a2, 0x2000\n" //sCurOcarinaBtnPress & BTN_Z
"bnel   $t5, $zero, plbl_postz\n"
```

Statics

anime.c

```

void HairPhys_UpdateDouble(HairPhysDoubleState *s, const HairPhysConstants *c,
    Vec3f *lPos, Vec3s *lRot, float windX, float windZ, float actorscale, bool ignoreY){
    const HairPhysDouble *dbl = c->dbl;
    Vec3f fulcrum; float costwist, sintwist;
    s16 twist = ExtractFulcrumTwist(actorscale, c->b->len, lPos,
        &fulcrum, &costwist, &sintwist, c->b->parentaxis);
    float oldy = fulcrum.y;
    if(ignoreY) fulcrum.y = 0.0f;
    if(!s->initted){
        s->initted = 1;
        s->s1.pos.x = fulcrum.x;
    }

s16 Statics_ExtractRotationAxis(float actorscale, u8 axis){
    MtxF *cmf = Matrix_GetCurrent();
    float as = 1.0f / actorscale;
    if(axis == 0){
        if(cmf->mf[0][1] * as >= 1.0f || cmf->mf[0][1] * as <= -1
            return 0;
        }else{
            return Math_Atan2S(cmf->mf[1][1], -cmf->mf[2][1]);
        }
    }

    //Gravity
    force.y -= b->restoreforce * b->mass;
    //Wind. Uses windpush for the constant wind force and yawmult for the
    //randomness, since yawmult is not otherwise used.
    force.x += windX * b->windpush + (Rand_ZeroOne() - 0.5f) * b->yawmult;
    force.z += windZ * b->windpush + (Rand_ZeroOne() - 0.5f) * b->yawmult;
    //Tame large forces
    mag = sqrtf(force.x * force.x + force.y * force.y + force.z * force.z);
    const float flimit = 0.6f;
    if(mag > flimit){
        d = sqrtf(flimit / mag);
        force.x *= d;
        force.y *= d;
        force.z *= d;
    }

    //Dampen velocity (applied to true old velocity)
    ss->vel.x *= b->dampening;
    ss->vel.y *= b->dampening;
    ss->vel.z *= b->dampening;

```

File Edit Render Window Help 3D View Full Animation Compositing Default Game Logic Motion Tracking Scripting UV Editing Video Editing +

Object Mode View Select Add Object Global Options

User Perspective (1188) Scene Collection | Cutscene.TriforceRoom_scene_header00_cutscene

OOT File Settings

- OOT Scene Scale: 10.00
- Decomp Path: //./../ot_dev/
- ☐ Header Sets Actor Visibility
- ☐ Enable HackerOOT Features

> OOT Tools

> OOT DL Exporter

> OOT Collision Exporter

> OOT Scene Exporter

Scene Exporter

Inside the Deku Tree (Ydan)

Scene Object: Scene

☐ Export as Single File

☐ Custom Export Path

Export Scene

Scene Importer

Inside the Deku Tree (Ydan)

Mesh Collision

Actors Cull Groups Lights

Cameras Paths Water Boxes

☐ Custom Path

Cutsscenes won't be imported.

Import Scene

Remove Scene

Inside the Deku Tree (Ydan)

Remove Scene

> OOT Animation Exporter

> OOT Skeleton Exporter

> OOT Cutscene Exporter

Camera Perspective (1188) Scene Collection | Cutscene.TriforceRoom_scene_header00_cutscene

Scene Collection

- Cutscene.TriforceRoom_scene_header00_cutscene
 - ActionList.Link.001
 - ActionList.TriforcePiece
 - Camera
 - Preview.Link.001
 - Shot00
 - Shot01
 - Shot02
 - Shot03
 - Shot04
 - Shot05
 - Shot06
 - Shot07
 - Shot08
 - Scene
 - Room00
 - DemoEffect
 - TriforceChest
 - TriforceLight

OOT Object Inspector

Object Type: Cutscene

End Frame: 2000

☒ Write Terminator (Code Execution)

Index: 81 Sta: 1885 En: 1886

Textbox List

Text 0

+ Add - Delete Up Down

messageId: 0x0ACE

startFrame: 445

endFrame: 490

type: 0x0000

topOptionBranch: 0x0000

bottomOptionBranch: 0x0000

Text 1

+ Add - Delete Up Down

Scene Collection | Cutscene.TriforceRoom_scene_header00_cutscene | Verts:120 | Faces:101 | Tris:166 | Objects:141 | Memory: 36.4 MiB | VRAM: 1.0/8.0 GiB | 3.2



```
#include "HereTogetherBank.h"
```

```
/* 0x0 */
```

```
AudioBank HereTogetherBank =
```

```
{
```

```
    .drums = HereTogetherBank_DrumList,
```

```
    .sfx = NULL,
```

```
    .instruments = {
```

```
        &PanFlute_Inst,
```

```
        &Oboe_Inst,
```

```
        &Clarinet_Inst,
```

```
        &Bassoon_Inst,
```

```
        &Horn_Inst,
```

```
        &Trumpet_Inst,
```

```
        &Trombone_Inst,
```

```
        &Tuba_Inst,
```

```
        &Glockenspiel_Inst,
```

```
        NULL,
```

```
        &Strings_Inst,
```

```
        &Pizzicato_Inst,
```

```
        &Piano_Inst,
```

```
        &Harp_Inst,
```

```
        &Bell_Inst,
```

```
    },
```

```
};
```

```
/* 0x50 */
```

```
AudioBankSample PanFlute_Sample =
```

```
{
```

```
    .codec = 0x0,
```

```
    .medium = 0x0,
```

```
    .unk_bit26 = 0x0,
```

```
    .unk_bit25 = 0x0,
```

```
    .size = 0x4686,
```

```
    .sampleAddr = (u8*)0x108690,
```

```
    .loop = &PanFlute_Loop,
```

```
    .book = &PanFlute_Book,
```

```
};
```

Binary format (ABI)

4b - Zelda community only
4c - Zelda new decomp names

Edit...

Import MIDI

Export MIDI

MIDI Import

☐ Use .pref file (if exist) Mute Behav. 20
☐ Smart Loop Mute Scale 32
☐ Relative Addr Default Mst.Vol. 58
☐ FL Studio compat ?

Optimizer

☒ Calls Merge Close: Quantize:
☐ Only Vels 5 Vol/Pan 2
NLYr Gates 3 Pitch 1
☒ Loops CCs 1 Other 1

MIDI Export

☒ Orig Inst/Drums PPQN 48x: 4
☐ GM, drums ch 10
☐ GM, drums multi

Import .mus

Export .mus

.mus dialect (for export)

☒ Community ☐ Canon ☐ Canon (Old)
Style: ☒ Music ☐ Technical / SFX

Import .com/.aseq

Export .com/.aseq

SEQ64 V2.3.0

Debug output:

Maximum of 255 loop iterations

Looking for data to loop

Looking for hooks

Fixing short-looped calls...
Reducing track notes to shortest types...

Done!!!

SEQ64 internal sequence representation:

Section 0: seqhdr (@FFFF) [U]
mutesbvh, Format 20
mutescale, Volume Multiplier 32
initchan, Channels 6FFF
startchan to Sec 1, Channel 00
startchan to Sec 2, Channel 01
startchan to Sec 3, Channel 02
startchan to Sec 4, Channel 03
startchan to Sec 5, Channel 04
startchan to Sec 6, Channel 05
startchan to Sec 7, Channel 06
startchan to Sec 8, Channel 07
startchan to Sec 9, Channel 08
startchan to Sec 10, Channel 09
startchan to Sec 11, Channel 0A
startchan to Sec 12, Channel 0B
startchan to Sec 13, Channel 0D
startchan to Sec 14, Channel 0E
tempo, Tempo 55
svol, Volume 5B
delay, Delay 1080
tempo, Tempo 4D
delay, Delay 80
tempo, Tempo 55
delay, Delay 0240
tempo, Tempo 40
disablechan, Channels 6FFF
and
Section 1: chanhdr (@FFFF), chn 0 [U]
[U] shortoff
[U] startlayer to Sec 15, Note Layer 00
[U] cpan, Pan 32
[U] lreverb, Wet 30

```
DECLARE_MESSAGE(0x0ACE, BOX_BLACK, POS_MIDDLE,  
    UNSKIPPABLE ITEM_ICON("\x73") QUICKTEXT_ENABLE  
    "You got the " COLOR(YELLOW) "Triforce" COLOR(WHITE) "!!!" QUICKTEXT_DISABLE NEWLINE  
    "After 23 years, the dreams of" NEWLINE  
    "millions of players around the" NEWLINE  
    "world have finally come true!"  
)
```



```
0
901 .byte 24
906 .short 0x0074
```

```
0000000089 01 01 18 04 02 00
```

```
# base addr
808301C0
# reloc table header (count) offset
!00023130

# Patch func_808519EC / func_8084F868 (1.0) / Link_Act
8084F898 lui a2, 0x0400
8084F8A8 addiu a2, a2, 0x2360

# Patch func_80851A50 / func_8084F8CC (1.0) / Link_Act
# anim frame to grab sword
8084F8F4 addiu v1, zero, 1
8084F918 addiu v1, zero, 1
# dlist selection--change left hand to holding regular
8084F96C addiu v0, v0, 0x7908
# sfx
8084F97C addiu a1, zero, 0x1836
8084F994 addiu t2, zero, 1
8084F9AC addiu a1, zero, 0x6801
8084F9B8 addiu t3, zero, 1

# Patch func_8083E5A8 / func_8083C678 (1.0) / Link_Pre
8083CA00 addiu t1, zero, 1

# Patch func_808473D4 / func_808454D8 (1.0) / Link_Get
80845678 addiu t5, zero, 1

# Patch Player_ItemToActionParam / func_80831758 (1.0)
80831774 addiu at, zero, 0x67
80831780 addiu at, zero, 0x67
80831790 addiu v0, zero, 0x1A

# Patch Player_Init to jump to Statics_Player_Init
# Need to save t8 and reconstruct v1 = -1
80844F28 jal Statics_Player_Init
```

Demo 2