

Battle RAM

This is a list of the RAM locations used by the battle program. The code that uses this data is split into two modules. The first module is the battle module, which controls the battle itself (damage calculations, monster A.I., etc.). The code for the battle module is in the first half of bank C2. The second module is the battle graphics module, which controls all visual aspects of the battle (animations, menus, cursors, etc.). The code for the battle graphics module is in bank C1 and the second half of bank C2.

\$0000-\$00FF: Battle Direct Page

```
+$00 Always #$0000
+$02 Always #$FFFF
+$04 Buttons in Repeat Mode
+$06 Buttons Pressed this Frame Modified Based on Button Config
+$08 Buttons Pressed this Frame but not Last Frame
+$0A Unmodified Buttons Pressed this Frame
+$0C Buttons Pressed Last Frame
    axlr----
    a: A button down
    x: X button down
    l: L button down
    r: R button down
    bystudlr
    b: B button down
    y: Y button down
    s: Select button down
    t: Start button down
    u: Up direction down
    d: Down direction down
    l: Left direction down
    r: Right direction down
$0E Frame counter
$0F -
```

----- \$0010-\$009F Variables Used by Battle Graphics Module Only -----

```
$10-$45 Scratchpad RAM
    $46 NMI in progress
    $47 Waiting for VBlank
++$48 Pointer to Current Position in Battle Message
    $4B

    $4E vhopppmm Current Menu Text Tile Data
    $55
    $57
    $59
```

```
++$5B Animation Script Pointer

+$61 pointer to monster graphics buffer
$63
++$64 pointer to monster graphics in ROM
$67
$68 Constant to add to each hex->dec conversion digit
$69-$70 Hex->Dec conversion result (most significant digits first)
$71 Next available sprite index
$72 Random Number counter for graphics module
$73
$74
$75
(+$76) Pointer to battle script commands, Starts at $2D6E (4 bytes each)
$00 Command index
$01 parameter 1
$02 parameter 2
$03 parameter 3
(+$78) Pointer to battle script data, Starts at $2C6E (16 bytes each, see
$A0-$AF)
$7A aaaaabbbb
a:
b:
$7B ?-----cc
?:
c: character number
$7C constant to add to window graphics data

$7D-$8D Vector math variables (* = input)
-----
$7D *x0
$7E *y0
$7F *x1
$80 *y1
+$81 dx (signed)
+$83 dy (signed)
$85 theta = arctan(dy/dx) (angle of the line between start and end)
+$86 sqrt(dx^2 + dy^2)
+$88 dx (unsigned)
+$8A dy (unsigned)
+$8C (delta_x / 8) + (delta_y * 4) (for intermediate calculation)
$8E -
-----
++$8F battle event pointer
$92
$93 play character active sound effect
$94 play cursor sound effect (move/cancel)
$95 play error sound effect
$96 play cursor sound effect (select)
```

```

$97 go to next part of song (SPC command $89)
$98 frame counter (inc each frame)
$99 Pause Sprite Animation Threads
$9A enable final KEFKA death animation
$9B
$9C-$9F -
-----
$00A0-$00FF Variables Used by Battle Module Only
-----
$00A0-$00AF Battle Script Data (gets copied to $2C6E)
  $A0 mcfs--dt (-> $2C6E)
    m: attacker is a monster (excludes AI characters)
    c: no character targets
    f: flash screen (critical)
    s: disable pre-magic swirly animation
    d: dragon horn effect (attacker bounces back up when jumping)
    t: poison/regen/seizure damage (no critical and ignore true knight
???)
  $A1 Attacker Index (-> +$2C6F)
  +$A2 Targets (-> +$2C70) (excludes targets blocked)
  +$A4 Targets Hit (-> +$2C72)
  +$A6 Targets Reflected Off Of (-> +$2C74)
  +$A8 (-> +$2C76)
  $AA Character 1 Block Type (-> $2C78) (0 = none, 1 = knife, 2 = sword, 3
= shield, 4 = zephyr cape, 5 = hand up, 6 = golem, 7 = dog)
  $AB Character 2 Block Type (-> $2C79)
  $AC Character 3 Block Type (-> $2C7A)
  $AD Character 4 Block Type (-> $2C7B)
  +$AE (-> +$2C7C)
-----
  $B0 ?p?s??c?
    p: Preemptive Attack
    s: disable pre-magic swirly animation
    c: no critical and ignore true knight ???
  $B1 d?b???r?c
    d: disable battle menus opening
    b: back attack
    r: can't run away
    c: counter attack flag (disables further counter attacks)
  $B2 dr?s??cn
    d: cap drain damage when attacker's hp if full (normally set,
cleared by seize)
    r: runic sword animation
    s: follow-up spell hits same target (random weapon spellcast)
    c: no critical
    n: show attack name ??
  $B3 vgrm?ucb
    v: ignore vanish
    g: gauntlet is equipped ??? (Bat.Pwr *= 7/4)
    r: ignore attacker row
    m: ignore damage multiplier

```

```
u: don't retarget, undead attack ???
c: automatic critical hit ??
b: blitz input failed
$B4 Battle Script Command
$B5 Command Index
$B6 Spell/Attack Index
$B7 Secondary Data Index (Item Index, Battle BG index, Atma Weapn
Length, dice rolls, etc.)
+$B8 Targets
$BA crxdfdioa
c: can't target characters
r: random target
x: can hit dead targets (Quadra Slam, Dragon Horn, etc. ???)
f: reflected
d: target only dead allies
i: no retarget if target becomes invalid
o: attacking opposite side only (no friendly targets)
a: can't target attacker
$BB ???????? Targetting Flags
$BC damage multiplier
$BD other damage multiplier
$BE random number for bank $C2
$BF -
$C0-$DF -
+$F0 Maps to $3254 Pointer to AI Script
+$F2 Maps to $3D0C AI Script Loop Address
$F4 Maps to $3240 Number of times to loop
$F5 Maps to $3241 Loop Counter
$F6 Pointer to Character/Monster Data in RAM
$F7
$F8 Final Attack has been done ??
+$FC Targets

++$F3 Decompression Source
++$F6 Decompression Destination
```

\$0100-\$01FF: Battle RAM

Used by battle menus.

\$0200-\$02FF: Menu RAM

See [Menu RAM](#).

\$0300-\$051F: Sprite Data

This data gets copied directly to the SNES OAM data every frame.

Format for sprites:

\$0300 X position

\$0301 Y position

\$0302 vhooppmm mmmmmmm

v: Vertical Flip

h: Horizontal Flip

o: sprite priority

p: Palette Index

m: Graphic Index

Notable Sprites

\$0300 char/monster 1 cursor (cursors can't be on monsters and characters at the same time, they flash from one to the other)

\$0304 char/monster 2 cursor

\$0308 char/monster 3 cursor

\$030C char/monster 4 cursor

\$0310 monster 5 cursor

\$0314 monster 6 cursor

\$0318 selected character triangle cursor

\$031C

\$0320 first available sprite (107 sprites available)

\$04CC-\$04EF ??? sprites

\$04F0 main battle menu cursor

\$04F4 secondary battle menu cursor (moving items, etc.)

\$04F8 ??? cursor

\$04FC up/down arrows for scrolling menus

\$0520-\$119F: Field RAM

See [Field RAM](#).

\$11A0-\$11FF: Shared RAM

Spell Mode (14 bytes from from \$C46AC0)

\$11A0 Targetting

\$11A1 Element

\$11A2 76543210

7: can't target characters (esper attacks, tools, desperation attacks)

6: no damage split

5: ignore target's defense

4: random target

```

    3: invert damage to undead
    2: resurrection targetting
    1: instant death spell
    0: physical damage
$11A3 76543210 Attack flags 1
    7: affect mp
    6: attacker dies after attack (air anchor effect)
    5: re-target if target becomes invalid
    4: quick/warp flag ???
    3: enable runic
    2: can learn as lore
    1: ignore reflect
    0: useable on field
$11A4 76543210 Attack flags 2
    7: damage is fraction of hp
    6: level divisible spell (evasion gives the factor)
    5: can't dodge
    4: use stamina for defense ???
    3: toggle status
    2: remove status
    1: drain effect
    0: restore hp/mp
$11A5 MP Cost
$11A6 Battle Power or Spell Power
$11A7 -----10
    1: display battle message based on attack index (if attack hits)
    0: automatically miss if target is immune to status
$11A8 Hit Rate
$11A9 Special Effect (0 = no effect)
$11AA Status 1
$11AB Status 2
$11AC Status 3
$11AD Status 4
$11AE Vigor * 2 or Magic Power
$11AF Level

    Item Mode
    -----
$11A0
$11A1 Element
$11A2
$11A3
$11A4
$11A5
$11A6 Battle/Defense Power

$11A9 Special Effect (0 = no effect)
$11AA Status 1
$11AB Status 2

```

```

    $11AC Status 3
    $11AD Status 4
+$11B0 Damage
    Stats Mode
    -----
+$11A0 Mag.Pwr
+$11A2 Stamina
+$11A4 Speed
+$11A6 Vigor
+$11A8 Evade
+$11AA MBlock
    $11AC Battle Power (main hand)
    $11AD Battle Power (off-hand)
    $11AE Weapon Hit Rate (main hand)
    $11AF Weapon Hit Rate (off-hand)
    $11B0 Weapon Element (main hand)
    $11B1 Weapon Element (off-hand)
+$11B2 bbhhhhhh hhhhhhhh
    b: hp boost (0 = none, 1 = 25% boost, 2 = 50% boost, 3 = 12.5%
boost)
    h: max hp
    $11B4 Weapon Spell Cast
    $11B5 -
    $11B6 Absorbed Elements
    $11B7 Nullified Elements
    $11B8 Weak Elements
    $11B9 Halved Elements
    $11BA Defense
    $11BB Magic Defense
    $11BC Status 2 Effects
    $11BD -
    $11BE ----mpbb Main Hand
    $11BF ----mpbb Off Hand
    m: can block magic attacks
    p: can block physical attacks
    b: block graphic (0 = Dagger, 1 = Sword, 2 = Shield, 3 = Zephyr
Cape)
$11C0-$11C5 -
    $11C6 Weapon
    $11C7 Shield
    $11C8 Helmet
    $11C9 Armor
    $11CA Relic 1
    $11CB Relic 2
    $11CC -
    $11CD -
    $11CE ---4321-
        1: weapon in off-hand
        2: weapon in main hand
        3: unarmed in off-hand
        4: unarmed in main hand

```

```
$11CF ---4---
    4: weapons in both hands. will oddly clear Genji Glove effect
in $11D8, for damage purposes.
$11D0 ----zhsh Physical Block Graphic
$11D1 ----zhsh Magical Block Graphic
    z: Zephyr Cape
    h: Shield
    s: Sword
    d: dagger
$11D2 Status 1 Immunity
$11D3 Status 2 Immunity
$11D4 Status 3 Effects
$11D5 76543210 relic effects 1
    7: MP +12.5% (bard's hat)
    6: MP +50% (crystal orb)
    5: MP +25% (minerva)
    4: HP +12.5% (green beret)
    3: HP +50% (muscle belt)
    2: HP +25% (red cap)
    1: raise magic damage (double earrings or hero ring)
    0: raise fight damage (atlas armlet, hero ring)
$11D6 76543210 relic effects 2
    7: jump continuously (dragon horn)
    6: steal -> capture (thief glove)
    5: slot -> gp rain (coin toss)
    4: sketch -> control (fakemustache)
    3: magic -> x-magic (gem box)
    2: fight -> jump (dragoonboots)
    1: prevent back/pincer attacks (back guard)
    0: increase pre-emptive attack rate (gale hairpin)
$11D7 76543210 relic effects 3
    7: raise vigor +50% (hyper wrist)
    6: MP cost = 1 (economizer)
    5: MP cost = 50% (gold hairpin)
    4: 100% Hit Rate, ignore target's MBlock (sniper sight)
    3: Increase Control Rate (coronet)
    2: Increase Sketch Rate (beret)
    1: raise magic damage (single earring or hero ring)
    0: Increase Steal Rate (sneak ring)
$11D8 -thgaebo relic effects 4
    t: protects weak allies (true knight)
    h: can equip heavy items (merit award)
    g: can equip 2 weapons (genji glove)
    a: uses weapon 2-handed (gauntlet)
    e: randomly evade (beads)
    b: randomly counter (black belt)
    o: fight -> x-fight (offering)
$11D9 7--43210 relic effects 5
    7: make character undead (relic ring)
```



```

    4: double GP (cat hood)
    3: double experience (exp. egg)
    2: casts wall when HP is low
    1: casts safe when HP is low (mithril glove, czarina ring)
    0: casts shell when HP is low (barrier ring, czarina ring)
$11DA 765---1- Weapon Effects (main hand)
$11DB 765---1- Weapon Effects (off-hand)
    7: enable runic
    6: 2-hand
    5: no back row penalty
    1: swdtech
$11DC Run Factor
$11DD -
$11DE -
$11DF t-s---mc Field Equipment Effects
    t: tintinabar effect (doesn't work)
    s: sprint shoes effect (1.5x walk speed)
    m: moogle charm effect (no random battles)
    c: charm bangle effect (50% less random battles)
+ $11E0 r-----bb bbbbbbbb
    r: randomly pick this battle or one of the next 3 (see C2/30E8)
    b: battle index
+ $11E2 ???????? ??bbbbbb
    b: battle background index
$11E4 ----3210
    3: continue current music (no battle music)
    2: on the veldt (enable leap in status menu)
    1: on the veldt (enable leap in battle)
    0: gau can appear after battle
$11E5-$11EF -
$11F0-$11FF Used by Bank $C0 and $EE

```

\$1200-\$12FF: Copy of Direct Page

The field direct page (\$0000-\$00FF) gets copied here during battle and when on the world world map.

\$1300-\$14FF: Sound/Music RAM

See [Sound/Music RAM](#).

\$1500-\$15FF: Interrupt Code and CPU Stack

```

$1500-$1503 NMI Jump Code
$1504-$1507 IRQ Jump Code
$1508-$15FF CPU Stack

```

\$1600-\$1FFF: Save RAM

This data (0x0A00 bytes) is saved to SRAM when the game is saved. See [Field RAM](#) and [SRAM](#).

\$2000-\$3000: RAM Shared by Battle and Graphics Modules

```
    $2000 monster VRAM map index
+$2001 monster 1 index
+$2003 monster 2 index
+$2005 monster 3 index
+$2007 monster 4 index
+$2009 monster 5 index
+$200B monster 6 index
$200D-$2014 monster names (4 items, 2 bytes each)
$2015-$201C number of monsters alive for each name (4 items, 2 bytes
each)
    $201D ----4321 characters shown
    $201E --654321 monsters shown
    $201F Type of battle (0 = normal, 1 = back, 2 = pincer, 3 = side)
    $2020 Number of SwdTechs known - 1
    $2021 ATB Gauge Setting (0 = off, 1 = on)
    $2022 Character ATB Gauge % ($00 = empty, $FF = full, display
only)
    $2026 Character Morph Gauge % ($00 = not shown, $01 = empty, $FF =
full, display only)
    $202A Character Condemned Numbers ($00 = not shown, $01 = 00 ...
$64 = 99, display only)
    $202E-$205D Character Battle Commands (4 items, 4x3 bytes each)
    -----
        $202E command number
        $202F d???????
            d: command is disabled (gray)
    $2030 remcobsu Battle Command Targetting
        r: randomize target
        e: cursor defaults to enemy
        m: manual party select
        c: auto confirm
        o: auto select one party
        b: auto select both parties
        s: 0 = can target both sides, 1 = can target one side only
        u: 0 = cursor can't be moved, 1 = cursor moveable
    $205E-$208D Controlled Monster Battle Commands (4 items, 4x3 bytes each)
    $208E-$21C9 Character Spell Lists (4 * 79 items [1 esper + 54 spells +
24 lores], 4 bytes each)
    -----
        $0000 spell index
        $0001 msb set if spell is disabled (due to low mp)
```

```

    $0002 targetting data
    $0003 mp cost
    $208E esper
    $2092 spell
    $216A lore
    $257E-$267D Rages known
    $267E-$2685 Dances known
+-----+
|$2686-$2B85 Battle Inventory (256 + 8 items, 5 bytes each) |
+-----+
    $2686 Item Index
    $2687 u?tjws??
           u: not usable in battle
           t: can be thrown
           j: can be used with jump
           w: is a weapon
           s: is a shield
    $2688 abcdefgh Item Targetting Flags
           a: random target
           b: enemy target by default
           c: multi-target possible
           d: auto-accept default target
           e: target all enemies or all allies
           f: target all enemies and all allies
           g: target can't switch between enemies and allies
           h: target single ally or enemy
    $2689 Item Quantity
    $268A ----4321 Item Equippability (set if character can't equip
the item)
    -----
    $2B86 Character equipped right-hand data (4 items, 5 bytes each)
    $2B9A Character equipped left-hand data (4 items, 5 bytes each)
+-----+
    $2BAE-$2BCD Pending User Actions from Battle Menu (4 items, 8 bytes
each)
    $2BAE character slot
    $2BAF command
    $2BB0 attack
+ $2BB1 targets
    $2BB3 secondary command (for x-magic ???)
+ $2BB4 targets with cursors shown

    $2BCE-$2C6D Damage variables for each target, from $33D0 & $33E4 (8
items, 20 bytes each)
    $2C6E-$2D6D Battle script data (see $A0-$AF, 16 bytes each)
    $2D6E-$2E6D Battle script command queue (4 bytes each)
    $2E6E-$2E71 Characters with Genji Glove
    $2E72 Item Index
    $2E73 Item Use Flags (see $2687)
    $2E74 Item Targetting Flags (see $2688)
    $2E75 Item Quantity

```

\$2E76 Item Equippability

\$2E77

+\$2E78 char 1 current HP (buffer, for graphics)
+\$2E7A char 2 current HP (buffer, for graphics)
+\$2E7C char 3 current HP (buffer, for graphics)
+\$2E7E char 4 current HP (buffer, for graphics)
+\$2E80 char 1 max HP (buffer, for graphics)
+\$2E82 char 2 max HP (buffer, for graphics)
+\$2E84 char 3 max HP (buffer, for graphics)
+\$2E86 char 4 max HP (buffer, for graphics)
+\$2E88 char 1 current MP (buffer, for graphics)
+\$2E8A char 2 current MP (buffer, for graphics)
+\$2E8C char 3 current MP (buffer, for graphics)
+\$2E8E char 4 current MP (buffer, for graphics)
+\$2E90 char 1 max MP (buffer, for graphics)
+\$2E92 char 2 max MP (buffer, for graphics)
+\$2E94 char 3 max MP (buffer, for graphics)
+\$2E96 char 4 max MP (buffer, for graphics)
+\$2E98 char 1 current status 1 & 2 (buffer, for graphics)
+\$2E9A char 2 current status 1 & 2 (buffer, for graphics)
+\$2E9C char 3 current status 1 & 2 (buffer, for graphics)
+\$2E9E char 4 current status 1 & 2 (buffer, for graphics)
+\$2EA0 char 1 current status 3 & 4 (buffer, for graphics)
+\$2EA2 char 2 current status 3 & 4 (buffer, for graphics)
+\$2EA4 char 3 current status 3 & 4 (buffer, for graphics)
+\$2EA6 char 4 current status 3 & 4 (buffer, for graphics)
\$2EA8

\$2EAE-\$2F2D character graphics data (4 items, 32 bytes each)

\$2EAE character graphics index

\$2EAF-\$2EB4 character name

+\$2EB5 current HP (for graphics)
+\$2EB7 max HP (for graphics)
+\$2EB9 current MP (for graphics)
+\$2EBB max MP (for graphics)
+\$2EBD current status 1 & 2 (second buffer, for graphics)
+\$2EBF current status 3 & 4 (second buffer, for graphics)
+\$2EC1 current status 1 & 2 (for graphics)
+\$2EC3 current status 3 & 4 (for graphics)
\$2EC5 row (for graphics, 0 = front, 1 = back)
\$2EC6 actor index

\$2F2E Command Setting (0 = window, 1 = short)

\$2F2F --654321 Monsters that are present (graphics buffer)

\$2F30 character slot 1 equipment change flag

\$2F31 character slot 2 equipment change flag

\$2F32 character slot 3 equipment change flag

\$2F33 character slot 4 equipment change flag

```

    $2F34 menu window graphics index (wallpaper)
    ++$2F35 variable 0 for battle message display
    ++$2F38 variable 1 for battle message display
    ++$2F3B variable 2 for battle message display
    ++$2F3E variable 3 for battle message display
    $2F41 Enable Battle Timers (doesn't override "Wait" setting)
    +$2F42 Characters/Monsters that is about to get doom cast on them
(enemy roulette ???)
    $2F44 Monster targets with clear status (for graphics)
    $2F45 Enable Characters Running Animation (L+R pressed)
    $2F46 Characters that are targettable
    $2F47 Characters acting as enemies (KEFKA, etc.)
$2F48-$2F4B Auxiliary Battle Data
-----
    $2F48 spbnaaaa
        s: disable side attacks
        p: disable pincer attacks
        b: disable back attacks
        n: disable normal attacks (if all are disabled, normal is
used)

        a: appearance effects
            0 = pre-drawn
            1 = *poof of smoke (Laser Gun, Missile Bay, FlameEater)
            2 = fall from ceiling
            3 = *come from sides, individually (most battles)
            4 = *jump out of water (Piranha, Ultros)
            5 = *float from ceiling
            6 = *jump out of sand (Ultros on land)
            7 = come from sides, at the same time
            8 = fade in 1 (top to bottom)
            9 = fade in 2 (bottom to top)
            A = fade in 3 (materialize)
            B = fade in 4 (bottom left to top right, diagonally)
            C = pre-drawn (boss death)
            D = flash in
            E = Chadarnook (fade from one painting to the other)
            F = slow drop from above (final Kefka)
            * = characters enter before monsters (see C1/1420)
    $2F49 e--l-jf-
        e: enable character AI
        l: disable Leap
        j: disable Joker Doom
        f: disable fanfare
    $2F4A Character AI Index (data at $D0FD00)
        00 = no character AI
        01 = shadow at colosseum
        02 = kefka and terra flashback
        03 = vargas vs sabin at mt kolts
        04 = kefka vs sabin at imperial base
        05 = cyan vs. soldiers at imperial base
        06 = cyan vs. soldiers at imperial base (w/ big soldier)

```

```
07 = piranha battle
08 = kefka vs sabin
09 = kefka vs terra
0A = gau returning from veldt
0B = unused
0C = esper gate 1
0D = esper gate 2
0E = esper gate 3
0F = ultros
10 = esper gate 4
11 = espers and airship
12 = kefka vs esper
13 = esper gate 6
14 = kefka vs leo
$2F4B c-mmmtvr
c: continue playing current music
m: music index
  0 = normal (battle theme)
  1 = boss (the decisive battle)
  2 = atma weapon (the fierce battle)
  3 = returners
  4 = factory train (save them!)
  5 = final battle (Dancing Mad #1)
  6 = none, continue playing current music
  7 = none, continue playing current music
t: disable attack type message (back, pincer, side) &
disable preemptive attacks
v: formation won't appear on the veldt
r: trying to run with L+R has no effect (for event battles)
+$2F4C Characters/Monsters that can't be targetted (used by Battle
Event Command $13, Zinger, running away)
+$2F4E Characters/Monsters that can be targetted (used by Battle
Event Command $13)
+$2F50 Character/Monster facing directions (1 = right, 0 = left)
$2F52
$2F53 horizontal flip for characters that are muddled
$2F54 horizontal flip for targets being controlled (by Relm)
```

\$3000-\$4000 RAM Used by Battle Module Only

```
$3000 TERRA character slot (#$FF if TERRA is not in the party)
$3001 LOCKE character slot
$3002 CYAN character slot
$3003 SHADOW character slot
$3004 EDGAR character slot
$3005 SABIN character slot
$3006 CELES character slot
$3007 STRAGO character slot
```

```

$3008 RELM character slot
$3009 SETZER character slot
$300A MOG character slot
$300B GAU character slot
$300C GOGO character slot
$300D UMARO character slot
$300E -
$300F -
+$3010 pointer to character slot 1 data (+$1600)
+$3012 pointer to character slot 2 data (+$1600)
+$3014 pointer to character slot 3 data (+$1600)
+$3016 pointer to character slot 4 data (+$1600)
+$3018 #$0001 character 1 mask
+$301A #$0002 character 2 mask
+$301C #$0004 character 3 mask
+$301E #$0008 character 4 mask
+$3020 #$0100 monster 1 mask
+$3022 #$0200 monster 2 mask
+$3024 #$0400 monster 3 mask
+$3026 #$0800 monster 4 mask
+$3028 #$1000 monster 5 mask
+$302A #$2000 monster 6 mask
+$302C pointer to character 1 spell list ($208E)
+$302E pointer to character 2 spell list ($21CA)
+$3030 pointer to character 3 spell list ($2306)
+$3032 pointer to character 4 spell list ($2442)
$3034-$3069 Master Spell List (1 byte per spell)
$306A-$3083 Master Lore List (1 byte per lore)
$3084-$3183 Pointer to each spell in master spell list (1 byte per
attack, used to get modified mp cost for character spells)
$3184-$3203 Command List (pointers to command/attack queue at $3420)
    NOTE: a command list slot equals itself if it is the last
pending action for a character/monster
        otherwise, it equals the next pending action to be
executed after this one
-----
-----
$3204 prsxcamj Character Update Flags
    p: update enabled spells/espers
    r: remove all advance wait actions
    s: condemned counter needs to be started
    x: condemned counter needs to be stopped
    c: update enabled commands
    a: ATB gauge constant needs to be updated (haste/slow)
    m: character just morphed or reverted - update menu, etc.
    j: character just jumped - remove all actions from action
queue
$3205 j????al? (init $FF, flags are active when clear)
    j: target is executing an action and can't jump
    a: air anchor effect
    l: near-fatal spell has been cast this battle

```

```
+ $3218 ATB Gauge % ($0001 = empty, $0000 = full)
  $322C Advance Wait Duration ($FF = disabled)
  $322D dnssssss Special Attack Data
    d: can't miss
    n: no damage
    s: special attack index ($00-$1F: status, $20-$2F: damage
increment, $30: drain HP, $31: drain MP, $32+: remove rfect status)
  $3240 AI No. of Times to Loop ???
  $3241 AI Loop Counter ???
+ $3254 Pointer to Start of AI Script
+ $3268 Pointer to Start of Counterattack AI Script
  $327C Character/Monster that just attacked you
  $327D -
  $3290 Last Target to Attack you
  $3291 Last Target to Cast a Spell on you
  $32A4 Last Target to Use an Item on you
  $32A5 Last Target to use an element on you ???
  $32B8 Target you Control (invalid if msb set)
  $32B9 Target Controlling you (invalid if msb set)
  $32CC Pointer to Next Pending Action in Command List, $FF if no
actions pending (+$3184)
  $32CD " " for Counterattacks
  $32E0 Last Target that Targetted you
  $32E1 Battle Background Index for Dance
  $32F4 Obtained Item index (steal/metemorph, $FF is no item)
  $32F5 "Targetting" target
  $3308 Steal Item 1 (12.5%)
  $3309 Steal Item 2 (87.5%)
  $331C Blocked Status 1
  $331D Blocked Status 2
  $3330 Blocked Status 3
  $3331 Blocked Status 4
  $3344 Esper Index
  $3345 Esper Targetting Data (from spell data byte 0)
  $3358 Seize target (invalid if msb set)
  $3359 Seize attacker (invalid if msb set)
  $336C Love Token target (invalid if msb set)
  $336D Love Token attacker (invalid if msb set)
+ $3380 Monster Index for Name Display
  $3394 Charm target (invalid if msb set)
  $3395 Charm attacker (invalid if msb set)
+ $33A8 Monster Index (set for Gau when using rage)
  $33BC
  $33BD
+ $33D0 nmddddd dddddd Damage Taken
    n: negative
    m: miss
    d: damage taken
+ $33E4 nmddddd dddddd Damage Healed
```


n: negative
m: miss
d: damage healed

\$33F8 Zinger attacker
\$33F9 Zinger target
+\$33FA Target that is Doom Gaze
+\$33FC Target that ???
+\$33FE Target that ???
\$3400 Current Spell index (\$FF = no spell)
\$3401 Battle message index
\$3402 Quick Counter
\$3403 Target that is Seized
\$3404 Target that is Quick
\$3405 Additional Attacks from Launcher and Super Ball ??
\$3406 Currently acting character/monster (used for multiple actions by one attacker)
\$3407 Currently counterattacking character/monster (used for multiple actions by one attacker)
+\$3408 Characters/Monsters that were revived/summoned (AI command \$F5)
\$340A Immediate Action (pointer to command list, +\$3184)
\$340B-\$340F -
\$3410 Last Spell Cast
\$3411 Last Item Used
\$3412 Attack Name Type (disabled if msb set)
0: normal
1: item
2: esper
3: ???
4: swdtech
5: command (GP rain)
6: monster special attack
7: joker doom [slot]
8: blitz
\$3413 Primary Command Index (holds fight command if a spell gets cast as a secondary attack from a weapon)
\$3414 Enable Damage Modification (randomness, defense stat, shell/safe, defending, row, morph, friendly fire)
\$3415 Randomize Targets ??
+\$3416 Interceptor Character/Monster
+\$3417 Character using Sketch
\$3419 Black Belt Targets ??
\$341A Enable Counterattacks
\$341B -
\$341C Enable Weapon's Spell Animation
\$341D Enable Weapon Animation
\$341E -
\$341F -

```
-----
$3420-$351F Command/Attack Queue (pointer from $3184)
$3520-$361F Targets Queue (pointer from $3184)
$3620-$371F MP Cost Queue (pointer from $3184)
$3720-$381F Advance Wait Queue (ready stance, jump pre-animation,
pointer at $3A64)
$3820-$391F Action Queue (pointer at $3A66)
$3920-$3A1F Counterattack Queue (executed before advance wait and
actions, pointer at $3A68)
-----
-----
+$3A20 Character 1 Actor mask (used for item equipability, 0 for
actor >= 0x0E)
+$3A22 Character 2 Actor mask
+$3A24 Character 3 Actor mask
+$3A26 Character 4 Actor mask
$3A28 Battle Script Command Byte 1
$3A29 Battle Script Command Byte 2
$3A2A Battle Script Command Byte 3
$3A2B Battle Script Command Byte 4
-----
-----
$3A2C Current AI Command
$3A2D AI Command Data Byte 1
$3A2E AI Command Data Byte 2
$3A2F AI Command Data Byte 3
+$3A30 Current Targets ???
+$3A32 Pointer to Current Battle Script Data (+$2C6E)
$3A34 Counter for Damage Variables (when $33D0 & $33E4 copied to
battle gfx buffer at $2BCE)
$3A35 -
+$3A36 Golem HP (starts at caster's HP, $0000 means no golem)
$3A38 Characters that *just* escaped (gets cleared after they run)
$3A39 Characters that have lef the battle (sneezed away, ran away,
etc.)
$3A3A Monsters that have died/escaped
$3A3B Run Difficulty
+$3A3C Targets that are invincible
+$3A3E Battle Turn Counter (used for desperation attacks, see
C2/1136, C2/15C8)
+$3A40 Enemy Characters (Gau Veldt/Shadow Colosseum)
+$3A42 ??? Enemy Characters (bitmask)
+$3A44 Battle Counter (increments once every 16 frames)
+$3A46 FEDCBA98 76543210
F: monsters go back to full HP/MP
4: ignore pending actions (set for sonic dive)
2: clear all pending actions when GAU appears on the veldt
1: ??? (set for joker doom and seize hp drain)
+$3A48 Targets missed due to no statuses changing or checks in
```

special effect

- +\$3A4A Targets with changed status
- +\$3A4C Max MP cost (based on character's current mp remaining)
- +\$3A4E Backup Targets (in case all targets die and there are still

attacks being made)

- +\$3A50 -
- +\$3A52 -
- +\$3A54 Characters/Monsters getting hit in the back
- +\$3A56 Characters/Monsters that have died
- +\$3A58 Characters with Menus that need to be updated ???
- +\$3A5A Missed Targets
- +\$3A5C Targets affected by "Mind Blast" (characters only)
- +\$3A5E -
- +\$3A60 -
- +\$3A62 -
- \$3A64 Advance Wait Queue Start (+\$3720)
- \$3A65 Advance Wait Queue End
- \$3A66 Action Queue Start (+\$3820)
- \$3A67 Action Queue End
- \$3A68 Counterattack Queue Start (+\$3920)
- \$3A69 Counterattack Queue End
- +\$3A6A ??? Pointer (+\$2BAE)
- \$3A6C Previous Frame Counter Value
- \$3A6D 76543210 Relic Effects 2 (party)
 - 7: jump continuously (dragon horn)
 - 6: steal -> capture (thief glove)
 - 5: slot -> gp rain (coin toss)
 - 4: sketch -> control (fakemustache)
 - 3: magic -> x-magic (gem box)
 - 2: fight -> jump (dragoonboots)
 - 1: prevent back/pincer attacks (back guard)
 - 0: increase pre-emptive attack rate (gale hairpin)
- \$3A6E End of Battle Special Event Index (pre-multiplied by 2, see C2/48F5)
- \$3A6F Default Battle Background for Dance (see C2/178E, C2/4DE4)
- \$3A70 Number of attacks
- \$3A71 ??? Battle Script Command Queue Pointer
- \$3A72 Battle Script Command Queue Pointer
- \$3A73 Number of Monsters at Start of Battle
- +\$3A74 Characters/Monsters that are alive (bitmask)
- \$3A76 Number of characters that are alive
- \$3A77 Number of enemies that are alive
- +\$3A78
 - \$3A7A Command index
 - \$3A7B Attack index
 - \$3A7C Command index
 - \$3A7D Target index ??? used item index ??? blitz index ???
 - \$3A7E -
 - \$3A7F -
 - \$3A80 Number of known blitzes
 - \$3A81 - (used when \$3A82 is loaded in 16-bit mode)

```

    $3A82 Golem block targets (disabled if negative)
    $3A83 Interceptor block targets (disabled if negative)
++$3A84 Lores learned this battle
    $3A87 Number of Lores Known
    $3A88 Characters that got Bababreath'd or Possessed ???
    $3A89 Enable Random Weapon Spellcast
++$3A8A Engulfed Targets
    $3A8C Characters that Obtained an Item (steal/metamorph, see
C2/62C7)
    $3A8D Characters present at start of battle (used to check if
everyone got engulfed)
    $3A8E Jump continuously (dragon horn)
    $3A8F Enable "Wait" Battle Mode
    $3A90 Battle Speed Constant = 255 - (battle_speed * 24) [231, 207,
183, 159, 135, 111] fast to slow (used to set advance wait constant $3AC8
for monsters)
    $3A91 Counter for checking status counters (low 4 bits are current
character/monster, has different effects for values 10-15, see C2/5A83)
    $3A92 -
    $3A93 Character That used Rage
    $3A94 -
    $3A95 Doesn't allows the battle to end (used by AI script command
$F5 to hide the last monster) action in progress/pending
    $3A96 Flag for killing all monsters immediately (unused, debug
mode ???)
    $3A97 character are on auto-pilot (colosseum)
++$3A98 AI is doing a counterattack (only execute until the first
"wait until next turn", "end if", or "end of script")
    $3A9A Number of Rages Known
    $3A9B Which tools are owned, used for picking randomly if berserk,
colosseum etc.
    $3A9C-$3A9F -
+-----+
|$3AA0-$3F1F Character/Monster Data|
+-----+
    $3AA0 76543210
        7: allow battle menu to open (cleared when character/monster
is seized)
        6: psyche was just cleared
        5: advance wait counter just triggered (never used ???)
        4: something with condemned
        3: action counter just triggered (ATB gauge is stopped)
        2: ogre nix can't break
        1: skip advance wait
        0: target is present
    $3AA1 76543210
        7: something with regen/poison/seizure (DoT)
        6: pending action from run/control/psyche/seize (triggers
subroutine at C2/0977)

```

```

5: row (0 = front, 1 = back)
4: target has a pending DoT action
3:
2: protection from instant death
1: defense mode (used def. command)
0: pending action goes directly to action queue
+$3AB4 Advance Wait Counter
+$3AC8 ATB Gauge Constant (see C2/09D2)
$3ADC Slow/Normal/Haste Counter (decrement status counters on
overflow)
$3ADD Slow/Normal/Haste Constant (32/64/84)
$3AF0 Counter for damage over time (poison, regen, seize,
phantasm)
$3AF1 Stop Counter
$3B04 Morph Gauge ($00 = not shown, $01 = empty, $FF = full)
$3B05 Condemned Number ($00 = not shown, $01 = 00 ... $64 = 99)
$3B18 Level
$3B19 Speed
$3B2C Vigor * 2
$3B2D Speed (dummy)
$3B40 Stamina
$3B41 Mag.Pwr * 1.5
$3B54 255 - (Evade * 2) + 1
$3B55 255 - (MBlock * 2) + 1
$3B68 Bat.Pwr (main hand)
$3B69 Bat.Pwr (off hand)
+$3B7C Hit Rate
$3B90 Attack Elemental
$3B91 Attack Properties
$3BA4 Main Hand Weapon Properties (Defense for Monsters)
$3BA5 Off Hand Weapon Properties (Magic Defense for Monsters)
$3BCC Absorbed Elements
$3BCD Immune Elements
$3BE0 Weak Elements
$3BE1 Halved Elements
+$3BF4 Current HP
+$3C08 Current MP
+$3C1C Max HP
+$3C30 Max MP
$3C44 Relic Effects 1
$3C45 Relic Effects 2
$3C58 Relic Effects 3
$3C59 Relic Effects 4
$3C6C Equipment Status 2
$3C6D Equipment Status 3
$3C80 c?ksruph Special Status 2
c: can't control
?: special event ???
k: can't sketch
s: can't scan
r: can't run

```

u: can't suplex
p: first strike (has an action at the very beginning of battle)
h: harder to run
\$3C81 Special Attack Animation Index
\$3C94 pppiiii Metamorph Info
p: metamorph probability (0 = 255/256, 1 = 3/4, 2 = 1/2, 3 = 1/4, 4 = 1/8, 5 = 1/16, 6 = 1/32, 7 = 0)
i: metamorph item set
\$3C95 ui-h-n-m
u: undead
i: imp critical ??
h: human
n: don't display name
m: dies at 0 MP
\$3CA8 Main Hand Item Index
\$3CA9 Off Hand Item Index
\$3CBC sssmpbb Main Hand
\$3CBD sssmpbb Main Hand
s: off hand special effect
m: can block magic attacks
p: can block physical attacks
b: block graphic (0 = Dagger, 1 = Sword, 2 = Shield, 3 = Zephyr Cape)
\$3CD0 Relic 1
\$3CD1 Relic 2
\$3CE4 ----zhSD Physical Block Graphics
\$3CE5 ----zhSD Magical Block Graphics
z: Zephyr Cape
h: Shield
s: Sword
d: Dagger
\$3CF8 Number of Available Magic Spells (including lores?)
\$3CF9 Psyche Counter
+\$3D0C AI Script Loop Address
+\$3D20 AI Script Loop Address (counterattack)
\$3D34 Main Hand Weapon Spell Index
\$3D35 Off Hand Weapon Spell Index
\$3D48 Command you were attacked with
\$3D49 Spell you were attacked with
\$3D5C Item you were attacked with
\$3D5D Element you were attacked with
\$3D70 Run Counter
\$3D71 Run Probability
+\$3D84 XP
\$3D98 Gold
+\$3DAC Character/Monster Variable (bit 7 set after using seize)
+\$3DC0 Character/Monster Timer (how many frames the monster/character has been alive)

```

$3DD4 Status to Set 1
$3DD5 Status to Set 2
$3DE8 Status to Set 3
$3DE9 Status to Set 4
$3DFC Status to Clear 1
$3DFD Status to Clear 2
$3E10 Status to Clear 3
$3E11 Status to Clear 4
$3E24 DoT Damage Multiplier (double damage every turn, max x7)
$3E25 -
$3E38 -
$3E39 -
$3E4C p--odcer Special Status 1
      p: piranha status (thing where enemies come in and out of
battle after you kill them)
      o: poison counter just triggered
      d: regen/seize/phantasm counter just triggered
      c: character runic
      e: enemy runic (Speck)
      r: retort
$3E4D -p----oc
      p: phantasm status (DoT similar to seize, goes away when you
die or get petrified)
      o: overcast status (turns you into a zombie when you die)
      c: use control battle menu (currently controlling something)
$3E60 Preliminary Current Status 1
$3E61 Preliminary Current Status 2
$3E74 Preliminary Current Status 3
$3E75 Preliminary Current Status 4
$3E88 -
$3E89 -
$3E9C -
$3E9D -
-----
$3EB0-$3ED3 Global Battle Variables
-----
$3EB0 Local Battle Variable 1
$3EB1 Local Battle Variable 2
$3EB2 Local Battle Variable 3
$3EB3 Local Battle Variable 4
$3EB4 - (same as $1DC9)
$3EB5 - (same as $1DCA)
$3EB6 - (same as $1DCB)
$3EB7 - (same as $1DCC)
$3EB8 - (same as $1DCD)
+$3EB9 abcdefgh Conditional Battle Flags (same as +$1DCE)
      a: if set, program compares current battle index with
          battle index at CF3780,X. if equal, battle index
          is changed to battle index at CF3782,X. (used with
GtBehemoth/SrBehemoth, M-TekArmor)
      b-h: same as a

```

```
$3EBB ----mtf (same as $1DD0)
      m: permanent morph (for Phunbaba battle)
      t: morph lasts twice as long (set after Phunbaba battle)
      f: magic only (fanatic's tower)
$3EBC ztrbemsg (same as $1DD1)
      z: zone eater just ate you
      t: timers are shown in menu and battle
      r: ran out of time (before emperor's banquet)
      b: ran away from battle (before emperor's banquet)
      e: espers have been acquired
      m: morph is available
      s: enables scene with LOCKE and EDGAR if TERRA uses magic
(battle event 6)
      g: game over after battle ends
$3EBD --ums-gd (same as $1DD2)
      u: LOCKE is wearing soldier uniform
      m: LOCKE is wearing merchant clothes
      s: SHADOW won't leave after battle
      g: GAU has been obtained
      d: Doom Gaze has been defeated
+$3EBE Doom Gaze's HP (same as +$1DD3)
$3EC0 Battles fought with the Cursed Shield (same as $1DD5)
$3EC1 - (same as $1DD6)
$3EC2 - (same as $1DD7)
$3EC3 - (same as $1DD8)
$3EC4 - (same as $1DD9)
$3EC5 - (same as $1DDA)
$3EC6 - (same as $1ddb)
$3EC7 - (same as $1DDC)
$3EC8 Elements Nullified by Forcefield
$3EC9 number of targets
$3ECA Number of different types of monsters in combat (alive)
$3ECB-$3ED3 unused local battle variables
-----
+$3ED4 Battle index

$3ED8 slot 1 actor index (character properties, can go up to 63)
$3ED9 slot 1 character index (character graphics, can only go up
to 23)
$3EDA slot 2 actor index
$3EDB slot 2 character index
$3EDC slot 3 actor index
$3EDD slot 3 character index
$3EDE slot 4 actor index
$3EDF slot 4 character index
$3EE0 Enable End of Battle Special Event (see C2/47ED)
$3EE1 Data Byte for Final Battle Scrolling (battle script command
$12, see C2/4AB3 & C2/2520)
$3EE2 Morphed Character ($FF if no one is morphed)
```



```

$3EE3 -
$3EE4 Current Status 1
$3EE5 Current Status 2
$3EF8 Current Status 3
$3EF9 Current Status 4
$3F0C Reflect Counter
$3F0D Freeze Counter
+$3F20 Last Command/Attack
+$3F22 Last Targets
+$3F24 Last Command/Attack (second attack w/ Gem Box), init #$12
(mimic)
+$3F26 Last Targets (second attack w/ Gem Box), init #$12 (mimic)
$3F28 init #$12 (mimic)
+$3F2C Characters/Monsters that are temporarily out of combat
(jump, seize) ???
$3F2E ----1234 Characters that have an esper equipped
$3F2F ----1234 Characters that have used a desperation attack this
battle
+$3F30 Morph Counter (high byte goes to $3B04)
+$3F32 Morph Counter Speed

+-----+
| $7E3F44-$7E3F53 Battle Data |
+-----+
+$3F44 mmmmbbbb bbbppppp
      m: graphic mold index
      b: bg1 monsters
      p: monsters present
$3F46 Monster 1 ID
$3F47 Monster 2 ID
$3F48 Monster 3 ID
$3F49 Monster 4 ID
$3F4A Monster 5 ID
$3F4B Monster 6 ID
$3F4C xxxxyyyy
      x: Monster 1 X Position
      y: Monster 1 Y Position
$3F4D xxxxyyyy
      x: Monster 2 X Position
      y: Monster 2 Y Position
$3F4E xxxxyyyy
      x: Monster 3 X Position
      y: Monster 3 Y Position
$3F4F xxxxyyyy
      x: Monster 4 X Position
      y: Monster 4 Y Position
$3F50 xxxxyyyy
      x: Monster 5 X Position
      y: Monster 5 Y Position
$3F51 xxxxyyyy
      x: Monster 6 X Position

```

```
        y: Monster 6 Y Position
$3F52 --abcdef
        a: MSB of Monster 1 Index
        b: MSB of Monster 2 Index
        c: MSB of Monster 3 Index
        d: MSB of Monster 4 Index
        e: MSB of Monster 5 Index
        f: MSB of Monster 6 Index
$3F53 -
```

\$4000-\$FFFF RAM Used by Battle Graphics Module Only

```
    $4000 Current Character (for battle menu order)
    $4001 Character 1 Battle Menu Order (0 = player is selecting a
command for this character, 1 = character is next in line, $FF = character
not active)
    $4002 Character 2 Battle Menu Order
    $4003 Character 3 Battle Menu Order
    $4004 Character 4 Battle Menu Order
    $4005 Item Index ???
    $4006 Item Quantity ???
    $4007
    $4008
    $4009
    $400A

    HDMA #0 Data
    -----
    $43F5-$4650 BG1 Scroll HDMA Data (battlefield region) -> +$210D
    $4651-$4774 BG1 Scroll HDMA Data (menu region) -> +$210D

    HDMA #1 Data
    -----
    $4775-$49D0 BG2 Scroll HDMA Data (battlefield region) -> +$210F
    $49D1-$4AF4 BG2 Scroll HDMA Data (menu region) -> +$210F

    HDMA #2 Data
    -----
    $4AF5-$4D50 Current BG3 Scroll HDMA Data (battlefield region) -> +$2111
    $4D51-$4E74 Current BG3 Scroll HDMA Data (menu region) -> +$2111
    $4E75-$4F74 BG3 Scroll HDMA Data (default)
    $4F75-$5094 BG3 Scroll HDMA Data
    $5095-$51D4 BG3 Scroll HDMA Data (item/magic character select)
    $51D5-$53D4 BG3 Scroll HDMA Data (list)
    $53D5-$5474 BG3 Scroll HDMA Data (esper)
    $5475-$5534 BG3 Scroll HDMA Data (weapon change)

    $55D5-
```

```
$56D5-      BG3 Tile Data Buffer ???

          $5755
          $575A

          $5760

$57D5-      Attack name

$5859-
$5871-

$5AD5-
$5DDA      swdtech menu bg tile data ???

$5E4D-$5ECC graphics ???

$5F6D-$5FAC tornado data
-----
          $5F6D
          $5F7D
          $5F8D
+$5F8E tornado y position
          $5F9D
+$5F9E tornado x position
$602D-$607C items received in battle (16 items, 5 bytes each, see $2686)
          $607E possible character targets
          $607F possible monster targets
          $6080 character targets hit
          $6081 monster targets hit
          $6082
          $6083
          $6084 Number of active threads (for animation command $9F)
$6085-$6094 palette shift counters
          $6095 BG1 scroll horizontal amplitude
          $6096 BG1 scroll vertical amplitude
          $6097
          $6098
          $6099 BG1 scroll horizontal frequency
          $609A BG1 scroll vertical frequency
          $609B BG2 scroll horizontal amplitude
          $609C BG2 scroll vertical amplitude
          $609D
          $609E
          $609F BG2 scroll horizontal frequency
          $60A0 BG2 scroll vertical frequency
          $60A1 BG3 scroll horizontal amplitude
          $60A2 BG3 scroll vertical amplitude
          $60A3
          $60A4
          $60A5 BG3 scroll horizontal frequency
```

```

$60A6 BG3 scroll vertical frequency
$60A7 Hide BG1 animation graphics
$60A8 Hide BG3 animation graphics
$60A9 Multi-target delay for animation threads
$60AA Shared Sprite and Extra Threads
$60AB Monsters shown ???
$60AC Pause BG1 Animation Threads
$60AD Pause BG3 Animation Threads
$60AE SwdTech Hit Index (0..3)
$60AF
$60B0
$60B3-$6132 graphics to display
$613D attack from battle script command 6 param 2 [Character
Targets]
$613E ?e?????? [Monster Targets]
        e: attack is hitting monster if set, characters if cleared
$613F character/monster (for bg1/bg3 thread starting position)
$6140 current character/monster (for thread init)
$6141 current character/monster (for damage numerals)
$6142 (1 byte per character/monster)
+$614C XY position ??
+$614E XY position ??
+$6150 Difference Vector Signs (+/-, +/-)
+$6152 Difference Vector Absolute Value (|dx|, |dy|)
+$6154 Triangle XY Position (absolute screen position)
$6156 Triangle Size (bounding circle diameter, in pixels)
$6157 Triangle Rotation Angle ($00 = down, $80 = up)
+$615B Triangle Vertex 1 XY Position [relative, ($80,$80) is center
of triangle]
+$615D Triangle Vertex 2 XY Position
+$615F Triangle Vertex 3 XY Position
+$6161 Triangle Top Vertex XY Position (lowest Y coordinate)
+$6163 Triangle Left Vertex XY Position
+$6165 Triangle Right Vertex XY Position
-----
$6167 Animation BG1 Palette/Esper Palette Index ???
$6168
+$6169 Pointer to Esper Palette (+$D27820), also used for sketched
monster palette
$616B Esper Graphics Width
$616C Esper Graphics Height
-----
$616D Counter for word lengths (used when writing words in long &
short battle messages)
$616E Character 1 palette index (saved)
$616F Character 2 palette index (saved)
$6170 Character 3 palette index (saved)
$6171 Character 4 palette index (saved)
$6172 Monster 1 palette index (saved)

```

```

$6173 Monster 2 palette index (saved)
$6174 Monster 3 palette index (saved)
$6175 Monster 4 palette index (saved)
$6176 Monster 5 palette index (saved)
$6177 Monster 6 palette index (saved)

$617E ??????vh Monster 1
      v: flip vertical (unused)
      h: flip horizontal (if controlled)

$6180 ??????vh Monster 1
      v: flip vertical
      h: flip horizontal

$618A Monster Weapon Attack
$6191 --123456 monsters ???
$6192 ----1234 characters that are visible (AI characters ???)
$6193 Characters not acting as enemies ???
$6195
$6196 Flash Screen (critical)
$6197
$6198 Player 2 controls character 1
$6199 Player 2 controls character 2
$619A Player 2 controls character 3
$619B Player 2 controls character 4
$619C ----4321 Characters with Vertical Mirror Image
$619D --123456 monsters with vertical mirror image
$619E ATB gauge value ($00 = empty, $FF = full)
$61A2 morph gauge value ($00 = empty, $FF = full)
$61A6 condemned number value
$61AA --123456 monsters present (from battle data)
$61AB --123456 monsters shown
$61AC ----1234 characters shown
$61AD ----1234 characters without hide status (for graphics/menu)
$61AE Disable Character Stepping Forward to Attack (1 byte per
character)
$61B2 ??? Facing Direction

$61B6-$6235 Character Graphics Data (4 items, 32 bytes each)
-----
$61B6
+$61B7 Character X Position (left)
+$61B9 Character Y Position (top)
$61BB Character Graphical Action
$61BC ----ppp-
      p: Palette Index
$61BD --oo---m
      o: sprite priority
      m: MSB of graphic index (unused ???)
$61BE vh-----
      v: vertical flip

```

h: horizontal flip
\$61BF Character Tertiary Graphic Action (use if \$61C0 = 0)
\$61C0 Character Secondary Graphic Action (use if \$61C1 = 0)
00: unused
01: dead, horizontal
02: walking down
03: walking back
04: walking forward
05: walking up
06: facing forward
07: attacking with back hand
08: attacking with front hand
09: casting
0A: critical
0B: ready
0C: hit
0D: dead, vertical
0E: blinking, facing down
0F: blinking, facing back
10: blinking, facing forward
11: winking (mirrored), facing down
12: winking, facing down
13: raising arms, facing down
14: raising arms, facing back
15: raising arms and jumping, facing forward
16: raising arms, facing up
17: glitchy
18: arms up, facing down
19: arms up, facing back
1A: arms up, facing forward
1B: arms up, facing up
1C-1F: dead, horizontal
20: wagging finger
21: wagging finger, mirrored
22: shaking head
23: laughing
24: dead, horizontal
25: spinning, confused
26-3F: glitchy
\$61C1 Character Primary Graphic Position (not animated)
00: Facing Forward
01-03: Walking Down
04-06: Walking Forward (map-style)
07: Jumping, Hands Up
08-09: Casting
0A: Dead, vertical
0B: Eyes Closed, Facing Down
0C: Winking, Facing Down
0D: Eyes Closed, Facing Forward

```

0E-10: Walking Up
11-12: Walking Forward (battle-style)
13: Walking Forward, Hands Up
14: Kneeling
15: Ready to Attack
16: Got Hit
17: Facing Down, Hands Up
18: Facing Up, Hands Up
19: Glitchy
1A-1B: Laughing, Facing Down
1C: Surprised
1D: Facing Down, Looking Forward
1E-1F: Wagging Finger
20-2F: Glitchy
30-4F: Same as 00-1F, mirrored horizontally
$61C2 Character Graphic Action Counter (increments every frame)
$61C3 Character Current Graphic Action
$61C4 Previous Graphic Action ???
+$61C5 Character X Offset (signed)
+$61C7 Character Y Offset (for animation threads, signed)
+$61C9 Target value - Character X/Y Angle from battle type + back
row ($0100 = vertical, $0180 = 45 degrees to the right)
+$61CB Current value (same as +$61C9, update x position if
different)
$61CD Counter for vanish status palette
$61CE
$61CF Character Status Sprite
00: none
01: poison bubbles
02: muddle swirl
03: dark eyes
04: berserk/rage bubbles
05: mute bubble
06: psyche (sleep) Z's
$61D0 Double speed graphic actions
$61D1
+$61D2 Character Y Offset (for jumping, signed)
+$61D4 Character X Offset (for animation threads, signed)

$6236-$6245 Saved Character Positions (4 items, 4 bytes each)
-----
+$6236 X coordinate
+$6238 Y coordinate

$6246-$6255 AI Character Positions ??? (4 items, 4 bytes each)
-----
+$6246 AI character X position
+$6248 AI character Y position
+$6266 Buttons being pressed (for blitz input)
+$6268 Buttons being pressed (that weren't pressed last frame, for
blitz input)

```

\$626A Animation Index (spell index, item index + 1, or \$5B/\$5C for atma weapon 2/3)

\$626B-\$6272 Weapon Animation Data (8 bytes from \$ECE400 for characters or \$ECE6E8 for monsters)

\$626B Weapon Animation Script (right hand)
\$626C Weapon Animation Script (left hand)
\$626D Weapon Palette
\$626E Hit Animation Script
\$626F Hit Palette
\$6270 tsssssss
 t: star/boomerang/gambler weapons (thrown)
 s: weapon animation init
 0 = normal
 1 = star-type & gambler-type (shadow sprites)
 2 = boomerang-type
 3 = atma weapon 3 (shadow sprites)
 4 = atma weapon 1 & 2

t----abf
 t: thrown animation
 a: atma weapon graphics
 b: boomerang animation
 f: disable screen flash

\$6271 Sound Effect
\$6272 -

\$6273-\$6280 Animation Data (14 bytes, copied from \$D07FB2)

+\$6273 sggggggg gggggggg
 s: Sprite script disabled (load graphics only)
 g: Animation Sprite Script Number (\$FFFF if unused)
+\$6275 sggggggg gggggggg
 s: BG1 script disabled (load graphics only)
 g: Animation BG1 Script Number (\$FFFF if unused)
+\$6277 sggggggg gggggggg
 s: BG3 script disabled (load graphics only)
 g: Animation BG3 Script Number (\$FFFF if unused)
\$6279 Animation Sprite Palette (\$00 if unused)
\$627A Animation BG1 Palette
\$627B Animation BG3 Palette
\$627C Animation Sound Effect Index
\$627D tsssssss
 t: bg1 target (instead of bg1 graphics)
 s: Animation Init Function (Points to Function at C2/E8D8)
+\$627E sggggggg gggggggg
 s: 0 = extra attacker sprite thread, 1 = esper
 g: Esper Animation Graphics (used by esper animations, et

al.)


```

$6280 Multi-Target Delay (adjusted for animation speed)
-----
$6281 Play ching sound effect (SPC command $2C)
$6282
$6283 Enable Wavy Battle BG (desert)
$6284
$6285 h-----s
      h: horizontal shaking only
      s: enable screen shaking (battle bg)
$6286 Character 1 can't change equipment during battle
$6287 Character 2 can't change equipment during battle
$6288 Character 3 can't change equipment during battle
$6289 Character 4 can't change equipment during battle
$628A Enable Flashback Mode
$628B disable battle menu
$628C Enable seamless scripts (i.e. don't wait 4 frames after
animation is done, see C1/9558)
$628D Victory fanfare is happening

$628F Timer Frame Counter (counts 60 frames)
+$6290 Timer Tile Data (minute 10s place)
+$6292 Timer Tile Data (minute 1s place)
+$6294 Timer Tile Data (colon)
+$6296 Timer Tile Data (second 10s place)
+$6298 Timer Tile Data (second 1s place)
$629A
$629B char 1
$629C char 2
$629D char 3 (song index ???)
$629E char 4
$62A4
+$62A5
+$62A7
$62A9
$62AA Battle Menu Strip Counter (see C1/04CA)
$62AB Pause Battle
$62AC
$62AD bgriiii
$62AE bgriiii Fixed Color for Backdrop Gradients
$62AF Monsters that are currently shown as BG1 ???
$62B0 Esper thread 1 sprites are shown below characters/monsters
$62B5 Enable roulette cursor (used by enemy enemy)
$62B6
$62B7 ??? Counter
$62B8
$62B9
$62BA ??? Counter
+$62BB
$62BD Hide Characters (during esper attack)
$62BE Hide Cursor Sprites (during esper attack)
$62BF Character color palettes are up to date

```

```
$62C0 Ignore Block Animations
$62C1
$62C2 Enable Monster 1 Imp Graphics
$62C3 Enable Monster 2 Imp Graphics
$62C4 Enable Monster 3 Imp Graphics
$62C5 Enable Monster 4 Imp Graphics
$62C6 Enable Monster 5 Imp Graphics
$62C7 Enable Monster 6 Imp Graphics
$62C8 BG1 Tile Data Quadrant (0 = top-left 16x16)
$62C9 BG3 Tile Data Quadrant (0 = top-left 16x16)
+$62CA Active Character (menu command select, used for arrow
indicator)
$62CC Char 1 is controlling a monster
$62CD char 2 is controlling a monster
$62CE char 3 is controlling a monster
$62CF char 4 is controlling a monster
$62D0
$62D1
$62D2 Sprite priority data is up to date
$62D3 Sprite index with echo effect
$62D4 Enable echo effect
$62D5

$62D6-$6315 Echo Sprite Data (8 items, 8 bytes each)
-----
+$62D6 XY position for top echo sprite
+$62D8 vhooppmm mmmmmmmm for top echo sprite
+$62D6 XY position for bottom echo sprite
+$62D8 vhooppmm mmmmmmmm for bottom echo sprite

$6316 Enable damage numeral graphics update in VRAM
+$6317 Pointer to damage numeral graphics in VRAM
$6319
$631A-$631D h-----e (4 items, 1 byte each)
      h: Green Numerals (heal damage)
      e: Enable Damage Numeral Thread
$631E-$6321 Damage Numeral Thread Target (4 items, 1 byte each)
$6322-$6325 Damage Numeral Frame Counter (4 items, 1 byte each)
$6326-$6329 numeral graphics x offset (width / 2) (4 items, 1 byte each)
$632A-$632D (4 items, 1 byte each)
      $632E Damage Numeral Counter (0..3)
$6330-$63AF BG2 Scroll HDMA Table Buffer (+X,+Y)
$63B0-$64AF BG1 Scroll HDMA Table Buffer (+X,+Y)
      +$64B0 Battle BG Horizontal Scroll Position
      +$64B2 Battle BG Vertical Scroll Position
      +$64B4 BG1 Horizontal Scroll Position
      +$64B6 BG1 Vertical Scroll Position
      $64B8 command select window type (0 = ???, 1 = short, 2 = command,
3 = RELM's "Command")
```

```

    $64B9
    $64BA magitek mode enabled
    $64BB
    $64CC magitek armor action for each character (0 = standing still,
1 = walking, 2 = cockpit open, 3 = jap text)
    $64D0
    $64D4 magitek color palette index (stored in an empty character
slot palette)

    $64D6-$64D9 character slots in battle menu order (1 byte per character,
$FF means no character)
    $64DA number of items obtained in battle (steal/metamorph, pointer
to data at $602D)
    $64DB number of obtained items that have been added to the
inventory
    +$64DC Offset to select Attacker or Target Position (+$6F7E)

    $64DE-$7A1D Animation Thread Data (16 x 4 bytes each, 8 sprite threads
per character/monster x 10 + bg1 thread + bg3 thread + 3 esper threads)
    -----
        $64DE Sprite is active
    +$64DF Sprite X offset
    +$64E1 Sprite Y offset
        $64E3 Animation frame number
    +$64E4 vhfpppm mmmmmmmm (final buffer before copying to sprite
buffer)
        $64E6 --ooppp-
        $64E7 -----t
            t: sprite layer priority (0 = show in front of
monsters/characters, 1 = show behind monsters/characters)
    +$64E8 ??? X Position
    +$64EA ??? Y Position
    +$64EC Animation script subroutine return address
    -----
        $6A2E Thread is active (3 = extra/esper thread)
        $6A2F Frame Width
        $6A30 Frame Height
    ++$6A31 Animation Script Pointer
        $6A34 Animation Speed (frames per update)
        $6A35 Animation Frame Counter
        $6A36 Thread index
        $6A37 Sprite Graphic index (tile number)
        $6A38 Attacker index ($00 to $09, MSB set if monster)
        $6A39 Target Index ($00 to $09, MSB set if monster)
    +$6A3A Thread X Position
    +$6A3C Thread Y Position
    -----
    +$6F7E Attacker X Position
    +$6F80 Attacker Y Position
    +$6F82 Target X Position
    +$6F84 Target Y Position

```

```

    $6F86 --oo--ll
           o: sprite tile priority
           l: thread layer (0 = sprite, 1 = bg1, 2 = bg3)
    $6F87 -h-----
           h: animation being performed facing to the right (h flip)
    $6F88 m-----l
           m: attack missed
           l: Animation is left-handed
+$6F89 Animation Script Loop Start Address
    $6F8B Animation Script Loop Count
    $6F8C Frame Offset (for animated loops)
    $6F8D Frame Offset Counter (init 1, increment $6F8C when it hits
zero)
    -----
+$74CE Thread X Offset
+$74D0 Thread Y Offset (for jumping, shadow doesn't move)
    $74D2 Target's width (in 8x8 tiles, 2 for characters)
    $74D3 Target's height (in 8x8 tiles, 3 for characters)
    $74D4
    $74D5 ----ppp-
           p: Thread Palette index
    $74D6
    $74D7 Calculated Vector X Component
    $74D8 Calculated Polar Angle/Vector Movement Speed
+$74D9 Current Polar Radius
    $74DB Current Vector Angle
+$74DC Calculated Vector Magnitude
-----
    $7A1E

$7A1F-$7A6E Character/Monster Order Priority Data
-----
    +$7A1F Character/Monster Bottom Y Position (buffer)
    +$7A21 Character/Monster Index (buffer)
    +$7A47 Character/Monster Bottom Y Position
    +$7A49 Character/Monster Index

$7A6F-$7A72 Cursor Sprite Tile Numbers (4 cursors, usually all $E0)
$7A73-$7A82 SwdTech bar graphics data (2 bytes each)
    $7A83
    $7A84
    $7A85 Item being used ???
$7A86-$7A9D
    $7AE8 Enable X-Magic for Battle Menu
    $7AE9

$7AEA-$7AEF Animation graphics data (6 bytes from $D4D000)
-----
    $7AEA 2?nnnnnn

```

```

                2: 2bpp graphics
                n: number of frames
                $7AEB Graphics formation index ($D20000 for 3bpp or $D2C000 for
2bpp)
+$7AEC Frame data index
                $7AEE Frame width (in 16x16 tiles)
                $7AEF Frame height

                $7AF0
                $7AF1
                $7AF4 attacking with left-hand weapon
                $7AF5 weapon animation number (character or monster)
+$7AF6 Pointer to animation thread data (+$6A2E)
+$7AF8 Pointer to attacker animation thread data (+$6A2E)
+$7AFA Pointer to ??? animation thread data (+$6A2E)
                $7AFC Animation sprite counter
                $7B0C Character/Monster Order Priority is invalid (buffer needs to
be copied to main data)
                $7B0D Number of animation threads to update
                $7B0E Number of animation threads to update (monster)
                $7B0F Number of animation threads to update (character)
                $7B10 Character 1 is facing right (swap hands)
                $7B11 Character 2 is facing right (swap hands)
                $7B12 Character 3 is facing right (swap hands)
                $7B13 Character 4 is facing right (swap hands)
                $7B14 Number of active threads (sprite)
                $7B15 BG1 Animation Tile Data needs to be updated
+$7B16 BG1 Animation X Offset
+$7B18 BG1 Animation Y Offset
++$7B1A Pointer to BG1 Animation Tile Data Buffer
+$7B1D BG1 Animation X position
+$7B1F BG1 Animation Y position
                $7B21 BG3 Animation Tile Data needs to be updated
+$7B22 BG3 Animation X Offset
+$7B24 BG3 Animation Y Offset
++$7B26 Pointer to BG3 Animation Tile Data Buffer
+$7B29 BG3 Animation X position
+$7B2B BG3 Animation Y position
+$7B2D Weapon Graphics Frame Width/Height
+$7B2F Hit Graphics Frame Width/Height
+$7B31 BG1 Animation Frame Width/Height
+$7B33 BG3 Animation Frame Width/Height
+$7B35 Animation Frame height/width
+$7B37 Esper Animation Frame height/width
                $7B3D
                $7B3E Enable Mass Damage Numerals
                $7B3F h-----e Mass Damage Numerals (10 items, 1 byte each)
                        h: Green Numerals (heal damage)
                        e: Enable Damage Numeral Thread
                $7B49 Damage Numeral Frame Counter (10 items, 1 byte each)
                $7B53 numeral graphics x offset (width / 2) (10 items, 1 byte

```

each)

\$7B5D

\$7B67 hide bg1 monster sprites

\$7B68

\$7B6A Vanish Animation is Happening

\$7B6C Character Graphics Index (morphed TERRA???)

\$7B78 character slot for status change animations

\$7B79

\$7B7D Characters with Cursors Shown

\$7B7E Monsters with Cursors Shown

\$7B7F Cursors on characters and monsters (there's only 6 sprites, so they flash between characters and monsters every frame)

\$7B80 Current Character Slot (battle menu)

\$7B81 Enable SwdTech Counter Graphics Update

\$7B82 SwdTech Bar Counter

\$7B83

\$7B85 battle menu windows open and close instantly

\$7B86

\$7B92 first slot is spinning

\$7B93 second slot is spinning

\$7B94 third slot is spinning

\$7B95 Need to Update HDMA #3 (+++\$2105, \$01: slot mode, \$02: normal mode)

\$7B96 Need to Update HDMA #5 (window positions)

\$7B97 Need to Update HDMA #6 (\$01: slot mode, \$02: normal mode)

\$7B98

\$7B99

\$7B9A Counter for gauge/condemned updates (character number

\$7B9B Character to update for gauge/condemned

\$7B9C

\$7B9D

\$7B9E

\$7BA5

\$7BA9 Enable ???

+\$7BAA VRAM destination address for ???

\$7BAD character needing graphical update in VRAM (\$FF = none)

\$7BAE vhopppmm (for menu window graphics)

\$7BAF

\$7BB0

+\$7BB1

+\$7BB3

\$7BB5

\$7BB6

\$7BB7

```

    $7BBB Battle Menu Update Pending (bg2 tile data)
    +$7BBC Battle Menu Tile Data Size ??? (unused, i think...)
    +$7BBE Pointer to Menu Tile Data in VRAM (BG2)
    +$7BC0 Pointer to Menu Tile Data buffer in RAM
    $7BC2 Current Menu Cursor State
    $7BC3-$7BC9 Menu Cursor State Queue
    $7BCA Menu Open or Opening
    $7BCB Close Menu
    $7BCC Next/Previous Character Enable, w/ X or Y Button ($01 =
next/X, $02 = prev/Y)
    $7BD1 Menu Window Needs to Change Size
    +$7BD2 Menu Window Horizontal Scroll Position (in pixels)
    +$7BD4 Menu Window Vertical Scroll Position (in pixels)
    $7BD6 Menu Window Height (in tiles)
    +$7BD7 Menu Window Bottom (in pixels)
    +$7BD9 Menu Window Top (in pixels)
    +$7BDB Menu Window Update for BG1 instead of BG2
    $7BDD
    +$7BDE
    +$7BE0
    +$7BE2
    +$7BE4
    $7BE6
    +$7BE7
    +$7BE9
    $7BEB
    +$7BEC
    $7BEE
    $7BEF HDMA enable ($210C)
    $7BF0 Current Menu State
    $7BF1-$7BFF Menu State Queue
    Unaltered color palettes
    -----
    $7C60-$7C6F Spell Animation Palette 3
    $7C70-$7C7F Spell Animation Palette 3
    $7C80-$7C8F Spell Animation Palette 3
    $7C90-$7C9F Spell Animation Palette 3

    $7D60-$7D6F Spell Animation Palette 1
    $7D70-$7D7F Spell Animation Palette 1
    Current color palettes
    -----
    $7E00-$7E3F Various Text Color Palettes (4 colors each)
    $7E40-$7E5F Menu Window Color Palette
    $7E60-$7E7F Spell Animation Palette 3 (gets sepia if in flashback mode,
used for some esper/monster palettes)
    $7E80-$7E9F Spell Animation Palette 3
    $7EA0-$7EFF Battle BG Color Palettes (buffer, real palettes are at
$7EEC11)
    $7F00-$7F1F Monster Palette 1 (max 3 different monsters per formation)
    $7F20-$7F3F Monster Palette 2

```

```
$7F40-$7F5F Monster Palette 3
$7F60-$7F7F Spell Animation Palette 1 (gets sepia if in flashback mode,
used for some esper palettes)
$7F80-$7F9F Character Palette 1
$7FA0-$7FBF Character Palette 2
$7FC0-$7FDF Character Palette 3
$7FE0-$7FFF Character Palette 4
-----
    $8000 enable large data VRAM DMA
    ++$8001 Large data VRAM DMA source address
    +$8004 Large data VRAM DMA destination address
    +$8006 Large data VRAM DMA Chunk size (amount transferred this
frame, max $0400)
    +$8008 Large data VRAM DMA Total size
    $800A Large data VRAM DMA Last chunk
    $800B
    $800C BG1 Scroll HDMA type (disable update if MSB set)
    $800D BG2 Scroll HDMA type (disable update if MSB set)
    $800E BG3 Scroll HDMA type (disable update if MSB set)
    +$800F Monster Center X Coordinate (in pixels)
    +$801B Monster Center Y Coordinate (in pixels)
    +$8027 Monster Bottom Y Coordinate (in pixels)
    +$8033 Character Center X Coordinate (in pixels)
    +$803B Character Center Y Coordinate (in pixels)
    +$8043 Character Bottom Y Coordinate (in pixels, for sprite order
priority)
    +$804B Monster Corrected Bottom Y Coordinate (in pixels, for sprite
order priority)
    +$8057 Monster Y-Shift for Sprite Priority (in pixels, makes some
monsters appear above others even though the others may be higher on the
screen)
    +$8063 Monster Right X Coordinate (in pixels) for Cursor ???
    +$806F Monster Additional Center Y Coordinate (in pixels) for
Cursor ???
    +$807B Monster Front X Offset (in pixels) for Cursor ???
    +$8087 Character Right X Coordinate for Cursor (in pixels)
    +$8093 Character Additional Center Y Coordinate for Cursor (in
pixels)
    +$809F Character Front X Offset for Cursor (in pixels, 0 if facing
left, 32 if facing right)
    +$80AB Monster ???
    +$80B7 Monster ???
    +$80C3 Monster Left X Position (screen location, in pixels)
    +$80CF Monster Top Y Position (screen location, in pixels)
    +$80DB vhooppmm mmmmmmmm - Monster Sprite Data
        v: vertical flip
        h: horizontal flip
        o: sprite priority
        p: Monster 1 Palette Index
```



```

        m: sprite graphics index
$80E7
$80E8
$80F3 ??????vh Monster 1
        v: flipped vertically (currently)
        h: flipped horizontally (currently)
$80F4 bg1 monster
$80FF Monster palette copied to spell animation palette ($7E60)
$8100 ??? something to do with $80FF
+$810B Saved Monster Sprite Data from $80DB (6 monsters, 2 bytes
per monster)
+$8117 Monster Palette Index
+$8123 Current Monster Palette Index
    $812F Monster Height/Width (in 8x8 tiles)
+$813B Character XY Positions (saved)
+$814B Monster XY Positions (saved)
$816B-$81A6 Saved Center/Bottom Positions (from $800F-$804A)
    $81A7 Current Monster Slot (for graphics loader)
+$81A8 Monster Graphics Index (for graphics loader)
    $81AA Monster Graphics Map Index (for graphics loader)
    $81AB Large Monster Graphics Map Flag (for graphics loader)
    $81AC 3bpp Monster Graphics ($80) and Large Map ($40) Flag (for
graphics loader)
    $81AD-$81CC Character 1 Palette (unaltered)
    $81CD-$81EC Character 2 Palette (unaltered)
    $81ED-$820C Character 3 Palette (unaltered)
    $820D-$822C Character 4 Palette (unaltered)
    $822D-$824C Monster Graphics Map
        $824D Counter for Graphics Map Pointer
        $824E Pointer to Graphics Map

    $8251 Monster Graphics Width (calculated using graphics map)
    $8252 Monster Graphics Width (used as a counter to load graphics
to RAM buffer)
    $8253 Monster Graphics Height (uses mold box height, used as a
counter to load graphics to RAM buffer)
    $8254

    $8256 Monster Graphics Mold Box Width
    $8257 Monster Graphics Mold Box Height
    $8258 Current Monster Slot (for graphics loader)
    $8259-$88B8 Monster Sprite Data (4 copies per monster, 6 monsters, 17
sprites per monster, 4 bytes per sprite)
    -----
    $8259 X position ($FF marks end of data)
    $825A Y position
+$825B vhoopppm mmmmmmmm
        v: Vertical Flip
        h: Horizontal Flip
        o: sprite priority
        p: Palette Index

```

m: Graphic Index

\$83F1 horizontally mirrored sprite data
\$8589 vertically mirrored sprite data
\$8721 horizontally & vertically mirrored sprite data

\$88B9-\$88BE Number of sprites used by each monster (1 byte per monster)
++\$88BF Sprite Palette 3 Addition/Subtraction quantities (R,G,B)
++\$88C2 Background Palette Addition/Subtraction quantities
++\$88C5 Sprite Palette 2 Addition/Subtraction quantities
++\$88C8 Sprite Palette 1 Addition/Subtraction quantities
++\$88CB Monster Palette Addition/Subtraction quantities
++\$88CE Character Palette Addition/Subtraction quantities
\$88D1 Monsters with visible sprites
\$88D2 Monster Index (current sprite update)
\$88D3 Window width
\$88D4 Window height
+\$88D5 Destination address for window graphics data in RAM
++\$88D7 Pointer to long/short battle dialog text
\$88DA
\$88DB
\$88DC vhoppp-- Menu text tile data
+\$88DD
+\$88DF
\$88E1
\$88E2

\$88E3-\$890A Cursor Sprite Data (10 cursors, 4 bytes each)

\$88E3 Main Cursor is Active
\$88E4 Main Cursor X Position
\$88E5 Main Cursor Y Position
\$88E6 vhooppm Main Cursor
\$88E7-\$88EA Same as above for Aux Menu Cursor
\$88EB-\$88EE Same as above for ??? cursor
\$88EF-\$88F2 Same as above for up/down arrows for scrolling menus
\$88F2 up/down arrows (0 = both, 1 = down, 2 = up)
\$88F3-\$890A Same as above for character/monster cursors (6 items, 4 bytes each)

\$890B character/monster counter for sprite thread init
\$890F Character 1 Cursor Position
\$8910 Character 2 Cursor Position
\$8911 Character 3 Cursor Position
\$8912 Character 4 Cursor Position
\$8913 Character 1 Cursor Vertical Scroll Position
\$8914 Character 2 Cursor Vertical Scroll Position
\$8915 Character 3 Cursor Vertical Scroll Position
\$8916 Character 4 Cursor Vertical Scroll Position
\$8917 Character 1 Cursor X Position

```

$8918 Character 2 Cursor X Position
$8919 Character 3 Cursor X Position
$891A Character 4 Cursor X Position
$891B Character 1 Cursor Y Position
$891C Character 2 Cursor Y Position
$891D Character 3 Cursor Y Position
$891E Character 4 Cursor Y Position

```

HDMA #3 Data (+++\$2105)

```

-----
$896F Screen Mode -> $2105 (Battlefield Region)
$8970 Screen Mosaic -> $2106 (Battlefield Region)
$8971 BG1 VRAM Location -> $2107 (Battlefield Region)
$8972 BG2 VRAM Location -> $2108 (Battlefield Region)
$8973 Screen Mode -> $2105 (Menu Region)
$8974 Screen Pixelation -> $2106 (Menu Region)
$8975 BG1 VRAM Location -> $2107 (Menu Region)
$8976 BG2 VRAM Location -> $2108 (Menu Region)
$8977 Screen Mode -> $2105 (Slot Region)
$8978 Screen Pixelation -> $2106 (Slot Region)
$8979 BG1 VRAM Location -> $2107 (Slot Region)
$897A BG2 VRAM Location -> $2108 (Slot Region)

```

HDMA #6 Data (+++\$2109)

```

-----
$897B BG3 VRAM Location -> $2109 (Battlefield Region)
$897C BG4 VRAM Location -> $210A (Battlefield Region)
$897D BG1/BG2 VRAM Location High Byte -> $210B (Battlefield
Region)
$897E BG3/BG4 VRAM Location High Byte -> $210C (Battlefield
Region)
$897F BG3 VRAM Location -> $2109 (Menu Region)
$8980 BG4 VRAM Location -> $210A (Menu Region)
$8981 BG1/BG2 VRAM Location High Byte -> $210B (Menu Region)
$8982 BG3/BG4 VRAM Location High Byte -> $210C (Menu Region)
$8983 BG3 VRAM Location -> $2109 (Slot Region)
$8984 BG4 VRAM Location -> $210A (Slot Region)
$8985 BG1/BG2 VRAM Location High Byte -> $210B (Slot Region)
$8986 BG3/BG4 VRAM Location High Byte -> $210C (Slot Region)

```

HDMA #7 Data (+++\$212A)

```

-----
+$8987 Mask Logic Settings -> +$212A (Top and Bottom Region)
$8989 Main Screen Designation -> $212C (Top and Bottom Region) all
layers are disabled
$898A Sub Screen Designation -> $212D (Top and Bottom Region)
+$898B Mask Logic Settings -> +$212A (Battlefield Region)
$898D Main Screen Designation -> $212C (Battlefield Region)
$898E Sub Screen Designation -> $212D (Battlefield Region)
+$898F Mask Logic Settings -> +$212A (menu region)
$8991 Main Screen Designation -> $212C (menu region)

```

\$8992 Sub Screen Designation -> \$212D (menu region)

\$8993-\$8D12 Subscreen Window Mask, Fixed Color +/-, +/- Enable, Fixed Color HDMA data -> +++\$212F, 4 bytes per HBlank

\$8D13-\$9012 Menu Window tile data (buffer)

\$9013-\$9212 Menu Window tile data (short mode)

\$9213-\$9412 Menu Window tile data (window mode)

\$9413-\$9612 Menu Window tile data for Relm's "Command" window

- \$9613 current circle size
- \$9614 current circle X position
- \$9615 current circle Y position
- \$9616 final circle size
- \$9617 final circle X position (min X position is #\$21 ??)
- \$9618 final circle Y position
- \$9619 circle speed
- \$961A vh flip for circle ???
- \$961B circle shape (0 = circle, 1 = bio blast, 2 = big blob, 3 = beam from top, 4 = vertical oval, 5 = small blob, 6 = horizontal oval, 7 = ultima, 8 = slimer blob)
- \$961C
- \$961D
- \$961E

\$961F-\$981E

\$9821-\$9A20

\$9A21-\$9C7C Window Position HDMA data Buffer (Battlefield Region)

HDMA #5 Data (+++ \$2126)

\$9C7F-\$9D9E Window Position HDMA data -> +++\$2126 (Menu Region)

\$9D9F-\$9F1E -

\$9F1F-\$A17E Window Position HDMA data -> +++\$2126 (Battlefield Region)

\$A17F-\$A37E Pointers to high byte of sprite data (4 bytes per sprite, +\$0500)

- \$A37F-\$A57E 32x32 sprite, x coordinate MSB = 0
- \$A57F-\$A77E 32x32 sprite, x coordinate MSB = 1
- \$A77F-\$A97E 16x16 sprite, x coordinate MSB = 1
- \$A97F-\$AE3E BG Tile Data buffer (2 bytes per tile)
- \$AE3F-\$BE3E Monster Graphics Buffer (also used as a buffer for other VRAM DMA)
- \$BE3F-\$CE3E Saved Monster Graphics Buffer
- \$CE3F-\$D8BE Sprite Animation Frame Data (32 frames, 21 tiles each, 4 bytes per tile)
- \$D8BF-\$E33E Sprite Animation Frame Data (horizontally flipped)
- \$E33F-\$E73E VRAM DMA Buffer (\$400 bytes)
- \$E73F-\$E7BE another VRAM DMA Buffer (\$80 bytes)
- \$E7BF-\$E7FE sine wave table (A=0)
- \$E7FF-\$E83E sine wave table (A=2)
- \$E83F-\$E87E sine wave table (A=4)

```

$E87F-$E8BE sine wave table (A=6)
$E8BF-$E8FE sine wave table (A=8)
$E8FF-$E93E sine wave table (A=10)
$E93F-$E97E sine wave table (A=12)
$E97F-$E9BE sine wave table (A=14)
+$E9BF VRAM destination address
    $E9C1

    $E9C3
+$E9C4 X Zoom Size (higher number = smaller)
+$E9C6
+$E9C8
+$E9CA Y Zoom Size
+$E9CC X Position
+$E9CE Y Position
$E9D2-$E9D9 Pointers to Condemned Numeral Graphics for each Character (2
bytes each, $7F0000)
    $E9DA
    $E9DB Counter for Condemned Numeral Graphics
    $E9DC
    $E9DD
    $E9DE
    $E9DF
    $E9E1 blitz button input pointer (+$E9FE)
+$E9E2 buttons pressed last frame (for blitz code)
    $E9E4 blitz code counter (64 frames)
    $E9E5
    $E9E6 Monsters that are visible (no clear status)
    $E9E7 Default Animation Sound Effect
    $E9E8 Sound Command (-> $2140)
    $E9E9 Sound Effect Index (-> $2141)
    $E9EA Animation Sound Effect Pan Value (-> $2142)
    $E9EB -
    $E9EC Enable Animation Sound Effect
    $E9ED Disable Sound Effects
    $E9EE
    $E9EF Stop Battle Timers
    $E9F0
    $E9F1
    $E9F5
    $E9F6 Screen is fading in
    $E9F7 Position of top fade bar (starts at scanline 152 and moves
up)
    $E9F8 Position of bottom fade bar (starts at scanline 0 and moves
down)
    $E9F9 Screen Brightness (0-F)
    $E9FB monster entry/exit animation type
    $E9FC misc. monster animation target
    $E9FE-$EA1D blitz button inputs (16 items, 2 bytes each)
    $EA1E-$EA31 correct button combo for current blitz (10 items, 2 bytes
per button)

```

\$EA32-\$EBF1 +/- Enable, Fixed Color HDMA data ->+\$2131, 2 bytes per scanline

\$EBFA

\$EBFB Number on Dice 1

\$EBFC Number on Dice 2

\$EBFD Number on Dice 3

\$EBFE

\$EBFF-\$EC06 monster names (4 items, 2 bytes each)

\$EC07-\$EC0E number of monsters alive for each name (4 items, 2 bytes each)

\$EC0F

\$EC10 Dragon Horn Effect

\$EC11-\$EC70 Battle BG palettes (3 palettes)

\$EC71-\$ECB0 Buffer for battle BG palette processing

\$ECB1

\$ECB2

+\$ECB4 ??? Monster y position (top)

+\$ECB6 Pointer to ??? monster graphics data

+\$ECB8 Battle BG Index

\$ECBA Curative Menu Type (0 = item, 1 = magic)

\$ECBB Enable Animation Sound Effect Panned based on Sprite Y Position (Animation Script Command \$87)

\$ECEF ztrbmsg Battle End Event Flags

z: zone eater just ate you

t: timer is shown (beneath enemy name)

r: ran out of time (before emperor's banquet)

b: ran away from battle (before emperor's banquet)

e: espers have been acquired

m: morph is available

s: enables scene with LOCKE and EDGAR if TERRA uses magic

g: game over after battle ends

\$ECF0

\$F800-\$FFFF Decompression Buffer

\$7F/0000-\$7F/FFFF: Graphics Buffers

\$7F0000-\$7F1FFF Character 1 Graphics

\$7F2000-\$7F3FFF Character 2 Graphics

\$7F4000-\$7F5FFF Character 3 Graphics

\$7F6000-\$7F7FFF Character 4 Graphics

\$7F8000-

\$7FA000-\$7FA3FF Current Character Graphics

\$7FA400-\$7FB3FF Animated Status Graphics, etc. (8 tiles, 4 frames each)

\$7FB400-\$7FB5FF Various blocking graphics

```
$7FB800-$7FBBFF Cursor, Scroll indicators, reflect, and shield graphics
    $7FBC00 "Miss" graphics
    $7FBC40 Numeral Graphics
    $7FBE00 Numeral Graphics
    $7FC000 Backwards Numeral Graphics
$7FC200-$7FC2FF Condemned Numeral Graphics
$7FC300-$7FC3FF Backwards Condemned Numeral Graphics
$7FC400-$7FE3FF BG1 Animation Tile Data Buffer (16 frames, 16x16 tiles each,
2 bytes per tile)
$7FE400-$7FF800 BG3 Animation Tile Data Buffer (8 frames, 16x16 tiles each,
2 bytes per tile)
```

Battle VRAM

```
$0000 Battle Animation BG1 Graphics
$0A00 Menu Window Graphics
$0C00 Battlefield BG1 Tile Data
$1000 Battle BG Graphics (BG2)
$2000 Character Sprite Graphics
$2200 Status Effect Graphics
$22C0 Character Shadow Graphics
$22E0 Active Character Pointer Graphics
$2400 Battle Animation Sprite Graphics
$2C00 Damage Numeral Graphics
$2CC0 "Miss" Graphics
$2E00 Hand Pointer Graphics
$2E20 Up/Down Page Indicator Graphics
$2E60 Reflect Graphics
$2EA0 Shield Graphics
$3000 Monster Graphics
$4000
$4080 Menu Number Graphics
$4200 Menu Window Graphics
$4400 Slot Graphics
$4800 Add'l Battle BG Graphics (BG2)
$5000 BG3 Graphics (2bpp)
$5400 Battlefield BG3 Tile Data
$5800 Fixed Width Font Graphics (2bpp)
$5C00 BG3 Font Graphics (2bpp)
$6000 Battle BG Tile Formation (BG2)
$6800 Menu BG1 Tile Data
$7000 Menu BG2 Tile Data
$7800 Menu BG3 Tile Data
```

Last
update: ff3:ff3us:doc:asm:ram:battle_ram https://www.ff6hacking.com/wiki/doku.php?id=ff3:ff3us:doc:asm:ram:battle_ram&rev=1589489106
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