ChaosFight

Interworldly Adventuring, LLC

ChaosFight Game Manual

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1 Introduction

CHAOS FIGHT

GAME PROGRAM

INSTRUCTIONS

FOR ATARI® 2600

INTERWORLDLY ADVENTURING, LLC

Portland, Oregon

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ChaosFight is a fast-paced fighting game for the Atari 2600 Video Computer System featuring 16 unique characters, each with distinct abilities and attack styles.

Game Features:

- 16 playable characters with unique moves and abilities
- 2 to 4 player simultaneous combat[1]
- 16 battle arenas with platforms and obstacles
- Weight-based physics affecting jump height, speed, and knockback
- Compatible with colour or black & white television
- Supports CX-40 joysticks, Genesis controllers, Joy2B+, and Quadtari adapters

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[1] Four-player mode requires Quadtari adapter

2 Getting Started

2.1 Equipment Required

- Atari 2600 Video Computer System
- ChaosFight Game Cartridge
- Television set
- One to four joystick controllers
- Quadtari adapter (optional, for 4-player mode)

2.2 Setup Instructions

1. Turn off console and TV.
2. Connect Atari 2600 to TV antenna input.
3. Plug joystick(s) into controller ports (Player 1: left port, Player 2: right port).
4. Insert ChaosFight cartridge into console. *Never insert or remove cartridges while power is on.*
5. Turn on TV and select channel 3 or 4.
6. Turn on Atari 2600 console.
7. Press fire button to skip intro screens and begin character selection.

   Troubleshooting:

No picture
> Check TV channel (3 or 4) and antenna connection.

Controllers unresponsive
> Verify connections and press fire button to activate controller detection.

Multicart users
> Navigate multicart menu to ChaosFight ROM before starting.

3 Controller Configuration

ChaosFight supports multiple controller types with automatic detection. Button mappings vary by controller type.

3.1 CX-40 Joystick (Standard Controller)

Joystick

- LEFT/RIGHT: Move and turn character
- UP: Jump (height varies by character weight)
- DOWN: Guard (blocks damage for 1 second)

Fire Button

Attack with character's weapon (melee strike or ranged projectile)

Plug Player 1 into left port, Player 2 into right port.

3.2 Genesis/Mega Drive Controllers

Genesis controllers (3-button and 6-button) supported with automatic detection. 6-button models work fine; extra buttons (X, Y, Z, Mode) are not used.

D-Pad

- LEFT/RIGHT: Move and turn
- DOWN: Guard
- UP: Jump (traditional method, always works)

Button B (Middle)

Attack (standard fire button via INPT4/5)

Button C (Top Right)

Jump (alternative to UP - requires paddle port detection via INPT0/2)

Buttons A and START

Not usable (hardware limitation)

Technical: Button C detection requires reading INPT0 (P1) or INPT2 (P2) paddle ports after grounding via VBLANK.

Note: Genesis controllers disable Quadtari 4-player mode. Use CX-40 joysticks for 4-player games.

3.3 Joy2B+ Enhanced Controllers

```
    ↑          <— Button III: Pause
 ← + →         <— Button II: Jump
    ↓          <— Button I: Attack

 [Extra]       <— Additional buttons
    (varies by model)
       |
    Cable
```
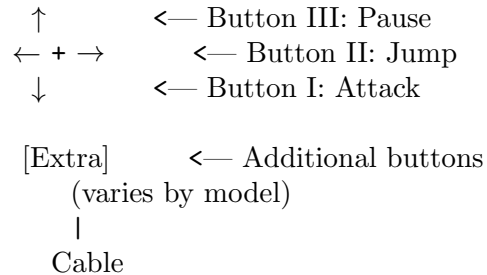
Fig. C - Joy2B+ Style Controller

Joy2B+ controllers are modern enhanced joysticks designed for the Atari 2600, featuring three fire buttons and improved build quality.

How to Use It in ChaosFight:

Joy2B+ controllers provide enhanced control with dedicated buttons:

Directional Control

Move the stick or D-pad:

- **LEFT/RIGHT:** Move and turn your fighter
- **DOWN:** Guard (block attacks)
- **UP:** Jump (traditional method, always works)

Button I (INPT4/5)

Attack - Standard fire button

- Melee characters: Close-range strike
- Ranged characters: Fire projectile
- Lock in character selection

Button II (INPT0/2)

Jump - Alternative to UP (via paddle port)

- Jump height varies by character weight
- Combine with LEFT/RIGHT for diagonal jumps
- Confirm menu choices
- Allows simultaneous attack + jump on separate buttons

Button III (INPT1/3)

Pause - Alternative to Game Select (via paddle port)

- Freezes gameplay immediately
- Press again to resume
- More convenient than console switch

Additional Buttons

Extra buttons vary by Joy2B+ model and are not used by ChaosFight.

Technical Note: Joy2B+ uses INPT0/1/2/3 (paddle/pot ports) for Buttons II and III. Detection requires grounding paddle ports via VBLANK and checking for HIGH state.

Why Choose Joy2B+?

- **Modern build quality:** New controllers, no wear and tear
- **Three dedicated buttons:** Attack, jump, and pause mapped to separate buttons for ultimate control!
- **Most advanced control:** The only controller with pause button support
- **Comfortable design:** Ergonomic shapes for long gaming sessions
- **Compatible everywhere:** Works with all Atari 2600 games
- **Best for competitive play:** Separate attack and jump buttons enable advanced techniques

Important Note:

Like Genesis controllers, Joy2B+ controllers **cannot be used with Quadtari** for 4-player mode. If you want to play with four players, use standard CX-40 joysticks with a Quadtari adapter!

3.4 Four-Player Mode with Quadtari

Quadtari Adapter

PORT 1 (Even Frame)   PORT 2 (Odd Frame)
Player 1 / Player 3   Player 2 / Player 4

The Quadtari uses time-multiplexing to support four controllers on two ports:

- **Even frames:** Reads Player 1 (left port) and Player 2 (right port)
- **Odd frames:** Reads Player 3 (left port) and Player 4 (right port)

The game automatically detects Quadtari by checking the INPT4/INPT5 lines during the Title screen.

3.5 Genesis Controller Mode

Sega Genesis 3-button controllers are supported with specific button mapping:

D-Pad

- LEFT/RIGHT: Move and turn
- DOWN: Guard
- UP: Not used (jump via Button C)

Button B   Attack (standard fire button - functions as joy0fire/joy1fire)

Button C   Jump (via TH line - requires SELECT toggling and reading INPT0/2)

Button A and START

Cannot be reliably detected on Atari 2600 hardware

Technical Note: Button C requires toggling the TH (SELECT) line via SWACNT register and reading INPT0 (P1) or INPT2 (P2). This is more complex than standard button reading.

Note: Genesis controllers and Quadtari cannot be used together. The game will detect which type is connected.

3.6 Joy2B+ Controller Mode

Joy2B+ enhanced controllers are supported with the same button mapping as standard joysticks. The additional buttons are not used in ChaosFight.

Note: Joy2B+ and Quadtari cannot be used together.

3.7 Controller Detection

The game detects your controller configuration:

1. When you press Game Select on the console
2. When returning to the Title screen from any game mode
3. During the initial Title screen display

The detection checks for:

1. Quadtari adapter (INPT4/INPT5 signature)
2. Genesis controller (read mode register)
3. Joy2B+ controller (extended INPT registers)
4. Standard joysticks (default)

4 Character Selection

After the Title screen, each player chooses their fighter by cycling through the 16 available characters.

4.1 The Character Selection Screen

The screen shows character sprites in fixed positions:

```
        [Sprite]      [Sprite]
           1             2

        [Sprite]      [Sprite]
           3             4
        (Quadtari only)
```
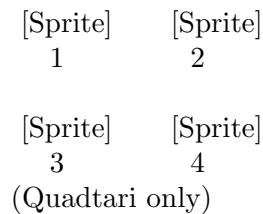
Fig. A - Character Selection Layout

Screen elements:

- **Character Sprites:** Animated 8×16 pixel sprites showing current selection
- **Player Numbers:** Playfield digit indicators (1-4) below each sprite
- **Lock Indicators:** Playfield border appears around locked selections
- **Handicap Mode:** Character freezes in recovery pose when DOWN is held

Note: The Atari 2600 cannot display text. Character names and statistics are not shown on screen. Refer to this manual to identify characters.

4.2 Selection Controls

LEFT/RIGHT
        Cycle through 16 characters (wraps around: 15→0, 0→15)

UP or DOWN (without FIRE)
        Unlock current selection to browse again

FIRE   Lock in character selection

- Playfield border appears around locked sprite
- Moving joystick after locking will unlock selection

4.3 Starting the Game

- **2-player mode:** Game starts when Player 1 locks selection
- **4-player mode (Quadtari):** Game starts when at least 2 players lock selections

4.4 Character Identification

Since character names cannot be displayed, memorise positions:

Position 0 Bernie

Position 1 Curling Sweeper

Position 2 Dragonet

Position 3-15
See Chapter 6 [Characters], page 13, for complete roster order

4.5 Handicapping for Advanced Players

Skilled players can start with reduced health for added challenge.

Activating Handicap Mode:

1. Select your character with LEFT/RIGHT
2. Hold DOWN on the joystick
3. While holding DOWN, press FIRE to lock selection
4. Character sprite freezes in recovery pose (visual confirmation)

Handicap Effect:

- Starting health: 75 instead of 100 (25% reduction)
- All other abilities unchanged
- Health bar starts 25% shorter during gameplay

5 Game Controls

5.1 Basic Movement

Hold the Controller with the red button to your upper left towards the TV screen.

```
            JUMP
             ^
             |
    LEFT <—-STAND—-> RIGHT
             |
             v
           GUARD
```
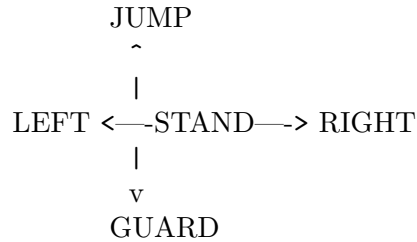
Fig. A - ChaosFight Controls

LEFT   Move your character to the left. If facing right, character will turn around.

RIGHT   Move your character to the right. If facing left, character will turn around.

UP (JUMP)

        Make your character jump. Jump height varies by character weight:

- Light characters (Ninjish Guy, Radish Goblin): High jumps
- Medium characters (Pork Chop, Grizzard Handler): Normal jumps
- Heavy characters (Ursulo, Fat Tony): Lower jumps
- Special: Some characters have unique jump abilities (see Chapter 6 [Characters], page 13)

DOWN (GUARD)

        Enter guard stance. While guarding:

- You take NO damage from attacks
- You cannot move or attack
- Guard lasts maximum 1 second (60 frames)
- Character flashes to indicate guard is active

FIRE BUTTON

        Perform your character's attack:

- **Melee characters:** Close-range punch/slash in facing direction
- **Ranged characters:** Fire projectile in facing direction

5.2 Advanced Mechanics

5.2.1 Momentum and Physics

ChaosFight features realistic physics:

- **Gravity:** Characters fall naturally when airborne
- **Momentum:** Movement builds up and decays gradually
  - Lighter characters accelerate faster
  - Heavier characters have more inertia
- **Knockback:** Getting hit pushes you back
  - Direction depends on attacker's facing
  - Distance based on attack strength and your weight
  - You enter "recovery" state and cannot act briefly
- **Wall Collision:** Characters bounce off walls
  - Bounce distance based on character weight
  - Heavier characters bounce less
  - Lighter characters bounce more
- **Player Collision:** Characters can walk through each other but are slightly pushed apart to prevent overlap

5.2.2 Attack System

```
     MELEE ATTACK           RANGED ATTACK

    [==]                 [o]->
   /   \               /   \
   PLAYER  -> <HITBOX>   PLAYER   <MISSILE>
```

Melee Attacks

- Hit enemies directly in front of character
- Range: 16 pixels
- Instant hit detection
- Cannot be blocked by obstacles
- **Special:** Bernie attacks both directions simultaneously!

Ranged Attacks

- Fire projectile across screen
- Two types: **Arrowshot** (straight) or **Ballistic** (parabolic arc)
- May disappear on impact or pass through
- Can be blocked by walls (character-dependent)
- Projectile size varies by character

5.2.3 Recovery System

After taking damage, characters enter **recovery** (hitstun):

1. Character flashes rapidly
2. Cannot attack or guard
3. Cannot take additional damage (invulnerable)
4. Slides backward from knockback momentum
5. Lasts 15-30 frames depending on damage taken

This prevents infinite combos and gives players a chance to recover position.

6 The 16 Fighters

Each character has unique properties affecting gameplay:

Weight   Affects jump height, movement speed, and knockback resistance

Attack Type

Melee (close range) or Ranged (projectile)

Special Abilities

Unique movement or attack properties

6.1 Character Roster

6.1.1 Bernie

Weight: Very Heavy
Attack: Ranged (1×1 pixel, arrowshot) + Melee (BOTH DIRECTIONS!)
Special: No jumping; wraps from bottom to top of screen; fall damage immunity

Bernie cannot jump, but he can fall off the bottom of the screen and reappear at the top! His unique attack hits both in front AND behind simultaneously (dual-direction AOE), making him dangerous in crowds. His small ranged projectile (1×1 pixel) travels horizontally. Bernie's tough constitution grants complete immunity to fall damage.

6.1.2 Curling Sweeper

Weight: Medium
Attack: Ranged (from feet, 4×2 pixels, ballistic)
Special: Projectile comes from character's feet

The Curling Sweeper fires a wide projectile (4 pixels wide, 2 pixels tall) from ground level, sliding across the floor. Great for hitting low targets!

6.1.3 Dragonet

Weight: Medium-Light
Attack: Ranged (2×2 pixels, ballistic arc)
Special: Fires projectiles in a parabolic arc

Dragonet fires a small projectile (2×2 pixels) that travels in a ballistic arc, making it excellent for hitting enemies at different heights!

6.1.4 EXO Pilot

Weight: Light
Attack: Ranged (long/wide bullet, arrowshot)
Special: High jumps, fast horizontal projectile

The EXO Pilot fires a long, thin missile that travels horizontally across the entire screen. Excellent for long-range combat!

6.1.5 Fat Tony

Weight: Heavy
Attack: Melee
Special: Standard heavy fighter

6.1.6 Grizzard Handler

Weight: Medium
Attack: Melee
Special: Standard medium fighter

6.1.7 Harpy

Weight: Light
Attack: Melee (swoop attack)
Special: Can "fly" by repeatedly pressing UP

The Harpy can maintain flight by repeatedly jumping! Her attack causes her to swoop down diagonally while performing a melee strike.

6.1.8 Knight Guy

Weight: Very Heavy
Attack: Ranged (3×3 pixels, arrowshot)
Special: Armored fighter with powerful projectile, longest melee duration (6 frames)

Knight Guy combines heavy armor with a powerful ranged attack. His projectile is larger than most (3×3 pixels) and travels in a straight line, making him a formidable opponent at any range!

6.1.9 Magical Faerie

Weight: Very Light
Attack: Ranged (small sparkle, ballistic)
Special: FREE FLIGHT - use UP/DOWN to move vertically, no guard action

The Magical Faerie can fly freely up and down using the joystick! However, she cannot guard (pressing DOWN makes her fly down instead). Her ranged attack creates magical sparkles.

6.1.10 Mystery Man

Weight: Medium
Attack: To Be Determined
Special: Reserved for future expansion

6.1.11 Ninjish Guy

Weight: Very Light
Attack: Melee
Special: Highest jumps, fastest movement, 50% fall damage reduction

The Ninjish Guy is one of the lightest characters, giving him incredible mobility and the highest jump in the game. His ninja training also grants him 50% reduction to fall damage, making him excellent at aerial combat!

6.1.12 Pork Chop

Weight: Heavy
Attack: Melee
Special: Standard heavy melee fighter

6.1.13 Radish Goblin

> Weight: Very Light
> Attack: Melee
> Special: Highest jumps, fastest movement, lowest health

The Radish Goblin is the lightest character, giving him incredible mobility but making him more vulnerable to knockback.

6.1.14 Robo Tito

> Weight: Very Heavy
> Attack: Melee
> Special: No jumping! Extends vertically to top of screen; fall damage immunity

Robo Tito doesn't jump - instead, pressing UP makes him extend vertically upward, reaching all the way to the top of the screen! His robotic construction grants complete immunity to fall damage, making him dangerous when dropping from heights. His sprite may remain visible even when not fully extended.

6.1.15 Ursulo

> Weight: Heavy
> Attack: Ranged (2×2 pixels, ballistic arc)
> Special: Strongest throw, hardest to knock back

Ursulo is one of the heaviest characters, making him extremely resistant to knockback but also giving him a lower jump height. His powerful ranged attack fires a 2×2 pixel projectile with the highest arc (velocity 7 horizontal, -6 vertical), making it excellent for hitting enemies on platforms!

6.1.16 Veg Dog

> Weight: Light
> Attack: Melee
> Special: Standard light melee fighter

7 Combat System

7.1 Health and Damage

HEALTH BARS (Top of Screen)

Player 1 (Blue)
Player 2 (Red)
Player 3 (Yellow)
Player 4 (Green)

Each player's health is displayed as a coloured bar at the top of the screen:

- Starting health: 100 points
- Bar length scales to health (0-32 pixels)
- Colors match player colors
- Health bars update every 4 frames (1 player per frame for performance)

7.2 Damage System

Damage varies by character and attack type:

Light Melee (10-15 damage)
Radish Goblin, Veg Dog, Ninjish Guy

Medium Melee (15-20 damage)
Pork Chop, Dragonet, Grizzard Handler, Harpy

Heavy Melee (20-25 damage)
Knight Guy, Fat Tony, Ursulo, Bernie

Small Ranged (8-12 damage)
Ninjish Guy, Magical Faerie

Medium Ranged (12-18 damage)
Robo Tito, Curling Sweeper

Large Ranged (15-22 damage)
EXO Pilot

7.3 Victory Conditions

PLAYER 2 WINS!

[Winner]
/   \
VICTORY!

The last player with health remaining wins!

- When your health reaches 0, you are eliminated
- Your sprite disappears from the playfield
- In 4-player mode, battle continues until only one remains
- Winner is displayed with their player number and character

8 Game Modes

ChaosFight offers multiple ways to play:

8.1 Two-Player Battle

```
[Player 1]          [Player 2]
  (Blue)              (Red)
```

Classic one-on-one combat. Each player selects a character and fights until one is victorious.

8.2 Four-Player Chaos

```
[P1]    [P2]    [P3]    [P4]
Blue    Red    Yellow  Green
```

Requires Quadtari adapter. All four players battle simultaneously in a free-for-all! Last player standing wins.

Note: Collision detection and health bar updates are spread across multiple frames in 4-player mode to maintain smooth performance:

- Health bars update 1 per frame (cycle: P1, P2, P3, P4)
- Collision checks spread across 3 frames:
  - Frame 0: P1 vs P2, P1 vs P3
  - Frame 1: P1 vs P4, P2 vs P3
  - Frame 2: P2 vs P4, P3 vs P4

8.3 Battle Arenas

Select from 16 different arenas during Level Select! Each arena offers unique tactical opportunities:

8.3.1 Arenas 1-8: Open Ground Variations

```
##############################################
#                              #
#                              #
#                              #
#    [P1]                [P2]   #
#                              #
#========================================#
```

Fig. B - Open Ground Arena (Pattern)

Simple flat ground. Pure fighting with no obstacles. Eight variations with different playfield patterns provide variety while maintaining the classic head-to-head combat feel.

8.3.2 Arenas 9-16: Platform and Pit Variations

```
###############################################
#                         #
#     =======     =======          #
#                         #
#   [P1]        =====        [P2]      #
#                         #
#=========================================#
```

Fig. C - Platform Arena (Pattern)

Multiple platforms for vertical combat. Jump to higher ground for advantage! Eight variations feature different platform arrangements, pit configurations, and obstacle placements to keep battles fresh and tactical.

9 Console Switches

The console switches provide additional game control:

9.1 GAME RESET Switch

        RESET
        =====

Pressing the RESET switch:

1. Returns to Character Selection screen

2. Clears all player selections

3. Re-detects controllers

4. Resets all game state

Use this to start a new game or change characters between matches.

9.2 GAME SELECT Switch

        SELECT
        ======

Pressing the SELECT switch:

1. Cycles through available game modes (if multiple modes)

2. Re-detects controller configuration

3. Can be used to refresh controller detection if players aren't responding

9.3 TV TYPE Switch (COLOR/B&W)

        COLOR <—> B&W

ChaosFight automatically detects the TV TYPE switch and adjusts all colors accordingly.

COLOR Position

        Full color display with distinct player colors:

- Player 1: Blue
- Player 2: Red
- Player 3: Yellow (4-player mode)
- Player 4: Green (4-player mode)
- Playfield: White
- Background: Black

B&W Position

        Grayscale display with brightness differentiation:

- Player 1: Very bright grey (luminance 14)
- Player 2: Medium-bright grey (luminance 10)
- Player 3: Medium grey (luminance 8)

- Player 4: Dark-medium grey (luminance 6)
- Playfield: White (luminance 14)
- Background: Black (luminance 0)

Damage Indication:

When characters take damage, colors darken in both modes:

- **Color mode:** Hue remains same, luminance reduced by 50%
- **B&W mode:** Grey darkens by 6-8 luminance levels

Health Bars:

Health bars maintain distinct brightness levels in B&W mode, matching sprite colors for easy player identification.

9.4 DIFFICULTY Switches

LEFT DIFFICULTY   RIGHT DIFFICULTY
(Player 1/3)   (Player 2/4)

The difficulty switches affect gameplay:

Position A (Advanced)

- Shorter attack range (12 pixels vs 16 pixels)
- Slower movement speed (80% normal)
- Longer attack cooldown (20 frames vs 15 frames)

Position B (Beginner)

- Normal attack range (16 pixels)
- Normal movement speed
- Normal attack cooldown (15 frames)

Controller Port Mapping:

- LEFT DIFFICULTY affects Players 1 and 3
- RIGHT DIFFICULTY affects Players 2 and 4

10 Tips and Strategies

Master these techniques to become a ChaosFight champion!

10.1 Basic Techniques

10.1.1 Timing Your Attacks

```
ATTACK ——> <—— COOLDOWN —-> ATTACK
 [==]        (wait)  xxxxxx        [==]
```

- Each attack has a cooldown period (15-20 frames)
- You cannot attack again until cooldown expires
- Watch for your character's animation to return to idle
- Don't spam the fire button - time your strikes!

10.1.2 Effective Guarding

```
INCOMING!                 GUARD!
  ->o–>  [YOU]    vs.    ->o–>  [[YOU]]
     |                         BLOCKED!
```

- Guard lasts maximum 1 second
- Use it to block predictable attacks
- You're vulnerable immediately after guard ends
- Don't hold guard too long - you can't counterattack!

10.1.3 Spacing Control

```
BAD:  [YOU][ENEMY]     Too close! Easy to hit.
GOOD: [YOU]     [ENEMY] Maintain safe distance.
```

- Keep distance from melee fighters
- Close the gap against ranged fighters
- Use platforms to control engagement distance
- Retreat when health is low

10.2 Advanced Tactics

10.2.1 Character Matchups

Playing Melee vs Ranged:
- Stay mobile - don't be a stationary target
- Use platforms to block projectiles
- Time your jumps to avoid shots
- Rush in after opponent fires (during cooldown)

Playing Ranged vs Melee:
- Maintain maximum distance

- Fire and retreat
- Use knockback to keep opponent away
- Jump to higher platforms for safety

10.2.2 Weight Class Tactics

Light Characters (Ninjish, Radish, Faerie):

- Use superior mobility for hit-and-run attacks
- Jump frequently to avoid attacks
- Be careful - you take more knockback!
- Don't trade blows with heavy characters

Heavy Characters (Ursulo, Bernie, Knight):

- Stand your ground - you're hard to knock back
- Use your weight advantage in close combat
- Don't chase fast opponents - let them come to you
- Control center stage

10.2.3 Arena-Specific Tactics

Open Ground:

- No hiding - stay alert!
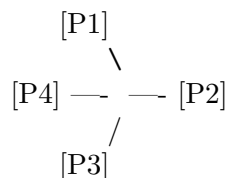- Circular movement keeps you safe
- Ranged characters have advantage

Platforms:

- High ground advantage for ranged attacks
- Jump between platforms to escape
- Melee fighters: attack from below/above

Pit:

- Don't get cornered in the pit!
- Control the edges
- Knock opponents into the pit

10.2.4 Four-Player Strategies

```
        [P1]
            \
   [P4] —-   —- [P2]
            /
        [P3]
```

Stay unpredictable in FFA!

- **Avoid the center** - you'll be surrounded!
- **Let others fight** - third-party while they're distracted

- **Target the leader** - whoever has most health is the threat
- **Stay mobile** - standing still means getting hit from multiple angles
- **Use revenge attacks** - immediately counterattack whoever hit you

10.3 Character-Specific Tips

Bernie   Use your dual-direction attack when surrounded. Your screen wrap is great for surprise attacks from above!

Robo Tito   Your vertical extension reaches the entire screen height. Use it to avoid ground attacks!

Harpy   Maintain flight by rapidly tapping UP. Swoop down for devastating diving attacks!

Magical Faerie

Your free flight makes you incredibly mobile, but remember you can't guard! Stay out of melee range.

Curling Sweeper

Your low projectile is hard to jump over. Fire and immediately jump yourself to create a two-level attack!

EXO Pilot   Your long-range missiles are perfect for cross-screen combat. Keep maximum distance!

11 Technical Information

11.1 System Requirements

Console   Atari 2600 Video Computer System (NTSC, PAL, or SECAM)

Cartridge Type
   64K bank-switched (F8SC or compatible)

RAM   Standard 128 bytes + SuperChip 128 bytes

Controllers
   1-4 Joystick Controllers (see Chapter 3 [Controller Configuration], page 4)

Display   Color or Black & White television

Optional   Quadtari adapter for 4-player mode

11.2 Technical Specifications

11.2.1 ROM Organization

Bank 1-16: Game code and data (16 × 4K banks)
Bank Layout:
  1-3:   Title sequence, preambles, character select
  4-8:   Gameplay routines (combat, physics, rendering)
  9-12: Character definitions and animation data
  13-16: Level data, music data

11.2.2 Memory Usage

STANDARD RAM (128 bytes):
 a-z: 26 variables (general purpose)

SUPERCHIP RAM (128 bytes):
 var0-var47: Available for variables
 var48-var127: Playfield data (varies by pfres)

PLAYFIELD RESOLUTION:
 Title/Preamble screens: pfres=32 (32×32 pixels)
 Gameplay screens: pfres=8 (32×8 pixels)

11.2.3 Graphics System

Player Sprites
   2 hardware sprites (8 pixels wide × 16 pixels tall)
   - Player 1: Blue
   - Player 2: Red

Missile Sprites
   2 hardware missile sprites (variable width)
   - Used for Players 3 & 4 in Quadtari mode

- Used for ranged attack projectiles in 2-player mode

Ball Sprite

     1 hardware ball sprite (variable width)

- Used for Player 4 in Quadtari mode
- Used for additional projectiles

Playfield   32 pixels wide × up to 192 scanlines

- Color-per-row support on title screens
- Standard two-color mode during gameplay

11.2.4 Performance Optimizations

ChaosFight uses frame budgeting to maintain consistent 60 FPS (NTSC) / 50 FPS (PAL):

1. **Health Bar Updates:** 1 player per frame (4-frame cycle)
2. **Collision Detection:** Spread across 3 frames in 4-player mode
   - Frame 0: Check 2 collision pairs
   - Frame 1: Check 2 collision pairs
   - Frame 2: Check 2 collision pairs
3. **Missile Collisions:** Alternating frames check different missiles
4. **Animation Updates:** Characters update on staggered frames

This ensures game logic never exceeds the overscan period (~1950 CPU cycles on NTSC, ~1630 cycles on PAL).

11.2.5 Audio System

Sound Channels

    2 channels (TIA AUDC0/AUDC1)

- Channel 0: Music (title and preamble screens only)
- Channel 1: Sound effects (gameplay only)

Music Format

- Converted from MuseScore (MSCZ) to MIDI to TIA data
- Stored as data tables: instrument, frequency, duration
- Three songs: AtariToday, Interworldly, Chaotica

Sound Effects

- "Chirp" for character selection
- Attack sounds (melee and ranged)
- Impact sounds
- Victory fanfare

12 Troubleshooting

12.1 Common Issues

12.1.1 Controllers Not Responding

Problem: Joystick inputs are not detected.

Solutions:

1. Press the GAME SELECT switch to re-detect controllers
2. Check that controllers are firmly connected to the correct ports
3. Try pressing a fire button at the Title screen to trigger detection
4. If using Quadtari, ensure it's properly connected and powered

12.1.2 Four Players Not Working

Problem: Only 2 players are active despite Quadtari being connected.

Solutions:

1. Verify your Quadtari adapter is compatible with Atari 2600
2. Press GAME SELECT to re-detect the Quadtari
3. Ensure all four controllers are connected to the Quadtari
4. Note: Quadtari is detected during Title screen - don't skip it too quickly!

12.1.3 Screen Flicker or Slowdown

Problem: Graphics appear choppy or unstable.

Solutions:

1. This is normal in 4-player mode due to hardware limitations
2. Health bars and collision detection are intentionally spread across frames
3. Ensure your console is properly ventilated
4. Clean the cartridge contacts with isopropyl alcohol

12.1.4 Characters Look Wrong

Problem: Character colors appear incorrect or hard to distinguish.

Solutions:

1. Check the COLOR/B&W switch position:
   - COLOR position: Characters are Blue, Red, Yellow, Green
   - B&W position: Characters are different shades of grey
2. For black & white TVs, set switch to B&W position for proper brightness levels
3. Adjust your TV's brightness/contrast for better grey differentiation (B&W mode)
4. Adjust your TV's color/tint settings (Color mode)
5. Verify correct ROM version (NTSC/PAL/SECAM) for your console

12.1.5 Game Won't Start from Multicart

Problem: ChaosFight doesn't launch from multicart menu.

Solutions:

1. Ensure you have the correct ROM version for your multicart
2. Try loading a different ROM first, then load ChaosFight
3. Some multicarts require specific bank-switching types - consult documentation
4. Verify the ROM file is not corrupted (check MD5 checksum if available)

12.2 Getting Help

If you continue to experience issues:

1. Check for ROM updates at `https://interworldly.com`
2. Consult homebrew Atari 2600 community forums for technical support
3. Contact Interworldly Adventuring at `https://interworldly.com`

13 Credits

13.1 Development Team

ChaosFight was developed by:

Programming
Bruce-Robert Pocock

Graphics   Bruce-Robert Pocock

Music   Bruce-Robert Pocock

Game Design
Bruce-Robert Pocock

Testing   [Playtesters TBD]

13.2 Special Thanks

- Fred *batari* Quimby (batariBasic compiler)
- Ryan Witmer
- Lewis *Muddyfunster* Hill
- Blake *SmittyB* Smith
- Zephyr Pocock
- Philip *Splendidnut* Blackman
- Vladimir *vhzc* Zúñiga
- Atari 2600 homebrew community
- Random Terrain (batariBasic documentation)

13.3 Tools Used

ChaosFight was created with:

- **batariBasic** - High-level BASIC compiler for Atari 2600
- **DASM** - Macro assembler
- **SkylineTool** - Asset conversion toolkit (Common Lisp)
- **GIMP** - Graphics editing
- **MuseScore** - Music composition
- **Emacs** - Text editing
- **Stella** - Atari 2600 emulator for testing

13.4 Copyright and License

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Portland, Oregon
`https://interworldly.com`

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13.5 Version Information

Version: 1.0
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Compatibility: NTSC/PAL/SECAM

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