Detailed Game Specification:  
TETRASLAM

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# General Game Overview

TETRASLAM is the redesigned game play of the famous 1985 retro puzzle game called TETRIS. The playing field is a 10x20 tile screen. A tile is composed of 16x16 pixels. This means the playing field is 160 152 x 302 pixels. In order to account for adjacency to the grid line, the total playing field will be 153 x 303 pixels. Unlike the original game, the player’s purpose is to clear the playing field as if another person had previously played. A “tower” will occupy the playing field. The tower is a collection of all seven Tetris pieces that players must clear. This game aims to eliminate the player’s choice of being the one to create their own obstacles. The game will also terminate if the tower manages to collide with the top edge of the playing field. To compensate for the lack of timed events, a counter of tiles is being occupied in the playing field. However, when a playable piece is dropped into the playing field, the tile counter will also account for the newly placed pieces. This game is designed strictly for precision and strategy by learning how to manage the tile counter.

The seven original Tetris pieces called tetrominoes will remain the same with no new pieces being introduced. A tetris piece will be a 16 x 16 pixel image. A row will be cleared, to a maximum of four rows, when all tiles occupy all 10 rows of the playing field. The properties of their objects are changed however. No gravity will exist on the playable pieces. Gravity refers to the downward motion that occurs to the playable piece and the tower in the playing field after a row clearance. No playable pieces will automatically drop and accelerate as the game session progresses. While there is no gravity on the playable pieces, gravity does apply to the tower when rows are cleared. After a row is cleared, blocks above it will fall to fill the gaps, maintaining the integrity of the tower. This also applies to column clearance, where gravity helps manage gaps in partially filled columns. No “bank” mechanic where players can hold a piece will be implemented, rather a way to cycle through all seven pieces in ascending order. Rotation of the seven pieces will also be removed. There will not be randomly generated pieces and instead each piece is alphabetically ordered in the form: I-piece, J-piece, L-piece, O-piece, S-piece, T-piece, and Z-piece. The start of each game session will always have the same starting order and that is the I-piece. Pressing a specific key will cycle to the next alphabetical piece. This implementation removes the random number generation that was used originally to provide the playable pieces and gives players freedom to how they approach the playing field.

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# A sample image of what the playing field will look like and what the tower object looks like. Empty tiles will occupy the top of the playing field to account for player movement. In this image the tile counter is 100/100. For the game winner flag to activate, players must clear the playing field until 90% of the tiles have been cleared or 10/100 is left.

# (from <https://www.freetetris.org/game.php#google_vignette>)

# 2. Game Play Details for Core 1-Player Version

## Objectives and Rules

The game’s playing field begins with (TBA) blocks pre-generated on the screen, collectively referred to as the tower. The first playable piece, the I-piece, is positioned at the top of the playing field. The objective is to clear as many tiles from the tower as possible while managing a tile counter. The game session starts with a 100/100 tile counter, meaning that half of the 200 tiles in the 10x20 playing field are occupied. Each time a row is cleared, the tile counter is updated to reflect the new number of tiles present. For instance, clearing a single row reduces the counter to 90/100. To win, the player must clear 90% of the tiles, ensuring that only 10/100 tiles remain on the stage. The game triggers a win flag when this threshold is met. A loss occurs if the tower reaches the top edge of the playing field. The game has no time limit, allowing players to complete it at their own pace, focusing on strategic management of the tile counter.

## Playable Piece and Playing Field Collisions

Colliding with the leftmost or rightmost stage boundary prevents the blocks from moving further in that direction. Each side of the block will account for collisions with both the playing field boundaries and the tower. The playing field continuously scans for collisions in each row. When no collisions are detected in adjacent rows of the tower, gravity will shift the blocks above the cleared space downwards to fill gaps.

## Playable Piece and Tower Collisions

A collision between a playable piece and the tower is necessary for a row to be cleared. When all 10 columns of the playing field detect a complete row of collisions, that row will be cleared. The tower is composed of a collection of tetrominoes, meaning that all adjacent pieces must have collisions to register a row clearance.

## Piece Movement and Selection

Players can use the arrow keys on the keyboard to move the block left or right across the 10x20 playing field. Holding the arrow keys will increase the block’s movement speed. Pressing the spacebar will drop the currently selected playable piece. With the absence of a rotation system, players have limited moves available, which emphasizes strategic placement. To cycle through different pieces, players can press the "C" key on the keyboard. Holding this key will accelerate the cycling through the pieces. Whenever a row is cleared and there are blocks above, those blocks will fall to the next available tile, maintaining the integrity of the tower.

## Objects

| Object or Object Type Name | Properties | Behaviours | Graphical Image |
| --- | --- | --- | --- |
| Playable piece  (I-piece [16x61], J-piece [31x46], L-piece [31x46], O-piece [31x31], S-piece [46x31], T-piece [46x31], Z-piece [46x31]) | * Position (x, y: TBA) * Speed (integer, constant: TBA) * Horizontal direction (integer: TBA) * Vertical direction (integer: TBA) * Tile count | * Move left * Move right * Drop * Cycle to next alphabetical tetromino * Merge with the tower |  |
| Tower | * Position (x, y: TBA) * Block count * Tile count | * Merge * Row clearance * Move down state * Detect gaps |  |
| Playing field  [153 x 303] | * Position (constant Integer pair: x, y) * Tile count | * Update * Scan |  |
| Tile counter | * Position (constant integer pair: fixed x,y - TBA) * Size (constant integer pair: fixed x,y - TBA) * Start value (100/100) | * Update (decrementing) | [TBA] |

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## Asynchronous (Input) Events

| Event Name | Triggering Input Event | Description |
| --- | --- | --- |
| Move left request | Left arrow key is depressed | This will set the player’s playable piece’s horizontal direction to -1. |
| Move right request | Right arrow key is depressed | This will set the player’s playable piece’s horizontal direction to 1. |
| Drop block request | Space bar is depressed. | This will set the player’s block vertical direction to 1. |
| Cycle block request | “C” key is depressed. | This will cycle the player’s tetromino to the next playable piece. |
| Quit | Esc key is depressed | Terminates the game flag. |

## Synchronous (Timed) Events

| Event Name | Trigger Timing | Description |
| --- | --- | --- |
| Move player piece | Every 1/70th of a second. | Once the clock refreshes, the left arrow key from the keyboard is read and updated. |
| Drop player piece | Every 1/70th of a second. | Once the clock refreshes, the space bar key from the keyboard is read and updated. |
| Cycling player piece | Every 1/70th of a second. | Once the clock refreshes, “C” bar key from the keyboard is read and updated. |
| Scan playing field | Every 1/70th of a second. | The playing field scans for collisions that occur in the playing field. |
|  |  |  |

## Condition-Based (Cascaded) Events

| Event Name | Triggering Condition | Description |
| --- | --- | --- |
| Player piece - left edge collision | The player piece has moved to the left and the block’s position is less than or equal to the stage’s left edge. | The playable piece no longer moves to the left after it becomes flush to the left stage boundary. |
| Player piece - right edge collision | The player piece has moved to the right and the block’s position is greater than or equal to the stage’s right edge. | The playable piece no longer moves to the right after it becomes flush to the right stage boundary. |
| Player piece - top edge collision | The next playable piece that occurs on top must have its positions less than or equal to the previous piece’s edge. | A player piece is dropped in the playing field and the next playable piece that is dropped occupies the previous piece’s top. |
| Player piece - bottom edge collision | When a player piece is dropped in the playing field, the pieces occupying the bottom must have its positions be greater than or equal. | A player piece is dropped in the playing field and there are pieces occupying at the bottom. |
| Tile counter increment | When a player chooses to drop a piece, it becomes an active piece which means it will increment the tile counter with how many tiles that block has. | [TBA] |
| Tile counter decrement | When a row is cleared, the tile counter will decrement. | [TBA] |
| Clear rows | When all 10 columns in a row are filled. | Playing field scans the columns from left to right and if collisions are adjacent to all columns it will then clear the row. |
| Update gravity | If the playing field does not scan any collisions in each subsequent row. | [TBA] |
| Win or lose | The player wins if the tiles on the screen are less than or equal to the tile counter.  The player loses if the tiles on the screen are greater than the tile counter. | Game winner flag is executed if the player succeeds in |
|  |  |  |

## Hypothetical Gaming Session

[TBA]

# 3. Game Play Details for Core 2-Player Version

The rules remain the same for the 2-player version. Players play simultaneously in the same session with the only difference being who can clear the playing field the fastest. The player with the least number of tiles remaining in the screen is the winner.

[2-player sample screenshot goes here.]

# 4. Sound Effects

| Sound Effect Name | Brief Description | Event which Triggers Playback |
| --- | --- | --- |
| Dropping block | thonk | player presses upon the action key to drop a block |
| Victory | trumpets | player wins the game by meeting the block threshold |
| Loss | crash | player loses the game by allowing the tower to collide with the top edge of the playing field |
| Cleared row | bonk | player successfully clears all 10 columns |

The background music is the original background music for the game Tetris.

# 5. Additional Features (Time Permitting)

[TBA]