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FIELD SERVICE
07 SEP 1981



TO: Morgan Hoff

FROM: Dave Theurer

SUBJECT: Tempest Game Specification

DATE: Aug. 27, 1981

I. General Game Description

The player controls a cursor which moves around the near end of a tubelike surface. The enemies land on the far end of the tube and climb towards the player. The player fires down the tube at the approaching enemies. When a player kills all the enemies on a tube, he blasts through the tube, flies through space, lands on a new tubelike surface, and fights the enemies on that surface. The player loses a life when killed by the enemy. The game is over when all the player's lives are gone.

II. Hardware Requirements

- A. Color XY monitor
- B. Player controls
 - 1. 1 player start switch/LED
 - 2. 2 player start switch/LED
 - 3. fire switch (2 if cocktail)
 - 4. superzapper switch (2 if cocktail)
 - 5. whirly gig (2 if cocktail) - (ROTATION CONTROL)
- C. Other switches
 - 1. 3 coin switches
 - 2. coin counters
 - 3. slam switch
 - 4. self test switch
 - 5. option switches
 - a. 2 banks of 8
 - b. 1 bank of 4
- D. 2 POKEYs
- E. Math box (Battlezone type)
- F. Analog vector generator circuitry (Battlezone type)
- G. EAROM
- H. 20K Program ROM (10 2716s)
- I. 4K Vector Generator ROM (2 2716s)
- J. 4K Vector Generator RAM
- K. 2K working RAM

II. Attract Mode

- A. High Score display mode
 1. 12 seconds duration
 2. Top 8 scores and initials in screen center.
 3. Rank from 1 to 99 for the player(s) in the last game appear under high score table.
 4. Score(s) from last game remain at top of screen.
 5. Highest score and initials appear at top middle of screen.
 6. Credits and coin mode appear on bottom line of screen.
 7. Bonus interval (alternating with "2 GAME MINIMUM" if option is selected) appears 2 lines from bottom.
 8. ATARI copyright appears 3 lines from bottom.
 9. 2 messages alternate under highest score. If credits
 - a. =0 then "INSERT COINS" and "GAME OVER" alternate.
 - b. >0 then "PRESS START" and "GAME OVER" alternate.
 - B. Tempest Logo mode
 1. 12 seconds duration.
 2. Multicolored square shrinks toward center from which the Tempest logo emerges very small and gradually grows to full size, going through a series of colors and multiple images.
 3. ATARI copyright appears on lower half of screen.
 - C. Game play mode
 1. 5 to 60 second duration.
 2. See III.A.4. thru 9. above for information displayed.
 3. Action
 - a. 1 of first 8 surfaces is chosen randomly.
 - b. computer controls cursor in intelligent manner and shoots at approaching enemies.
 - c. Enemies act as they would during game for that surface.
 - d. Mode ends when either
 1. computer cursor gets shot or spiked.
 2. computer kills all enemies on surface, blasts through tube and space and lands on next surface.
 - D. Special events in attract mode.
 1. If player has credits and attempts to play game (spins knob)
 - a. current attract mode is aborted.
 - b. "PRESS START" appears in center of screen.
 - c. Information described in III.A.4. thru 9. is displayed.
 - d. 3 seconds after player stops spinning knob the high score table mode will take over.
 2. If 2 game minimum option is in effect,
 - a. If player presses start after obtaining 1 credit, "INSERT COINS" will appear in center of screen.
 - b. "2 GAME MINIMUM" will alternate with bonus interval message.
3. Program RAM is not zeroed as in self test.
 - a. Credits are retained.
 - b. High score table is not cleared (unless EARTH high scores were zeroed).
4. Monitor size adjustment guide.
The large white box around screen should be entirely visible and within 1 inch of the edges of the monitor.

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Configuration Mode

Entry/Exit

1. Entered by switching self test switch during attract mode.
2. Aborted by switching self test switch back or by pressing fire & superzapper to go to self test.

B. Description

1. Provides operator with game configuration information.
 - a. Options are described.
 1. Coin mode indicated in lower right corner.
 2. Coin mech multipliers are indicated under times as X1BC where 1, B, and C represent left, center, and right mechs multipliers.
 3. Bonus adder is indicated. For example, 14 signifies 1 free coin for every 4 inserted.
 4. Number of lives/game is indicated by the corresponding number of cursor pictures.
 5. Bonus interval: BONUS EVERY X0000 or no message if no bonus.
 6. Language option can be deduced by reading coin mode.
 7. "2 game minimum" alternates with bonus interval if selected.
 8. EASY, MEDIUM, and HARD indicate game difficulty option.
 9. Minimum level choice option is not indicated.
 - b. Number of games and times are listed (in seconds).
 1. Total time game has been powered on.
 - each real game.
 - wraps to 0 after 194 days (16777215 seconds).
 2. Total time game has been played.
 - starts when start button is pressed.
 - ends when last life is lost.
 - does not include fireworks and initial entry time.
 3. Number of 1 player games.
 4. Number of 2 player games.
 5. Average game time.
 - $(\# 1 \text{ player games} + 2 * \# 2 \text{ player games}) / \text{seconds played.}$
 6. All above buckets wrap to 0 at 16,777,215.
 - c. Option switch settings are indicated by 3 banks of 0's and 1's in center of screen.
 - d. # credits appear.
2. Selective EAROM clearing by operator.
 - a. High scores. *TIMES*
 1. Turn knob until top line reads "PRESS FIRE AND START 1 TO ZERO TIMES."
 2. Press fire and start 1 simultaneously.
 3. "ERASING" will appear until process is finished.
 4. Do not abort this mode until erasing is finished.
 - b. Times. *HIGH SCORES*
 1. Turn knob until top line reads "PRESS FIRE AND START 2 TO HIGH SCORES."
 2. Press fire and start 2 simultaneously.
 3. "ERASING" will appear until process is finished.
 4. Do not abort this mode until erasing is finished.
3. Program RAM is not zeroed as in self test.
 - a. Credits are retained.
 - b. High score table is not cleared (unless EAROM high scores are zeroed).
4. Monitor size adjustment guide.

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1. Originate
 1. from enemies landing on far rim
 2. from pulsar tankers
 - a. getting hit by player shot
 - b. getting very close to near rim.
- m. Cause player to explode into pieces.

6. Enemy Shots

- a. Appear as a core of red dots surrounded by white dots rotating in opposite direction.
- b. Cause player to lose a life if they contact cursor. Player's cursor disappears and a jagged flashing explosion takes place.
- c. Worth 0 points.
- d. Maximum of 4 on screen at once.
- e. Move faster than all enemies except fuseballs.

G. High Score Mode

1. Entered at end of game.
2. If player had one of top 8 scores
 - a. a short fireworks display occurs.
 - b. then the computer requests his initials.
 1. high score table is displayed.
 2. player's score is highlighted with a special color.
(The player enters his initials directly into the high score table.)
 3. a highlighted "A " appears in the initials spot.
 4. player then rotates knob until correct initial appears.
 5. player presses fire or superzapper to select the letter.
 6. steps 4 and 5 are repeated for last 2 initials.
 - c. instructions are displayed in bottom area of screen.
 - d. hitting a start button will abort this mode and start a new game.
3. If both players got high scores, then both perform step G.2.. The last player playing enters his score first.
4. Game then goes into attract mode, starting with the high score display.
5. During this mode, EAROM is updated
 - a. game time and powered on time are updated.
 - b. If any of the top 3 scores changed, then
 1. high score & initials are rewritten.
 2. game play options are rewritten.
6. At the beginning of the game, all options are established for the entire game. If they differ from those saved in the EAROM for the EAROM high scores, then the high score table is initialized to 10101. However, the EAROM is not updated until the end of the game.

VI. Game play hints

A. Chose correct starting level

1. New players should start at level 1 and work their way up to familiarize themselves with each enemy situation in the intended gradual manner.
2. If a player finds it impossible to make it through the chosen level, he should start at the next lower level.
3. Start at the highest level possible for the highest score.

2. Superzapper takes time, so don't wait until a flipper is on top of you before using it.
3. Save the mini-superzapper for that last fuseball that's got you in the corner at the top.

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maximize score within a level

1. Learn the value for shooting each type of enemy.

50 points for spikers

100 points for tankers

150 points for flippers

200 points for pulsars

250, 500, or 750 points for fuseballs.

2. Shoot at the most valuable enemies.

3. Shooting a tanker produces 2 flippers, or a potential 400 points.

4. If superzapper remains, use it right before last enemy reaches top. This will give you points for all enemies that would normally have been left at the top.

C. Get a jump on the enemy

1. When new surface approaches, observe where enemy dots are heading and send some shots down to greet the enemy when he lands.

2. When firing on a tanker, blanket both lanes around it with shots to kill the enemies which emerge when the tanker splits.

D. Avoid kamikaze situations

1. When firing on a pulsar tanker, fire and move away quickly, since emerging pulsars could be pulsing.

2. Avoid shooting at fuseball tankers near the top, since emerging fuseballs usually zip straight up to the top and kill you.

E. Learn the angles

1. A flipper flips at a constant rate, so when a flipper is flipping toward you at the top

a. acute angles are bad, since the flipper can traverse them almost instantly.

b. obtuse angles (the larger the better) are good, since it takes the flipper long enough to traverse it that you can pick him off.

2. Utilizing this requires agile movement on some surfaces, especially, the star.

F. Learn to kill the enemy at the top

1. Save up shots.

2. Wait until the enemy is on adjacent lane.

3. Start firing as soon as the flipper starts his flip.

4. Use the spike technique to get more shots in and have a better chance of picking off the enemy as he flips.

G. Learn how to get more shots

1. You may have up to 8 shots on the screen at once.

2. You get a shot back when it

a. hits an enemy

b. goes off far end of surface

c. goes a short distance into a spike

H. Use the spike technique for maximum firepower in dealing with enemies at the top.

1. Keep an eye out for the longest spikes.

2. Let the spikers build some long spikes.

3. When a flipper at the top approaches you, move over the long spike and wait. As the flipper hits the adjacent lane, start firing into the spike. You will get your shots back so fast that no special timing is necessary.

I. Superzapper usage

1. Use it when it will kill a lot of enemy.

2. Superzapper takes time, so don't wait until a flipper is on top of you before using it.

3. Save the mini-superzapper for that last fuseball that's got you in the corner at the top.

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tions
able Entry or Self Test Display) 0=ON (Label on PCB Switch),
1=OFF

The Self Test orders the switch information as below ie. left to right is switch 1...switch 8.

Coin mode bank of 8 (PCB Location N13)

Switch 1	2	3	4	5	6	7	8	Option
=	=	=	=	=	=	=	=	=====
							1 0	free play (see VII. B. Sale Mode below)
							1 1	1 coin 2 plays
							0 0	1 coin 1 play
							0 1	2 coins 1 play
				0 0				right mech mult=1
				0 1				right mech mult=4
				1 0				right mech mult=5
				1 1				right mech mult=6
				0				center mech multiplier=1
				1				center mech multiplier=2
0	0	0						no bonus adder
0	1	0						bonus adder: 1 free every 4
0	1	1						2 free every 4
1	0	0						1 free every 5
1	0	1						1 free every 3
1	1	0						no bonus adder
1	1	1						no bonus adder

B. Sales Mode

1. In effect if coin mode=free play
2. Freeze action by setting switch #1 to off.

(NOTE: if freeze is selected and reset is attempted, the program will not start).

(NOTE: attempting to freeze during a player death explosion will cause the program to go into the weeds).

3. Switch #2 to off for
 - a. ability to abort tube (induce passage down surface towards far rim before finishing off enemies by pressing either start switch). Keep fire button pressed to clear out a path through spikes at bottom of tube.
 - b. ability to chose any of the levels (1 thru 81) during rating mode.
 - c. score will be zeroed at end of game to avoid invalid high -score entries.

C. Game play/foreign languages bank of 8 (PCB Location L12).

Switch 1	2	3	4	5	6	7	8	Option
=	=	=	=	=	=	=	=	=====
							0	no credit minimum
							1	2 credit minimum
				0 0				English language
				0 1				French
				1 0				German
				1 1				Spanish
		0	0	0				20000 point bonus interval
		0	0	1				10000
		0	1	0				30000
		0	1	1				40000
		1	0	0				50000
		1	0	1				60000
		1	1	0				70000
		1	1	1				no bonus lives.
0	0						3	lives/game to start
0	1						4	"
1	0						5	"
1	1						2	"

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16/10/81.

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Bank of 4 on aux board
Switch 1 2 3 4 Option
=====
      0 0 Medium difficulty
      0 1 Easy
      1 0 Hard
      1 1 Medium
0 Minimum rating range=1,3,5,7,9
1 Minimum rating range tied to high score:
  1,3,5,7,9 if hi score<300000
  1,3,5,7,9,11 if hiscore>300000 and <500000
  1,3,5,7,9,11,13 if hiscore>500000 and <700000
  1,3,5,7,9,11,13,15 if hiscore>700000
x Not used

```

E. NOTE that all option switch settings are set up so that all 0 settings (all switches the same direction) gives recommended settings.

F. Difficulty option

1. Easy

- a. 1/8 less enemies/level
- b. 1 less enemy shot on screen at one time
- c. enemies move 7/8 as fast as MEDIUM.
- d. flippers flip half as fast at top in levels 1 thru 16.

2. Medium is recommended standard setting.

3. Hard

- a. 1/8 more enemies/level.
- b. 1 more enemy shot (up to 4) on screen at one time.
- c. enemies move 1/8 faster than MEDIUM.
- d. pulsars start shooting at level 20, rather than 60.

4. Changing options

1. Go into Configuration Mode.
2. Change options.
3. Verify change on screen.
4. Effect on high scores in EAROM
 - a. if bonus interval, live/game, or difficulty options are changed, then the high score table will be initialized to 10101. EAROM is then updated when Configuration Mode is exited.
 - b. if the switch is changed outside of Configuration Mode, then when the first game is started, the high score table will be initialized. However the EAROM high scores will not be changed until the end of the game.

Figure 1

High Score Display

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Player 1 score

Hi score/Initials

Player 2 score

PRESS START or INSERT COINS
alternating with GAME OVER

HIGH SCORES

- 1. EJD 10101
- 2. DES 10101
- 3. RRR 10101
- 4. MPH 10101
- 5. DFT 10101
- 6. SML 10101
- 7. MRP 10101
- 8. BEH 10101

RANKING FROM 1 TO 99

- 33. PLAYER 1
- 59. PLAYER 2

C ATARI MCMLXXX
BONUS EVERY X0000

CREDITS 2

1 COIN 1 PLAY