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THUNDERJAWS

Game Initiation Package

Atari Games Division

Company Private

Date: 1/2/89

Submitted by: TJ Development Team

1. Introduction

1. 1. Theme:

The beautiful, brilliant, but quite mad Madam Q has devised a plot to destroy the surface of our world and leave her underwater city intact. She has created an army of genetically mutated humans and bionic warriors to protect her labs, bases, and city and to carry out her mad schemes.

1. 2. Your Goal:

You are a member of a crack underwater special forces unit and have been selected to attack Madam Q's bases and stop her demented plans before she can destroy the world.

1. 3. Mission Briefing:

The only known operation of Madam Q's vast underwater empire is a research station located on Paradise Island in the South Pacific. You will be taken there to begin your mission. You are directed to take this station, shut it down, and learn as much as possible concerning the whereabouts of other parts of Madam Q's empire.



Figure #1 -- Madam Q

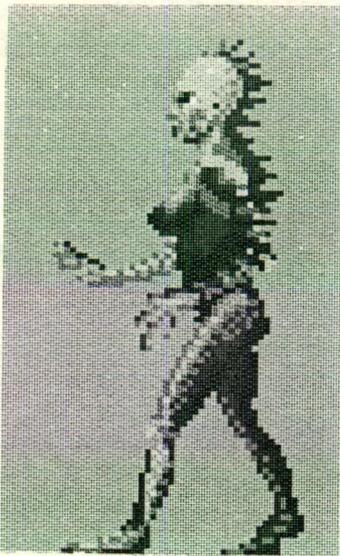


Figure #2 -- Lizard Lady

Madam Q's creatures and personal guard are totally devoted to her. They will gladly die to protect her...

- Special Forces Briefing

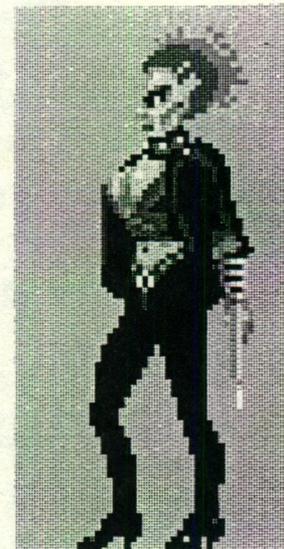


Figure #3 -- Punker

2. Game Elements

2. 1. Perspective

Both the surface and underwater phases of the game will be an edge-on side view (identical to Rolling Thunder). Player and enemies will normally face toward either the left or right edge of the screen. However, during special events, the player or selected enemies may face either directly toward the screen or away from the screen (such as when performing choreographed sequences).

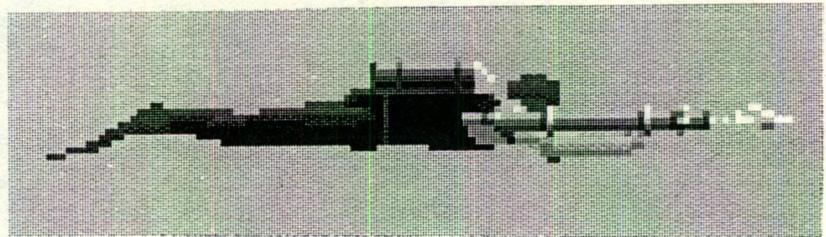
One of the design goals for ThunderJaws is the provide visual entertainment. One of the ways we plan to implement this involves the use of our second scrolling playfield. Using the second playfield, we will show scenes taking place "outside", or in other rooms, or on large video screens. For instance, while the player is fighting his way through the corridors of the experimental station, a window on the wall into the laboratory will show the sequence of turning the beautiful babes into the mutated creatures. In other areas of the surface world and underwater, the second playfield will be used to provide a feeling of "depth."

We know she's brilliant. We know she's insane. We don't know 100% what she is up to, but we do know that if we don't stop her soon we will all be very dead.

- Special Forces Briefing

2. 2. Scrolling

We will use a "locked" scrolling algorithm similar to P.O.W. and Rolling Thunder. This will keep players from being able to retreat backwards once they advance in the game. Also, scrolling will be locked in the forward direction until selected enemies are defeated (similar to P.O.W but hopefully more subtle). The scroller target positions will be embedded in the playfield and are not open to control by any player actions (other than proceeding forward and defeating enemies).



leg. stuck fill
knock out
something

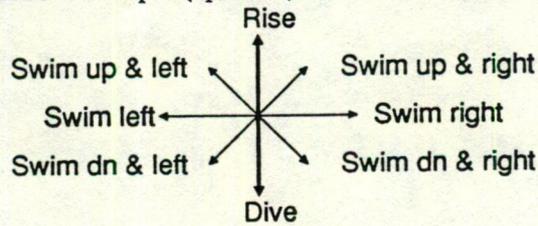
Figure #4 -- Player (swimming)

2. 3. Controls

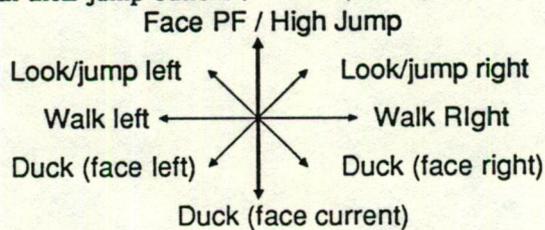
We are planning on using an 8-position joystick and two buttons per player station. One button will be used as a fire button and the other will be a jump button.

2. 3. 1. Joystick

Underwater the joystick will control depth (up/down) and swimming (left/right).



On the surface, the joystick will control movement (left/right), ducking (down), and turn-in or high-jump (up) -- depending on if the jump button has been hit. This is nearly identical to the way Rolling Thunder used the joystick and had it interface with their jump button. *Go thru door or whatever*



2. 3. 2. Jump Button

Underwater, since the player doesn't actually "jump", this button will serve as a sort of "boost" effect and cause the player to get a momentary speed burst (in effect, an underwater jump). The button will work in conjunction with the joystick and cause the boost to occur in the currently selected direction.

On the surface, if the joystick is in the neutral position, this button will cause the player to jump off the ground far enough to avoid low flying shots. When used in conjunction with the joystick, the player will be permitted to jump high enough to reach platforms at about the player character's head level. The jump button will have no effect on the surface if the player is trying to duck with the joystick.



Figure #5 -- Player (surface)

2. 3. 3. Fire Button

This button is used to fire the player's weapon(s). By default, the player is carrying a speargun which fires jet-propelled bolts. This weapon will work both underwater and on the surface and has an unlimited supply of bolts. There is a small re-charge delay, however, between each shot.

*Aug. pl-7r.
75% of time* will have a special weapon

There are a number of "special" weapon enhancements which the player may recover in his travels. When the player has one of these, they are fired instead of the speargun. All of the special weapons have a limited number of shots or charge. See the section on weapons, below, for more information. Once the special weapon is exhausted, the player's speargun will again be operational.



will be feel "powerful" enough

2. 4. Number of Players

ThunderJaws will accommodate 1 or 2 players simultaneously. They will be able to join in anytime and/or add-a-coin at any time (with the exception of the latter phase of wave 5, see below).

A common coin pool will serve for both players. Hitting the fire button will start (or continue) the game at the player station whose fire button was pushed. This startup function of the fire button will transfer a credit into a number of starting lives (selected by the operator). A player may only turn a credit into lives if he has no active lives left. Ie. a player may only use a single credit until he has used that credit up.

Need separate start buttons? (or else he will hit fire forever & not know he re-start)

2. 5. Player Lives

A player will start with a number of lives (the game may be set to provide different number of starting lives), each consisting of 3 hits. Additional health (1/3 lives) may be picked up by alert players in the form of air tanks (underwater) and as first aid kits (on land). The player may carry a maximum of two extra hits over a full life but can never "add" a full life back. Ie. the player will never increase his lives (except by adding coins), but he could possibly achieve full health (3 hits) plus as much as 2 hits more on the current life. These bonus hits will not normally be displayed on the life gauge and will only show up if the player is at better than full health.

The "life" display will be shown as a horizontal bar graph divided into fifths. Normally, only 3/5 of the display will be active, but if the player is really really good, he might be able to get 4/5 or even 5/5 of the display to light up.

2. 6. Player Weapons

The players' normal weapon is a speargun which can fire jet-propelled bolts both underwater and above ground. In addition to the speargun, the player can use a series of special weapons dropped by enemies or issued to the players at the start of a wave. All of these special weapons will contain a limited number of shots and will vanish

when empty. These weapons will graphically attach to the player's normal weapon, thus some are merely enhancements while others alter the weapon's characteristics entirely. The following sections detail each of these "special" weapons.

Their weapons are better than ours. So we made ours able to accept their special modules. You will be able to fire their own weapons back at them...

- Special Forces Briefing

2. 6. 1. Uzi Enhancement

This addition to the player's speargun will permit the player to fire at about a 4x normal rate.

2. 6. 2. Explosive Enhancement

This addition to the player's speargun will make each speargun bolt explode upon contact, thus doubling its effectiveness.

2. 6. 3. Super-Seeker Enhancement

The Super-Seeker is a "smart" shot which will cause the bolt to head in the direction shot, but change its vertical alignment to take out the closest target at any vertical position (not just in front of the player). Note that the shot will not wrap and head in the opposite direction from which it was shot.

2. 6. 4. Grenade Launcher

This weapon launches grenades at an arc towards the target. This is very useful when the player must fire over a blocking wall or junk heap at enemies which are taking cover.

2. 6. 5. Flamethrower

This weapon fires a blast of liquid flame (even underwater)! While very useful against many of the enemies, there are some which are immune to it.

Burst of flame. Not continuous.

Area gets taken out. But, wait hurt you.

How about continuous? maybe hell try it.

2. 6. 6. Laser (Blaster)

A handy weapon which fires a very VERY fast blast at an enemy. Also useful against balky doors and equipment.

2. 6. 7. 'Bot-Be-Gone

This wide angle shot is most effective against the robotic enemies, causing them to short-out and fry. Normal (biological) enemies are only mildly effected (at 1/2 to 2/3 of a normal shot).

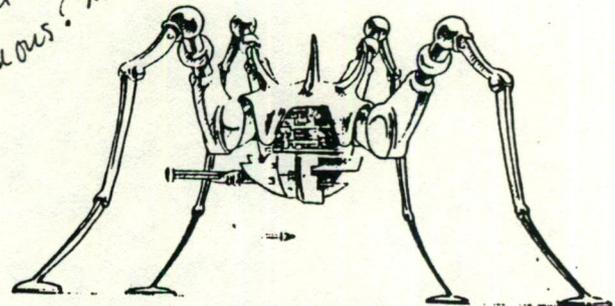


Figure #7 -- Spider 'bot

Duck to pick up weapon.

ThunderJaws

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Will go away if you lose a life, or if use it up.

Will have a counter to know ~~when it's~~ how much you have left.

can't shoot other player

2. 7. The Bad Guys

The following sections detail all of the enemy creatures, robots, etc. used in ThunderJaws.

2. 7. 1. Enemy Attack/Defense Characteristics

The following table lists each of the enemies, the manner in which it attacks and defends itself, and any other pertinent information...

Critter	Intelligence	Attack	Defense	Hits to kill
Guard-human male (W)	dumb	Fire spear prone & upright	none (sitting duck)	1
Guard-human male (S)	dumb	Fire bullet upright & squat	none	1
Manta-guy (W)	med / high	Swimming to attack with claws	evasive maneuver	2
Sharks (W)	animal	Swimming to attack with jaws	tough hide	3
Pillbox/Fixed Wpn (W)	automatic	Fire projectile	can move up/down	1 (must be accurate)
Bionic Guard (W)	high	Fire spear prone & upright	jump/swim up & evasive	3
Bionic Guard (S)	high	Fire bullet upright & squat	ump & duck	3
Punker (W)	very high	Swim fast to position for shot	evasive swim	2
Punker (S)	very high	Run quick to pos. for flame	jump & duck	2
Bionic Wolf (S)	animal	Jump to bites	fast & low	2
Spider-bot (W)	robo-tech	Laser welder-close but deadly	hops	2
Spider-bot (S)	robo-tech	Laser welder-far & deadly	hops	2
Tread-bot (S)	robo-tech	Shoots bullets & screamers	armor plate / launch screamer	4 (after 2, screamer)
Screamer-bot (S)	robo-tech	Zips at player & blows up	none	1
Railrunner-bot (S)	robo-tech	Fires Laser welder DOWN	evasive	1
Pirhana Wedge	primitive	Swim with sharp Teeth	stength in numbers	1 each (collape wdg)
Lizard-lady (S)	med / high	Climber/crouch to jump/claws	jump & climb away	2
Mines (floating-W)	automatic	Area Effect -- attract exp.	must hit spike	1 (must be accurate)
Toxic Waste (W)	random	Area Effect -- burn/hurt	none	N/A
LiveWire (W)	random	Area Effect -- stun	shot slow & fall at gen.	1 (must hit pwr src)
Dropping Barrel (W)	random	Drop onto player	none	1 (causes toxic waste)
Mines (fixed-W)	random	Area Effect -- limited attract	must hit spike	1 (must be accurate)
Manta Circle	animal	Swim straight at player & die	strength in numbers	1
Per.Guard-female(S)	very high	Fire multi-weapon up to elect.	wily -- can duck/jump/eva de	2
Tiger-lady (W)	medium	Good swim, fire special	hit & run	2
Bat-gal (S)	medium	Flyer, can claw or drop charge	fast	2
Flame Dancers (S)	med / high	Throw fireball	immune to flamethrower/duck	3
Fireball	N/A	Comin' at ya	none	1
Bat-cicle <i>circle</i>	animal	Fly at player & die	strength in numbers	1
Magma Monster (W/S)	medium	Throw rocks	tough hide/regenerate	4
Rocks from Magma	N/A	Comin' at ya	none	1
Volcanic Vents (W)	N/A	Throw BIG HOT rocks	none	N/A
Nuclear Device	automatic	Shoots Electons/gen. new ones	Orbiting electrons	3
Electrons	N/A	Comin' at ya	Quick elliptical path	11
Madam Q	genius	Fires wrist lightning	Evasive -- smart & quick	8 (personal shield)

Notes:

S = Surface
W = Water

Table #1 -- Enemy Attack / Defense Modes

Can shoot rocks etc. What are coming at you

2. 7. 2. Enemy Distribution

There is a large variety of enemies for the player to battle against in ThunderJaws. A design goal was to present the player with a wide variety of enemies to battle quickly and yet keep enough in reserve to present something new in the later waves. The following table lists the opponents and the waves where they appear.

Critter	Playfield				
	1	2	3	4	5
Guard- human male	W/S	W/S	W/S	S	W/S
Manta-guy	W	W	W	W	W
Sharks	W		W		W
Pillbox (fixed / moving)	W(f)	W(m)	W(m)	W(f)	W(m)
Bionic Guard	S	W/S	S		W/S
Punker	S		W/S	W/S	W/S
Bionic Wolf	S		S	S	S
Beautiful Chained Babes	S				S
Spider-bot		S	W/S	S	W/S
Tread-bot		S	S		S
Railrunner-bot		S	S		S
Lizard-lady		S	S	S	S
Toxic Waste		W			W
LiveWire		W	W		W
Dropping Barrel / Rocks		W(b)		W(r)	
Pirhana Wedge		W		W	W
Mines (teathered / moving)		W(m)	W(t)		W(t,m)
Manta Circle			W		W
Per. Guard-human female			S	S	S
Tiger-lady				W	W
Bat-gal				S	S
Flame Dancers				S	S
Bat-cicle				S	
Magma Monster				S/W	S/W
Volcanic Vents				W	
Nuclear Device					S
Madam Q					S

Notes:

S = Surface

W = Water

Table #2 -- Enemy Cross Reference Matrix

3. The Game

3.1. Wave Structure

ThunderJaws consists of 5 waves, each of which has an underwater phase and a surface phase. The game ends upon completion of wave 5. Players may join in at any time (except during the final scene of wave 5). Also, players may continue a game at any time. If there is only 1 player, continuation games will start at the beginning of the current wave. If there are 2 players, the game will continue uninterrupted at the point the second player is located.

We have captured several of the creatures from Madam Q's experimental station on Paradise Island. You must put a stop to the creation of more of these abominations...

- Special Forces Briefing

Prior to Wave 1, and between each wave an "interlude frame" will be presented which will either congratulate the player on something he accomplished, or prepare the player for the following wave. These full screen limited animation sequences will help provide the groundwork and advance the storyline without interfering in the gameplay.

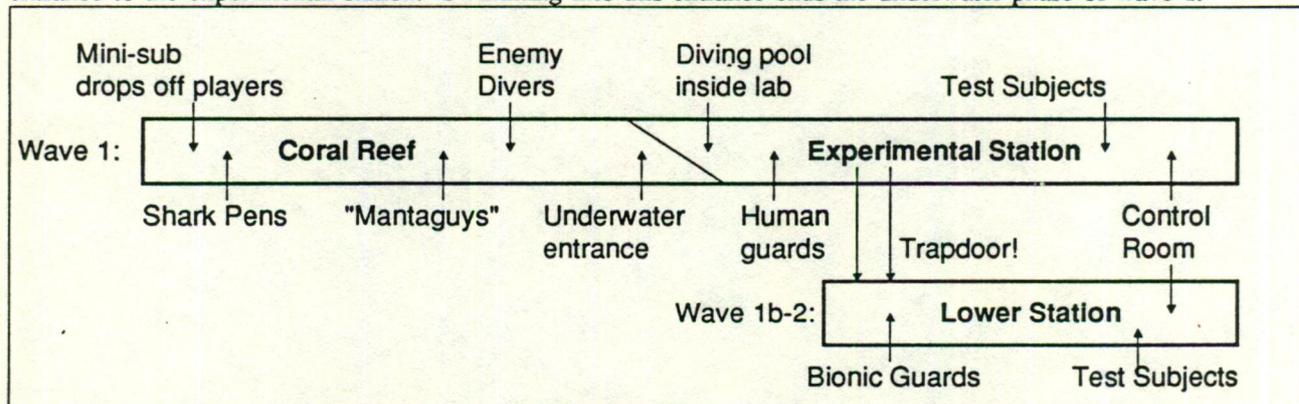
3.2. Specific Gameplay

The following sections detail each of the 5 game waves and their interlude frames...

Introduction animation: Briefing showing Madam Q and some of her genetically mutated "pets."

3.2.1. Wave 1 -- Paradise Isle

Players are dropped off underwater by a mini-sub outside a coral reef which borders Paradise Island. As the player swims toward the island, he is confronted by enemy divers which will shoot at him and attempt to engage the player in hand to hand combat if the player closes on them. They will also open doors to pens holding sharks which attack the player. As the player continues, enemy divers are joined by some genetically altered humans -- "mantaguys" and other human/marine critters. The player must battle his way through all these to find an underwater entrance to the experimental station. Swimming into this entrance ends the underwater phase of wave 1.

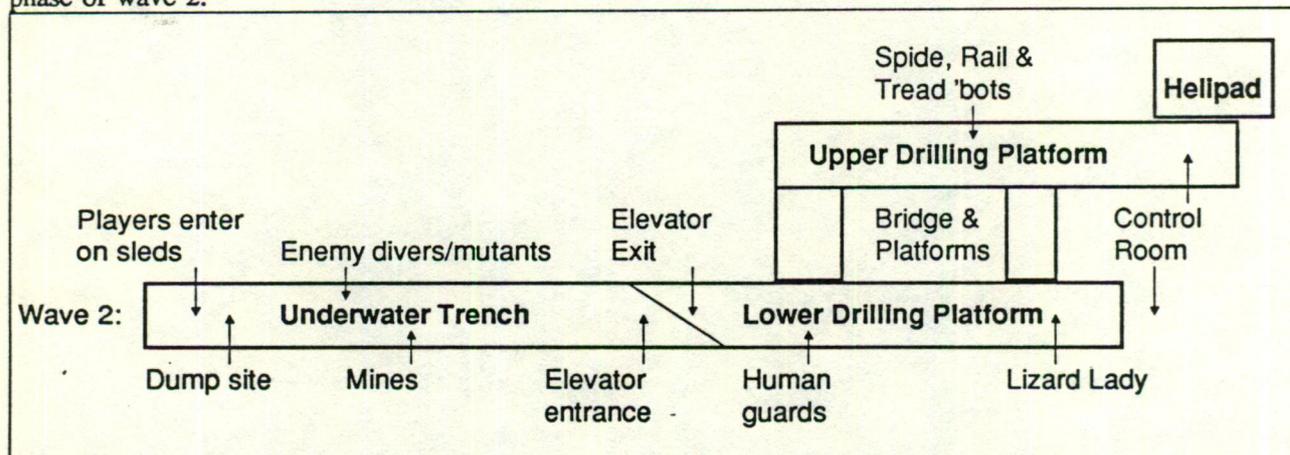


Players are shown standing next to a pool with a ladder coming out of it. They have shed most of their scuba gear and partly unzipped their wetsuits (to show off their bulging muscles and chests, of course). Now the players encounter more human guards with rifles and partly mutated human subjects (mostly female) which will fling themselves in attack at the players. As the players press on into the heart of the station, they pass bizarre lab equipment and eventually pass female test subjects chained to the walls. Finally, after an intense fight to get into the highly guarded control room (possibly guarded by a couple of the bionic warriors), the player will pull a lever which releases all the test subjects (this will be an automatic choreographed sequence). The wave ends as the freed test subjects come to thank the players... Behind them on the large video screen in the control room can be seen Madam Q's communications base which is mounted on an offshore oil drilling platform -- the players next target.

Interlude frame: The player character in the typical James Bond pose with the freed test subjects hanging all over the legs, etc.

3. 2. 2. Wave 2 – Oil Drilling Platform

This wave the players are shown coming onto the screen using diving sleds. They players will continue to use the sleds until they are hit by enemy fire in which case the sled is destroyed (but the player is safe). Players are then back to just swimming to reach their goal. This phase of the wave takes place in an underwater trench which has been used as dump site. There are old rusted hulks of cars overgrown with sea life as well as leaking drums of toxic chemicals scattered about. Enemy divers will be found hiding behind various piles of junk. In addition, tethered contact mines will also block the players progress. More mutant creations will also attack the players in their quest to reach the bottom of the oil platform. An elevator shaft is inside one of the tubular pylons of the drilling platform. Once the players dispatch of the last enemies they are free to enter the elevator which ends this phase of wave 2.

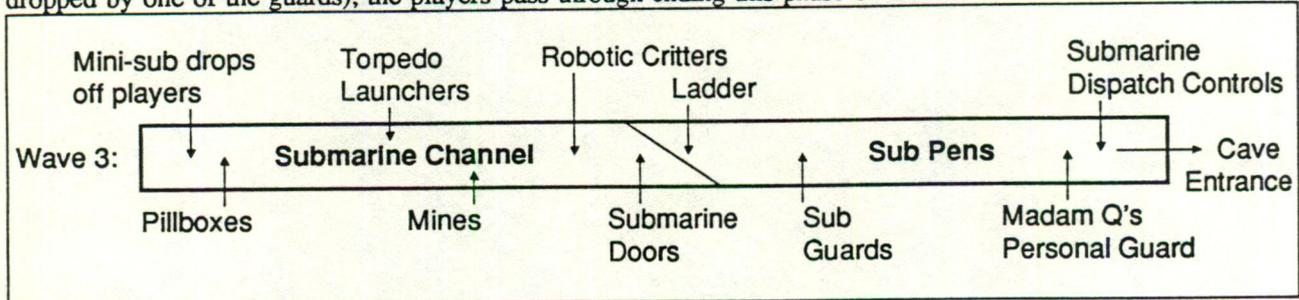


Coming out of the elevator (without scuba gear, unzipped wetsuits) the players find themselves on the surface of the drilling platform. Cranes and other equipment are in the background as well as antennae and satellite dishes. The players must fight their way across the platform into the control room. On the screen behind them is a picture of the next wave -- an extinct volcano with a submarine base at the water level. Once the last of the enemies has been dispatched, the players go into a choreographed sequence where they place explosives and exit the other side of the control room onto a helipad where a ladder is lowered which they climb up to safety as the entire platform explodes.

Interlude frame: Technical briefing on the A-29 Robot-Be-Gone assault weapon (first issued to the players in the previous wave), and the A-41 Super-Seeker Speargun Bolt (first issued to the players in the next wave).

3. 2. 3. Wave 3 -- Submarine Pens

Players are let off underwater by the mini-sub and must swim toward the sub pens. More high-tech enemy weapons are trained on the players this wave. Automated underwater pillboxes and torpedo launchers, robotic spider-like critters, etc. If the player does not already have a special weapon when he starts this wave, he will be issued a special weapon which can home in on infrared sources and wipe out most of the nasties (the super-seeker weapon enhancement). After blowing a hole in the doors to the sub pens (easiest if the player uses a special weapon dropped by one of the guards), the players pass through ending this phase of the wave.



The players are shown standing next to a ladder leading down into the water. Behind them are several LARGE submarines which extend out of sight to the right. The players will be attacked by enemy soldiers which come from the right as well as some which will exit from openings in the submarines themselves. After working their way to the back of the sub pens, the players will encounter a heavily guarded door which they must pass through. Once all enemies are dead, the players perform a choreographed sequence of leaving explosives and entering the door. Entering this door transitions the players to Wave 4 (a subtle transition -- unlike the other wave transitions). As soon as they pass through the door, it closes and a large explosion takes place which leaks through the door just a little. The players wipe the sweat from their brow...

There is NO interlude frame between waves 3 and 4. The players proceed directly to wave 4.

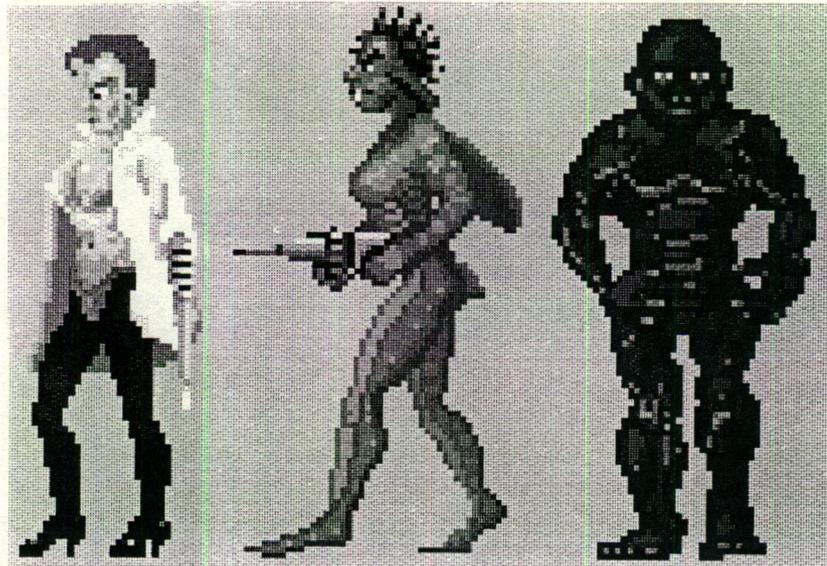


Figure #8 -- Tiger Lady

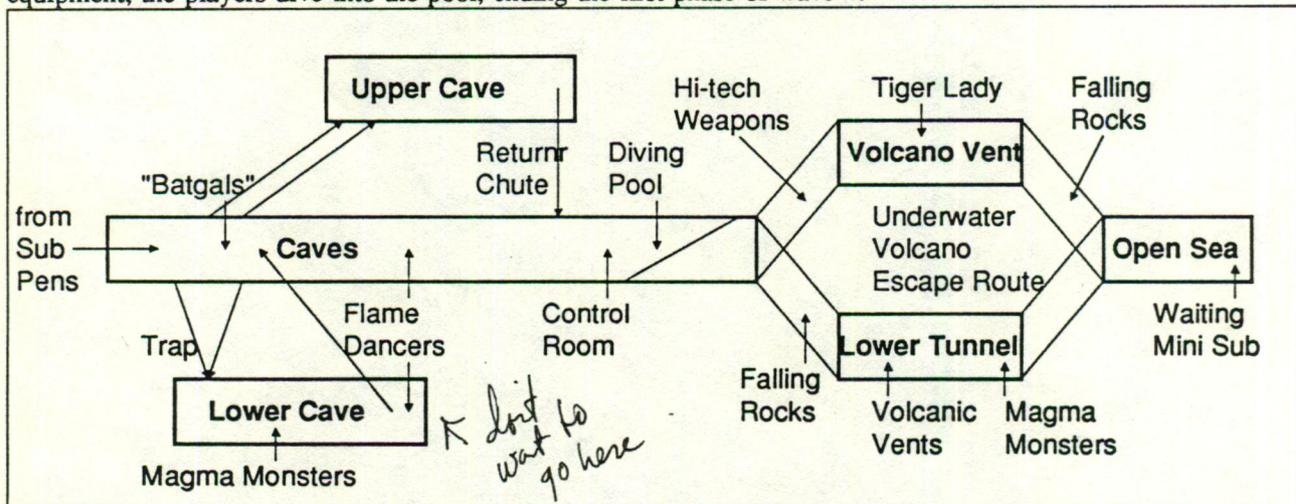
3. 2. 4. Wave 4 -- Volcano

The players find themselves in a cave-like environment leading back into the heart of the extinct volcano. New nasties await them in abundance as they work their way to the control center. There will be many "surprise" entrances from above and from behind rock outcroppings. Possible nasties here include magma-like men/women, flame creatures, and bat-people in addition to the normal enemy warriors. Finally, the players enter the control center in the core of the volcano. In front of the main control panel is Madam Q herself. While the players are battling her servants, she laughs and throws a lever (conspicuously labeled "SELF DESTRUCT or DO NOT THROW THIS LEVER") then exits through a back door which slams shut behind her.



Figure #9 -- Enemy Diver

On the control screen as the players entered was a symbolic picture of a drill digging into the globe. As Madam Q threw the lever, it changed to a picture of a high-tech sub in a cave which we see Madam Q enter and speed away in toward a beautiful underwater city (the next wave). An ominous rumbling is beginning as the players dispatch the final enemy warriors (mostly female) in the control room. Soon audible explosions are heard and pieces of equipment begin to fall from the ceiling. The players need to rush from the control room via the only open doorway which leads them to a diving pool with scuba equipment hanging nearby. Quickly donning the equipment, the players dive into the pool, ending the first phase of wave 4.



The players now find themselves swimming for their lives as fissures open around them and rocks and gasses are spewed up. Also lava flows are coming down the walls of the underwater trench they are swimming in. Explosions continue to come from behind.

In addition to the natural phenomena that the players must contend with (mostly avoid), more of Madam Q's magma creatures emerge from the lava to do battle with the players. Also, automatic high-tech weapons continue to operate and must be dealt with by the players. (Note: if the players are pinned down for too long we will destroy some of these ourselves as fissures open up and swallow them). Finally, the players exit the underwater trench to the open sea where the mini-sub is waiting to pick them up.

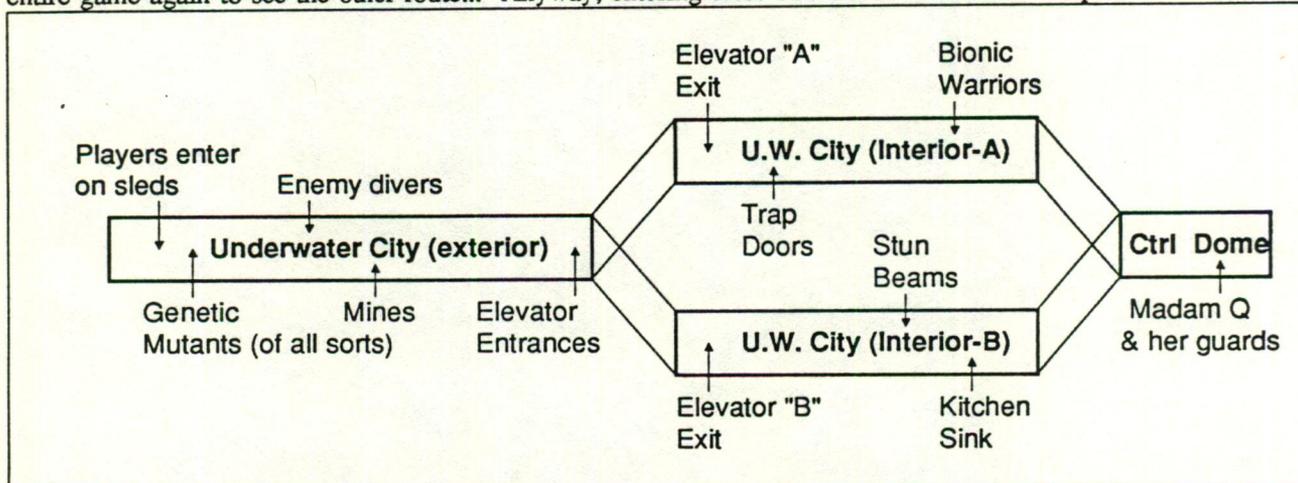
what is d.f. in two routes

IF both jump over trap, ok. IF one gets caught, they both go to lower one. (ground collapses under upper one)

Interlude frame: Attack plans against the underwater city. We see the city in its entirety (in perspective) and are shown entry points and main rooms (the control center and reactor rooms) via animating arrows.

3. 2. 5. Wave 5 -- New Atlantis

Players enter the screen riding their sleds again and head toward Madam Q's underwater city, New Atlantis. They will be confronted by virtually every creature they have encountered previously during the game as well as some new ones (such as the Dragon Lobsters guarding the underwater entrance to the city). When the players finally come to the sloping pylons which support the city, there will be two open doors. Taking one door will close the other one (forcing all players to take the same one). We plan on having two different unique routes through the city to the central control room where Madam Q is waiting. This will hopefully encourage players to play the entire game again to see the other route... Anyway, entering these doors ends the underwater phase of wave 5.



The players emerge in one of two corridors inside the city. Players again encounter armies of everything they have seen before as they fight their way to the control room. Note: during this final phase of the game, no add-a-coin or new players are permitted. The players have just the one shot at finishing the game. We plan to have some unique surprises waiting for the players in the city, different for each of the two routes into the control dome. Finally, the players encounter Madam Q herself who is armed with wrist-strap lightning bolt throwers and who will call additional enemies from behind the players to her aid. Defeating her will NOT be easy. However, if the players are good and persistent, she can be defeated. When killed, she will self-destruct herself, leaving just one of her smoking spiked-heel shoes behind...

Interlude frame: Congrats, you saved the world! (More beautiful babes similar to wave 1 interlude).

4. Project Elements

4. 1. Project Team

Project Leader: Rusty Dawe
Programmers: Rusty Dawe, Natalie Burgess
Engineer: Pat McCarthy
Tech: Alex
Animation: Susan McBride, Will Noble
Audio: Brad's group

Mktg: Linda

If the military powers of the world had the same calibre of personnel as I have, we might have cause to worry. As it is, they couldn't even design a video game, let alone a viable weapons system...

- Madam Q (intercepted broadcast)

Our schedule (shown in detail in Appendix B) is aggressive and takes into account the large amount of code we will be able to "lift" from Treasure Hunt. This includes the motion object / animation driver, the 2 processor executive, the playfield scroller and editor, among other routines.

Two other assumptions were used in setting the dates for this schedule. 1) Both programmers will be able to devote 100% of their time to ThunderJaws. 2) Each programmer will have a development system capable of handling two processors (two AMS systems or a dual-pod ARIUM) at their disposal. ~~The ability to~~

mixed ok? yes

4. 2. Hardware

For ThunderJaws, we will be using the MOBALOT II hardware which will be similar to the ESCAPE hardware (MOBALOT) and has the following features:

- Processor: 68000 (2)
- ~~16k-32k~~ 32kx16 Video RAM
32kx16 common RAM (2nd processor only sees common RAM)
- Playfield: (2) independent 4kw scrolling (!!)
each: 64 x 64 stamps (30 x 42 displayed)
each: 24-bit addressing -- 16 bit stamp address, h-flip, 16 palettes (4-bit deep), 2-3 bit priority vs. MO
combined: 64k stamps MAX (independent or shared with MO)
- Motion Objects: 56 linked per scan line (MAX)
MOBS, VAD, PRI, SHIFT chips
First in priority (first MO in link has highest priority)
4 bits deep, 16 palettes
2 bit priority with PF
64k stamps MAX (independent or shared with PF)
- Alphanumerics: 1024 stamps
2 bits deep, 32 palettes
- Audio
SA board with YAMAHA only, or (optionally) SAD board with YAMAHA and ADPCM

Development will initially take place on a ROMALOT board with switchover to a MOBALOT board as soon as possible. Approx. 3 months into the project we should be able to introduce a piggy back board which will provide use with our second scrolling playfield. Production boards with the new VAD, PRI, & SHIFT chips is anticipated in the July/August timeframe.

4. 3. Animation Support

We are endeavoring to make ThunderJaws a visually exiting game. With the use of large motion objects and two scrolling playfields, we believe that the game will have a very "rich" look. The characters should feel as if they come alive under control of the players. Appendix C contains a detailed analysis of the stamp usage required for ThunderJaws. The remainder of this section details the animation support required to produce the graphics listed in Appendix C.

Motion Object time estimate totals:

	131.6	Days
or	26.25	Weeks
or	6.55	Months

Playfield time estimate totals:

	216.5	Days
or	43.3	Weeks
or	11.0	Months

The unqualified support of those I rule is essential to my plans. Of course if I don't get it I shall simply have them killed <insane laughter>...

- Madam Q (intercepted broadcast)

To meet our 9 month schedule (see Appendix B), the above figures indicate we will need a support level of close to 200%. Only about 10% of the Treasure Hunt graphics are re-usable by ThunderJaws, although we will be able to re-use some of them for preliminary work.

4. 4. Audio Support

The SAD audio board would work very well for ThunerJaws. We anticipate having background music running throughout the game with sound effects overlaying the music. Music should be fast paced and move the game action forward. Good action/adventure music.

The SAD board would provide us with the means to generate sound effects using the ADPCM chip for the underwater waves that would be truly unique to our game. In addition, while we don't anticipate the need for a great deal of speech, if we have the ability to generate speech, we would use it to provide occasional commands to the guards, or warnings from the 'bots. The 'bots speech could be generated by the YAMAHA as an alternative, but if we wan't Madam Q to speak, the YAMAHA is not adequate.

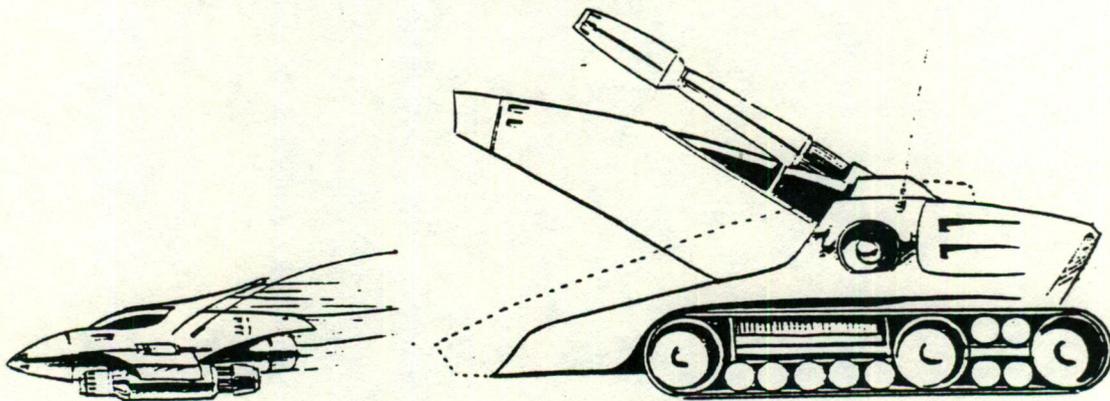


Figure #10 -- Tread 'bot & Screamer

Appendix A

Hardware Cost Estimate

The following cost estimate was prepared Jan. 4, 1989 and is based on an estimate from ESCAPE which was prepared on Dec. 23, 1988.

Item	Price	P/N
ELECTRONICS	[475.33]	
Display, 19 INCH	187.00	139XXX-XXXX
Stand Alone Audio PCB SA	67.00	(no TI speech)
Power Supply	41.33 ?	A043363-01
MOBALOT II PCB		
2 68000s, MOB chip,		
PRI chip, 2 24-bit PFs	180.00	w/o ROM
ROMS	[194.00]	
Graphics ^{250.5}		
(8 x 1 meg) @ 5.55 ?		
(\$4.15 + \$3500 mask chg.		
for order of 2500) 1500	44.40	
(16 x 27512 OTP) @ 4.10	65.60	
(1 x 27128) @ 2.75	2.75	
Program/Audio		
(12 x 27512) @ 6.25 } 4.90?	75.00	
(1 x 27512) @ 6.25 }	6.25	
COIN SYSTEM	[45.28]	
Coin Door, Coin counter,		
and Cash Box	45.28 ?	171027-001,038091, 171078-002
CABINET	[175.11]	
Wood	130.00	"Family" Cabinet
Fluores. Light	10.04	
Attraction Shield		
Attract Decal	3.70	From Blastroids
4 Color Pro. Side Panel Decals	7.20	From Blastroids
Speakers (2)x\$4.52	9.04	148007-104
Speaker Grill	2.25	From Blastroids
Air Vent Grills	1.88	042914-01,037332-01
Lock W/Cam	1.11	178197-001,178198-002
Draw Latch Brackets (fam. cab)	0.39	178198-002
Monitor Shield, Glass	5.00	044067-01
Monitor Bezel, Black	4.50	043596-01
CONTROL PANEL ASSEMBLY	[47.59]	
Control Panel w/Decal	14.00	Estimate
2 8-position Joysticks @9.00	18.00	Jack Estimate
4 snapaction gold buttons @ .50	2.00	Milt Estimate
4 button tops @ .77	3.08	Milt Estimate
Control Harness	7.50	Estimate
Hex Driver Tool	.47	

VAD, Priority, shifter should be used also, if possible.

Tim - schedule

Item	Price	P/N
OTHER	[64.77]	
Harnesses	30.00	PWR,AUX,COIN,DSP,SKR
PWR Cord & ON/OFF SW	4.88	A043055-01
Labels & Manuals	5.50	TM,SP,
Shipping Container	15.00	
Hardware: Nuts, Screws	4.00	
RESERVE: MISSING PARTS	5.39	
TOTAL MATERIAL	1002.08	
LABOR:		
PCB(1.5*8.57)	12.85	
SUB(1.5*7.19)	10.78	
FINAL(1.20*7.19)	8.63	
TOTAL LABOR	32.26	
OVERHEAD:		
FIXED(4.20*16)	67.20	
VARIABLE(4.20*42)	176.40	
TOTAL OVERHEAD	243.60	
MATERIAL	1002.08	
LABOR	32.26	
OVERHEAD	243.60	
FULLY ABSORBED COST	1277.94	

Distributor Pricing

FULLY ABSORBED COST 1277.94
40% Margin / .6

Distributor Cost	2129.90
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Operator Pricing

Distributor cost 2129.90
Dist Op 15% Mark up / .85

Operator Cost	2505.76
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Appendix B

Project Schedule

Event	Date	Goals
Project Initiation	01/11/89	Start Game! Establish Game Play Complete Playfield Layout
1st Review	03/07/89	Demonstration of player walking/swimming on sample playfield Convert code from Treasure Hunt to Thunder Jaws Convert Mo's to ESCAPE then MOBALOT format Modify scroller Modify PF editor Install PF #1 (water/surface) Player MO control Player (redo swimming) Player (walk/jump/duck/) Player status display Player shots w/ PF collision Player transition (strip) seq. Redo shark swim Enemy Guard (grunt)
2nd Review	04/20/89	Rough Gameplay, 1 wave completed Come-from-behind critters Enemy Diver Enemy Diver/shark cage Auto. wpns (gun/pillbox) Special wpn (Uzi, exp. bolt) Special wpn--grenade Wolf Mantaguy Bionic Guard Punker (surface only) Traps/doors, etc. Lab seq., control room,
3rd Review	06/13/89	Complete but untuned gameplay for 2 waves (#1 and #4) Add 2nd scrolling PF PF for wave #4 Splitting playfield & traps Lava pits Exploding vents, falling rocks, other PF animation Bats & bat circle Batgal Flame Dancer Magma Monster Punker (swimming) Madam Q escape sequence Tiger Lady Spider 'bot
Focus	06/28/89	Finish up & partial tune gameplay for waves #1 and #4 Personal Guard Fix nagging bugs Add rough statistics Test standalone mode
4th Review	07/28/89	Complete waves #1, #3, #4 Install PF #3 PF anim. (moving walkway) Lizard Lady Rail 'bot LiveWire™ Pirhana Wedge Interlude screens Attract Mode
Field Test	08/11/89	Waves #1, #3, #4 Install coin options, statistics, high score & attract mode High score Coin modes & testing
Field Test Upgrade	08/25/88	Add wave #2, fix any bugs Install PF #2 Tread 'bot & screamer Toxic waste & dropping barrels
Production Release	10/09/88	Complete game (waves #1 through #5) with multiplayer tuning Install wave #5 Nuclear device Reactor Room, control room Madam Q

ROM Release

2 wks (
2 wks (

*mid oct. FGA?
14 wks lead on chips (custom)*

Appendix C

Stamp Estimates (Motion Objects)

The following table (Table # 3) lists all of the motion objects anticipated for ThunderJaws. In all cases, the estimates are rounded up, so as to give a worst case stamp usage scenario.

Motion Object	Size	Poses	TP	stamps
Player (W)	48x88	5 angles,swim(3),front(2),death(9),fire(3),extras(6),sled(3)	27	2046
Player (S)	88x48	jump(6),front,rear,walk(6),climb(3),fire(3),death(9),extra(6)	35	2310
Player - strip	88x48	5 step seq.	5	330
Player - throw lever	88x48	3 step seq.	3	198
Player - kiss babes	88x48	3 step seq.	3	198
Air Tanks/First Aid Kit	32x24	2 X-life pictures	2	12
Player Weapon	48x24	5 varieties - 3 poses	15	270
Speargun Bolt	48x8	1 type (2), death bolt (2)	4	24
Grenade	16x16	(4)	2	16
Flamethrower shot	96x56	(3)	3	252
Laser shot	112x8	(3)	3	42
Bullet	8x16	(1)	1	2
'Bot-be-gone shot	16x16	2 angles, (5)	10	40
Electro-shot	112x16	(3)	3	84
Torpedo	64x16	(2)	2	32
Explosion #1 (small)	48x48	9-10 steps with 48x48 AVERAGE size	10	300
Explosion #2 (large)	96x96	(10+)	10	1440
Explosion #3 (large)	96x96	(10+)	10	1440
Hit smoke puff(S)	32x48	(5)	5	120
Hit bubble puff(W)	32x48	(5)	5	120
Bubbles (normal)	16x24	(10)	10	60
Beautiful Babes	48x88	Walk(4), misc(3)	7	462
Guard-human male (W)	88x48	Swim(3), upright, back, fire(2), death(3)	10	660
Guard-human male (S)	48x88	Walk(4), front, fire(2), death(3)	10	660
Manta-guy (W)	88x40	Swimming (4), claws (2), death (3)	9	495
Sharks (W)	96x48	Swimming (3), jaws open(2), death(3)	8	576
Shark Cage	32x32	3 step to open	3	48
Pillbox (W)	48x32	2 step fire	2	48
Pillbox Riser	16x64	8 steps, getting larger from 8x16 to 64x16	8/	72
Rising Gun/Lasr (W/S)	48x16	2 step fire	2	24
Riser for Gun/Laser	8x64	In steps to max height	8/	36
Riser Mask	24x16	(1)	1	6
Bionic Guard (W)	88x48	3 angles, swim (3), fire at 2 angles (2), 3 death	13	858
Bionic Guard (S)	48x88	jump (3), front, walk (4), duck(1), fire (2), death(3)	14	924
Mini-Sub	96x64	(3) -- 64x64 piece for door opening sequence	4	224

Table #C-1 Motion Object Stamp Estimates (page 1 of 2)

Motion Object	Size	Poses	TP	stamps
Punker (W)	88x48	swim (3), dodge/up/down/stop/bend (6), shoot (2) death (3)	14	924
Punker (S)	88x48	run (4), front, duck(2), fire(2), death(3)	12	792
Bionic Wolf (S)	64x32	run (6), front, jump (2), bite (3), death (3)	15	480
Spider-bot (S/W)	64x56	walk (6), hop (3), fire, death (3), fry (5)	18	1008
Tread-bot (S)	32x56	walk (3), front(1), fire (1), open & launch (4), death/fry(8)	17	448
Screamer-bot (S)	32x24	zip(2), death(3), fry(3)	8	96
Railrunner-bot (S)	32x24	move(3), fire(1), death(3), fry(5)	12	144
Pirhana Wedge	24x16	swim(3), open mouth(3), death(2)	8	48
Lizard-lady (S)	48x88	climb(6),walk(4),front/look(2),crouch/jump/claw(8),death(3)	23	1518
Mines (floating-W)	64x64	(2)	2	128
Toxic Waste (W)	64x96	floating cloud (5)	5	480
LiveWire unit (W)	24x24	(1)	2	9
LiveWire effect (W)	96x96	area "buzz" (3)	3	432
Dropping Barrel (W)	48x32	(2)	2	48
Dropping Rocks (S/W)	48x32	3 rock types (3)	9	216
Mines (fixed-teather)	80x16	5 angles	5	100
Manta Circle	48x24	9 angles, swim(3) horizontal, death(2)	14	252
Per.Guard-female (S)	48x88	walk(6),crouch(2),jump(2), front, fire(3), twist(3), death(3)	20	1320
Madam Q (S)	48x88	walk(6),crouch/jump/twist/turn(13),front(3),fire(3),death(10)	35	2310
Madam Q's Shield	48x48	shot deflector (3)	3	144
Tiger-lady (W)	88x48	swim (3), turn (3), fire (2), death (3)	11	726
Bat-gal (S)	48x88	fly (4), drop (2), claw (3), front, death (3)	13	858
Flame Dancers (S)	48x88	walk (4), throw (4), front, death(3), immune(3)	14	924
Fireball	24x16	flamer (3), splatter (3), death (1)	7	56
Bat-cicle	24x16	angles(9), fly(4), death(2)	15	90
Magma Monster (W/S)	48x88	walk (4), front, throw (4), death (special--not included)	9	594
MM Shatter sequence	16x24	shatter pices (14), 2 step animate	8	68
MM regen sequence	24x64	6 steps to better monsters	6	96
Rocks from Magma	16x24	2 steps, hit player (3), hit by shot(3)	8	48
Volcanic Vents (W)	48x32	6 step seq., hit player (3), hit by shot(3)	12	88
Nuclear Device	32x32	3 step seq.	3	48
Electrons	64x32	4 angels, 5 steps, hit player (3), hit by shot (3)	26	832
Pick-up stuff	48x24	12 "items"	12	216
Misc MO machine pts	32x32	handles, springs, mad scientist junk, etc.	40	640
Misc. MO sea life	16x24	foreground kelp (5), inocent fish (3), bubbles (20)	28	168
Underwater Shadows	40x16	2 sizes, 40x16 and 32x8	2	14
Total MO Stamps				31,182

Table #C-1 Motion Object Stamp Estimates (page 2 of 2)

Stamp Estimates (Playfield)

The following table (Table #4) lists the screens and tiles used on a per playfield basis.

PF Stamp Usage Function Breakdown	Playfield Tiles (8x8) /Screens (42x26)										
	1W	1S	2W	2S	3W	3S	4S	4W	5W	5S	
Prelude/Interlude	2S		1S		2S				1S	1S	
Pre/Int animations			3Tx3		3Tx3				2Tx3	4Tx12	
Primary PF	5S/2	10S	8S/2	13S/2	8S/2	11S/2	20S/2	15S/2	12S/2	25S/2	
Primary PF anim.	2Tx3	4Tx3	1Tx3	8Tx3	2Tx3	2Tx3	8Tx3	8Tx5	2Tx3	12Tx3	
Secondary PF	5S/2	2S	8S/2	10S/2	8S/2	11S/2	20S/2	15S/2	12S/2	25S/2	
Secondary PF anim.	1Tx3	6Tx2	1Tx3	6Tx3	1Tx3	2Tx3	6Tx14	12Tx3	2Tx3	6Tx3	
Title/Attract/HS = 4S											
PF Stamp Usage	Playfield						Totals				
Relative Cost Breakdown	1	2	3	4	5	Scrn/Tile	Unique	Stamps			
Usage Factors: Screens											
Unique Heavy (50%)	7	5	2	7	4	23	11.5				
Unique Light (25%)	10	8	9	15	5	46	11.5	25,116			
Recycled (no new stamps)	9	10	10	13	34	76	0				
Usage Factors: Tiles											
Unique Heavy (50%)	9	10		12	12	43	21.5				
Unique Light (25%)	5	9	8	36	30	88	22	6,560			
Cycle Animation (25%)	22	26	12	96	80	236	59				
Recycled (no new stamps)	0	12	4	0	32	48					
Total PF Stamps									31,676		

Table #C-2 Playfield Usage Cross Reference

The following are the playfield animation sequences referred to in Table #4:

Interlude Frame:

Babes hanging on players (pre-2W)
Attack of Atlantis (pre-5W)

Weapon Briefing (pre-3W)
Victory celebration (post-5S)

Control Screens:

Wave 1: (Oil Platform -- Next Target)

Wave 2: (Volcano Base--sub, smoke plume)

Wave 4: (Drilling Earth Schematic/Madam Q's getaway/City)

Wave 5: (Mutant armies attacking New York? Malibu?)

Various underwater life (1W,2W,3W,4W,5W)

Fixed weapon launcher (1W)

Sliding Doors (1S,2S,3S,5S)

Babes chained to wall (1S,5S)

Xform machine (1S,5S)

Trap floor (1S)

Leaking toxic waste (2W)

Moving bridge (2S, 5S)

Elevator (2S, 5S)

Swinging Ramp (2S)

Helicopter (2S)

Sub door opening (3S)

Crumbling Trap Floor (4S)

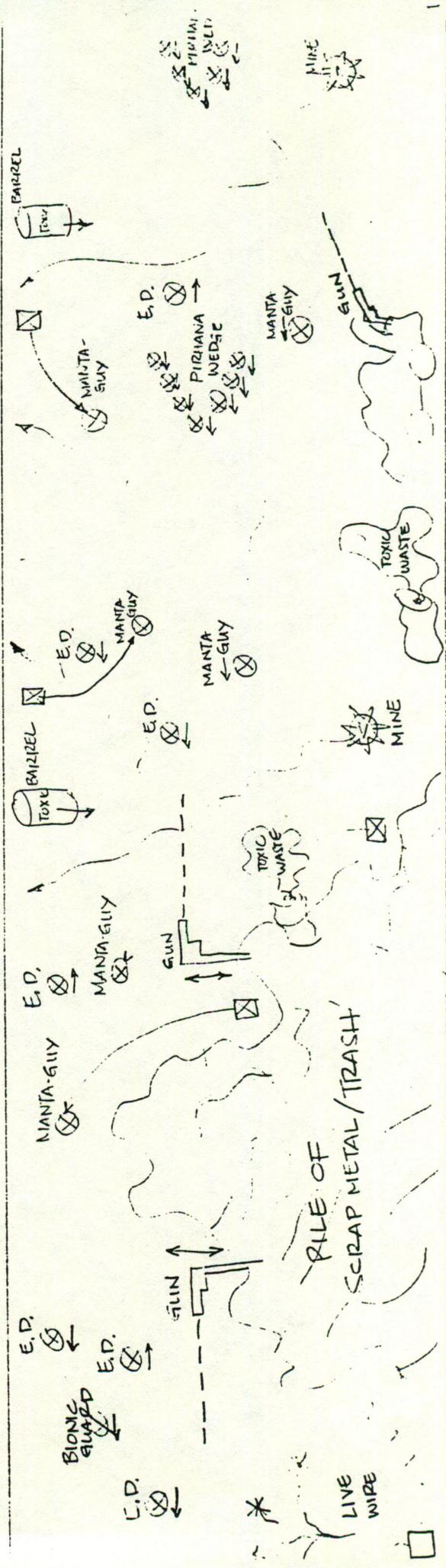
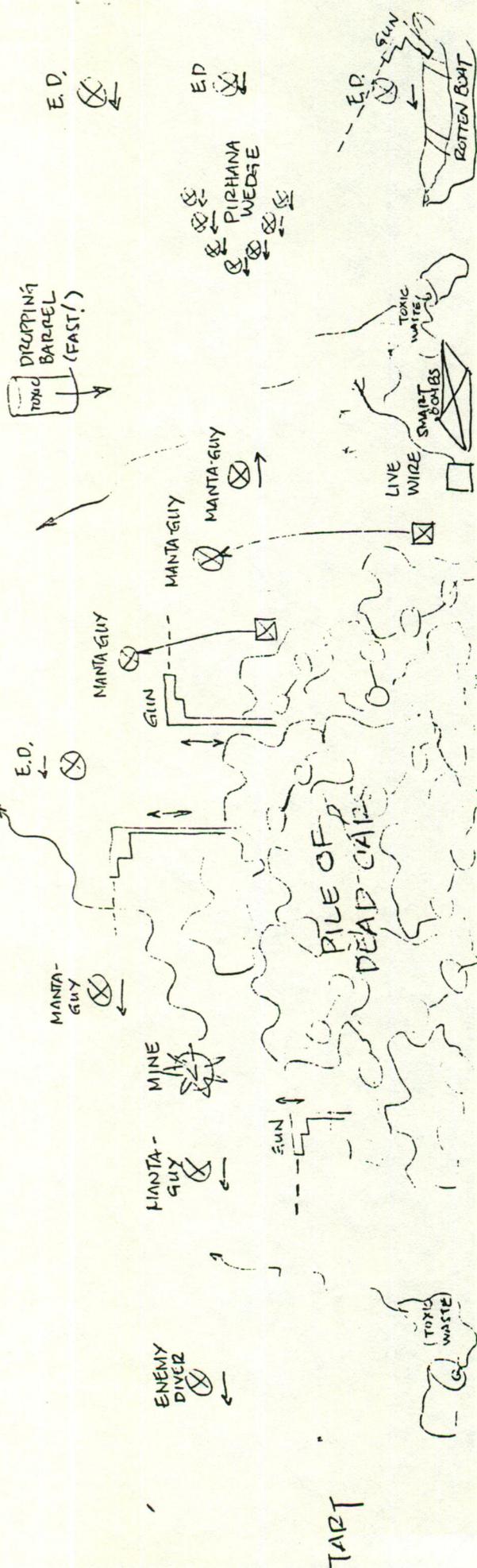
Falling Earthquake junk (4S)

Lava Flows in background (4S)

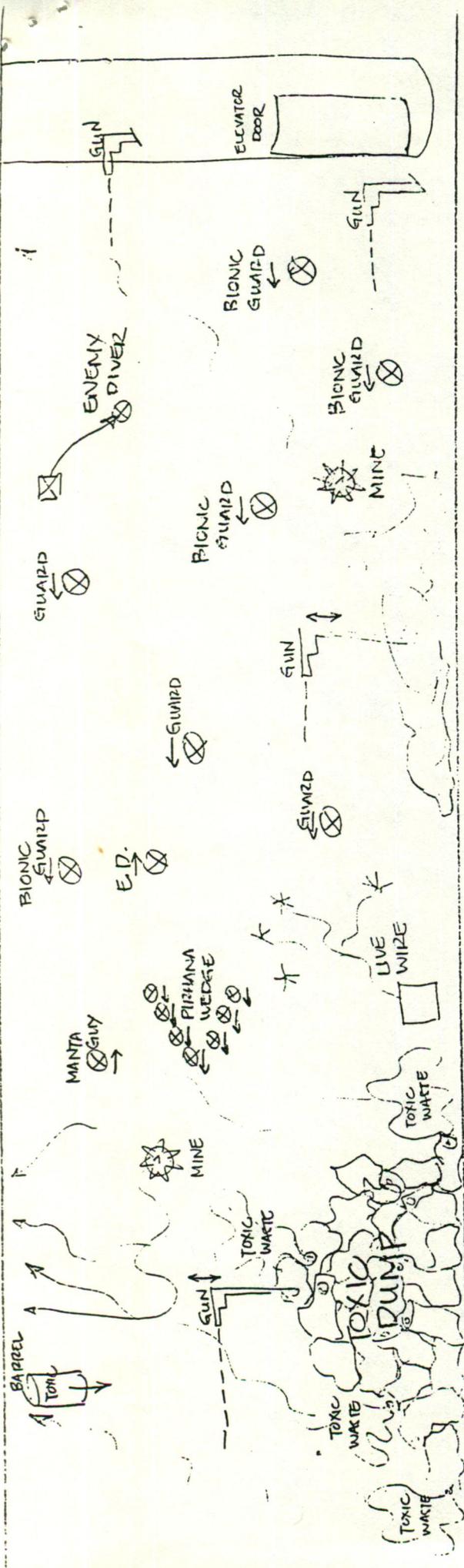
Underwater Exploding Vents (4W)

Reactor Room (5S)

WIND 47A 0000 0000 0000



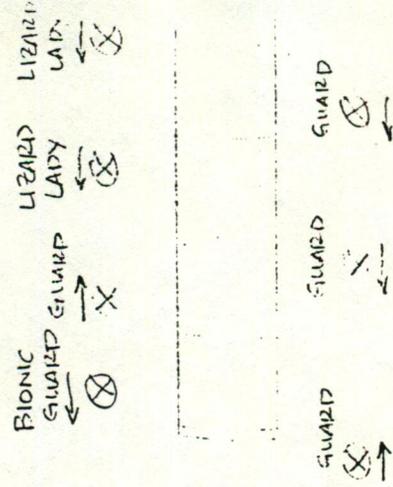
WAVE 741 - TOXIC RUMPS (CONT.)



B
D
D
D
D
D

B

WAVE 2B-OIL DERRICK 2



THIS PIECE SLIDES BACK AND FORTH

