

Earth Invaders

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Soft Details

In Earth Invaders you play the commander of an alien mothership bent on destroying humanity. In this RTS style game you control alien units trying to destroy the city while the pitiful humans try to stop you. While on the planet, destroying buildings and killing the weaker lifeforms increases the elder's trust in you – and with it, your usable income. I've heard some folk will even pay large sums for fresh, living specimens. Once you've destroyed the nearby cities the mothership will move along, allowing you to attack newer, more human filled cities. Hopefully this disgusting infestation is cleaned up soon so you can get off this wretched planet.

Game Objects

Buildings

- **Teleporter:** Creates a two-way link to the Mothership. Units can be spawned here, and captured specimens can be sent to be processed.
- **Buildings** (Houses/Apartments/Bunkers): Levels start with these scattered throughout the map. Can not be created by player. Infantry (allied and enemy) can enter the buildings for safety.
- **Rejuvenation Station:** Heals nearby units when placed.

Dynamic Units

All the following units can be created by the player and instructed to move to a location. All combat units can be divided into *infantry*, *aerial* or *heavy*. In a 'rock-paper-scissors'-esque system, infantry is strong against heavy, heavy is strong against aerial and aerial is strong against infantry. Combat units can be instructed to attack any attackable entity, and infantry can enter buildings.

- **Aliens** (infantry)
 - Humanoid/skeletal animation.
- **Attack Craft** (aerial)
- **Alien Tank** (heavy)
- **Capture Craft**
 - Not a combat unit, hence no classification. Instead of attacking, this unit uses a tractor beam to pick up enemy infantry/civilians. They can then be dropped off at a teleporter to receive a reward.
- **Spider**

- This massive 8-legged alien beast (articulated skeleton) spawns with a large (and hopefully strong) muzzle. Since the spider moves much faster than a regular unit, infantry can climb on to get to their target faster.

Enemy Units

- **Soldiers** (infantry)
- **Helicopter** (aerial)
- **Tank** (heavy)
- **Civilians**¹
- **Troop Transport**

Interactions

- **Dynamic & Building**
 - Infantry (alien or human) can enter buildings.
 - If the building is unoccupied, the entering troops will be protected from damage.
 - If the building is occupied by friendly units, the new troops will join. Buildings can only hold a certain number of units.
 - If the building is occupied by enemy units, a firefight breaks out inside. One side eventually comes out victorious and the building is then occupied by them.
 - Buildings can be destroyed by attacking them, so units housed inside can still be killed by destroying the building they are in.
 - Capture Craft can empty their holding cells at a teleporter, teleporting any specimens to the mothership for reward.
- **Dynamic & Enemies**
 - All combat units (infantry, aerial and heavy) can attack other units. After taking a certain amount of damage, the unit will be destroyed. Destroying units and buildings gives the player resource to spawn more allied units.
- **Buildings & Enemies**
 - Occupied buildings will shoot at any enemies that are close enough.
 - Enemies will attempt to destroy teleporters and rejuvenation stations if they can see them.

Architecture

I'll be using CRC cards to describe the main component classes for the game.

¹ Hardly an enemy. Doesn't attack, just flees!

Entity

The basic building block for all entities.

Knows health Knows allegiance (ally, enemy) OnShot event OnDeath event	
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Map

Helps entities navigate the world.

Knows navmesh. findPath(point A, point B)	Entity
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Movable

A component for units that can move around the map.

Knows target location Knows speed MoveToLocation	Entity Map
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Attacker

Component for any unit that wants to be able to attack.

Knows target Entity Knows threat range Knows classification (infantry, aerial, heavy) Knows what it is strong/weak against Knows firerate Knows damage AttackTarget	Entity
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Infantry

Generic foot soldiers.

Can enter buildings Can board transport	Entity Attacker Movable
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Transport

Entity that can carry infantry. Usually much faster than going on foot.

Knows occupants AddUnit Disembark	Entity Movable
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Building

Entity for housable buildings.

Knows occupants Knows who is in control Knows capacity Attack nearby enemy units Firefight AddUnit EvacuateUnit	Entity Attacker
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Abductable

Entities that can be abducted by the capture craft.

GetAbducted: activate ragdoll	Entity
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CaptureCraft

Entity responsible for capturing enemy infantry.

Knows capacity Knows how many specimens it's currently carrying Can drop specimens at teleporter	Entity Abductable Teleporter
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Teleporter

Entity for spawning units.

Knows radius Trade specimens for credits	Entity
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RejuvenationStation

Heals nearby units.

Knows radius Knows healrate Heal: locates all nearby allied entities and heals them	Entity
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GameManager

Overarching script for game control.

When the click functions are called, a few things are checked.

- If the player has a selected unit
 - If they clicked on a unit, interact with that unit. This involves a call to InteractManager to interact the two objects.
 - If they didn't click a unit, tell the selected unit to move to the location.
- If they have no selected unit AND they clicked on a unit, select that unit.

Knows resource amount Knows selected unit Knows remaining buildings Handles input Spawns player units Triggers interactions	Entity Teleporter InteractionManager
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InputManager

Provides input-based functionality.

When a user clicks, GameManager's click functions are called. InputManager tells GameManager what Entity was clicked on, or if no entity was clicked than it sends the location of the click.

Knows mouse position OnHover: returns Entity currently hovered on OnClick: tells GameManager what was clicked	GameManager
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UIManager

Handles updating relevant information in the UI.

Update available actions based on selected unit and mouse position.	GameManager InputManager InteractionManager
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InteractionManager

Holds information for how Entities interact with each other.

Entities tell the InteractionManager what their interactions are by giving a function callback paired with a class (ie. Infantry would say "when I (Infantry) interact with Transport, call Board() for me"). When Interact is called, the manager creates an event containing the secondary Entity (the one being interacted *with*) and calls the bound function (on the interacting Entity).

Knows the matrix of Entity:Entity actions (including allied:allied and allied:enemy) AvailableActions: takes two Entities and tells available actions	Entity
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Interact: takes two entities and interacts them	
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AIController

Handles the game playing for the enemy units.

Knows current units Knows players units	Entity
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