IForce

A bunch people!

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Chapter 1

IForce

1.1 Contents

The Game of Invasion Force Guide

Amiga Version 0.15

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1.2 1. Introduction

```
WHAT IS INVASION FORCE (alias Empire II)?
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From The New Hacker's Dictionary:

> empire n. Any of a family of military simulations derived from a
> game written by Peter Langston many years ago. There are five or
> six multi-player variants of varying degrees of sophistication,
> and one single-player version implemented for both UNIX and VMS;
> the latter is even available as MS-DOS freeware. All are
> notoriously addictive."

There have been a couple of previous versions of Empire on the Amiga as
well as various Empire-like games such as Civilization. Invasion Force
(originally called Empire II, but that name is taken) follows strongly in
the tradition of Interstel's famous commercial release of Empire: Wargame
of the Century. You may think of Invasion Force as an unofficial and
wholly unauthorized sequel with updated programming, expanded gameplay,
and a whole raft of new features {many of which don't exist yet}. It is
meant to be the last word in Amiga wargames.

1.3 2. Requirements

```
SYSTEM REQUIREMENTS
===================
```

Invasion Force is designed to run on a wide range of Amiga systems.
You must have Workbench 2.04 or higher. A 68020 CPU or better is highly
desirable, though the game may function on 68000 systems {provisional}.
To run the game in a useful manner, you should have 1MB RAM free
{provisional}? when starting it. If you have more RAM, the game will
allow bigger maps and more players. Invasion Force will work on
standard ECS machines, but can take advantage of AGA or graphics cards
to allow higher resolutions and a flicker-free display. The game can
run from the boot floppy {I hope! It will be nice if we can somehow
cram the essentials onto a 880K floppy, but I'm not betting money on it.}
or can be installed on a hard drive. If you run it from a hard drive,
you must have ReqTools library and Topaz 11 font installed in your system.
{I hope this can be taken care of by the installer in the general public
release.}

It is assumed that the user is familiar with the basics of using Intuition
programs on the Amiga. Explaining how to use the mouse, drop-down menus,
or common gadgets is beyond the scope of this document.

1.4 3. Overview

```
OVERVIEW
========
```

Each game is played on a map of hexagon-shaped terrain sectors. Most
often it will be ocean with islands or continents scattered about, though
the map editor can be used to create many forms. Also scattered on the
map are cities. The game hinges on control of these cities.

At the beginning of the game, each player controls one city. The rest of
the cities are "neutral". Each city that is controlled by a player will
produce military units. The player can select what kind of unit each
city makes. The units made by the player's home city can then be used to
conquer others, so the empire grows. The ultimate goal for you is to
control all cities in this manner, fighting the other players as necessary.

1.5 4. The Units

THE MILITARY UNITS
==================

The battle is fought with several kinds of military units. They are:

INFANTRY -- Composed of footsoldiers, they are equipped mainly with rifles,
but also machineguns, small anti-tank and anti-aircraft missiles, and even
pack howitzers. In open terrain they can move one hex per turn, and they
can invade and capture cities. They can lay minefields or clean them up.
Because infantry can be quickly raised, they are the natural foundation of
your war machine.

ARMOR -- The elite ground forces, armored units consist of tanks, mobile
artillery and mechanized infantry. They can move twice as fast as
infantry, sustain twice as much damage without dying, do twice as much
damage with their heavy guns, and can also invade and capture cities.
However, they are much more expensive than infantry. (In Invasion Force
terms, "expensive" means that something takes a long time to build. There
is no money as such.)

AIR CAVALRY -- The combination of helicopter gunships and troop carriers
have limited range, but can move quickly over terrain obstacles and even
short stretches of water to reach their targets. Although unable to
attack other aircraft, the air cavalry can invade and capture cities.
They are quite expensive, but the ability to launch surprise attacks
against hard-to-reach cities makes air cavalry important.

FIGHTER -- The fighter unit is great for coastal defense and clearing
the skies of enemy aircraft. It can also attack surface targets, but
may sustain heavy losses when doing so. Because of their speed, fighters
are prime units for scouting and reconnaissance of all kinds. The fighter
cannot attack cities.

BOMBER -- Similar to the fighter, the bomber is a bit slower and has
longer range. It is unable to attack other aircraft, but is more
effective at destroying surface targets. It does twice as much damage
as the fighter. The bomber can also can bombard cities to destroy enemy
units stationed there, though it cannot capture the city.

TRANSPORT -- These are cargo ships which are made to carry infantry or
armor. An undamaged transport can carry six ground units and unload them

in amphibious assaults against the enemy. Transports have little combat
value of their own, and are easy targets for the enemy unless you protect
them with your own aircraft and warships.

SUBMARINE -- These small, inexpensive ships are invisible to enemy
aircraft. Only enemy cities, subs, destroyers or cruisers can spot them.
Although vulnerable to attack if spotted, the submarine's torpedoes can
do great damage and even sink battleships with a bit of luck.

DESTROYER -- Small, inexpensive, fast warships are used for scouting,
escorting transports, hunting submarines, minelaying and minesweeping.
Although not suited for heavy combat, the destroyer's versatility makes
it useful.

CRUISER -- Medium sized warships, cruisers can attack other ships,
sustain some fairly heavy damage without sinking, spot submarines, and
bombard shore targets with their guns.

BATTLESHIP -- The most powerful individual unit in the game, the
battleship is extremely expensive to produce, but also very hard to sink.
It is a floating fortress that can attack other units with confidence,
doing great damage with its guns and sustaining many hits without sinking.
It can also bombard land targets with great effectiveness.

CARRIER -- The ship has little combat effectiveness of its own, but is
fairly tough and is designed as a base for aircraft. It can carry eight
aircraft on board, and can sustain even more by rotating them (flying
some while others refuel). It is often used with attack fleets to
provide fighter reconnaissance, thus multiplying the effectiveness of
surrounding warships. It could also carry bombers or air cavalry for
surprise raids.

The details of how these various units move, fight, are manufactured,
repaired, and so forth will follow later on.

1.6 5. Main Menu

THE MAIN MENU
=============

When you first start Invasion Force from the Workbench, it will open
its own custom screen. The display at this time is mostly blank, but
you can use the drop-down menus or right-Amiga shortcut keys to select
various functions:

    Project
        [A] About Invasion Force   --> version information
        [N] New Game   --> begin a new game
        [L] Load Game   --> load an existing game
        [M] Map Editor   --> enter the map editor
        [Q] Quit Program

    Prefs
        [G] Screen Mode   --> select the graphics display

If you select [G], the program will give you a system requester
allowing you to select any Amiga screen mode you like, provided the
size is 640x400 or greater. This information will be saved to the
"empire2.prefs" file. If this file is not found for any reason,
the game will revert to a default NTSC 640x400 display.

1.7   6. Starting a Game

STARTING A GAME
===============

When you select the [N] New Game command from the main menu, the program
will present you with a large and complex looking requester. Don't panic!
This merely lets you set various options for the game. Let's take a look
at the requester items one at a time!

The left half of the requester is all player information. Here you can
set the number of players, their names, type (computer or human) and
handicap. At top is a row of small buttons. Each of the numbered buttons
from [1] to [8] represents a player. At first only two buttons are active
and the rest ghosted. This indicates we are set up for a two player game.
Clicking the [+] button increases the number of players. The [-] button
decreases the number of players. The minimum is two, maximum eight.

Below the row of buttons is a selection of other gadgets showing
information about a player. If button [2] is selected, for example, the
gadgets below will display everything about player two. You can change
these values to adjust the game. (Some of the gadgets can be activated
using hot keys, as indicated.) They are:

[N] Name: This is the name the player will use in the game. You can put
 your real name here, make up a fanciful handle, or even use the provided
 default names.

[T] Type: This tells the game whether a player will be controlled by a
 human or by the computer. You can mix any combination of human or
 computer players.

Color: This little icon shows what color each player will be and what
 his map icons will look like. This cannot be changed. Each player
 number has a fixed color assigned to it.

Production Efficiency: This slider allows you to adjust the efficiency
 of cities you control, which determines how long it takes them to build
 units for you. As the value is increased, cities need less time to
 crank out units. For an even game, you will probably want to leave
 this slider at the default value of 50%. As you gain experience with
 the game, you can adjust it to create new challenges.

Attack Efficiency: This slider adjusts the strength of your troops in
 battle when they attack enemy forces. Again, the default value of 50%
 is most commonly used, but you can adjust it to make the game easier
 or harder for different players.

Defense Efficiency: Similar to attack efficiency, this slider adjusts

the battle strength of your troops when they are attacked by hostile
forces.

Computer Competency (as Aggressiveness): This value ranges from 1 to 10
 and influences the strategy of the computer opponent. A low value will
 cause the computer player to behave defensively, guarding his cities
 well and waiting until he has great strength before attacking you. A
 high value will cause the computer to strip his defenses to build an
 attack force for quicker strikes. This slider has no effect on human
 players.
   [NOTE: This has been changed from the original intent, perhaps
   permanently, perhaps not. Currently there are a number of different
   AI opponents implemented, which will correspond to the range of
   values from 1 to 10. As of 10/1/96 #1 and #2 have been implemented
   and #3 is on the way. Eventually, a single AI opponent may be
   selected from the "contenders" that are developed along the way,
   and this slider changed back to it's originally intended meaning.
   But for now, selecting a value from 1 to 10 will have that particular
   player use the corresponding AI opponent code, or the highest
   numbered one implemented if that particular one isn't done yet. So
   right now, selecting 1 will enable AI opponent #1, and any other
   value will use AI opponent #2.]

It is important to understand that each of these gadgets has a different
value for each player. For example, if you select player one and move
the production efficiency slider, the value is only changed for player one.
The other players are unaffected.

The other half of the requester controls options of a more general nature.
These options apply to the whole game, not to individual players. They
are:

Game Play: This cycle gadget lets you choose a normal game, a file-mail
 game, or a modem game. If you are not familiar with Invasion Force,
 you should play a few normal games before trying the other types. They
 are described in more detail later in this document. {Of course, only
 the normal game is implemented so far.}

[S] Use Stacking Rules: This checkbox lets you choose whether more than
 one military unit can be placed (or "stacked") in a hex. By default
 this is turned off, so that units can only be stacked under special
 conditions, such as on board a ship or in a city. When the option is
 turned on, you can stack units freely in open terrain. Aside from your
 first game or two, you will probably want to turn this option on.

[D] Defend Cities: This checkbox determines whether units stacked in a
 city will help to defend it. Normally when a city is attacked, a default
 infantry unit (called a "militia") is used to defend it. However, if
 this option is selected, you may stack powerful units such as battleships
 in your cities to protect them. This option will most often be left
 turned off. { note: I am still not 100% sure how this option should work
 in the final game; I might decide it's too much hassle and kill it }

[F] Allow Fortification: This option makes it possible for ground units
 (infantry or armor) to dig earthworks to protect themselves from attack.
 { note: Not currently implemented. }

Define Sounds: This button will open a small window and allow you to select
custom sounds for each game event. The original sounds are already preset.

Map: This button and string gadget let you choose a map file to load into
 the game. This is the map you will play on. You can type a file name
 directly into the string gadget or you can use the [Map] button to call
 up a file requester. If you select a directory, the program will
 attempt to choose a map file at random from that directory.

Units Available: Here is a set of icons which allow you to choose the
 units that are available for production in the game. At the extreme
 left are infantry and transports, which are always available. They
 cannot be turned off. The other units are armor, air cavalry, fighters,
 bombers, destoyers, cruisers, battleships, aircraft carriers and
 submarines. At the extreme right are icons enabling land and sea mines.
 { mines not yet implemented, of course }

The default values of these options present a game similar to the
Interstel Empire game that many are familiar with. By altering the
options, you can explore strategies and ideas that were not possible
with Empire.

When you have adjust all the player values and options to your
satisfaction, select [Continue] at the bottom of the requester
(or press [Enter]). If you wish to abort the game, you can do so using
the [Abort Game] button, which returns you to the main menu.

1.8 7. Game Sequence

THE GAME SEQUENCE
=================

Once you have gotten the game started, it follows a general sequence
of play, like so:

     1 -- summon the player
     2 -- show the automatic combat report
     3 -- show the city production
     4 -- units move and attack

After a player has completed this sequence, the next in line is summoned.
After all players have completed their moves, the next turn begins and
the cycle continues. This will carry on until the game is through, when
all players but one have surrendered or been crushed.

When it is your time to move, the game will show a requester to call you
by name. During your move, it is important that the other players not
be allowed to look over your shoulder. Secrecy is a part of Invasion
Forces, and you will want to keep your opponents guessing about how much
land you control, what unit types you are building, and where your
forces are preparing to attack.

If there have been battles since your last turn, the game may
automatically show you a report. The battles will be displayed on the

map for you to observe, with comments appearing above on the title bar. The automatic report can be turned off with your user preferences, but the report will remain available from the menus.

Every turn your cities work to produce military units for you. When a unit is completed, a requester appears telling you about it, and allows you to change the city's production to something else if you wish. Your user preferences can suppress these requesters for land and air units, but it will always inform you of ship production. The game chooses a random name for each ship, but you can personalize your ships by giving them different names of your choosing.

After these things are out of the way, you will get to the meat of the game, which is moving your units on the map. It is possible that the game may skip this phase if you have no units to move, or if all your units are on sentry duty or otherwise occupied. More often, however, this phase is where you will carry out most of your actions.

The game will automatically select a unit for you to move. After you move it, the game will select another for you, and so forth until all your units have moved. However, you can change the order of movement and select units to move in any order you like. The automatic selection is merely an aid to help you keep from forgetting any.

The whole movement phase offers several different modes of operation. The most important of these are MOVEMENT MODE and SURVEY MODE. There are many commands and menus associated with them, so I will describe them in more depth.

1.9 8. Movement Mode

```
MOVEMENT MODE
=============
```

When the game is in movement mode, the currently selected unit will blink. You can look to the window title bar for information about the unit, or to the movement bar at the left to see how far the unit can move this turn. Each marker on the movement bar indicates one hex of movement over unobstructed terrain. Movement through difficult terrain drains the bar faster.

Movement is done using the mouse or keyboard. If you click the mouse on a hex adjacent to your blinking unit, the unit will try to move onto that hex. The numeric keypad can also be used to move in any of the six directions, like so:

```
    7   9
     \ /
    4-*-6
     / \
    1   3
```

The numbers 2 and 8 have no effect in this game, and the number 5 has a special purpose, as we shall soon see.

Each available unit type has a specified movement rate:

```
    UNIT            SPEED   RANGE
    Infantry ---- 1 ----- unlimited
    Armor ------- 2 ----- unlimited
    Air Cavalry - 3 ----- 12
    Bomber ------ 4 ----- 24
    Fighter ----- 6 ----- 18
    Transport --- 2 ----- unlimited
    Submarine --- 2 ----- unlimited
    Destroyer --- 3 ----- unlimited
    Cruiser ----- 2 ----- unlimited
    Battleship -- 2 ----- unlimited
```

SPEED:
The speed is the number of hexes the unit can move in one turn, assuming
open terrain. If the unit tries to cross difficult terrain, such as
swamp, mountains or jungles on land, or shallows in the ocean, the
movement may be reduced. This will be explained in more detail later on.

RANGE:
The air units can only remain aloft for a limited time, then must land
and refuel or else crash. The Air Cavalry can fly for three turns, the
Fighter three turns and the Bomber six turns. This limits the distance
they can travel, as indicated in the table above. However, any leftover
movement an aircraft has at the end of the turn is lost and does not
carry over to the next turn. The aircraft is refueled when it lands in
a friendly city or on board a friendly aircraft carrier.

ORDERS:
Units can be given orders – this can free you from having to tell each
unit what to do each turn, and make playing the game less work and more
fun. The variuos orders are lited below. After each order's name is
its keyboard shortcut key in parentheses:
  Sentry(s) – When a unit has been given a Sentry order it will no
   longer be highlighted each turn. In order to access that unit you
   can select it using the survey mode and clear its orders. A unit
   in Sentry will have a small letter 's' in its icon to indicate its
   orders.
  Load Units(l) – This function is only useful for Transports and
   Carriers (most useful for Transports). It causes the Transport or
   Carrier to "load" – pull onboard – units that it can carry that it
   finds in adjacent hexes. The Transport or Carrier will
   automatically end this order when it is full (has onboard all the
   units it can hold). The user is informed how many units it has
   taken on board each turn.
  Unload Unit(u) – This will "wake up" all units on board the ship
   that are in sentry mode, readying them to disembark a Transport or
   fly off a Carrier.

COMMANDS:
Commands can be given to units – these are momentary in nature, so they
are separated from orders (which may exist for many turns, or the entire
game for that matter). After each command's name is it's keyboard
shortcut key in parentheses:
  Clear Orders(o) – This clears the orders for the selected unit.
  Skip(<space bar>) – This order ends a unit's movement for that turn.

```
  Note that aircraft always use fuel - skip cannot be used to keep an
  aircraft from running out of fuel.
 Wait(w) - This command causes the selected unit to wait until the
  end of the turn for orders/moves.  This can be quite handy - it
  will permanently rearrange when a unit is activated (usually, units
  are activated in the order of their creation - oldest units first,
  and brand-new units last).
 Center on Unit(c) - This command will redraw the map display, with
  the selected unit in the center of the new display.
```

1.10 9. Combat

```
COMBAT
======

Combat in Invasion Force is fairly complex (there are a number of
factors involved) but simple in practice - one players unit is simply
moved into a hex occupied by another player's unit or city, and combat
is automatically resolved.

The real question is: Which will win?  Ultimately, success in the game
depends on winning individual combats.  It is therefore important to
know how combat is resolved to make the best use out of your units.

The first item to cover are attack and defense modifiers.  There are a
number of them tied to specific unit types:
  INFANTRY:
    Defense Efficiency is reduced by 40% when attacked by CRUISER
    Defense Efficiency is reduced by 40% when attacked by BATTLESHIP
    Defense Bonus of +10% when in FOREST terrain
    Defense Bonus of +20% when in JUNGLE terrain
    Attack and Defense Bonus of +30% when in MOUNTAINS terrain vs INFANTRY
    Attack and Defense Bonus of +30% when in MOUNTAINS terrain vs ARMOR
    Attack and Defense Bonus of +20% when in HILLS terrain vs INFANTRY
    Attack and Defense Bonus of +20% when in HILLS terrain vs ARMOR
    Attack and Defense Bonus of +10% when in RUGGED terrain vs INFANTRY
    Attack and Defense Bonus of +10% when in RUGGED terrain vs ARMOR
  ARMOR:
    Attack Bonus of +25% when attacking into DESERT terrain
    Attack and Defense Bonus of +30% when in MOUNTAINS terrain vs INFANTRY
    Attack and Defense Bonus of +30% when in MOUNTAINS terrain vs ARMOR
    Attack and Defense Bonus of +20% when in HILLS terrain vs INFANTRY
    Attack and Defense Bonus of +20% when in HILLS terrain vs ARMOR
    Attack and Defense Bonus of +10% when in RUGGED terrain vs INFANTRY
    Attack and Defense Bonus of +10% when in RUGGED terrain vs ARMOR
  FIGHTER:
  BOMBER:
    Attack Bonus of +25% when attacking into DESERT terrain
    Defense Efficiency is reduced by 40% when attacked by FIGHTER
  AIRCAV:
    Attack Bonus of +10% when attacking into FOREST terrain
    Attack Bonus of +20% when attacking into JUNGLE terrain
  TRANSPORT:
    Attack Efficiency is reduced by 50%
    Defense Efficiency is reduced by 40%
```

```
DESTROYER:
SUBMARINE:
  Defense Efficiency is reduced by 40%
CRUISER:
CARRIER:
  Attack Efficiency is reduced by 50%
BATTLESHIP:
```

NOTE: When an Attack or Defense Efficiency is 'reduced by' a percentage,
it refers to a percentage off the original Efficiency as set in the Start
Game window for that player (i.e. a number from 1 to 100), so if it was
set to 50 (the default), then 'reducing it by 40%' will result in that
efficiency going down from 50 to 30. Bonuses are fixed amounts added on
top of that, so a Bonus of 30% will result in that efficiency going from
30 to 60.

After adjustments for Attack and Defense Efficiency have been taken, a
random number from 0 to 99 is added to the attacker's and defender's
total. The two totals are then compared – the higher of the two suceeds
in "hitting" the other. Damage equal to the hitting power of the unit
type is inflicted. These hitting powers are listed below:

```
        infantry --- 1
        armor ------ 1
        aircav ----- 1
        bomber ----- 2
        fighter ---- 1
        transport -- 1
        sub -------- 3
        destroyer -- 1
        cruiser ---- 2
        battleship - 3
        carrier ---- 1
```

If the inflicted damage (accumulated with whatever damage that unit
had sustained so far in this combat or others) does not destroy the
struck unit, another round of combat occurs. This continues until
either the attacker or defender is destroyed. Since either the attacker
or defender is struck each round, combat is over quickly. The survivor
remains (with any damage it might have sustained) in possesion of the
contested hex.

Another point to keep in mind is that there is only ONE attacker
(of course) and ONE defender (not as obvious). When units are allowed
to stack on one hex, only one unit is selected from the stack to defend.
If that defender is eliminated, the entire stack is lost. This is done
for game balance – to balance the advantages of stacking (greater
flexibility in moving, concentrating forces, etc.) against the risks
of losing multiple units from a single attacker. For example, landing
troops from a fully loaded Transport onto enemy held shores becomes more
interesting – do you hold some of the troops back in the Transport to
prevent stacking them and losing more to counterattacks, or do you stack
the troops so that your vulnerable and valuable Transport can make a
quicker getaway? The following is the list of unit types, in order of
their selection as defender:
```
  INFANTRY  First Choice
  ARMOR
```

```
  AIRCAV
  TRANSPORT
  SUBMARINE
  DESTROYER
  CARRIER
  CRUISER
  BATTLESHIP
  FIGHTER
  BOMBER     Last Choice
```

Unless the attacker is a FIGHTER, in which case the order is:

```
  FIGHTER    First Choice
  BOMBER
  AIRCAV
  INFANTRY
  ARMOR
  TRANSPORT
  SUBMARINE
  DESTROYER
  CARRIER
  CRUISER
  BATTLESHIP  Last Choice
```

Units that are onboard other units (Infantry and Armor on Transports, or
Fighters, Bombers, and Aircav on Carriers) are excluded from
consideration. Some interesting things can be seen from these lists –
for example, you can use Fighters to provide air cover for more
vulnerable units against enemy Fighters. Friendly Fighters can protect
Bombers by flying with them. Of course, if you lose the fight with the
enemy Fighter, the Bomber is lost too – but the Bomber on it's own is at
a heavy disadvantage against the same Fighter.

1.11 10. Terrain Costs

```
TERRAIN COSTS
=============
```

Each type of unit in IF has different 'costs' associated with each
terrain type. These are shown in the following table. The number of
movement points each unit type receives at the start of the turn is shown
in parentheses. The movement point cost to enter a hex of a certain
terrain type are shown in the rest of the columns. An entry of N/A means
that unit cannot enter a hex of that terrain type. The Forbidden Zone
(HEX_FORBID) is not listed, since nothing can move through it.

```
                |   |   |   |   |   |   |   | M |   |   |   |   |   |   |   |
                |   |   |   |   |   |   |   | o |   |   | S |   |   |   |   |
                |   |   |   |   |   |   |   | u |   |   | h |   |   |   |   |
                | P | D |   | F | J | R |   | n |   |   | a |   | D |   |   |
                | l | e | S | o | u | u | H | t | P | S | l | O | e |   |   |
                | a | s | c | r | n | g | i | a | e | w | l | c | p |   | C |
                | i | e | r | e | g | g | l | i | a | l | o | e | t | I | i |
                | n | r | u | s | g | l | l | n | a | l | o | e | c | I | t |
                | n | r | u | s | l | e | l | n | k | m | w | a | h | c | t |
Unit Type       | s | t | b | t | e | d | s | s | s | p | s | n | s | e | y |
```

```
===============|===|===|===|===|===|===|===|===|===|===|===|===|===|===|===|
Infantry (60)  | 60| 60| 60| 70| 90| 60| 70| 80|N/A| 90|N/A|N/A|N/A| 60| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Armor (120)    | 60| 60| 60| 90|150| 70| 90|110|N/A|N/A|N/A|N/A|N/A|N/A| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Aircav (180)   | 60| 60| 60| 60| 60| 60| 60| 60|N/A| 60| 60| 60| 60| 60| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Bomber (240)   | 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Fighter (360)  | 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 60| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Transport (120)|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A| 80| 60| 60|N/A| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Submarine (120)|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A| 80| 60| 60|N/A| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Destroyer (180)|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A| 80| 60| 60|N/A| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Cruiser (120)  |N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A| 80| 60| 60|N/A| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Battleship(120)|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A| 80| 60| 60|N/A| 10|
---------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
Carrier (120)  |N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A|N/A| 80| 60| 60|N/A| 10|
---------------+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
```

You will notice that certain terrain type costs exceed the number of
movement points givent to the unit each turn - for example Jungle costs
150 points for Armor to enter, yet Armor is only given 120 points at the
start of the turn. In the case where the cost to enter a terrain type is
greater than the number of movement points a unit has, a ratio is used as
a chance to enter that hex. In the example above, an Armor unit begins
its turn with 120 movement points. It tries to enter a Jungle hex (cost
150). The unit then has a 120/150, or 4/5, chance to enter that hex. On
80% of attempts, it will be successful. On the other 20% of attempts, it
will end its movement without leaving its hex. In either case, it will end
up with 0 movement points left.

1.12   11. AI Docs

```
AI Opponents
============
```

   There are currently three different AI opponents available in
Invasion Force. These are: AI#2, AI#3, and AI#4 (catchy names, no?). There
used to be an AI#1 as well, but it has been retired, although it will be
explained in the following section anyway.
   To select a particular AI opponent to be used for a particular
player (i.e. to make player 3 use AI#4) it must be done when setting up the
parameters for a new game. Select a player number from the button row
numbered from 1 to 8, then select "Computer" in the choice widget below the
row of buttons - the slider at the bottom left of the window will activate.
Then simply move the slider until it reads the number of the AI opponent
you wish to use (1 to 10). This only affects the selected player number
though - to make more opponents AI you need to repeat these steps with other
player numbers.
   The slider selections allow up to 10 different AI opponents to be

selected. However, only 3 are available, so selecting 1 or 2 will use AI#2,
selecting 3 will use AI#3, and selecting 4 or above will use AI#4. When
AI#5 is available, then selecting a 4 will use AI#4 and selecting 5 or
higher will use AI#5.
   So why all the different AIs? This is an ongoing project and I
wanted to be able to work on newer, better AIs without losing older, but
still working, AIs in the process. This is a learning experience for me as
well, so the newer AIs use some of the older AIs code (as appropriate).
Also, should anyone want to pick up the code and improve the AIs they can
start with the basics and learn as I have learned. Then either improve on
what I have done or take their own approach (but still possibly using some
of the low-level routines I have written, such as path finding, etc.)
   Following are descriptions of each of the 4 current AIs, and a
preview if you will of AI#5.

AI#1 Description (cyber1.c)

   This was actually the second attempt at an AI for IForce. The very
first attempt was a "just dive in and make it all happen" approach that
failed miserably – just couldn't get anywhere with it. So, I took a step
back and made the absolute minimum of an AI – AI#1.
   AI#1 deals only with Infantry units. It creates then, sets them
off to wander randomly, and has them attack other units or cities when it
finds them. And if the city is taken, all units return to the city to try
and recapture it. That's all.
   Well, it worked. Showed what was missing, and gave me a solid core
of working code to build AI#2 from.

AI#2 Description (cyber2.c)

   This AI deals with Infantry and Armor, and tries to build the one
that is most appropriate to the terrain around the city building it. The
production is handled by getting requests from all cities owned by that
AI player and building the highest priority request. So the city that is
building the unit may not be the one that "owns" it after it is built.
   This gives the cities some measure of cooperation.
   It too just sends units off randomly, but reacts with more
direction once an enemy city or unit is discovered. Enemy units near the
city will be attacked by units of that city (or hunted as I call it, since
it involved both moving towards the enemy units and attacking them). An
enemy or neutral city nearby will be attacked and captured if possible, and
as before, all units of a city will converge on it and try to recapture it
after it has fallen into enemy hands.
   This one can be some fun to play against. While simple it can
respond very vigorously to invasion once established. It throws away it's
random wanderings and hurls wave after wave of Infantry and Armor at an
invader to throw them back into the sea.

AI#3 Description (cyber3.c)

   This AI deals with aircraft as well as Infantry and Armor.
   AI#3 does production a little differently still – it holds a raffle.
Each city puts in its own request for units to be built, each with a
priority associated with it. The city doing the production then adds up
all the priorities and rolls a random number to pick what gets produced. A
higher priority request has a higher probability of being selected, but any
one of the requests can be selected. Hopefully that randomness makes the

AI a bit harder to predict.
   This also had the original path finding algorithm which could take
inordinate amounts of time to find a path (since it worked recursively).
This path finding routine has been replaced by one in AI#5 (even though AI#5
is not finished yet, some parts are).
   It includes new commands for moving randomly (more like a billiard
ball than a mexican jumping bean) and searching with aircraft (which is
based on a lookup table of offsets from the city's location).
   Fighters and bombers are used for exploration, patrolling, and
defense. Aircav are only used to attack cities that are detected by are not
accessible by ground forces (Infantry and Armor).
   Still not great, but a start.

AI#4 Description (cyber4.c)

   This AI is a slightly modified version of AI#3 - it does not add
any new unit types to the kinds it uses, but does add a little more to the
overall functionality.
   This AI adds a command to walk the coastline - useful for having
ground or naval units map the edges of an island or continent - and a new
goto command with some improvements over the older one.
   Not much else.

AI#5 Description (cyber5.c)

   This AI is supposed to be the first foray into a full featured AI
that works with all the unit types - so it adds all the naval units to the
ground and air units that previous AIs use.
   Currently, the unit production selection routines are in written,
as well as the new path finding algorithm. It is far from finished.
   This new path algorithm implements a full-blown A* (aye-star)
search, supporting the new roads and terrain types as well as selectable
speed settings (you can get a bit slower, more exhaustive search, or a
quicker, less rigorous search). This algorithm is being used extensively
for the human player as well as the AI opponents to enable units to "goto"
another location efficiently.
   Also new here is a "smart" routine to calculate odds in combat of
units vs. other units - taking into account player settings, current unit
damage, terrain types, etc., etc. Quite complex, it needs to be reworked
to handle the new combat system.

Known Problems with AI Opponents
================================
   In an effort to chase down bugs in the AI code, I added several
checks to try and detect when *bad things* happen (since I can't run
Enforcer). So, if you see a message that starts:
   "Error! Unit List Fouled..."
   You might as well reboot. The game cannot exit gracefully as the
system memory pool pointers have gotten corrupted somehow or other. You
might as well reboot.
   So please save games in progress often. You can load up a game
saved from previous turns and continue on (unfortunately the problem is
very sporatic - it refuses to repeat itself, otherwise I would have found
it by now). My hope is that when all Enforcer hitting code has been fixed
this problem will never surface again.

AI#3 and AI#4 have been reported to "lock up" or take "forever" to
process a turn. If you can get this to happen with the latest revs, let
me know please.

Bug Report Information for AI Opponents
=======================================
   Since the AI Opponents are a mixed bag of old and new code, there
are a number of items that are needed to pinpoint a problem in the AI
code.
   1) First is the revision of the program, of course. If it is not
one of the latest (or *the* latest) I may not be able to help - I don't
keep development environments very far back at all.
   2) Which AI opponent type (AI#2, AI#3, AI#4) is the player? The
different opponents act very differently, and use different code.
   3)

1.13   12. Map Editor

Map Editor
==========

{Some notes from me, Ed Snyder :) }

I figured that I've done enough damage to the map editor now, so it's time
to write some form of docs for it.

Once entering the map editor the screen will fill with blue hexes (that's
the ocean terrain!). The title bar will change to "Map Editor vX.x" (the
X.x being the current version of the map editor, NOT the game!). Also, in
the title bar you will notice the x/y readout when you move the mouse. This
lets you know which hex the mouse cursor is currently over.

MENUS:

Project:

        [L] Load Map - This will load a map file into the map editor.

        [S] Save Map - This will save any maps you have created or edited.

        [R] Resize Map - This allows you to change the size of the map.
                Just remember, the bigger the map the more memory required.

        [C] Clear Map - This will erase the currently displayed map and
                fill the display will the currently selected terrain type.

        [X] Exit Map Editor - This will exit the map editor, NOT the
                entire program. If your map wasn't saved you'll get
                the usual warning.

        [Q] Quit Program - This will quit the entire program and drop you
                back at Workbench (or wherever you came from). Any

                    unsaved maps will result in the usual warning.

Terrain:

        (Spacebar) Toolbar - This toggles a small window with all of
                the terrain types. From here you can select a terrain
                type and then return to the map window and draw with
                the newly selected terrain. There's also an INFO button
                that will display info on the selected terrain.

        Terrain Types - These are the available terrain types. These may
                also be selected from the Toolbar (above).

        (I) INFO - This will display info on the selected terrain. This
                option is also available from the toolbar. This is
                explained in more detail below.

Other:

        World View - This will shrink your map and display it, in its
                entirety, in a separate window.

        [M] Random Maps - This neat little button will take you to the
                Random Map Generator. This option is explained in more
                detail below.

        [I] Statistics - This will display the current map statistics.
                Such as... the percentage of each terrain types, number
                of cities, etc.

        =---=

TOOLBAR:

        Operation of the Toolbar is simple. The spacebar will toggle it
        on(displayed) or off(not displayed). When ON, you may select a
        terrain type simply by clicking on it with the mouse. Once you
        have selected a terrain type you will need to toggle the Toolbar
        OFF in order to draw with it. No drawing is currently possible
        with the Toolbar ON. This may change in the future.

        If you happen to have a 3-button mouse you can toggle the Toolbar
        with the MIDDLE mouse button.

        Also present are two buttons, OKAY and INFO. Okay just toggles the
        Toolbar back OFF. The Info button is described below.

        The close gadget (upper left corner of most Amiga windows) has the
        same effect as the Okay button.

INFO:

        The Info window displays more detailed information about the

selected terrain. It will show the terrain itself and the name
of the terrain. Below that it will show all of the unit types.
Any unit that is crossed out cannot traverse the selected
terrain type.

Below all of that is the movement costs, speed, etc. These
items were explained earlier in this doc, so I won't bother
repeating it here.

RANDOM MAPS:

The Random Map Generator window is a huge, not so pretty, beast.
Within it lurks all those things your mother warned you about! :)

Actually, it's just a big window with several sliders and a few
buttons thrown in for good measure. Across the width of the
window is a row of vertical sliders. There's one for each of the
terrain types. These sliders select the percentage (more or less)
of each terrain to be generated in the random map. To the far
right of these sliders in a small box that displays the current
total percentage of the map. This cannot be higher than 100%, but
may be lower.

NOTE: There is an EXTRA slider displayed, but not currently
      marked or in use. This is for the continents/islands
      option in the next release.

Also to the right are three buttons. These are HELP!, GENERATE,
and PRESETS. The HELP! button will display some quick help data.
The GENERATE button will generate your map, based on the settings
you've selected. The PRESETS button will allow you to randomly
generate a preset environment (i.e. Desert). As soon as I complete
this option I'll describe its use here.

TIPS: Before using the Random Map Generator make sure you have
      set the map size of your choice.

      Don't set any ocean, since the ocean terrain is already
      in the blank map. This will help to eliminate that camo-
      netting effect. :)

      To CANCEL the generation just click the close gadget.

After the map is generated you will be prompted to select the
number of cities to be sprinkled. After that is complete you
can save your map or hand edit it to fine tune it a bit.

===

DRAWING MAPS:

Drawing a map is fairly simple, but I'll try to explain it a

little in detail.

First, make sure the map size is what you want. At the present
time resizing the map clears the current map from the display,
so you will need to set your map size BEFORE starting to draw.

After you have sized the map, just toggle the Toolbar and select
a terrain (or you can select it from the menu). Then toggle
the Toolbar to the OFF position and you're ready to draw. Clicking
on a hex, with the mouse, will cause the terrain you selected
to be drawn in that hex. If you holding the mouse button (the
left one) down while moving the mouse then each hex the mouse
cursor passes over will be filled with the terrain you selected.
Just repeat this process until you've created your map.

New in this release is the ability to add ROADS to your maps.
To draw a road simply hold down the control (CTRL) key on the
keyboard while using the mouse to draw, just as you did with the
terrain. Roads can be placed on water type terrain to create
bridges. Roads have some benefits where movement costs are
concerned.

After you've added the roads you can add in your cities. There
are some terrains (like the water types) that cities are not
allowed. If you try to place a city there you will get the
usual "Oh no you don't!" requester. :) After you've placed your
cities you can then go back and name them. Just make sure the
city terrain type is still selected and then click on each
city in your map. A small window will be displayed asking you
for the name.

After all that, you're done (more or less). Just save it and
you will be able to use it in future games.

TIPS:
        If you just want a map with no particular shape or order
        then use the Random Map Generator to create your basic
        map. Then touch it up by hand to suit your needs.

        If you map is to be mostly one terrain type (like
        plains or ocean) then select that terrain type and
        use the clear map option from the menu. This will
        flood (fill) the map with the selected terrain. Then
        you can just touch it up. This could speed things up
        on a large scale map.

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That's all I could think of for now. As more features are added
this doc will be updated. Enjoy!