

The Software Toolworks

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INVADERS
Version 1.3 -- February 1981
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Introduction

INVADERS is an action video game for H89 and H8+H19 microcomputers. Waves of alien space creatures attack your barricaded cannons. You must shoot them down before they overrun you or bomb all of your cannons. This version of the game uses the limited character graphics of the H19 terminal. It includes a user-modifiable parameter file which will allow game customization in literally millions of different ways, including designing your own graphics for the game display.

To Play

Before doing anything else you should place a write protect label on your original INVADERS distribution disk. Copy the three files from the INVADERS distribution disk to a disk which is not write protected. If you have a single drive system, this disk should be a bootable system disk. In order for INVADERS to run, all three files -- INVADERS.SCR, INVADERS.DAT and INVADERS.ABS (INVADERS.COM on CP/M) -- must be on the same disk.

Mount the disk you have made. (If you are using CP/M, you must be running from that disk. For example, if the INVADERS files are on disk B, type the command "B:" to CP/M, so that the prompt changes to "B>".)

Now run the INVADERS program, by typing "INVADERS" and pressing the RETURN key. The screen will blank out, then fill with fifty invaders, four barricades, your cannon (at the lower-left), and some scoring information (see next section). Fire the cannon with the space bar on the keyboard. You have an energy cannon, which can only maintain one energy shell at a time, so you can not fire again until the previous shell has exploded or faded out of range.

Move the cannon using the 4,5,6 keys, either on the keypad (with

your right hand) or on the main keyboard (if you prefer using your left). The 4-key (left arrow) starts the cannon moving left; the 6-key (right arrow) starts it moving right; the 5-key (home) stops it. (Note: These controls differ from most video games, which move objects such as the cannon only while a left or right button is depressed. For those accustomed to such games, it will take some getting used to.)

If your shell hits an invader, the invader explodes and your score goes up. If a bomb hits your cannon, there is a louder bang and your cannon explodes. You get three cannons for a single game. Shells and bombs destroy one another if they collide. You can hide behind barricades for a while, but the invaders' bombs gradually blast away these fortresses. The invaders have powerful short range weapons, and if they get close enough they will disintegrate the barricades.

If an invader ever actually reaches your cannon, it destroys the cannon and the game terminates immediately. If you shoot down all the invaders, another fifty of them regroup and start at you again, this time a little faster than before. Your forces succeed in repairing some, but not all, of your barricades before the renewed attack.

From time to time, a "mystery ship" passes overhead; it's generally worth a lot to shoot it down.

When the game ends, INVADERS asks if you wish to play again. Sometimes you answer "yes" but it ignores you; this means you typed a command after your last cannon was hit and the program took that command as your answer. Just run INVADERS again to continue playing.

Scoring

The bottom line shows scoring and status information. Your score is continuously displayed, along with a high score previously achieved and saved on disk. (If you beat this score, your name and new high score are saved for posterity!) The number of cannons you have left is displayed. Finally, whenever a "mystery ship" is present, its value appears on the right-hand side of the bottom line.

The bottom two rows of invaders are worth 10 points each. The next two rows are worth 20. The top row is worth 30 points. "Mystery ships" are worth between 50 and 300 points.

You are awarded an extra cannon each time you get enough points (the exact number comes from the parameter file--it is initially 1500).

Customizing

The game uses two auxiliary files: INVADERS.SCR and INVADERS.DAT.

Both files must reside on the same disk as the main INVADERS.ABS (or INVADERS.COM) program. The SCR file is used to store high-score information. If it is not present, no previous high score is assumed and your play creates it. Manually modifying this file is cheating!

The file INVADERS.DAT (included on this disk) contains important parameters for the game. You may change these parameters to vary the game according to your tastes. However, please note that INVADERS does very little error checking when it reads INVADERS.DAT, so if you change the file you are on your own.

INVADERS.DAT contains the game parameters. Generally, each parameter occupies one line, with the value beginning in column 1. If a parameter is a number, that number is terminated by a non-numeric character; any text which follows on that line will be ignored. If a parameter is non-numeric, no comment text is allowed on the line. The following table describes the parameters in the order they must appear in the file:

<u>Line</u>	<u>Description</u>	<u>Reasonable Range</u>	
1	Frequency of bombing varies inversely with the number of targets. This parameter determines that frequency. Low numbers = higher frequency.	0-5	
2	The invaders are smart enough to lead the cannon motion as they drop their bombs. The number of columns which the upper row of targets must lead the cannon is this parameter.	0-80	
3	Invaders can only drop this many bombs at once. Zero bombs yields a pretty dull game; five keeps you very busy.	0-5	2
4	You get this many cannons during a single game. Changing it from the nominal three changes the game quite a bit.	1-10	3
5	How often the mystery ship glides by (actually random but based on this number).	1000-30000	
6	You get a new cannon every time you get this many more points.	500-5000	
7	Each time you successfully shoot down all fifty invaders they regenerate themselves and come at you a little faster. This number determines how much faster. Higher numbers = less speed-up.	3-10	3
8	Frequency of mystery ship motion (msec; see below).	30-300	15
9	Frequency of target motion (msec).	100-1000	6
10	Frequency of bomb motion (msec).	25-200	7

11	Frequency of shell motion (msec).	25-200	
12	Frequency of cannon motion (msec).	12-100	
13	Frequency of invader advance (msec).	5000-30000	10
14	Mystery ship drawing instructions (see below).	N/A	
15	Top row target drawing instructions.	N/A	
16	Second row target drawing instructions	N/A	
17	Third row target drawing instructions	N/A	
18	Fourth row target drawing instructions	N/A	
19	Fifth row target drawing instructions	N/A	
20	Cannon drawing instructions	N/A	
21	Explosion drawing instructions	N/A	
22	Number of 2-line barrier representations	1-10	
23	Initial barrier drawing instructions -- top row	N/A	
24	Initial barrier drawing instructions -- bottom row	N/A	
25,26	First "repaired" barrier drawing instructions	N/A	
27,28	Second "repaired" barrier drawing instructions	N/A	
29,30	etc... until the total barrier instructions equal twice the number on line 22		

Parameter lines 8-13 determine how fast the game is. Each parameter is the number of milliseconds between the stated motions. For example, in the supplied file, shells and bombs move at the same rate; each moves once every 100 msec. You might make the game easier by making shells move twice as fast as bombs (by setting line 11 to 50), or you might try "fast bombs" by instead setting line 10 to 50. Changing all speed parameters proportionally yields a general speed-up of the game; you might wish to decrease everything by 20%, for example, when you become expert at the version supplied. Speeding up the game beyond a factor of four is not recommended, and trying to speed it up too much will run into the speed limitations of the terminal.

Parameter lines 14-21 specify the graphics for the game figures. Each figure (except a barricade) is constructed in a rectangle 5 character positions wide by 2 lines high. Each invader must begin with a blank space to separate it from its left-hand neighbor, so invaders are effectively only 4x2 in size. A figure is drawn from its specification in INVADERS.DAT using the

following rules:

- \$ = escape
- / = Begin a new line of the figure. To actually draw a '/', write '//' in the file.
- Any other character prints as itself.

Each figure is begun with the cursor positioned at its upper lefthand corner. The terminal is initialized in normal (not inverse) video and graphics mode. These modes can and usually will be changed inside a figure specification by using an appropriate sequence--for example, '\$p' will go to inverse video until changed back with a '\$q'. (See your H89, Z89 or H19 instruction manual for the character sequences which control the terminal's modes and produce graphics characters.) After a figure is completely displayed, the terminal should be left in normal video and non-graphics modes. It is a good idea to try to understand each figure specification in INVADERS.DAT before attempting to change them.

Line 22 determines how many pairs of barrier specification lines follow. Each barrier specification consists of two data lines, corresponding to the two display lines during the game. The following code is used:

- 0 = blank
- 1 = upper half character position
- 2 = full character position (inverse video blank)
- 3 = right diagonal character position
- 4 = left diagonal character position

The first pair of lines determines the barrier setup when the game is begun. Each following pair of lines determines successive "repaired" barriers. These are used whenever you shoot down all fifty invaders and they, and you, regroup your forces. In the data file provided, each time a barrier is repaired, less and less of is reconstituted, until after three regroupings, only the thin bottom layer of barricade is reconstructed. Changing these instructions will affect longer games considerably. For example, you can prevent barricades from being repaired at all, making the game much more difficult, by changing line 22 from "4" to "2" and following the first two lines of barricade specifications with only two more lines which consist of zeros. Or you can delete the last two lines altogether, change line 22 to "1," and rebuild the barricades completely with each new wave of invaders.

A final word: if you do alter the game parameters, it is less meaningful to compare scores with those achieved using the original parameters or another modified set. Also, if the game is modified to be too easy, you will soon lose interest. So you may want to use restraint in changing INVADERS until you have become proficient at the game in its original version.