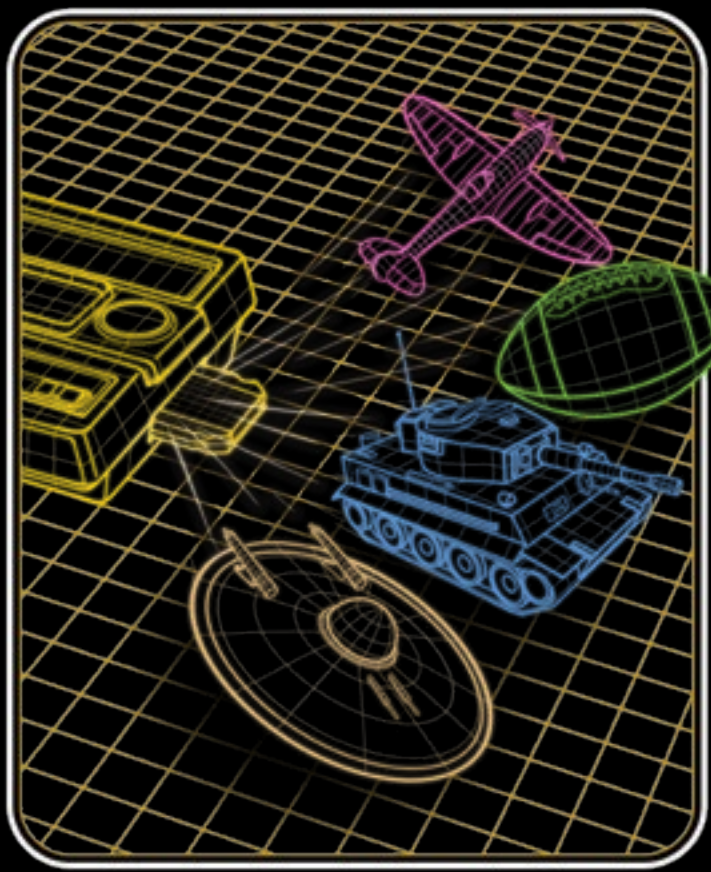
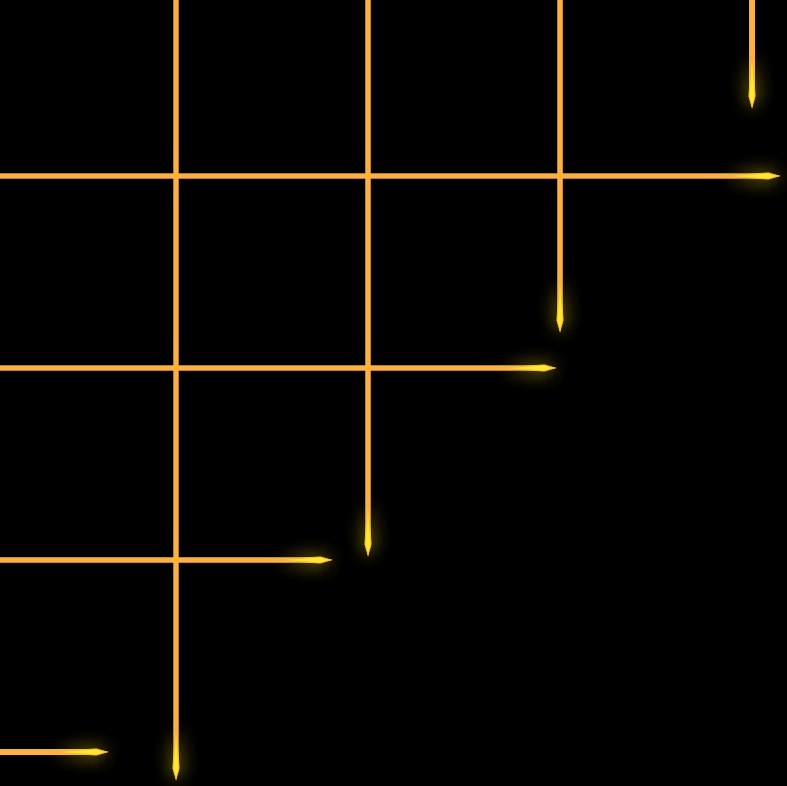
Left Turn Only presents

LTO Flash!





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LTO-04 Manual Revision A

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Introduction

Congratulations! You now own the most advanced **INTELLIVISION®** flash cartridge available today. ***LTO Flash!*** unlocks the power of your **INTELLIVISION** video game system. It puts your entire ROM collection at your fingertips, and brings exciting new capabilities for future games.

System Requirements

- ☞ An **INTELLIVISION** compatible Master Component
- ☞ A recent Windows PC or Macintosh with USB support
  - Recommended:
    - ✓ Windows 7 or later
    - ✓ MacOS X 10.9 or later
  - Also supported:
    - ✓ Windows XP, Windows Vista
    - ✓ MacOS X 10.7 or later
- ☞ A microUSB cable to connect ***LTO Flash!***
- ☞ The ***LTO Flash!*** GUI. Download the latest here:

http://ltoflash.leftturnonly.info/

Getting Started

Download and install the ***LTO Flash!*** GUI. Depending on your operating system and version, you may also need to install additional drivers. See the website for system-specific directions.

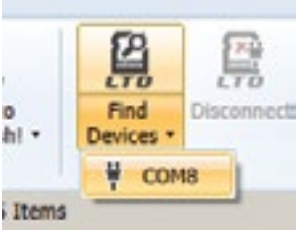
Now connect ***LTO Flash!*** to your computer with the microUSB cable. Do not plug it into an **INTELLIVISION** Master Component yet.

Launch the GUI, and verify that it sees the cartridge. The GUI displays a USB connect icon when it finds ***LTO Flash!***

Macintosh: Icon appears at upper right

Windows: Icon appears at lower left

If the GUI does not recognize ***LTO Flash!*** after 10 seconds, click ***Find Devices*** to search for your device. If you do not see your device listed, consult ***TROUBLESHOOTING*** below.



Windows: The drop down lists the devices found. Click a device to select.

*Macintosh: Click a device from the list, and then click **Select.***

SEND IN THE ROMS!

The GUI makes it easy to import your ROM library and set up a menu for ***LTO Flash!*** Lay out your menus however you like. Send your ROMs and menu layout to ***LTO Flash!*** with the click of a button.

Let's get started! Ask the GUI to scan your system for **INTELLIVISION** compatible ROMs. It can also populate the menu layout for you.

- ☞ Click ***Add Folders***
- ☞ Select a folder to search for ROMs and click ***Open***
- ☞ Select ***Add new ROMs to menu layout*** if you want the GUI to automatically add the ROMs to the Menu Layout
- ☞ Click ***OK***

The GUI scans the selected folder and any folders it contains. It adds any new ROMs it finds to the ROM List. It also adds them to the Menu Layout if you asked it to.

To import individual ROMs, click ***Add Files*** and select the ROMs to add. The newly added ROMs appear in the ROM List.

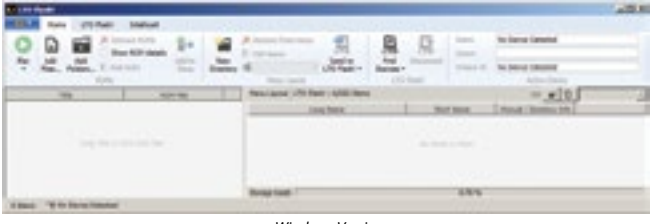
If a particular ROM is on removeable media—e.g. thumb drive, CD-ROM, or network shared drive—the GUI also makes a copy of the ROM locally. Otherwise, it remembers the ROM's location on your local hard drive.

Repeat these steps whenever you'd like to add more ROMs.

Lets Make a Menu

The menu editor has two panes. The ROM List on the left shows every ROM the GUI knows about. The Menu Layout on the right shows which ROMs and folders will appear on ***LTO Flash!***

Macintosh Version



Windows Version

Simply drag ROMs from the ROM List into the Menu Layout. Click the + icon at the upper right to add a new folder. You can also drag items within the Menu Layout to organize the menus.

Once you have the menu laid out as you wish, click ***Send to LTO Flash!*** This copies the menu layout and ROMs to ***LTO Flash!***

If you add, change, or remove anything in the Menu Layout, click ***Send to LTO Flash!*** again to update ***LTO Flash!***

Special Features

Nested folders! Organize your ROMs into folders to make them easier to find. Nest folders as deeply as you like. ***LTO Flash!*** supports up to 128 folders.

Short and long ROM names! You can set two names for each ROM. The short name (18 characters) displays by default. The long name (60 characters) displays when you highlight the ROM.

Color-coded ROMs and folders! Spot games and folders more easily by giving them unique colors. Select among **Black**, **Blue**, **Red**, **Dark Green**, **Green**, **Tan**, **Yellow**, and **White**.

Automatic de-duplication! Want the same game in multiple places in the menu? Go for it! ***LTO Flash!*** knows it's the same ROM, and saves space by only storing one physical copy.

Manuals for your ROMs! ***LTO Flash!*** lets you read a game's manual with your **INTELLIVISION** video game console! Right click on any ROM in the Menu Layout and select ***Set Manual File...*** to add a manual. Format the file to fit in 20 columns for best results.

Would You Like to Play a Game?

Now that you've loaded up your ROMs, it's time to fire up your **INTELLIVISION** console. Plug ***LTO Flash!*** into the cartridge slot and turn on the system. You may leave the cartridge connected to your computer.

The ***LTO Flash!*** title screen will appear. Tap any controller input to go to the ROM Menu. Navigate the menu using either the **INTELLIVISION** hand controller or the ECS keyboard.

☞ With the **INTELLIVISION** hand controller:
- ***DISC*** up/down moves between items
- ***DISC*** left/right moves a page up or down
- enter and upper action buttons select a ROM or enter a folder
- clear and lower action buttons exit current folder or screen
- ⊡ views a manual for a ROM, if a manual is attached
- 1 switches to the Configuration Menu

☞ With the ECS alphanumeric keyboard:
- ↑ and ↓ move between items
- ← and → move a page up or down
- RTN selects a ROM or enters a folder
- ESC exits the current folder or screen
- 0 views a manual for a ROM, if a manual is attached
- 1 switches to the Configuration Menu
- 2 through 9 and A through Z cycle through titles by letter

You can also play a ROM directly from your computer without adding it to the menu. This is especially useful when developing new games. To play:

☞ Insert ***LTO Flash!*** into your **INTELLIVISION** console
☞ Connect ***LTO Flash!*** to your computer
☞ Launch the ***LTO Flash!*** GUI
☞ Turn on the **INTELLIVISION** console
✓ ***LTO Flash!*** must be at the title screen or ROM Menu
☞ Load the game with the GUI in one of multiple ways:
✓ Select a game from the ROM List and click ***Play***
✓ Select ***Browse & Play*** from the File menu
✓ Double click on a ROM in the ROM List

CONFIGURATION MENU

LTO Flash! offers a few configuration options. Its motto, though, is ***set it and forget it!***

- **Title Screen**
  - ✓ ***Never***: Never display the title screen
  - ✓ ***Power On***: Display on power-up, but not after reset
  - ✓ ***Always***: Display title screen after power-up and reset
- **INTV 2 Compat**
  - ✓ ***Never***: Never work around **INTELLIVISION II** compatibility issues
  - ✓ ***Per Game***: Fix games marked incompatible with **INTELLIVISION II**
  - ✓ ***Always***: Apply fix to all games. Safe for all games
- **Enable ECS**
  - ✓ ***Never***: Never enable ECS ROMs
  - ✓ ***ECS Games***: Enable ECS ROMs only for games that *require* it
  - ✓ ***Compat***: Enable ECS ROMs for all compatible games, even if they don't know about the ECS. Useful for ECS BASIC and MUSIC modes
  - ✓ ***Always***: Always enable ECS ROMs
- **Save Menu Pos**
  - ✓ ***Never***: Never remember your position in the ROM Menu
  - ✓ ***Session***: Remember your position across reset, but not power-down
  - ✓ ***Always***: Remember your position across reset and power-down
- **Keyclicks**
  - ✓ Turn ***On*** to enable the infamous **INTELLIVISION** keyclick sounds!
- **Bkgrnd FS Maint**
  - ✓ This controls whether ***LTO Flash!*** cleans up unused flash storage in the background. You can safely leave this ***On***.

The Configuration Menu also offers two informational screens:

- **Device info...** Shows firmware version and device ID
- **Flash info...** Shows flash statistics and life remaining

Flash Save Areas

LTO Flash! provides ***flash save areas*** of up to 1MB per game. ***LTO Flash!*** is compatible with games written for the JLP Flash Save Game feature. Directly supported by IntyBASIC!

Each menu entry gets its own flash save area. If you put multiple copies of a game in the menu, each entry gets its own save area. This makes it easy to share your ***LTO Flash!*** Make a menu entry for each person. Your saved games & scores stay separate!

Attention INTELLIVISION programmers: Visit the website for the ***LTO Flash! Programmer's Guide*** to find out more!

http://ltoflash.leftturnonly.info/

Firmware Updates

LTO Flash! can be upgraded by loading new firmware.

- ☞ Download and unzip the firmware update
- ☞ Disconnect ***LTO Flash!*** from the **INTELLIVISION** console
- ☞ Connect ***LTO Flash!*** to your computer
- ☞ Launch the ***LTO Flash!*** GUI
  - Windows: Select ***» LTO Flash! » Firmware » Update Firmware...***
  - Mac: Select ***Tools » LTO Flash! » Firmware » Update Firmware...***
- ☞ Select the firmware to install and click ***OK***

LTO Flash! retains a copy of the original factory firmware. You can roll back at any time by selecting ***Restore to Factory Default...*** in the same menu.

TROUBLESHOOTING

LTO Flash! takes great pains to be easy to use and trouble-free. However, Murphy's Law sometimes has other ideas.

Symptom: The GUI does not recognize ***LTO Flash!***

- ☞ Ensure USB cable is plugged in securely at both ends
- ☞ Try a different USB port on your computer
- ☞ Try a different USB cable
- ☞ If using a USB hub, try connecting directly instead
- ☞ If using older versions of Windows or MacOS X, ensure the necessary drivers are installed. See our website for details.
- ☞ Try rebooting your computer to reinitialize the drivers

Symptom: Certain games fail to load and run correctly.

- ☞ If the file is in BIN format ensure it has the correct CFG file
  - ✓ BIN files have the extensions BIN, INT, or ITV
  - ✓ The website has a table of CFG files for known games
- ☞ Check the **INTELLIVISION II** and ECS compatibility settings
  - ✓ Try changing the compatibility mode settings in the Configuration Menu to help diagnose
  - ✓ Tweak the game's compatibility flags in the GUI and click ***Send to LTO Flash!*** to update the cartridge
- ☞ Check the game in an emulator to ensure it's correct
  - ✓ You can download ***jzIntv*** at its website:

http://spatula-city.org/~im14u2c/intv/

Symptom: ***LTO Flash!*** or the GUI reports that an update was interrupted.

- ☞ Connect ***LTO Flash!*** to your computer
- ☞ Launch the GUI
- ☞ Click ***Send to LTO Flash!*** to complete the update

Symptom: ***LTO Flash!*** or the GUI reports that it detected a firmware (FW) error, and requests to send a bug report.

This should only happen in the unfortunate circumstance that you hit a bug in ***LTO Flash!***

- ☞ Connect ***LTO Flash!*** to your computer
- ☞ Launch the GUI. The GUI then will:
  - ✓ Read critical information from the unit
  - ✓ Generate a bug report with the information gathered
- ☞ Send us the bug report so we can improve ***LTO Flash!***
  - ✓ Be sure to send us the files the GUI collected!

Firmware errors automatically reset you to the factory firmware image, erasing any firmware updates. You can install updated firmware revisions after sending a bug report.

Something else? If you did not see your symptoms listed here, or you've tried these steps and still have issues, contact us! Visit our website for contact information and other useful tips:

http://ltoflash.leftturnonly.info/

TECHNICAL SPECIFICATIONS

- ☞ Full speed USB 2.0
  - ✓ 2Mbps peak transfer rate
  - ✓ Serial connection available to new programs
- ☞ 32MB flash storage
  - ✓ Corruption-resistant journaled filesystem
  - ✓ Minimum 2,000,000 Erase/Write cycles
  - ✓ 20 year data retention, typical
  - ✓ Maximum 1MB file size
  - ✓ Maximum 128 folders, 1536 files, and 3072 forks
- ☞ 1MB RAM
  - ✓ Emulates RAM, ROM and WOM
  - ✓ Supports ROMs up to 512K words (1024K bytes)
  - ✓ Supports all known banking/page-switching modes
- ☞ Transparent **INTELLIVISION II** compatibility fixes
  - ✓ 3rd party ROMs play on **INTELLIVISION II** consoles
- ☞ Transparent ECS compatibility fixes
  - ✓ ECS-incompatible ROMs play with ECS attached
- ☞ JLP Accelerator support
  - ✓ Multiply / divide accelerator
  - ✓ CRC-16 generation
  - ✓ Random number generation
- ☞ JLP Flash Save Game support
  - ✓ Up to 1MB per game
- ☞ Field-upgradable via firmware updates
- ☞ Compatible with all **INTELLIVISION** Master Components
- ☞ Compatible with ECS and **INTELLIVOICE**
- ☞ Compatible with NTSC, PAL, and SECAM systems

Credits

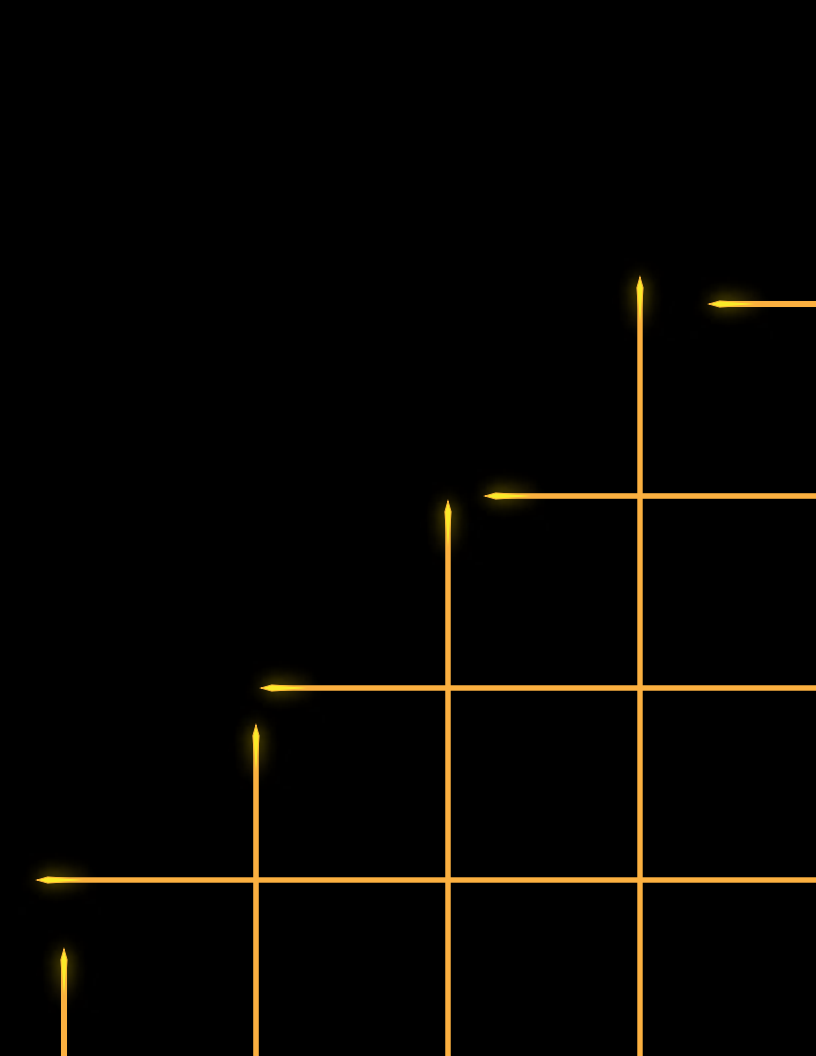
Cartridge Hardware, Firmware, & Software
Joe Zbiciak
Left Turn Only, LLC

PC and Mac GUI
Steve Orth
INTV Funhouse

Box & Manual Artwork
KLAY

Testing & Feedback
David Frost
Steve Orth
Gary Magnan
Arnauld Chevallier
Michael Bergeron
William Moeller

Special Thanks
Chad Schell



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