

Installation and Operation Manual

FD151CV-LP

15.1” Low Profile LCD





FD151CV-LP

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General Information

The FD151CV-LP is a 15.1" Low Profile LCD which has features that allow installation in the smallest of mounting areas with the minimum of interface equipment. Built with retrofit aircraft integration in mind, this display can switch between three video input sources using an infrared remote.

Front View



Additional Information

The FD151CV-LP utilizes a state of the art digital video decoding chipset for the analog video input. The video sources in order of picture quality are VGA (computer graphics like moving maps), and Composite Video (DVD, camera or VCR). Both NTSC and PAL formats are auto-detected.

The FD151CV-LP can also be connected to existing video switchers and just take a composite video input from a selector interface box. In this case multiple input sources can be selected and displayed on the monitor. You would only use the IR remote to set up the screen during installation.

The FD151CV-LP is made of all metal components. DO-160 testing has been completed and is available upon request.

The LCD is protected with a .060" Lexan lens. The purpose of this lens is to prevent scratching of the LCD.

Specifications

Display Type	15" TFT Color LCD
Display Color	16.7 Million Colors
Pixel Pitch	0.3 mm x 0.3 mm
Screen Resolution	VGA 1024 x 768
Brightness	400 cd/m ²
Dimensions	14.14" (W) x 11.95" (H) x 1.1" (D)
Display Size	11.89" (W) x 8.91" (H)
Weight	5 lbs 14 oz
Power	28VDC @ 1.5 AMPS
PC & Video Input	VGA (High Density DB-15 Connector) 2 Composite Video
Video Type Supported	NTSC/PAL
Screen control	On Screen Display Menu
Remote Control	IR, included
Materials	Aluminum
DO-160 testing	Section 21 Category B

Installation Instructions

All cabin entertainment equipment, such as the FD151CV-LP, should be installed on a non-essential bus and have a dedicated circuit breaker. It is a requirement that a switch be installed in the cockpit so that the pilot can de-energize the entertainment system should it become necessary.

For mounting specifications refer to drawing at the back of the manual. **(NOTE: Removing the front cover does not void the warranty.)**

When installed, at least ¼" gap should be maintained along the top and along the bottom of the unit to allow for convection cooling.

Power

This is a **28VDC** monitor that requires 1.5 Amps (42 Watts) of power to operate. The unit turns on automatically upon power application.

Wiring Suggestions

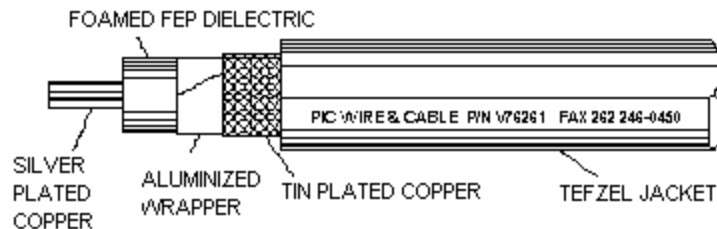
All shields should be grounded to the connector at the source, and floating at the display.

Avoid routing video wiring parallel to:

- AC wiring
- Strobe wiring
- DC motor supply cables
- Inverter cabling
- Or any other potential noise source.

S-Video/Composite and Audio Wiring

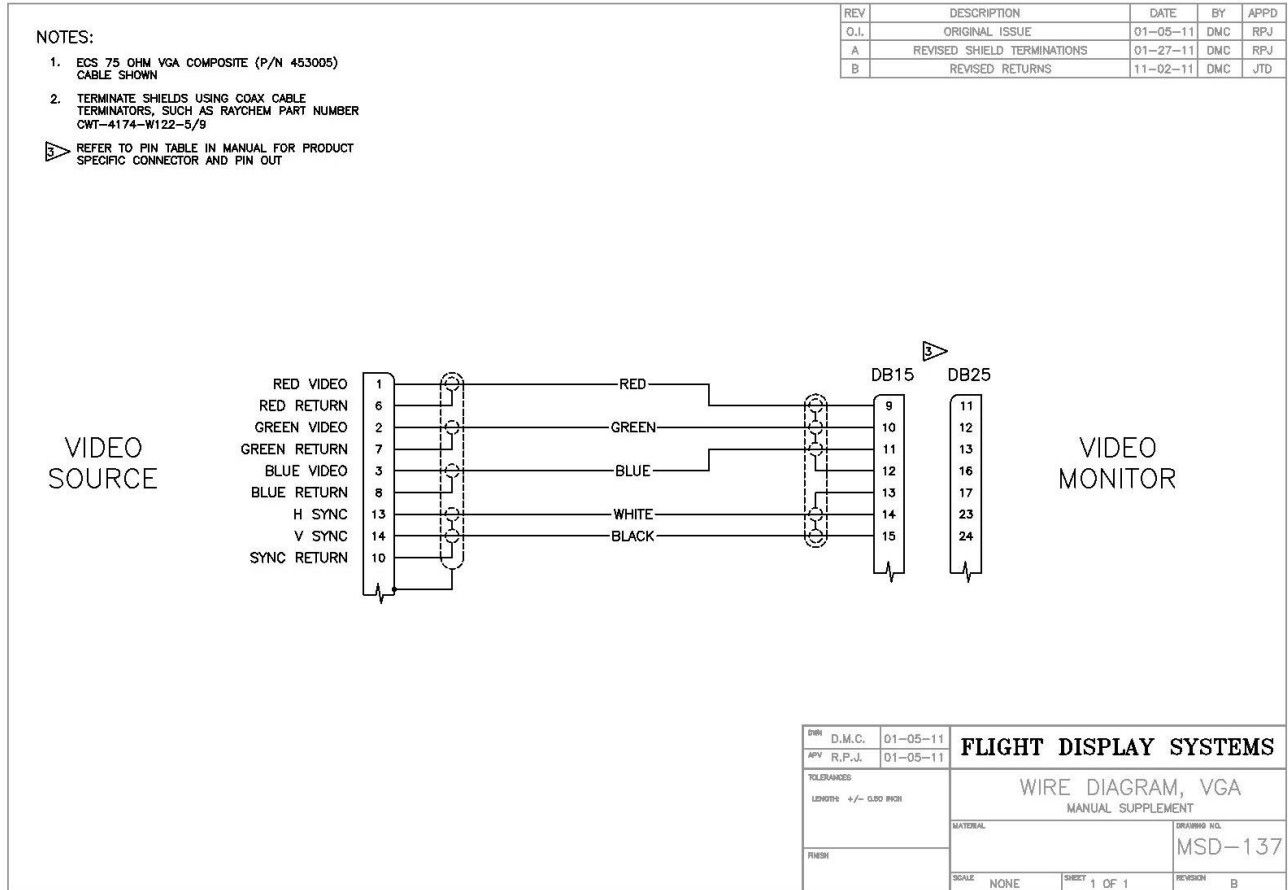
Recommended cable for s-video/composite and audio purposes is PIC 75 Ohm Coax, P/N V76261. This is a lightweight, flexible, and low signal loss cable which meets FAA flammability requirements of FAR 23.1359(d), FAR 25.853(a) and FAR 25.869(a)(4).



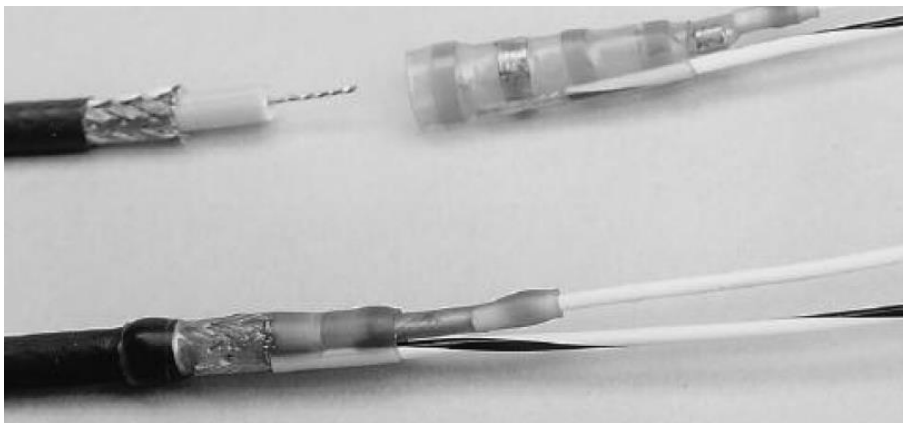
Similar aviation coaxial cable can be used from other vendors, as well. Some aircraft are prone to AC noise - we recommend adding to the composite source a 75Ohm video isolation transformer such as Deerfield Laboratory, Inc. Part No. 162-1 (www.deerfieldlab.com, (650) 632-4090). In most cases this should be added to the video output of the source.

VGA Wiring

Recommended cable for VGA purpose is ECS P/N 453005. This is a single shielded cable containing 5 separate coaxial cables, color-coded to match the functions of the wires.



We recommend coax cables be terminated using solder sleeve coaxial cable terminators such as Raychem Part Number CWT-4174-W122-5/9.



Power and Ground Wiring

This is a 28VDC monitor that requires 1.5 amps of power to operate. To operate properly this monitor requires an input voltage of 18-29VDC.

The rated current of the equipment and associated voltage drop should be taken into consideration when selecting wire gauge. The following example is based on an install with a 28VDC power system and a total of 50 feet of wire between the circuit breaker, monitor and ground.

Example: 22awg wire has 16.2 Ohms per 1000 feet, this equates to .81 Ohms for 50 feet. 1.5 Amps of current on .81 Ohms will drop 1.22 Volts.

Resistance of Wire Type M22759/16-** (** = Gauge)	
Gauge (AWG)	OHMS/1000'
24	26.20
22	16.20
20	9.88
16	4.81
12	2.02
10	1.26
8	.701

Also, use short heavy gauge wire and a clean tight connection for ground.

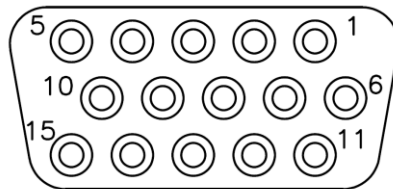
It is the installer's responsibility to understand the product's requirements to install the product in compliance with industry standards and safety.

Power/Video

Pin out for P1 (High Density DB-15 Receptacle)

Connector
 Crimp Contacts

P/N: M24308/2-286 or Equivalent
 P/N: M39029/57-354 or Equivalent



MATING FACE

Pin Number	Description
1	28VDC Power
2	28VDC Ground
3	Composite Video 1 - Signal
4	Composite Video 1 - Shield
5	Composite Video 2 - Signal
6	Composite Video 2 - Shield
7	N/C
8	N/C
9	Red Video (Pin 1 on Standard VGA)
10	Green Video (Pin 2 on Standard VGA)
11	Blue Video (Pin 3 on Standard VGA)
12	RGB Ground (Pins 6,7,8 on Standard VGA)
13	Sync Ground (Pin 10 on Standard VGA)
14	Horizontal Sync (Pin 13 on Standard VGA)
15	Vertical Sync (Pin 14 on Standard VGA)

Operation Instructions

The FD151CV-LP is continuously on but can be de-energized by removing power from the entertainment system. No pilot or aircrew action is necessary during flight or ground operation.

The passengers will be able to change the video output from the FD151CV-LP using the video source select button on the display, or remotely throughout the cabin with the included IR remote. Point the IR remote at the top of the LCD to make changes.

When applying 28VDC power, the display will turn on and look for a valid input on the last known source. If no input is found, the display will go to standby mode. Pressing the Select button will select new video input.

Button Controls

Located on the bottom of the FD151CV-LP are 5 buttons.



From right to left (fan inwards), the functions are as follows:

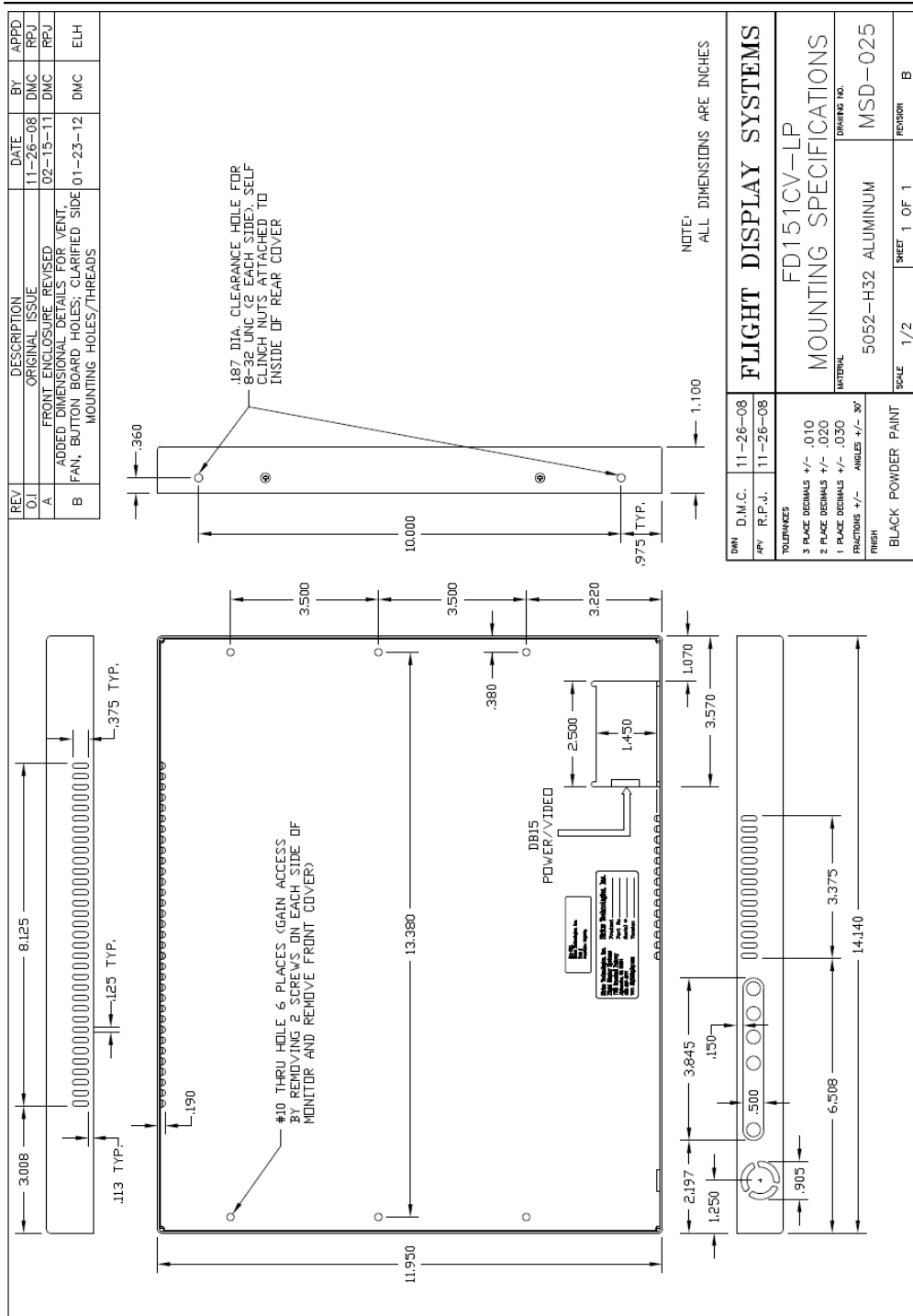
BUTTON	DESCRIPTION
POWER	Pressing will turn the monitor ON or OFF from Standby mode.
SOURCE	Select video source with the following order: Composite 1, Composite 2 and RGB (PC).
UP	Press while in menu- Adjust selection UP. Press out of menu – Brightness (Use up or down to change.)
DOWN	Press while in menu- Adjust selection DOWN. Press out of menu – Contrast (Use up or down to change.)
MENU	Opens the menu, changes between selections.

Remote Control Buttons

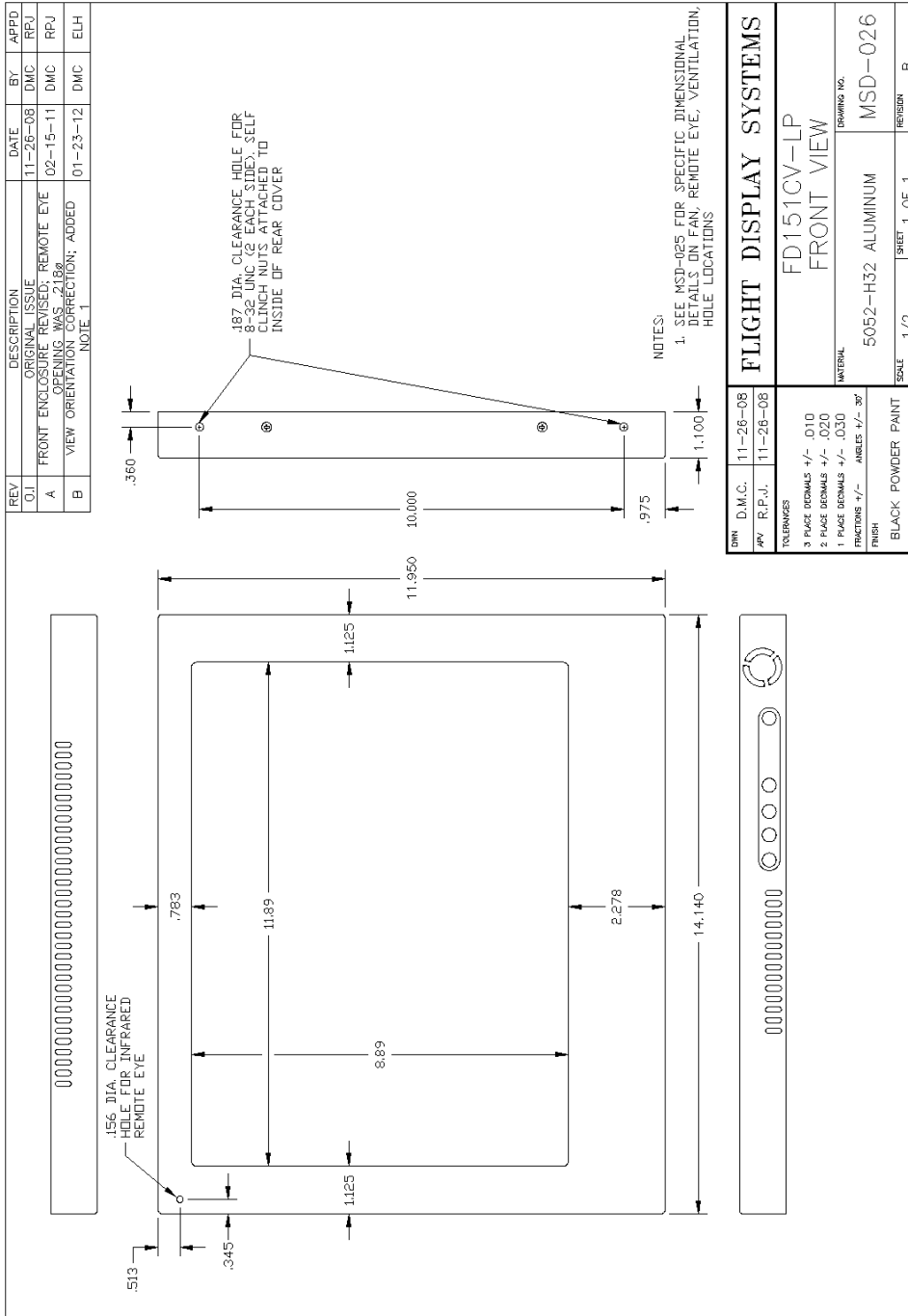
Refer to Button Controls on previous page.



Technical Drawing



Technical Drawing



Troubleshooting

VGA Shadowing

Most of shadowing problems are due to shielding on the wire. Locate the point where all of the shields are connected. Cut away the shields, one at a time, while viewing the display on the screen to observe which shield is causing the noise. Cutting away one shield at a time will allow you to focus and isolate the video noise issue.

- Twisted pair wiring is prone to video noise. ECS VGA Wire (Detailed under “Video Wiring Suggestions”) is recommended.

Snow or Sweeping Lines

Lines that slowly sweep up and down are a result of AC noise. This AC noise can be generated by a power cart on the aircraft. Take the power cart off of the aircraft. Be careful of inverter wiring, which can also cause noise. Stand off the wires, if necessary.

If snow or sweeping lines persist, it is possible that the ground is at an incorrect point in the aircraft. Try moving the ground to another location.

No power to Monitor, or No video Input

- Verify correct wiring. Check the base receptacle connectors for possibly damaged pins.
- Check that the video source is:
 1. Powered on,
 2. In Play mode, and
 3. Displaying video.

Color Distortion

- Adjust brightness and contrast settings using the buttons on the monitor.



Technical Support

Should you have any questions concerning this product or other Flight Display Systems products, please contact our Product Support representatives at (470) 239-7421.

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For further product information, technical data and sample wiring diagrams, please click on the **Dealers** section of our web site at www.FlightDisplay.com

Instructions for Continued Airworthiness

The FD151CV-LP is designed not to require regular general maintenance.





Limited Warranty

All Flight Display Systems (FDS) products are warranted to be free from material or manufacturing defects for a period of 24 months from the date of shipment for General Aviation customers or 12 months from the date of shipment for Government/Special Mission customers. Any material or repair workmanship for in warranty repair service will be specifically warranted for 90 days or the remainder of the original warranty period, whichever is longer. If the original warranty period has expired, the 90 day repair warranty is limited to the material and workmanship specific to the repair activity completed.

The following conditions are exclusions to warranty coverage:

1. Labor costs associated with installation, removal or reinstallation of any product.
2. Damage to or malfunction caused by any unauthorized alteration made to the product.
3. Resolving signal quality issues caused by externally generated noise introduced by aircraft electrical systems or other components connected to any FDS product.
4. Any malfunction caused by improper installation or connection to aircraft wiring, industry standard cabin management/ inflight entertainment systems, or third party commercial equipment not specifically identified as compatible with FDS products.
5. Any malfunction caused by installation that does not conform to precautions associated with operating environments listed in the operating manual or consistent with industry best practices such as; high temperature, adequate ventilation, high humidity, high dust, or power surges.
6. Cosmetic damage or damage to internal components caused by installation or removal, failure to follow installation or operating instructions, or any neglect or misuse of the product.
7. Any product that is returned for service with a broken tamper evident seal, indicating tampering or improper handling of the product by an unauthorized person. Violation of product tamper evident seals or modification of factory installed serial and PMA labels voids any warranty, either expressed or implied.

The FDS technical support team is available to provide distance troubleshooting support during business hours (8:00am to 5:00pm EST) Monday through Friday at (470) 239-7421.

Many repair requests can be resolved through distance support and may not require return of merchandise to the factory. If a product must be returned to the factory for repair, an RMA number will be issued as directed by the technical support team and communicated by the repair coordinator.

Upon request by the customer, FDS may send a service technician onsite to repair any non-PMA products. The travel expenses incurred to include transportation, lodging and meals along with the technician's hourly rate shall be payable by the customer in accordance with FDS' applicable rates and procedures.

Flight Display Systems will, upon receipt of returned merchandise, remanufacture or replace the unit at our discretion and return the product by Ground Return Shipping. Express return shipment will be the responsibility of the sender.

This warranty is not transferable.

Any implied warranties expire at the express limited warranty expiration date. FDS shall not be held liable for any indirect, special, punitive, incidental or consequential damages.

Some states do not allow limitation on the length of an implied warranty. In such states, the exclusions or limitations of this limited warranty may not apply.





Log of Revisions

Rev	Date	Page	Description
A	01/25/2007	---	---
B	05/21/2007	7	Added remote control information.
C	03/05/2008	6	Changed button order.
D	11/26/2008	---	Updated VGA, Power & Ground, Pinout and Assembly drawings
E	03/30/2009	2,11	Updated Specifications, Warranty info
F	03/30/2010	2	Added Clearance Space Info
G	02/17/2011		Updated S-Video/Composite and VGA Wiring info, Pinout info, remote control, Technical drawings, Format change
H	07/26/2013	All	Updated VGA Wiring Suggestions and VGA Pinout Information. Also updated address info, warranty, Revision

