How to Guide for Televisions

Presented by Ace.studios

A guide to understanding TVs, connections, and how to save money.

Overview

At the end of this presentation you will understand:

- Resolutions
- Frame Rates
- TVs types
- Connections
- And learn a few tips to save time and money!

Ace.Studios

We are an independent film company that produces cinema and provides videography services.

Website: www.acestudiosfilming.com

Do's and Don'ts

- DO.....
- Enjoy yourself! We Want This To Be Fun!
- Let us know if you don't understand something. So We Can Answer Your Questions!
- Free yourself from TV related stress!

Do's and Don't cont.

- Don't...
- *Stress out about trying to remember everything!!!!*
- Much of the information found here is available online, including Wikipedia.
- We also have a transcription of the presentation that can be accessed from our website (www.acestudiosfilming.com)
- Doubt your ability to understand this, so you can relax and enjoy yourself!

However…

How did we arrive here?

- The television was invented around 1920 and color was added in the 60s.
- In 2007, LCD (liquid crystal displays) surpassed CRT (cathode ray tube) models in sales.
- As for why... well its technical and they are lighter, smaller, and the picture looks better so really why should we complain about it?

Aspect Ratio Explained

- 4:3
  - Generally speaking, 4:3 looks like a square.
  - Official ratio is 1:33:1

- 16:9
  - Generally speaking, 16:9 looks like a rectangle.
  - Official ratio is 1:77:1

Frames Per Second (FPS)

- Frame rate, also known as Frames Per Second (FPS) is the amount of frames or still pictures shown each second.
- FPS is used to measure Film, TV, Computer Monitors, and Video Games.
- On Flat Screen TVs, FPS is measured in Hertz, (Hz).
- Hertz are named after Henirich Rudolf Hertz and is one cycle of electricity per second.
- FPS and Hertz are designed to work in harmony for the best results.

FPS Example


24/30
frames per sec
48/60
frames per sec
60/72
frames per sec
Smoothest

Progressive Vs Interlaced

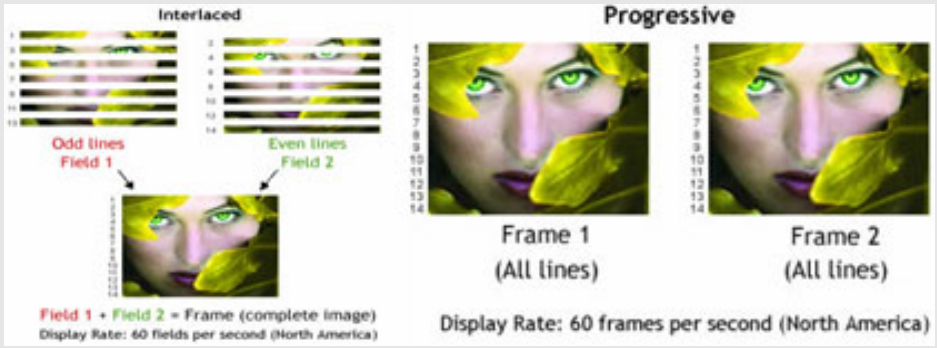
Progressive (p)

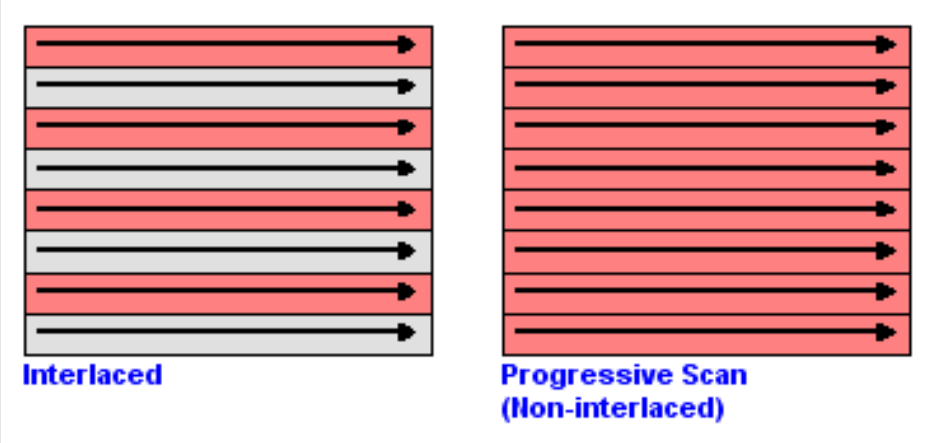
- Progressive Scan displays an image line by line from top to bottom, in a “progression”.
- Progressive Scan displays in one pass.

Interlaced (I)

- Interlaced Scan displays an image line by line from top to bottom but displays it in two passes.
- Odd and even columns are alternated and “Interlaced” by the eye.

Progressive Vs Interlaced Examples





Commonly Used Frame Rates

24p

Used in film, “cinematic” look

60i

Used for TV broadcasting, DVDs, and consumer cameras

30p

Occasionally used in film as well to reduce blur

48p

New format being used by the movie industry experimentally

60-144p

FPS goal of Video Games, although lower is sometimes used

Different frames rates are used in different regions!

TV Sizes

- TVs come in many different sizes and generally speaking the bigger sizes need higher performance to look good.
- TVs often list their size, but if you need to measure it's easy.
- Simply measure from the top right of the TV screen to the bottom left or vice versa.

Resolutions

- Each Film, Photo, TV, Computer Monitor, or Video Game uses Pixels to display a picture
- Pixels are the lowest unit of measurement for a screen
- The number of pixels in a resolution is a screen number for width then height (Example: 640 by 480)
- The resolution is usually dictated by its height and indicates whether it is progressive or interlaced (Ex 640 by 480i is 480i)
- Example: a 39 inch 480i screen would be a 39 inch diagonally wide screen that has 640 by 480 interlaced pixels

List of Common Resolutions

480i

SDTV, 640 by 480i (DVDs use 720 by 480i)

480p

EDTV, 640 by 480p, can be used by older game consoles

720p

HDTV, 1280 by 720p, used in broadcasting HDTV channels

1080i

HDTV,1920 by 1080i, last resolution to use interlaced, used in broadcasting HDTV channels

1080p

HDTV, 1920 by 1080p, current standard, used in blu-rays and targeted by video game developers

2160p

UHDTV or 4K, 3840 by 2160, in the experimental stage

Example of TV Specs using everything we have learned

You go to the store and buy a 32 inch 720p Flat Screen with a refresh rate of 60hz.

What does that mean in English?

ANSWER!

It means you have bought a TV that has:

1280 by 720 pixels,

Is 32 inches diagonally,

Displays in progressive mode (All at once)

And has 60 Frames Per Second! (Or, sixty still pictures)

Example #2

You go to the store again and you see a TV with this description:

- 1080i
- 39 inch
- 60hz

What does this means in English?

ANSWER!

It is a TV that:

Is 39 inches diagonally,

Has 1920 by 1080 pixels,

Can only display 1080 in interlaced (alternating rows),

And displays at 60 FPS

And now it time for...

55 inch 1080p 120 Hz

What kind of TV is this?

ANSWER!!!

A 55 inch diagonally wide TV that can display up to 1920 by 1080 pixels in progressive mode and has 120 FPS!

Upscaling

When a TV can display higher than the source material it upscales the footage to “stretch” it.

- Example 480i is upscaled to 1080p to fill the screen
- TVs sometimes do this well, other times not so well, so you might want to invest in an external converter

(hold that thought, more on that later.)

Order of Resolutions

TV Resolution listed is the highest it can display; it can display anything lower.

The order is:

- 480i
- 480p
- 720p
- 1080i
- 1080p
- 2160p

Television Types

- The LCDs that replaced CRTs have now been replaced as well
- The TVs on the market now are:
  - LEDs
  - Plasmas
  - OLEDs

LED TVs

- LED (Light Emitting Diode) is actually a hybrid of LCD and LED TVs, (called LEDs for marketing)
- An LED light displays behind the Liquid Crystals to take advantage of both types strengths
- This is the current standard

Plasma

- Officially PDP (Plasma Display Panel) Plasma TVs are available from 30 in and up
- Uses small cells containing electrically charged ionized gases or basically plasma to display the image

Plasma Pros and Cons

Pros

- Better Contrast Ratio (looks nice in English)
- Wider viewing angles
- Less motion blur
- More light uniformity (no dark/light spots, even)

Cons

- Sometimes has flickering or other effect
- Heaver than LEDs (Boooooo)
- Big screens (50 in and higher) can have noticeable black lines
- Could be a problem at extremely high altitudes (Gas expands in high altitudes, probably won't explode, but probably won't work)

OLED TVs

- OLED stands for Organic Light Emitting Diodes
- Uses an organic filament based on Carbon
- Does not use a back-light
- Is thinner than plasmas or LED
- Is the current top of the line model

OLED Pros and Cons

Pros

- Best quality currently available
- Substrate in TV can be printed on a printer, so easy to produce
- Lightweight and flexible
- Uses 40% less power than an LED displaying deeper blacks
- Faster FPS possible (theoretically, 100,000!)

Cons

- EXPENSIVE!!!!!!!!!!! ($5000 for top of the line models)
- Blue light diodes disintegrate faster than other colors
- Water Damage, get it wet and it's toast
- Does not work well outside
- It HATES displaying the color ***WHITE!*** (instantly uses three times as much power)

Congratulations! Now you have completed your Flat Screen TV training! Now all you have to do is hook up your new TV!

Oh yeah we should cover that shouldn't we...

How to Hook up your TV

- In order to use other devices (DVD, Blu-ray, Streaming box, Video Game console, Cable, Antenna, Computer, etc.) you will need to use connections
- Connections used in the US are:
  - Coaxial
  - RF
  - Composite
  - S-Video
  - VGA
  - Component
  - HDMI

Coaxial Cable

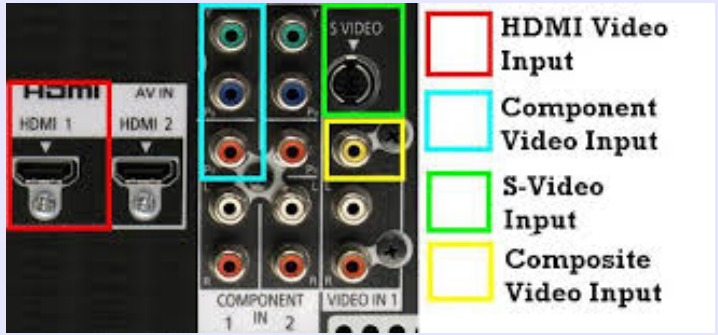
- Invented in 1880 by English mathematician and engineer Oliver Heaviside
- Used for carrying low frequency signals and has consistent dimensions
- Can carry both SD and HD signals

RF Modulator

- A radio frequency modulator is used to convert signals to a format that can be used by older devices needing RF signals
- Most often, these signals come in on channel 3 or 4
- NEVER USE! If you need this to work your TV you really need to upgrade. The picture looks terrible (faded colors, snow, etc.)

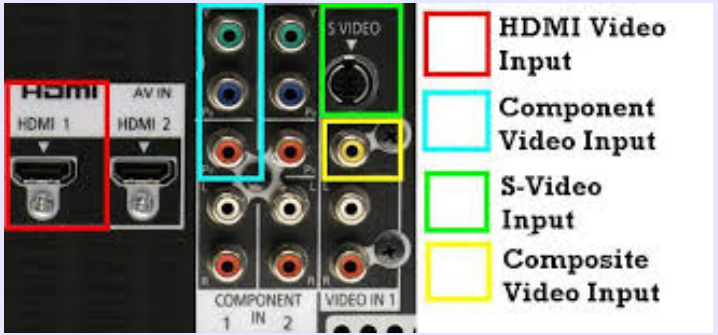
Composite Cable

- Designed to carry all video signals together (or in a composite)
- Can only display in 480i
- Try to avoid, use only in place of RF



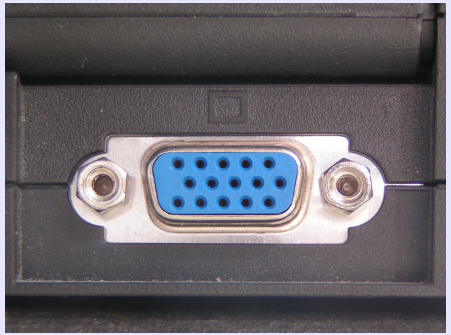
S-Video

- A separate (S) video cable carries the same signal a Composite cable carries
- It gives better picture by separating black and white color signals
- Use for SD devices (480i) unless something better is available



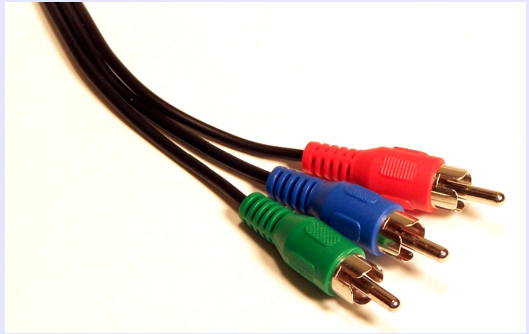
VGA

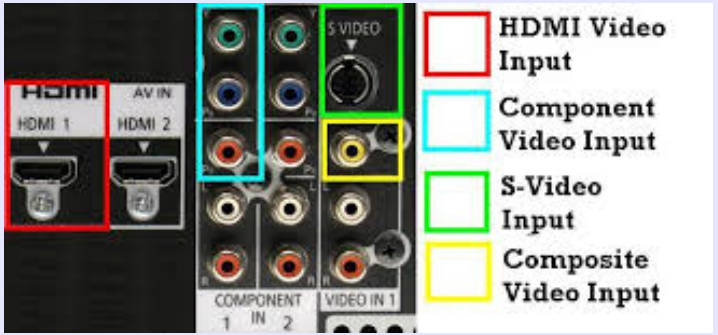
- A Video Graphics Array (VGA) connector is a three-row 15-pin connector
- Can display 480p to 1080p
- Used mostly for computers but some TVs have them
- Only carries video, not sound!



Component Cable

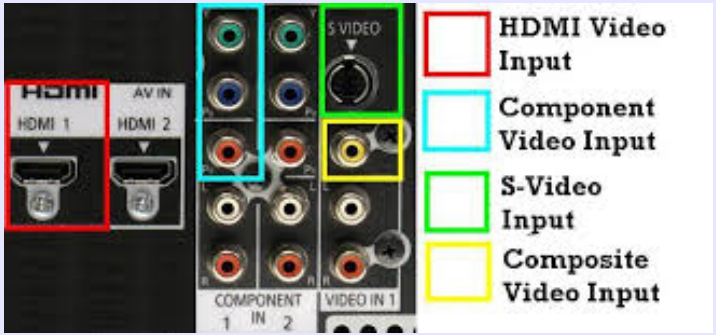
- Called Component Cables due to the fact that they carry each component of signal individually
- Also called RGB (Red, Green, Blue) cables
- A current standard, can display both SD and HD clearly and well





HDMI Cable

- HDMI (High-Definition Multimedia Interface) transmits uncompressed video
- Also can transmit compressed or uncompressed audio
- Currently two versions 1.4 and 2.0
- 1.4 maximum signal is UHD (2160p) and 24fps
- 2.0 maximum is UHD (2160p) at 60 fps
- Use when possible (plus it's easy with only one cable!)



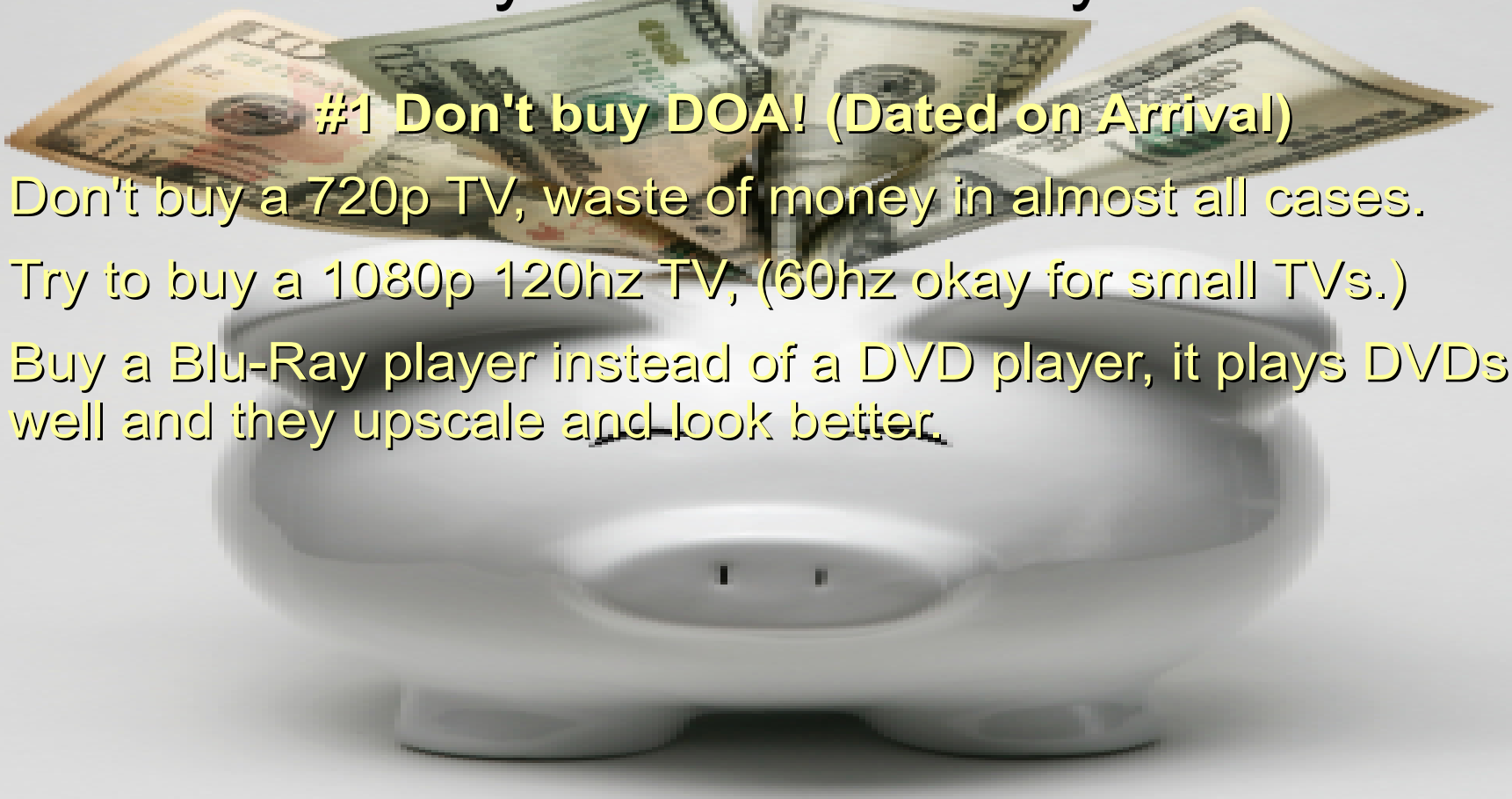
Upscalers/Converter Box

- A converter box takes one connection (Ex. Composite) and converts it to another (Ex. HDMI)
- Sometimes (but not always so check) it upscales the signal (Ex. 480i to 1080p)
- Use when your TV doesn't have the connection you need (and in place of an RF modulator!)

Switch Boxes

- Switch boxes are for when you need more inputs than your TV has.
- You can find one for almost any connection

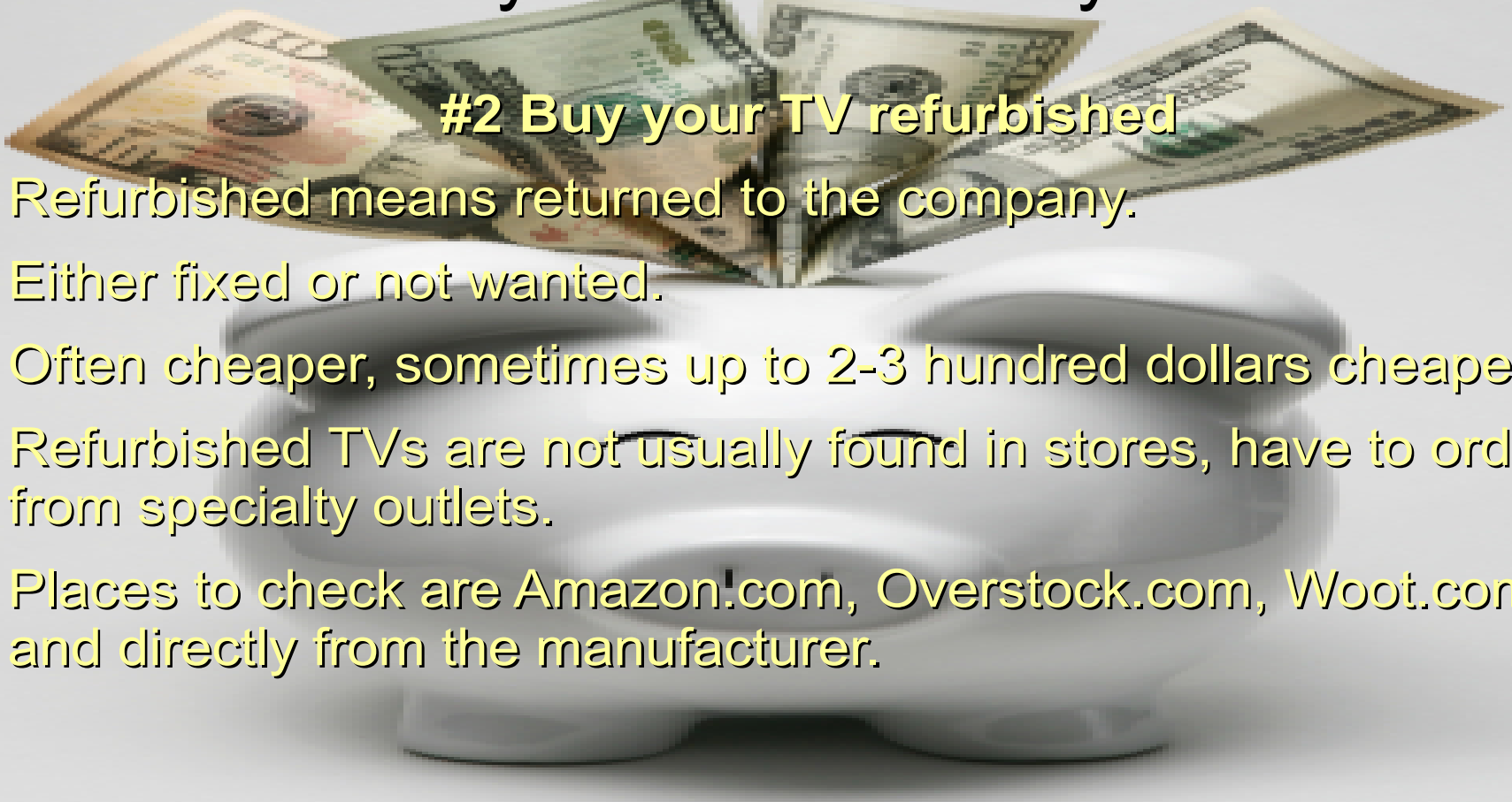
Ways to Save Money!



#1 Don't buy DOA! (Dated on Arrival)

- Don't buy a 720p TV, waste of money in almost all cases.
- Try to buy a 1080p 120hz TV, (60hz okay for small TVs.)
- Buy a Blu-Ray player instead of a DVD player, it plays DVDs as well and they upscale and look better.

Ways to Save Money!



#2 Buy your TV refurbished

- Refurbished means returned to the company.
- Either fixed or not wanted.
- Often cheaper, sometimes up to 2-3 hundred dollars cheaper!
- Refurbished TVs are not usually found in stores, have to order from specialty outlets.
- Places to check are Amazon.com, Overstock.com, Woot.com, and directly from the manufacturer.

Ways to Save Money!

#3 Don't worry about buying a smart TV

- A smart TV is a TV that can hook up to the Internet to access TV shows and other applications.
- Non-smart TVs are usually about 1-2 hundred dollars cheaper.
- The selection of apps (Applications) on most smart TVs are limited.
- There are other cheaper ways to make your TV “smart”…

Ways to Save Money!

#4 Buy a streaming box

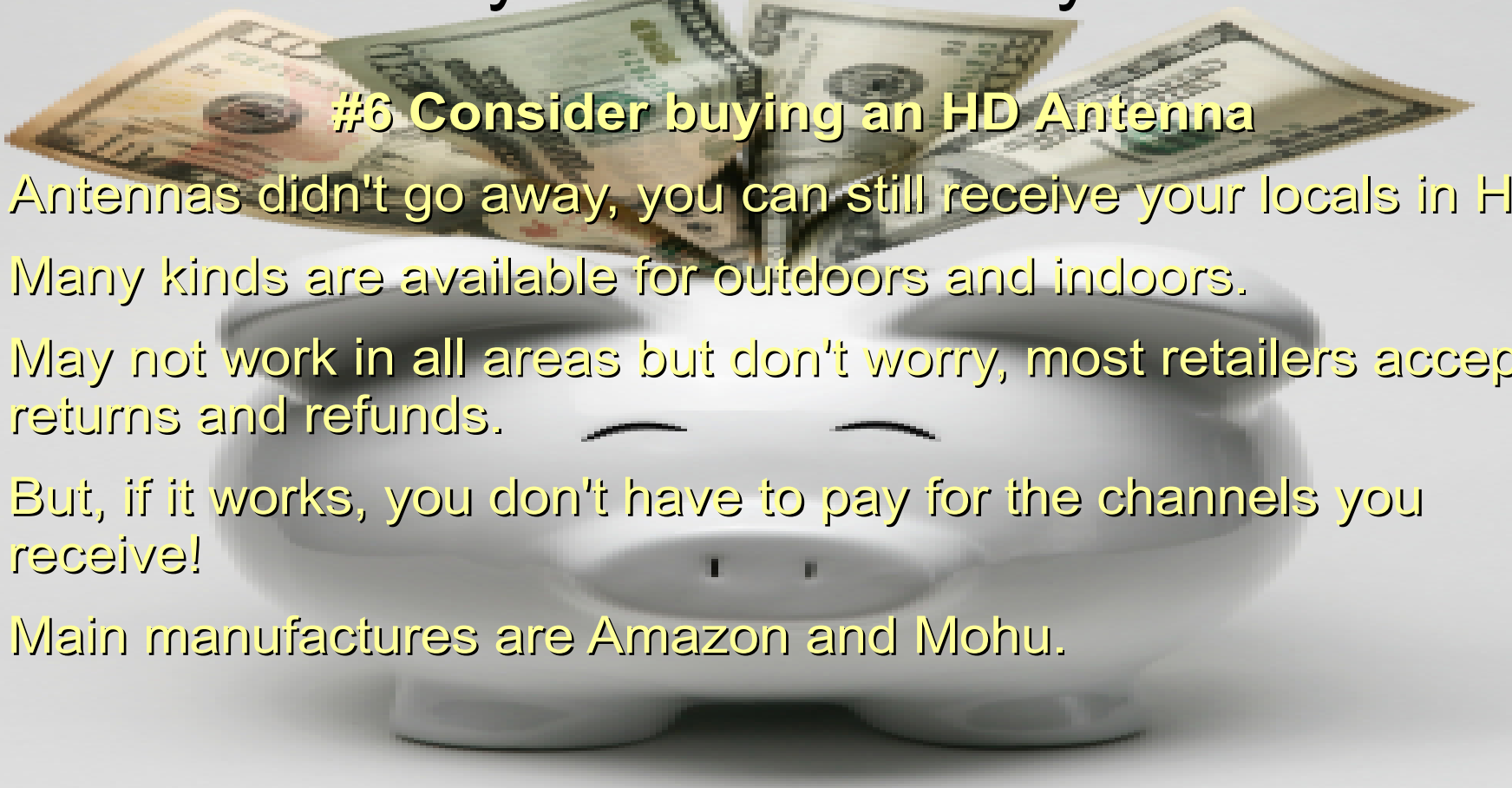
- A streaming box is a devices that uses the Internet to stream shows to your TV.
- They are inexpensive and many companies make different ones: Amazon, Apple, Digixstream, Roku, Google, and Sony to name a few.
- With these boxes, you can access several hundred different channels/apps, some are free, and some only cost $10 a month!
- In fact, you might have something that does some of these things already (Blu-ray player, Tablet, Computer, Game Console)
- Even if it costs a ***little*** more you will have a more flexible schedule.

Ways to Save Money!

#5 Don't overspend on connections!

- Stores RIP YOU OFF when it comes to connections!
- Buy from on-line outlets, you receive longer cords for sometimes 1/3 of the price!
- Best places you can buy from are Amazon.com and Overstock.com

Ways to Save Money!



#6 Consider buying an HD Antenna

- Antennas didn't go away, you can still receive your locals in HD.
- Many kinds are available for outdoors and indoors.
- May not work in all areas but don't worry, most retailers accept returns and refunds.
- But, if it works, you don't have to pay for the channels you receive!
- Main manufactures are Amazon and Mohu.

Ways to Save Money!

#7 Visit your local rental stores

- Brick and mortar rental stores have to compete with digital distributors, and the winner is you!
- Rental stores make most of their money on new releases so check out their older movies.
- Don't forget your local library also has movies to rent too.
- Also, many stores have TV series and Video Games.

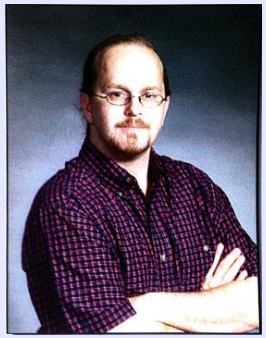
Ways to Save Money!

#8 Support independent filmmakers (Like Us!)

- There are many fantastic independent content creators on-line
- They usually don't charge for you to view their content (get paid from Ad revenue on their show, product placement, personal ad placement, or contributions)
- Usually content is hosted on youtube.com, vimeo.com, or on a film company's website
- If you see a show or creator you like, please leave a contribution, it helps out. Money is usually transferred through Google Wallet, Kickstarter.com, Paypal, or Patreon.com
- Even if you tip a couple people each month, it is still cheaper than cable, (and means a lot more to the people making them!)
- https://vimeo.com/acestudiosfilming


THANK YOU FOR LISTENING
HAVE A GOOD DAY :)

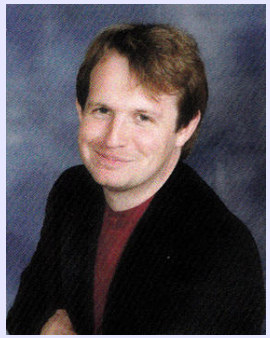
Contact Information:
Website: www.acestudiosfilming.com



Tim Evans

timevans1985@hotmail.com

620-218-6471



Chance Alquest

Ace.studios@hotmail.com

620-222-1409