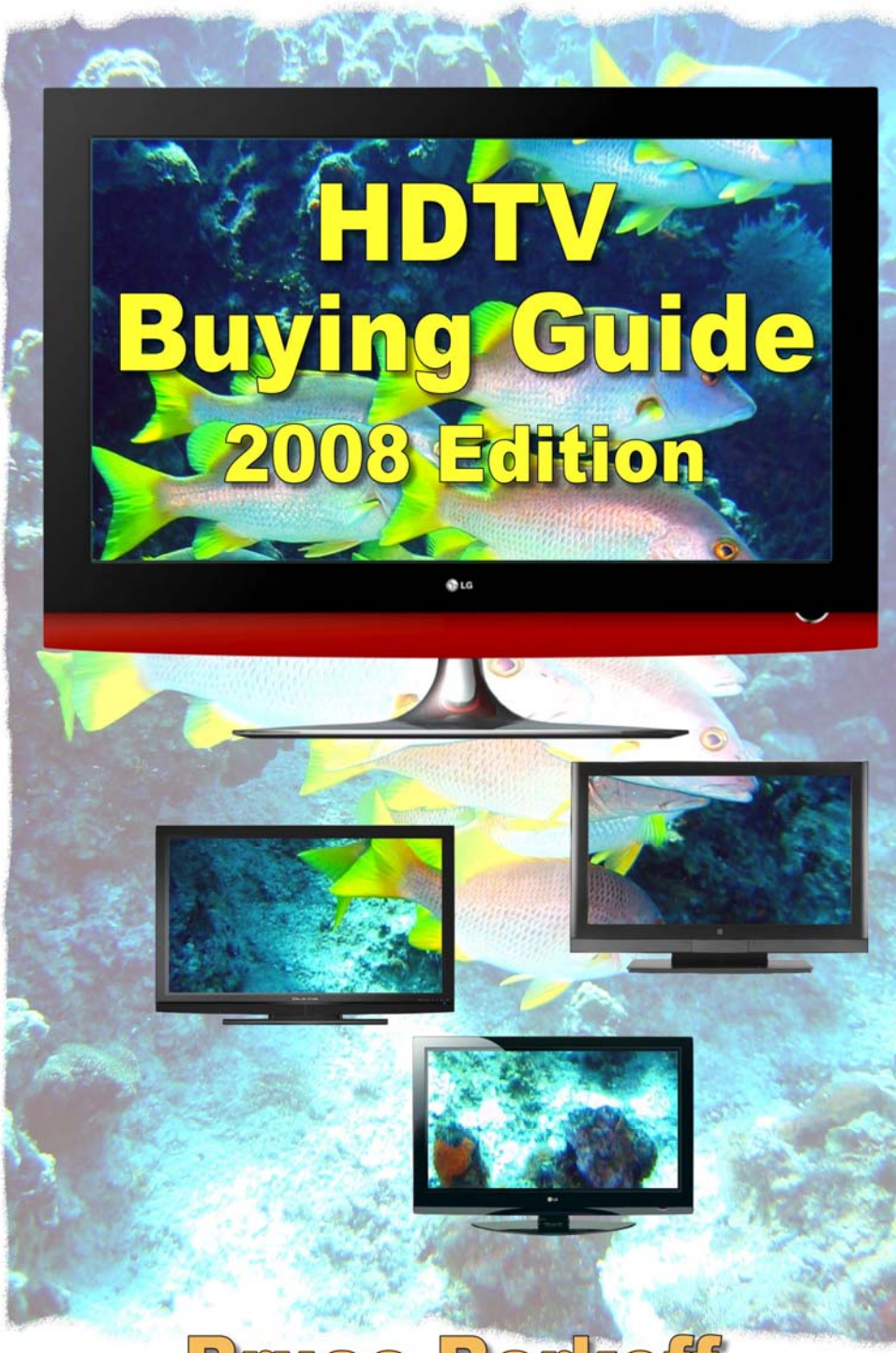
HDTV
Buying Guide
2008 Edition
Bruce Berkoff

HDTV Holiday Shopping Guide
2008 Edition

Dedication

To Beth and Marvin,
who taught me that unconditional love can come in true high definition. I hope that I can teach my kids the same.

HDTV Holiday Shopping Guide
2008 Edition

By Bruce Berkoff

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Preface:
A Letter to My Parents

Dear Mom and Dad,

You've got the same type of television in your living room that you had when I was still living at home many years ago. I know that you've been thinking about replacing it, but are having trouble making up your mind about what to get. All this talk about HDTV and flat screens and such can be confusing.

I'll admit that some of the issues may seem a bit complicated, but they're not really all that bad. Remember how you felt about getting your first cell phone? Well now you use them all the time (though you still take the occasional picture of your ear by accident). Think about how convenient cell phones have become for you and the rest of the family. You don't have to know how a cell phone works in order to be able to use it. It's the same with a new HD (High Definition) television.

2008 HDTV Buying Guide

Because I work with televisions and display technology, you've been asking me a bunch of questions about the new televisions that are becoming more affordable. I thought it would be easier for us both if I just write down some of what I know about them, and tell you what you need to know in order to make a choice about which one (or more) to get.

So I've written this book for you. It shouldn't take you long to read, and it's not technical or complicated, so you will find the information easy to understand and helpful as you decide what to buy. I know that Dad is interested in some of the technology (or at least the terms), so I've included some information about that. Mom, feel free to just skip over any of those parts (though it may help you when you have to tell Dad what to do to get things to work).

And after you've read this, you'll be an expert on new televisions (well almost). All your friends will turn to you for advice, and you'll be able to help them. Or you could just give them this book.

I remember pushing you to get your first UHF antenna so that I could watch *Speed Racer* like my other friends in First Grade; now I hope to push you to get your first "Full HD" TV.

I hope that when I'm home for the holidays this year, I'll get to watch your favorite shows along with you on your new HD television.

With love, your son,

Bruce

Chapter 1:
What's New about Televisions?

Televisions are a lot different than they were just 10 years ago. There are three main differences:

1. They are bigger and flatter (thus thinner, but larger).
2. They have sharper pictures (or more dots, or "resolution").
3. They are digital (thus no need to worry about the coming analogue "switch off" in the USA in February 2009).

The first two points are easiest to see and understand, so I'll tackle those first.

Bigger and Flatter

It used to be that a 19" or 24" CRT (cathode ray tube, or thick glass) television was plenty for your living room, and smaller sets

worked fine for the bedroom or kitchen (but they got heavy quickly with diagonal size).

> **Screen Measurement:** How do they measure the size of a television? It's the diagonal distance from one corner of the image on the screen to the opposite corner. Then they round this to the nearest inch. So a 37" television has an image that is 37" from the bottom left corner of the image to the top right corner.

Televisions used to be made with picture tubes, and there are practical limits to how big a picture tube can get. They are made of glass, and have a vacuum inside. When you make a bigger picture tube, the vacuum space gets bigger, and it takes a lot more glass to make the tube. Glass is heavy, and even a 32" set could be more than one person can lift easily.

New technology has largely solved this problem. You've probably heard of "LCD" and "plasma" televisions, but now most people just call these "flat panel" TVs. You can easily find flat panel TVs that are 40", 50", or even 60" and larger. While these can weigh 100 pounds or more, they weigh a small fraction of what a picture tube that size would weigh (and LCDs are usually thinner and lighter than plasma, with next generation LED "edge lights" on LCDs make them even thinner).

These new flat panel televisions are much thinner than a traditional television. A typical 32" picture tube set is about 22" deep, but a flat panel set will be 4" or less (with 1" or so coming in the future). This means that it will take up less space; you can even hang it on the wall like a picture frame. As a result, it's easier to fit it into your room décor, for any and every room.

New 16:9 (or "16 by 9") wide aspect ratio screens have bigger diagonals but less area than same size "standard" or 4:3 TVs used to, but luckily large and wide format screens are getting ever bigger and more affordable.

Sharper Pictures

But why would anyone want a bigger TV? The main reason is that there is a new type of television content available called "high definition", but most people just call it HDTV for short.

HDTV content differs from standard definition television (SDTV) in that it uses many more dots to make a picture. (The technical term for a dot is a "pixel", but I'll call them dots because that's simpler.) The end result is an image that is much sharper and more detailed than anything you've ever seen on a traditional television.

Think about a snapshot that was taken with a Polaroid instant camera. The picture is nice, and you can certainly get a good likeness of the subject of the photo. But now think about a portrait by a professional photographer. The picture would use 35 mm film, and would be printed on good photo paper. And you would see much more detail in the face of the person in the picture. The same comparison would hold true if you were taking photographs of a landscape.

That same extra detail and sharper picture is now available on television, just as it has been on your PC for a while. Not only are the pictures sharper, but they're also wider, like at the movies. When you watch a sporting event or a prime time drama on one of these new televisions, it is like watching them at the movies instead of at home on your tradition television.

Digital Televisions

And this leads us to the third point; televisions are now "digital". What does that mean?

The difference is between analog and digital. These terms sound technical, but the concepts are actually familiar. Consider an "old-fashioned" vinyl phonograph record. The way the sound is recorded on the record is that there are microscopic squiggles on the edge of the record's groove. A needle drags across these squiggles, and vibrates in response. Those vibrations are

amplified to drive the speakers that create sound waves. In effect, the squiggles in the groove are a picture of the sound waves that are stored in the record.

Now consider an audio CD. Here the music is stored as “digital” information. It has been transformed (by “optical dots”) into computer data — ones and zeros — that are read by the CD player as flashes of laser light. The computer inside the CD player takes this data, and recreates the sound waves, and sends this information to the speakers.

Okay, that’s all well and good, but why should you care? The fact is that digital music is much “cleaner” than analog. A vinyl record can have clicks and pops and rumble and other noises that were not part of the original sounds. And the sound quality will degrade each time you play the record. On the other hand, a CD sounds the same the first time and every time you play it, and it will contain exactly the sounds that were in the original recording; nothing more, nothing less.

What does this mean for television? It means that you get the same benefits: sharper images that deliver everything in the original content, and nothing else.

Traditional television broadcasts use analog signals. These signals are subject to interference and poor image quality. You’ve seen “snow” and ghosting on television broadcasts. Local televisions now also broadcast using digital signals. When you watch a digital broadcast, you get a clear picture that looks as sharp as if you were watching a DVD.

There are other sources of digital signals for your television. Satellite services such as DirecTV and DISH Network use digital signals to send shows to your set top box. Many cable companies now offer digital cable service in addition to or instead of traditional analog service that delivers the shows to your set top box. And new services are coming from phone companies like

Verizon and AT&T that use fiber optic cable to deliver digital television content to your home.

Do You Need a Digital TV?

Lots of people are confused about this. They may have heard that on February 17, 2009, all analog televisions will stop working. That's not exactly right.

If you are using cable or satellite or some other subscription service to get television content, then nothing is going to change. You can continue to use the same television that you're using now.

If you use an antenna to get television signals from local TV stations, then you may be affected by the change. On that date, local stations (except for some low-power community stations) in the United States will cease broadcasting analog signals. They will only broadcast digital signals. You can still use your existing antenna, but your television will need to have a digital tuner in order to receive those signals.

Here's the simple fact; almost any new "flat" television that you buy now will have a digital tuner (in addition to a traditional analog tuner). So if you buy a new television, you will still be able to receive local broadcasts after February 17, 2009. If you don't want to buy a new television, and still want to receive local broadcasts, you can buy a box that contains a digital tuner. Just connect this converter box between your antenna and existing television, and you will be able to view the programs. The federal government has a voucher program that will give you a $40 discount on the purchase of a digital converter, which typically cost about $50. It may be best to do both: buy a new flat TV today, and move the old TV to the guest room and use the government coupon to buy a converter box for that one later.

Tuner Acronyms: Technology people love acronyms, even though most people often find them confusing and difficult to remember. Here are two acronyms that are helpful to know. **NTSC** refers to the standard used for analog television broadcasts. **ATSC** refers to the standard for digital television broadcasts. If you get a television that has an "ATSC tuner", then you're all set to receive digital television broadcasts for a long time.

Is Digital TV the Same as HDTV?

This is another place where people get confused. Remember that HDTV means the picture has more detail. Digital TV means that it uses a digital signal to transmit the program images.

Here's the key fact; you can't have HDTV without digital TV. Only digital signals can carry all the extra information that it takes to create the detailed picture. So if you're using an analog signal, you can't have HDTV.

However, you can broadcast standard definition television (SDTV) images using digital signals. Most of the local broadcast programming is still in standard definition, even though it is broadcast on a digital signal. You can tell when you're watching standard definition programming on an HDTV, because the image won't be wide enough to fill the screen; there will be black bars on either side.

At this point, most of the HDTV programming is found mostly on primetime shows and sports, though you will find some public television and a number of cable and satellite channels that carry high definition shows, with more being added all the time.

So here's what it all boils down to; if you want to watch local broadcast television for free using an antenna after February 17, 2009, you need a digital TV tuner. And if you want to see the extra detail you can get from high definition (HD), you need an HDTV.

In the next chapter, we'll look at the different types of HDTV that are available.

Chapter 2:
Types of HDTV

It’s not enough to just say you want to buy a “flat screen” television these days. There are different types, and each has its advantages and disadvantages. Here are the four main categories:

- Picture tube (a CRT, maybe with a “flat” front, but a “fat” back).
- Flat panel (usually a LCD or plasma/PDP)
- Rear projection (RPTV)
- Front projection

Let’s take a look at the different types.

Picture Tube TVs

This is the traditional television with a big (heavy) glass picture tube. The technical name for this type is “cathode ray tube” or CRT. (That’s the fancy way of saying “picture tube”.)

You can sometimes still find picture tube televisions for sale, but they tend to be smaller models, and many do not have the resolution needed to create an HDTV image. The manufacturers have developed ways to make the front of the picture tube flat, so that it looks more like the other types of flat screen TVs, but don’t be misled. The image quality is often not as good as the other newer technologies and it’s bigger and heavier than a similar sized LCD.

For a small screen that is not high definition, you can save a little money by getting a picture tube TV, but it’ll take more space and seem “old and dated”. For a larger, high definition screen, you’re better off buying one of the other technologies.

Flat Panel TVs

This is the kind of television that many people want these days. Even very large sets may be only four or so inches thick and some LCDs are less than 2” to 3” and getting thinner and lighter. People like the idea of hanging one like a painting on the wall, without the need for a bulky piece of furniture as an “entertainment center”.

There are actually two main different types of flat panels that you can buy: LCD and plasma (or “PDP” which stands for “plasma display panel”). Both have their strengths and weaknesses.

LCD Flat Panels

Let's make this easy. If you are going to buy a new television smaller than 50" or so diagonal, you probably want an LCD. They represent the best value on the market today for that size range, and usually have the highest resolutions available.

LCDs have a bright light in the back of the panel (the "backlight"), and then a layer of liquid crystal material that acts like tiny shutters to block the light or let it pass through. One of the problems is that these shutters don't always block the light completely, so some panels don't always show black as deep and dark as some other types of TV.

Also the shutters don't always open and close fast enough to show fast moving objects without some minor blurring, thus some electronic techniques must be used to overcome this. Some models have more problems with motion blur than others, and we'll discuss this more in a bit.

> **Myth Busting:** Some people are concerned that LCD HDTVs have a limited viewing angle. This was true with early LCD panels, but advances in technology have improved performance to the point that a good quality set will have a good, viewable image at a wider angle than you'd probably choose to watch programs. So with newer LCD TVs this is just not a real issue. In fact, with newer liquid crystal "IPS" or "VA" technology viewing angles can be fantastic!

On the plus side, LCDs are bright compared with others, so they are very good if you have a room with lots of windows, lamps, or other sources of light. LCDs are almost all HD (1 megapixel) or FHD (full HD, or 2 megapixels) vs. today's SD (standard definition) at 0.3 megapixels. So you get the highest resolutions available with LCDs, three to seven times more than you have in a traditional television.

Plasma Flat Panels

Plasma TVs were the original flat panel televisions, which is why some people call all flat panels “plasma TVs” even though most today are LCDs. Plasma panels are competitively priced in the 50” to 70” range, and you may find some bargains even down to 42” (though often these have been lower resolution than LCDs “HD” so be careful)..

Plasmas work as if they had millions of tiny fluorescent lights that flash on and off to make the image. These tiny cells make their own light, so there is no need for a backlight.

The advantages and disadvantages of plasma are just about the mirror of the LCDs. Where some LCD TVs may blur fast-moving objects, plasmas are fast enough to show them clearly. Some LCDs don’t make deep blacks, but most plasmas make velvety deep blacks (though new LCD electronics and especially

LED dynamic backlights or edge-lights will help overcome these differences).

On the other hand, plasma screens tend not to be as bright as LCDs, and the perceived image quality can be decreased more by bright lights in the room, such as from windows, and they usually show reflections off the front which may be annoying. Also, if you leave an image on the screen for a long time — such as the "bug" that many networks put in a corner or the menus and other features that you typically find in video games — the image can persist when you change to a different program. In early plasma TVs, this persistence could be permanent, but these "after images" or "burn-in" will eventually fade after a few hours on most newer models thus are not still a problem. Plasma can be impacted by high altitude and are still very heavy glass, and thus may be a bit harder to hang on a wall.

> **Myth Busting:** Some people are concerned that a plasma television won't last very long. The lifetime of any television is measured as how long it takes until it puts out half as much light as it did when it was new. Some early plasma models got noticeably dimmer after just a year or two, especially if they were on all the time. Current models will last as long as many picture tube TVs, so there's no real need to be concerned about the overall lifetime for a plasma TV any longer.

Rear Projection

The early rear projection televisions used big, heavy picture tubes, and they were big and deep monsters that would take over any room. (Also the picture quality was not that good, and the images were dim.) Many people think of these old picture tube models when they think of rear projection, which is a bit unfair because the current models that use microdisplay technology are much smaller and lighter than before, and can create quite good picture quality.

There are three different types of technology used for most rear projection TVs today. DLP stands for “digital light processing’, and uses a tiny chip created by Texas Instruments. DLP uses millions of microscopic mirrors to reflect light to create an image. The chip is lit by red, green, and blue light in rapid sequence, so fast that your brain combines the images to create a full color image. Some people are more sensitive to this design, and sometimes see a “color breakup” or “rainbow effect” where they see separate red, green, and blue images. This happens most when you’re looking at small white objects on a dark background, such as stars in a night sky.

Other models use another type of small LCD technology. They use three tiny LCD panels, and shine bright light through them, then combine the three images to create a full color image. This eliminates the field breakup problem. The way LCDs work, however, means that part of the light is blocked at each cell. As a result, some people notice a “screen door” effect, in which you see a grid separating the dots of the image, as if you were looking through a faint screen door.

The third type of microdisplay used for rear projection is “LCoS”, which stands for “liquid crystal on silicon”. Some companies use other names for their own version of LCoS; Sony calls their technology “SXRD” and JVC uses “D-ILA”. Like DLP, LCoS is reflective and you don’t get a screen door effect, but like LCD, most LCoS models use three separate panels so you don’t get any color breakup problem. LCoS models tend to be the most expensive of all the rear projection designs today, but as in all consumer electronics, prices are dropping.

Rear projection models are the best value in very large screens, from 60” to 70” and above today, but will move toward 80” to 90” quickly, though you may find some good bargains in smaller sizes as they become “close outs”. This large screen size for a good price is one of their main advantages. They also often have thin bezels — the frame around the screen — so a larger screen size will fit in the same horizontal space as a smaller plasma or

LCD screen but it will be much “thicker”. And they tend to weigh a lot less than LCD or plasma flat panel televisions of the same size.

One main disadvantage is that the cases are much deeper than a flat panel, making it harder to hang a rear projection TV on the wall. New designs are helping make the cases thinner, and now you can get a rear projection set that is within inches of the depth of a flat panel set sitting on a stand.

The other main disadvantage of rear projection sets is that you don’t get as wide a viewing angle as with other flat panel TVs. Side to side is a bit limited, but the image quality is affected even more if you view the image from above or below. If you plan to sit in front of the set, or a bit to one side or the other, you probably won’t notice any difference, but lying down may also change the image a lot.

Front Projection

If you want a really large image, then the most cost effective way to get it is with a front projector. (You can get over 100” diagonal flat panel HDTVs, but they cost more than a luxury car.) Front projectors use the same imaging technology choices as rear projection HDTVs.

Prices for projectors with HDTV resolutions have come way down in recent years. You can now get a 720p projector for less

than $1,000, and you can get excellent 1080p models for under $3,000.

There are two drawbacks to front projectors. Unless you have an expensive and sophisticated projection screen, you'll need to be able to control the lighting of the room. This generally means room-darkening drapes and recessed overhead lighting. A dimmer on the room lighting is also a good idea.

The second problem is that projectors don't have tuners. Most accept the same types of inputs as a flat panel HDTV, but you'll have to run the cables to the projector, which can be a complicated or expensive process (until wireless connectivity for audio and video catches up with that for PC networks).

What to Look for

The bottom line is this; your next television should be an LCD, a plasma, or a rear projection model. Those are the three key choices, with the main choices to make being diagonal size and styling, for the specific room you want to put the HDTV in. For 15"-47" LCD is almost certainly the primary choice, with Plasma being best in the 60"-70" range today, and RPTV in the 72"-90" segment, with front projection meeting the need for 100" and above. If your needs fall into "overlap" regions, you'll most likely make a choice based on design and cost considerations.

In the next chapter, I'll go over some of the features to look for in any new television. Then in the three chapters after that, we'll take each one of these types of HDTV in turn, and talk about the features that are different between the various models, and why you might or might not want that feature.

Chapter 3:
What to Look for in Any HDTV

Whether you choose an LCD, plasma, or rear projection television, there are some features common to all three. In this chapter, I'll go over some of the major features to consider.

What to Ignore

Before we look at the different important features, however, let me take a moment to tell you what features to ignore.

When shopping for a new television, you will quickly discover that there are lots of competing claims out there, and they often contradict each other. One of the easiest ways to find the

differences between different models is to look at the manufacturer's specifications. Unfortunately, this may be easy but it's also often a waste of time.

For example, let's consider "contrast". This is a terribly important feature. It describes how different "black" and "white" are on the screen. If the black parts of an image are dark gray, and the white parts are light gray, then the whole image will look washed out and lifeless. Even the colors won't look good.

Contrast plays a major role in image quality.

But if the blacks are deep and rich, and the whites are crisp and bright, the whole image will look better and the colors will seem to just pop from the screen. Better contrast also helps details stand out, making the image look sharper and crisper.

The contrast specification is meant to describe the difference between the amount of light the screen gives off when it's showing white and when it's showing black. This is reported as a ratio. A contrast ratio of 1,000:1 should indicate that the screen has better contrast than one with a 100:1 contrast ratio.

So you'd think that you should just go out and buy the television with the highest contrast ratio, right? Sadly, that's often wrong. Display manufacturers have chosen to measure contrast in so many different ways that it has little or no value in predicting what contrast you'll see when you get the television home and turn it on.

As a result, you should pay almost no attention to contrast specifications. For similar reasons, ignore brightness specifications as they do not report the light output of the televisions in a very meaningful way.

The only specifications that you should count on are the ones that actually count things that you can touch. By this I mean you can trust the specifications for the dimensions of the TV, or the number of connectors it may have and even the resolution (which is the number of "dots", like 1366 x 768 for one megapixel "HD" or 1920 x 1080 for 2 megapixels "FHD"). But for performance measures such as brightness, contrast, or viewing angle, you should trust your own observations more than the published specifications.

Dimensions

This may seem obvious, but it's one of the most important factors in choosing a new television. You don't want to get a set that is too big, or one that is too small, but just right for the room or furniture you want to place it in

Too Big

Many people think that hanging a new flat panel TV on the wall is a cool idea, and they're right. But hanging a TV is not as simple as it may seem at first.

Once you've installed the wall mount (which is an extra cost item), then you have the problem of what to do with the wires. A tangle of wires hanging down definitely diminishes the "cool" of a TV on the wall. You can run the wires through the wall, but this is a complex and difficult job that is often best left to

professionals. And getting a professional installation can cost as much or more than the television itself.

As a result, about 70% to 75% of the people who purchase flat panel TVs don't hang them on the wall. And in many cases, they already have furniture that holds their current television. Replacing that furniture can be expensive and disruptive to the existing decorating arrangements, so many people choose to just put the new TV in the space occupied by the old one.

This can lead to problems, however. Most older pieces of home entertainment furniture are designed for standard definition televisions that are about as tall as they are wide (the old 4:3 aspect ratio). New HDTVs have a wide screen format (usually 16:9) that may not fit in the same space as the older TV.

For example, a 32" standard definition picture tube TV can be about 30" wide and 26" tall. A 32" LCD HDTV with speakers on the sides can be as much as 42" wide. It is wider because it has a wide format screen.

The wide format screen also means that the screen will not be as tall; the 32" LCD HDTV case will be about 24" tall. As a result, you may feel that the wide screen television looks smaller than the standard definition model, even though they have the same diagonal screen measurement.

As a result, if you get a new wide screen television to fit your existing furniture, it may actually look smaller than the one you are replacing.

Too Small

You want to make sure that the new television you get is not too small. With the lower resolution of the standard definition TV, you can sit further from the screen and still see all the detail. In fact, you need to sit pretty far away so that the image looks smooth.

Since an HDTV uses more dots to make its images, however, you may need to sit closer (or get a larger screen) than you might be used to with your old set.

Think about it this way; when you go to the movies, where do you prefer to sit? You probably don't want the front row, because you can't see the whole image and you'll get neck strain trying to look up at the big screen. On the other hand, you don't choose the back row of the theater, either. You sit in the middle of the theater so that the screen fills a large portion of your field of view.

That's the same way to think about the size of your HDTV. The image is made up of more dots than on a standard television, so they are relatively smaller. If you sit too far back from the screen, you won't be able to see the extra detail. It won't look worse than your old standard television from that distance, but it won't look any better either.

A good rule of thumb is that the screen should be about 5" to 8" diagonal for every foot that you will be sitting from the screen. So at 6 feet, you should have a screen that is 30" to 48" in size.

Just Right

Like Goldilocks, you'll want to pick the TV that is "just right" for your needs. If you're planning to keep an existing piece of furniture, be sure to get a TV that will fit in the space. But also make sure that the screen you get will be big enough for the distance at which you'll be sitting when you watch television.

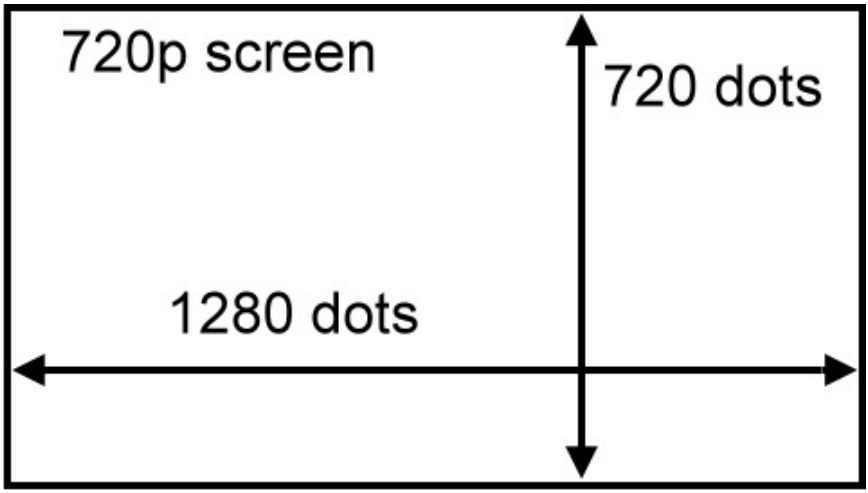
Resolution

Probably the next most important feature after size is resolution. As you shop for a new TV, you'll see "720p" and "1080p" and other terms bandied about. Which one is best for you?

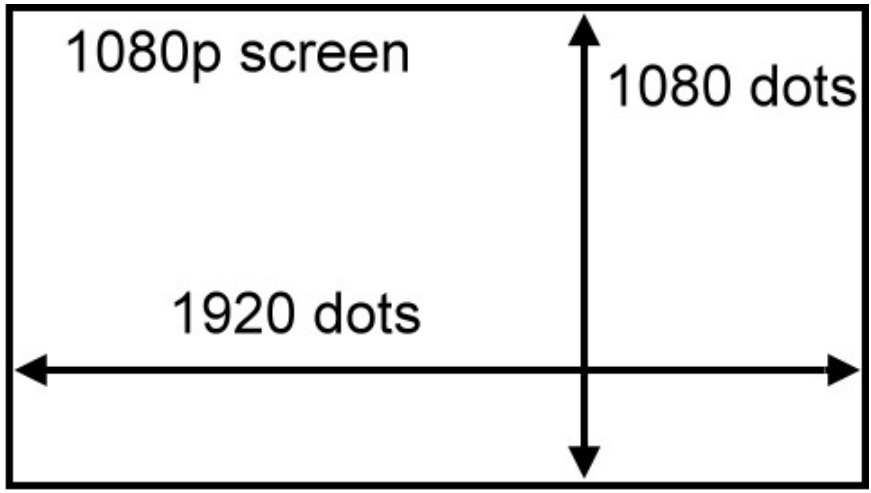
The first general principle is that — all else being equal — more dots are better than fewer. So if you can get an HDTV with more dots than another one with fewer, and they are the same size and

the same price and same quality, then the one with more dots is the better deal.

The numbers refer to how may rows of dots the screen has. A 720p screen has 720 rows, and a 1080p screen has 1,080 rows. These numbers line up with the two different ways HDTV content is created.



A 720p screen has 1280 by 720 dots.



A 1080p screen has 1920 by 1080 dots.

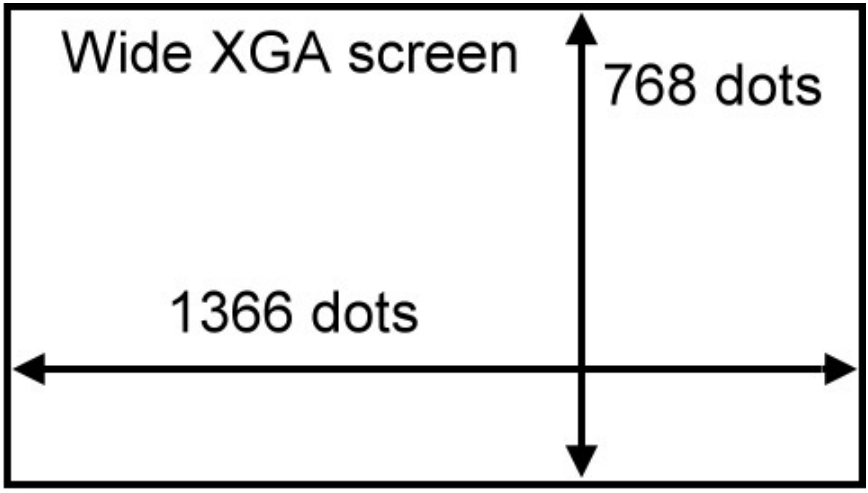
Some channels use a 720p signal. (The “p” stands for “progressive” which means that the whole screen is painted at a time.) Most channels use a 1080i signal. (The “i” stands for “interlaced”, which means that the screen is painted in two steps, first the odd number lines, then the even ones. But this happens so fast that you don’t see it.)

Some people will say that 1080p is a waste of money because none of the TV channels produce a 1080p signal. They are right about the signal; about the only way to get 1080p signal right now is to use a high definition Blu-ray DVD player.

But these people miss the point. For the best quality, you want the TV to use one dot on the screen for each dot in the image signal. If you try to show a 720p image on a 1080p screen, the picture will be “scaled”. This means that it will be enlarged to fill the more dots. And since the screen has more dots than the image, the electronics in the TV will have to “invent” the missing dots. With a good quality set, you are not likely to see any artifacts from this scaling.

On the other hand, if your signal has more dots than the television, then the electronics have the task of “throwing away” the extra dots that don’t fit on the screen. This too can result in artifacts, but since information is being removed from the image, you are more likely to see the scaling artifacts.

So most HD channels use 1080i signals, and if you do have to scale, it’s better to start with too many dots than too few. For this reason, most high definition images are likely to look better on a 1080p screen than a 720p screen.



A Wide XGA screen has 1366 by 768 dots.

Note that there are many screens with “Wide XGA” resolution, which is 1366 by 768 dots. (Most wide screens at 37” and below come in this “native” “HD” resolution. For 47” and above most LCDs are “FHD” or 1920x1080, but many plasmas are not, so check carefully). This happens to be a convenient resolution for the companies that make LCD panels, but it guarantees that any high definition image will have to be scaled. The 720 lines of 720p will have to be scaled up to 768 lines, and for 1080p, the 1,080 lines will have to be scaled down to match the 768 lines.

The bottom line? If it doesn't cost much more, get a 1080p resolution HDTV. For 47" and above you probably want this "FHD" resolution so you do not see the individual "pixels" or "dots" too much on your TV.

"GREEN" TV features

Starting in the later part of 2008, many sets will be rated under the EPA's "ENERGY STAR" program. Remember, with the prices of electricity going up, saving energy will not only be good for the earth but also will save you money. So look at average power usage (as well as low standby power modes when the TV is off, and other neat energy saving features like an ambient light sensor to automatically lower the average brightness when you turn the lights down). Over time, TV set vendors will learn to use smaller boxes to save on waste (landfills!) and shipping costs (as more boxes will fit on one truck) and also sets will meet higher standards for recycling and environmental safety with less heavy metals in the glass and electronics, so look for these features in the future when you can as well. (LED backlights may also help here, too).

Other groups are also offering their own energy-saving standards to help consumers. For example, the LCD TV Association has a "Green TV" logo program for flat panel sets that automatically lower the brightness of the screen when the light in the room is

dim. This can save significant amounts of energy, from 30% to 60%.

Connections

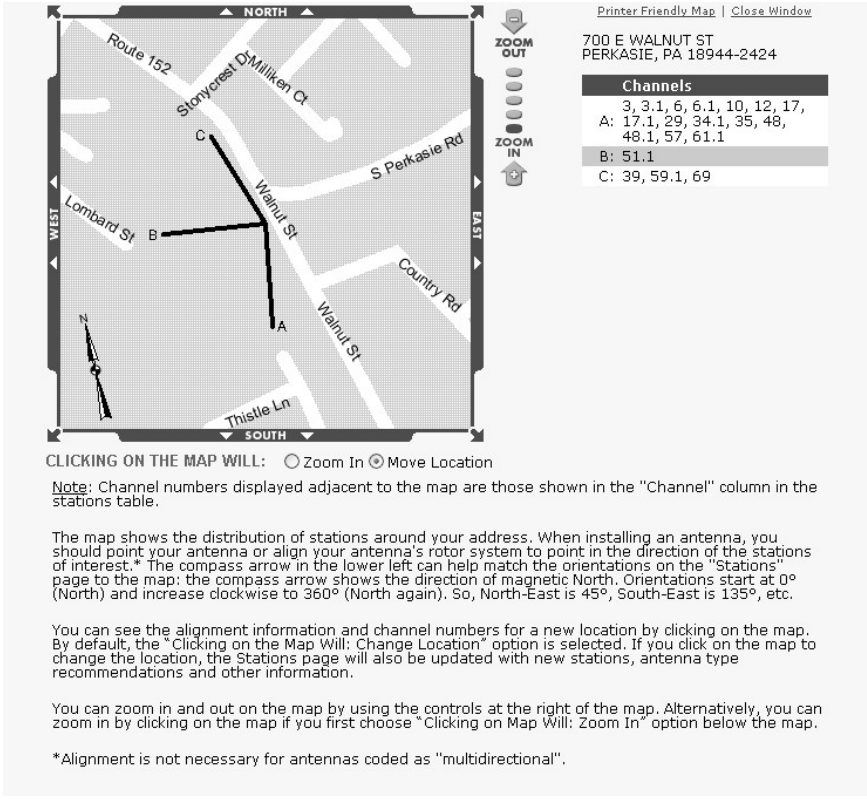
In order to get a picture on your new television, you need to connect it to something.

Antenna

If you're going to get signals over the air from an antenna, you'll need a connection for that. Any TV that has a tuner will have a connection for the antenna. If you live near a city, you may be able to use an indoor antenna. Old fashioned "rabbit ears" may do the job, or you may find that you need a more powerful antenna.

If the broadcast signal is weak, you'll need a larger antenna, which most people put on their roof (though it will work from inside the attic in some cases). Again, if you already have an antenna in place, try that first before purchasing a more powerful antenna. Note that you may get a picture from a weak analog signal, but you may get a blank screen from a weak digital signal. As a result, if you're in a weak reception area, you may need to upgrade your existing antenna or add a signal amplifier.

If you want to find out what type of antenna — indoor or outdoor — will work best for your location, check out AntennaWeb.org at www.antennaweb.org. This free service lets you enter your address and it will show you what television stations you can receive, the direction to the broadcast tower, and what level of antenna you'll need.



AntennaWeb.org helps you get the right antenna for your location.

Video

The majority of U.S. homes with televisions do not use antennas to receive television programming today. About half are connected to cable television services, and about a quarter have satellite or other service. In these cases, you get a “set top box” that connects between the signal source and your television.

In order to get HD programming, you must have a high definition digital subscription from your television service. In some cases, this costs more, though in others all you have to do is pay the extra for the high definition set top box.

Once you have the high definition subscription, however, the trick is getting the HD signal into your TV. Standard definition televisions use either a composite or S-video connection. A composite video connector uses a single round RCA plug, and it typically has the inner ring colored bright yellow. (Stereo audio cables use the same round RCA plugs, but these are typically colored red and white for the left and right audio channels.) S-video uses a round plug with multiple pins, similar to a computer keyboard plug.

Neither composite video nor S-video connectors will give you a high definition image, even though you'll find these connectors on your HDTV. Only two types of connector will deliver an HD signal: component and HDMI.

A component connection is an analog connection that splits up the video signal into three components. These use the same round RCA plugs as composite video, but there are three of them. The cables and connectors are typically colored red, green, and blue to make it easier to connect the cable to the connectors correctly.

A component connection is good, but it has some limitations. A poor quality cable can result in degraded image quality, especially if you need to use a long cable. And some devices — such as some high definition DVD players — won't put out the highest resolution image across a component connection because it can't be protected against illegal copying.

An HDMI plug looks a bit like a computer's USB plug.

The best connection for an HDTV is an HDMI connector. This is a digital connection, so like an audio CD, you will get the original image on your screen without any loss in quality.

Save Some Money: The quality of cables can make a difference with component video connections, but this is much less important for HDMI connections. Digital connections are typically pass/fail; either it will work well or not at all. So start by buying the cheapest HDMI cable you can find; they are readily available on the Web at less than $20. Don't let some store salesperson talk you into spending more than $100 on a cable. If the cheap cable doesn't work, or if you need a very long cable, then you can see about spending more for an HDMI cable. (Only if you have a very high end video source like a Blue Ray 1080p player as found in a PlayStation 3, with 1080p content too, might a higher cost and higher speed rated cable provide some benefit.)

In addition to providing the best fidelity for video images, HDMI has some additional advantages. It can carry the sound signals as well as the video, so you may not need to run extra sound cables.

The latest version of HDMI is 1.3, and this has some extra advantages. This connection can provide more color information, which can result in richer, more lifelike colors on the screen. Also, multiple devices can communicate with each other using the HDMI connection. This means that you may be able to press a single button on your remote control if you want to watch a movie, and that one press will cause your TV, DVD player, and sound system to turn on, and they will select the DVD player as the source for the sound and video automatically.

Set top boxes, DVD players, digital video recorders, and even video game consoles like the Sony Playstation 3 have HDMI connectors. As a result, you'll probably want more than one HDMI connector on your new television. Three or four HDMI connectors are not too many to cover your future needs.

So you'll need to know what type of connections your set top box supports. If HDMI is an option, use that. Component video is the only second choice for high definition support.

1080p24 Support

This is a relatively new consideration, but it may become more important in the future. Some of the new high definition Blu-ray DVD players put out a 1080p signal at 24 frames per second. This comes about because that's the frame rate for movie films.

Not all HDTVs can process this signal correctly, which is often called 1080p24. If you have a high definition DVD player or think there may be one in your future, you'll want to make sure your new television supports this feature.

Speakers

The speakers that are included with your average HDTV are a lot better than the speakers that are built into a typical computer monitor, but that's not very strong praise.

The fact is that an inexpensive home theater sound system is likely to outperform the speakers you get with just about any HDTV. If you're only going to watch the news and weather, then the built-in speakers will be fine. But if you're going to watch movies or sports, you'll find the experience is greatly enhanced by having the multiple channels and surround sound and sub-woofer of a home theater system.

If you're planning to add a separate sound system, then you don't have to be concerned about the quality of the built-in speakers. In fact, you may even want to look for models that have detachable speakers or that don't even come with speakers in the first place. This can help you fit a larger screen into a smaller space, and you may also save some money over models that have speakers.

Wireless audio and video connections are starting to become available, making it easier to install a home theater sounds system or HDTV. Buyer beware; the quality of initial systems will vary greatly, with some having "synching" issues from delays, where the lips may move and the sound will follow, like the old fashioned "Godzilla" movies.

Chapter 4:
What to Look for in LCDs

As I said earlier, if you're going to buy a new television that is smaller than 50", then you are probably going to want to buy an LCD. They represent the best value in this size range, and you may find that an LCD is the right choice for even larger sizes.

And as I mentioned at the start of the last chapter, do not pay much attention to contrast, brightness, or viewing angle specifications for LCD panels. These are all important factors, but you can't usually trust most manufacturers' specifications to tell you anything very useful about how their sets will perform in your house.

So here are some of the key features to look for in an LCD.

Smaller Bezel

One of the new developments in LCD HDTVs is that the panel makers have found ways to make the bezel smaller. The bezel is the frame around the edge of the screen, and typically holds some essential electronic components. It's not uncommon for a bezel to be a couple of inches wide, or less, though perhaps more if a speaker is in the sides or bottom of the set.

The Toshiba REGZA 40RF350U has a bezel that is less than one inch wide.

Now LCD HDTV makers have shrunk the components and redesigned their sets so that the bezel can be much smaller. For example, Toshiba has released new REGZA 40" and 46" models with bezels that are less than an inch wide.

The 40” 40RF350U is 22.76” wide overall. This compares with 24.13” for an older Toshiba 37” model. This means that the 40” model fits in the same space as the older 37” model. As seen in the last chapter, it’s important to get a screen that is large enough. The new thin bezel design makes it possible to fit a larger screen in a smaller space, which may be a helpful feature for your installation.

The whole “interior design” aspect is very important in set choice, as the high “WAF”, or “Wife Acceptance Factor” has helped make LCDs so successful so quickly. New thinner bezels, and followed by thinner overall sets with LED edge-lights, will make the “WAF” even better!

120 Hz Screen Refresh

As I mentioned in Chapter 2, fast moving objects may appear to blur slightly on some LCD HDTVs. Manufacturers have come up with a number of solutions to this problem, but one in particular seems to be the most popular and effective solution.

Instead of repainting the image 60 times a second (60 Hz), many models now repaint the screen image twice as often: 120 times per second, or 120 Hz. This helps the liquid crystal molecules to respond more quickly, and the perceived motion blur is thus reduced.

The JVC LT-42X898 has a fast 120 Hz refresh rate that reduces motion blur on this LCD HDTV.

In order to make this work, the controlling electronics must figure out what the intermediate images must look like. It interpolates between the two 60 Hz images to create a new one to insert between them.

This 120 Hz refresh rate has an added benefit. A lot of television content is created at 30 frames per second. To show this at 60 Hz is easy; just show each image twice. To show it at 120 Hz, you repeat the image four times.

Most movies are shot with film, however, and film runs at just 24 frames per second. In order to show 24 frames on a screen that repaints 60 times a second, you have to do a complex shuffle that repeats some images more often than others in order to make everything come out even. Unfortunately, this can result in a herky-jerky motion on the screen.

120 Hz solves this problem, too, because it can simply show each frame five times, and it comes out even because 5 times 24 is 120. As it turns out, rather than just repeat the images, the

controlling electronics usually creates the four intermediate images, so you see smoother action on the screen.

Scanning Backlight

Closely related to the 120 Hz refresh technology are scanning backlights. This approach turns the LCD panel backlight on and off in sync with the image as it's painted on the screen. This sounds pretty technical, but it's actually easy to understand.

Just think back to the days of John Travolta and "Saturday Night Fever". Every disco had strobe lights, which would seem to "freeze" the motion of the dancers. By flashing the backlight of the LCD panel on and off very quickly, you can seem to "freeze" the apparent motion of the objects on the screen.

The Samsung LNT4681flashes its LED backlight to help reduce motion blur.

LED Backlights

Another innovation is the use of LED backlights. LEDs are a solid state light that essentially never burns out. They are used for the familiar glowing dots on all sorts of electronic equipment and appliances. They are now being used in place of the fluorescent lamps that have been used up until now in almost all LCD HDTVs, computer monitors, and notebook screens.

LEDs are smaller than the fluorescent tubes, so the displays can be made thinner and lighter, and lower power. They can also switch on and off faster, so that they make scanning backlights practical.

LED backlights have an additional benefit. They produce light with a broader spectrum of color. This means that the color on the LCD HDTV screen can be richer, especially in the red shades. As a result, you can get images with much more lifelike color, especially if red, green, and blue LEDs are used instead of just the white LEDs that are becoming common today in smaller cell phone and notebook displays.

Chapter 5:
What to Look for in Plasmas

Plasmas are the original “flat screen” televisions. It was the Philips “TV on the ceiling” ad campaign that got people thinking about the advantages of thin panels as replacements for the bulky picture tube TVs.

LCDs have displaced plasma for the most part for sizes under 50”, but plasma models are competitively priced at the larger sizes. There are a couple of points to keep in mind when considering a plasma set.

The “Burn In” Myth

Maybe it’s too strong to call this a myth. Early plasma TVs had a serious problem. If you left an image on the screen for too long, it would “burn in” so that you would see a permanent afterimage even when you were watching something else. This was especially an issue when watching a channel that placed a network logo superimposed on one corned of the image. News

and sports channels with fixed “crawl” banners at the top or bottom, and video games with fixed scoreboards or status windows were also problems.

Most current plasma models are not permanently affected by these fixed images any more, though the problem does remain as a temporary effect. It can take an hour or more of watching other content to get the persistent afterimage to go away, but it should eventually fade.

Still, I don’t recommend plasma HDTVs for use with video game consoles because this image persistence problem could affect your viewing experience if you use the same set for television or movie content.

The “Burn Out” Myth

Again, this part of plasma’s reputation is based on fact, but the situation has changed. Many people think that plasma TVs will “burn out” after a couple years, and will have to be replaced.

The truth of the matter is that early plasma TVs had short life spans, often as low as 4,000 hours. The sets would not die after this interval; it was just the measure of time until the set would put out less than half as much light as it did when new. (For complex reasons, a TV does not look half as bright when it puts out half as much light, but it will look noticeably dimmer by comparison.) There is nothing you can do to restore the light output of a plasma panel. So after a year or two, these very expensive sets looked dim and washed out.

Current plasma sets have much longer useful lifetimes, typically on the order of 60,000 hours or so. This is about the same as you’d get from a typical picture tube television, so you can expect a plasma set to last at least 8 to 10 years for average home viewing these days. So there’s no need to be concerned about the lifetime of a plasma HDTV.

Resolution

There is one feature for plasma sets that demands attention, and that is the resolution of the display. LCD panels are almost all high resolution, and many models now offer 1080p resolution (or "FHD" with 2 megapixels as we discussed earlier). Plasma televisions have a much wider range of resolutions, however, and you need to be careful about what you're buying.

If a deal sounds too good to be true, it probably is. You can find lots of low prices for plasma televisions, but understand from the start that some of these may not be capable of displaying true HDTV images in detail.

For example, you may find some inexpensive plasma models that have wide screens, but check the resolution. Some may have just 848 by 480 dots. This is merely standard television resolution extended out to a wide format, and is often called Enhanced Definition Television, or EDTV. Standard DVDs may look great on these, as might standard definition programs, but it's not high definition.

Then there are plasma panels that offer something less than high definition resolution. A 720p HDTV image has 1280 by 720 dots. This is in keeping with the 16:9 ratio of a wide format image. Since the dots are in proportion to the wide format, the dots are square. This is required to deliver all the detail from the HD signal.

Simulated wide format image

Here is a simulated picture of a wide format image. Note that it has lots of thin lines, and lots of lines that are nearly vertical. I have enlarged a portion of the top left portion of the picture to make a point about plasma television resolutions.

The left image simulates a close-up of a 720p screen, and the one on the right simulates a 1024 by 768 plasma screen.

Some plasma panels have a resolution of 1024 by 768 dots. Mathematically, this is not enough columns of dots to display all the dots in a 720p image. Even though the panel has a wide format, the dots are not in the 16:9 proportion. This means that the dots have to be wider than they are tall — like little bricks — instead of the squares of a true 720p screen.

The simulated enlargements show that there's not always a lot of difference between the 720p and the 1024 by 768 resolution images. If you look closely, you may see more "jagged" lines on the right hand picture. You are more likely to notice the difference if the camera is panning across the image, but you can't do that with a printed page.

The left image simulates a close-up of a 720p screen, and the one on the right simulates a 1024 by 1080 plasma screen.

This next set of images simulates the difference between a 720p screen and one of the new Hitachi panels that have 1024 by 1080 dots. Hitachi calls this "HD1080 Resolution" which certainly implies that it can produce high definition images with fidelity.

Even on the printed page, it is easy to see the effect of this lower resolution. The fact that the panel has fewer dots per line means that the dots are stretched rectangles instead of squares. This causes the fine vertical lines to break up, and diagonal lines are very jagged. Put this image into motion, and the effect will be even more pronounced and noticeable.

So what should you do about this? The key is to look for yourself and see if the image quality is acceptable. If you're a sports fan, look carefully at finely spaced lines, such as the hash marks on a football field, or the boards of a basketball court. You can also look for any image with a fine vertical pattern, such as a pinstripe suit or architectural features such as a brick wall or iron railing. Watch the appearance of these fine vertical lines as the camera pans across them; they will change shape and appear to jump on sets with lower resolution.

Mile High Club

Plasmas have one other feature that will only affect a small number of consumers, but you should know about it. Many panels will make an annoying and noticeable buzzing sound when operating at higher altitudes. Most manufacturers offer special high altitude versions of their products that don't have this problem. So if you're considering a plasma for your ski chalet in the Rockies, keep this in mind. (Note that LCDs don't have this issue.)

Chapter 6:
What to Look for in Rear Projection

Rear projection displays have come a long way from the large, bulky models that used vacuum picture tubes to create the image a few years back. Today, they are often brighter, weigh less, and can be an excellent bargain if you are shopping for a display that is 72” or larger. As an added benefit, nearly all rear projection models are now 1080p resolution.

Solid State Light

Most rear projection models rely on a miniature arc lamp to illuminate the imager chip. These are similar to those used in front projectors, and are rated for 2,000 to 4,000 hours of use before they get half as bright. That means that you’ll have to

replace the lamp every few years. And since they can cost $200 to $300, this adds up and can be a hassle as well as costly.

Fortunately, rear projection manufactures are developing models that have solid state light sources, which essentially means that they won't get dimmer or burn out during the average lifetime of the television set.

Samsung uses high-brightness LEDs for some of their DLP models. These shine red, green, and blue light in rapid sequence, which means that the design also eliminates the spinning color wheel that is used in most DLP rear projection sets. This gets rid of some moving parts, which makes the set quieter and more reliable.

The HL-T6189S uses high brightness LEDs as a light source.

The LEDs have an added bonus. The colors are much richer than conventional lamp models, especially in the red shades. Some people may find the red response is even a bit strong, but remember that you can adjust that down. If there isn't enough red in the picture on a conventional system, you can't add any more when you get to the maximum.

Panasonic has a different solid state lighting system for its LCZ and LCX Series models of LCD rear projection HDTVs. They

use a LIFI light source, which uses microwaves to excite plasma in a tiny quartz capsule. Like high brightness LEDs, it starts up faster and has better color performance than a conventional lamp.

The Panasonic PT-61LCZ70 uses a solid state LIFI light source.

3D Support

If you go to the movies at your local cinema — and especially if you go with children (or your grandchildren) — you've probably seen at least one movie in 3D or are thinking about it! This uses technology that presents different images to your left and right eyes, so you see what appears to be in three dimensions with some objects closer to you than others. The effect can even make objects appear to come out in front of the screen.

The cool news is that some rear projection HDTVs come equipped to deliver the same effect at home (with plasma and LCDs about to follow). Samsung and Mitsubishi have taken the lead on this so far, and just with RPTV for now, but others are sure to do so as well. These currently require the use of optional goggles to see the 3D effect, and you need to have content that supports it. There are some DVDs available that support this, but the primary market initially may be game console users. Many video games have 3D information built-in. Demand for this

feature at home is building slowly, but in terms of movies outside the home it may be a growing differentiator with economic benefits for Hollywood. If you expect the TV you are looking for will be used for 3D gaming or movies, keep an eye out for this feature, but otherwise do not worry about it for now.

Chapter 7:
Let's Go Shopping!

Okay, so it's time for the fun part. To be prepared, make your list and check it twice.

Start with the basics. Figure out about how much you want to spend on your purchase, and check newspaper ads for a few weeks to get a feel for TV set prices levels in general in various stores and for a sampling of brands. Remember to budget an increase in your cable or satellite service, if necessary, so that you will get HD content to view on your new HDTV set.

Next, plan on how big a set you'll get. If it has to fit on or in existing furniture (or at least the room), be sure to measure all three dimensions: width, height, and depth. If you're going to hang it on the wall, measure the space where you plan to put it.

> **Big Tip:** Before you make your final decision on size, cut out a big piece of paper or cardboard that roughly matches the dimensions of the front of the set you have in mind. You can then tape this to the wall or prop it up on your piece of furniture so that you can roughly see how it will look. Better to have some paper and tape now then regret later!

Now, get some of the recent sales circulars from the Sunday newspaper, and get an idea of whether your budget and your size expectations work together (and check online too if you feel comfortable doing that). You'll quickly find out whether you can afford a top brand, one of the quality value brands, or one of the least expensive brands. In general, I'd recommend that you think about saving money with a slightly smaller size top brand or look at a highly rated newer and less expensive brand rather than just buying the least expensive TV, as there may well be a noticeable difference in image quality in some sets from all types of brands. Thus, I would encourage you to look at some of the many good reviews from well established places either, online or in print, such as Consumer Reports, PC Magazine, HDTV Magazine, or CNET.

Checking in the Store

Consumer electronics stores are notorious for piping poor quality signals to the sets on display, and often they do not have the sets adjusted optimally. A higher-end store is more likely to have sales staff who know what they're talking about — and willing to help you check out the sets — than you may find in the heavy discount stores or "clubs", but you can easily shop around at both.

Here are the most important things to look for in the store. First and foremost, look at the picture quality when the set is showing a standard definition image. After all, much of the programming that you're likely to watch right now will be in standard

definition (though HD content is growing quickly). Look for blotchiness in faces or jagged edges of sharp lines, which are signs of poor quality video processing.

Also look to see how "black" the black images are, as deeper blacks will make the colors look brighter and make the picture look sharper. Remember that this will also be affected by how bright the lights are in the store.

If you're in a discount store, chances are that the lighting will be very bright. If you're in a professional AV or electronics store, the lights may well be very dim. Try to view the set in the conditions that will most closely resemble what you have at home, but bright lighting is a worst case scenario; if a set looks good there, it will probably look good in your home.

Before You Buy

Make sure that you understand the store's return and price guarantee policies. You want to be able to bring the set back within a reasonable time if it doesn't suit your needs or tastes, and you don't want to have to pay a lot for this privilege. Ask now, as it is "better safe than sorry" as mom always taught me.

Many stores have a price guarantee, but the print can be mighty fine on the details, so make sure you understand how it works. Prices do continue to go down for HDTVs, but not as quickly as they have in the past. If you see the same set offered for a lot lower price a few weeks after you buy one, you'll want to be able to get some of that savings back. (If the store does not have a price guarantee but does have a liberal return policy, you may have to return your set and go buy the other one at the lower price in order to get the savings.)

Doing the Deal

Be careful about add-ons to the sale. As I mentioned earlier, don't spend a lot on your HDMI or other cables. In fact, you'll may be able to get good quality cables for less elsewhere than

where you buy your HDTV (but the time and hassle factor may not be worth it).

You probably do not want to buy the extended warranty unless the set and installation you are considering is expensive and tricky and you want an “insurance policy” that may be pricey but give you some comfort. Remember, the technology used in most of these HDTVs is very mature and has proven to be about as reliable as your old picture tube set. As a result, if anything is going to fail, it’s likely to do so when the set is relatively new and still covered by the standard warranty.

You might want to go for delivery and installation services. Large sets can be pretty heavy and unwieldy, and it can be worth a little money to have someone come and set it up for you. Best Buy and Circuit City both bundle installation services into some attractively priced packages, and other retailers are now following suit.

The final word of advice is to pay for your purchase with a credit card, even if you plan to pay for the set in full right away. The reason for this is that in the unlikely event that you have a serious problem with your new set and you have difficulty resolving it with the store, you can contest the charge with the credit card company. This effectively pulls your money back from the store, and which can quickly cause the store to become more interested in satisfying your complaint.

Sit Back and Enjoy!

Soon, you'll have the big screen set up and you'll be watching your favorite programs, movies, or sports in high definition, with more detail and a sharper picture than you've ever seen this side of your local cinema. (Next year I will explain to you how these may become more often 3D, especially for the music concerts or "Broadway plays" you like so much, bringing them to every town in the USA, but you do not need to worry about that for a little while.) For now, enjoy the thought of upgrading to your first HDTV set, and realize that the sooner you buy the more time you get to enjoy it in your own home, and the sooner you will "see" what you have been missing…. so bring this book to the store and start shopping!

An HDTV Glossary

Like any technology, HDTV has its own share of jargon and acronyms. These can be confusing or intimidating if you don't understand what they mean. Here are some of the terms you are likely to encounter as you shop for an HDTV.

1080p: an HDTV resolution that has 1080 lines of dots in the image; this is the highest resolution generally available

120 Hz: a technology that repaints the image on an LCD TV twice as fast as normal, which helps eliminate motion blur

720p: an HDTV resolution that has 720 lines of dots in the image

Analog: a signal that are carried by a wave

Aspect ratio: the proportion between the width and height of a device; a wide format HDTV screen has a 16:9 aspect ratio

ATSC: The Advanced Television Systems Committee, which came up with the digital television standard

Backlight: a bright light used to illuminate LCD panels

Brightness: the amount of light that a television can produce, which is of more concern in a brightly lit room than in a dimly lit room

Component video: a three-cable analog connection that can carry high definition television signals

Composite video: an analog connection for standard definition television signals that cannot carry high definition signals

Contrast ratio: a comparison between the brightest image that a TV can create and the darkest image

Converter box: an electronic device that can translate new digital broadcast television signals so that they can be viewed on a traditional television with an analog tuner

CRT: a "cathode ray tube", which is the same as the picture tube in a traditional television

Digital: a signal that is carried as a series of On and Off signals

DLP: Digital Light Processing, a microdisplay technology used in rear projection TVs and front projectors

FHD: Full HD, or 1080p resolution

Fiber optic cable: a new technology that uses light to carry data through a glass fiber, instead of using electricity through a copper wire

HD: high definition

HDMI: a digital connection for TVs that can carry both the picture and the sound signals in one cable

HDTV: high definition television

LCD: a "liquid crystal display" which is used to make flat screens for computer monitors, notebook computers, cell phones, and televisions

LCoS: Liquid Crystal on Silicon, a microdisplay technology used in rear projection TVs and front projectors

LED: a "light emitting diode", such as the little red or blue dots that are often used as power indicators on electronic devices

Megapixel: a million pixels

NTSC: National Television Systems Committee, which established the standards for traditional, standard definition television

PDP: Plasma Display Panel, which is one of the two main technologies used for flat panel TVs

Pixel: a colored dot used to create a television image

Plasma: a flat screen display technology that uses electrical pulses to create an image, also known as "PDP"

Resolution: the number of dots in the television screen

Scaling: the process of expanding or shrinking an image so that it will fit the resolution of a flat panel screen

Standard definition: also called "SD" or "SDTV", the resolution of traditional television sets, using a 4:3 aspect ratio

S-video: an analog connection for standard definition television signals that cannot carry high definition signals

UHF: ultra high frequency, which is used to broadcast television channels 14 through 83

Wide XGA: a flat panel resolution with 1,366 by 768 pixels

About the Author

Bruce Berkoff is the Chairman of the LCD TV Association, a global not-for-profit marketing trade association dedicated to “informing, promoting, improving and connecting” the entire LCD TV supply chain and their related companies, to help promote “a great LCD TV in every room in the house!”

For more than six years Mr. Berkoff lived in South Korea and was the Executive Vice President of Marketing and Chief Marketing Officer (CMO) for LG.Philips LCD. He has also been the CEO of a fabless semi start-up in the video processing space and general manager of Philips Flat Display systems software and electronics business. Prior executive positions also include UMAX Computer Corporation, Radius, and SuperMac Technologies.

Mr. Berkoff is a well known speaker and author in the display and electronics industry. He has display related patents both granted and pending in the USA and China. He holds an undergraduate degree in physics from Princeton and a graduate degree in biophysics from the University of California- Berkeley.

Mr. Berkoff currently sits on the boards of various publicly traded companies including: LG Display (LPL), Tvia, Inc. (TVIA), and Uni-Pixel, Inc. (UNXL). He is known for his visionary talks at many display and technology related conferences around the globe.

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