

Hitachi 42HDT20 42" Plasma Panel

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In the last issue of *The Perfect Vision*, I wrote that the flat-screen revolution has hit high gear. Now, it's accelerating. While the performance of direct-view CRT screens improves at a snail's pace, flat-screen manufacturers are doing their best to get these new thin marvels into more hands by rapidly improving performance and quickly dropping prices. The 42HDT20 is the second plasma television ensemble (NTSC tuner and separate switching/control-center included) to enter the marketplace, and more are coming. At \$8999, its retail price is lower than that of the first model to appear in this size class. The 42HDT20 also represents the first flat panel with a copy-protected digital interface (DVI/HDCP).



Features

The 42HDT20 is a widescreen 42"-diagonal plasma with a native pixel count of 1024x1024. The set incorporates Hitachi's ALiS technology. For those of you not familiar with it, let me take a few paragraphs to explain the differences between the ALiS plasma and conventional panels.

With the conventional panels used by other plasma-makers (as of this writing there are now seven core plasma producers, including Fujitsu/ Hitachi as one joint venture), the pixels are constructed in crate-like fashion, with four (relatively) thick walls surrounding each respective red, green, and blue phosphor "cell." These walls do not illuminate, and this decreases the amount of "fill" between the glowing panel areas and the total area of the screen. ALiS consists of continuous, wall-less, vertical phosphor stripes, with (thinner) walls separating the pixels horizontally. The result: a better fill factor and a brighter picture.

Let me illustrate the other key differences between the 42HDT20's ALiS panel and other conventional plasmas I've reviewed. First, with conventional plasma designs the picture is displayed "progressively," i.e., all pixels are illuminated every 1/60th of a second. The ALiS panel alternately illuminates horizontal row of pixels every 1/60th of a second—the first set in 1/60th of a second, then the adjacent set in another 1/60th of a second.

Second, conventional 42"-43" plasmas overdisplay 1080i material by about 5% in all directions, creating a "safe area" to mask image position inconsistencies in HD broadcasts (the term "overdisplay" here is analogous to "overscan" in CRT devices, but since plasmas don't use scan lines to create an image I had to think of another word). A 1920x1080 image fed to one of these plasmas is actually converted to something closer to 1020 pixels vertically and 1800 pixels horizontally. With the conventional plasmas the remaining (approximate) 1020 vertical pixels are then scaled to 768 vertical pixels, or whatever the native pixel count of the display demands.

The 42HDT20 also overdisplays the 1080i image, but it does so in such a way that derives exactly 1024 vertical pixels, which are then displayed with no vertical scaling (and thus no vertical scaling artifacts). This increased vertical resolution and reduction in artifacts translate to an image that is perceptibly sharper.

The 42HDT20 comes in two parts: the panel itself with a (removable) tabletop stand, and a separate A/V controller. The controller (AVC20) is a rather tall unit measuring about the same height as my two-disc DVD changer (4 3/4" high). It's all silver and has a swing-down, front-access door. Behind the door is a set of A/V inputs (composite-video, S-video, and L/R audio), and rudimentary controls for the panel, such as channel

up/down and input selection. The rear of the AVC20 has four other sets of inputs. Input 1 accepts both component video and analog RGB-HV (via a 15-pin sub-D connector). Input 2 accepts both component video and digital RGB, called "DVI/HDCP," via a DVI 1.0 connector. (DVI stands for Digital Visual Interface, the connection method that will start appearing on all DirecTV HD set-top boxes shortly. With this connection you can send a digital satellite signal directly to the panel in its native digital form. This should result in an even sharper picture by eliminating all digital-to-analog conversions. Unfortunately the signal is *uncompressed* digital, meaning that it will never be a means to record HDTV programs—read more on this subject in my HDTV Insider column in Issue 43.) Inputs 3 and 4 allow you the choice of S-video and composite video. For Inputs 1 or 2, the user must select which source he is using (component or RGB) via the remote control. All inputs also include L/R analog audio via RCA connectors.

The AVC 20's back panel also houses two IR-blaster ports. With the four included IR-blasters and Hitachi's A/V Net system, up to four components can be switched and their basic functions controlled by the AVC20. I tried it, and it works well, but with certain limitations.

Hitachi's Set Up Wizard on-screen guide makes A/V Net easy to configure. First choose the types of devices—limited to VCR, set-top box, cable box, amplifier, and DVD player—then tell the AVC 20 which brands and models they are, looking up the products' four-digit codes in the owner manual. Key in the codes and you're in business.

You're limited, however, in the types of devices the AVC20 allows you to network. For example, my TiVo was listed in the VCR product category. I did the setup in seconds and the AVC20 did indeed control my DirecTV TiVo. But, as I expected, it only performed VCR-type functions with the TiVo, such as fast-forward, play, etc. I still needed the TiVo-supplied remote to carry out other functions, such as choosing which program to play. (For a DVD player or VCR these limitations should not be a factor.)

Other features include PIP, which is a side-by-side affair with various surf features, three preset color temperatures, and four aspect ratios for 480i/480p sources—Standard, which I call "full" or anamorphic (basically a side stretch); 4:3, with a choice of gray or black side bars; Zoom 1, to fill the screen with 16:9 letterbox content; and Zoom 2, to fill the screen with 2.35 content. Video controls include the normal Brightness, Color, Tint, Contrast, and Sharpness, plus a Picture mode, which consists of video presets called Sports, Movies, News, and Music. These pre-sets can be overridden with the user controls and made into custom settings. This is a good thing because there are no individual user settings for each input. The AVC 20 includes 3-2 pulldown, but only when the Movies category is selected. Another unique control is Color System, which adjusts the color matrix for the proper color space for either HD or DVD (they are slightly different).

The 42HT20 includes a pair of matching all-black speakers that mount to the sides of the panel. When attaching them, mount the bracket to the speaker and then to the panel, not the other way around as the instructions say. The speakers provide an adequate sound pressure level, though I found them somewhat bass-shy. When I increased the "Tru Bass" boost-control to medium, they provided a fuller sound.

The panel itself is very attractive with a gloss-black bezel and dark tinted screen. (I've never been a fan of silver sets. I find the picture pops off the screen when the image is surrounded by black.) The remote is a pretty customary universal affair with some backlit buttons.

Performance

Let's start with NTSC reception. Watching NTSC programming was a very pleasant surprise. NTSC upconversion to HD resolution is still a developing science, and this television/controller definitely raises the bar. The unnatural wax-like appearance I've reported with many HDTVs was rarely present. Faces had

gradient detail, and flesh looked like real skin, not a rubber mask. The better-quality sources such as HBO provided a very watchable, enjoyable picture. The overall look, when compared to my reference 34" direct-view (no scaler), was quite good. The plasma picture was much brighter. Black levels were not quite as dark as the direct-view, but noticeably darker than the previous panel I reviewed (and still had on hand for comparison). In fact, the blacks were deep enough for me to watch the set without the lights on. With this panel, "black level" is no longer a performance issue—it's that good. There were however a number of picture artifacts.

These were very noticeable when I closely examined the screen from a one-foot distance. As I moved to my normal viewing distance, about five feet away, most were either undetectable or minimized. Nevertheless, I'd like to describe and explain them to you.

Most noticeable was a motion artifact that, when present, would make the screen look like it had a granular surface. This artifact was at times perceptible from any viewing distance and was highly dependent on the overall signal/content quality and the amount of motion in the picture. With minimal motion this artifact was non-existent.

The next artifact was false contouring, which is a lack of gradient tones, particularly in dark areas, causing ridges of brightness changes rather than smooth transitions. It is sometimes described as giving the picture a moss-like appearance. False contouring has always been noticeable on past ALiS panels, though Hitachi has made enormous strides in minimizing this artifact with the 42HDT20. While the set hasn't totally eliminated false contouring, it was only noticeable in dark areas of the picture and rarely from a normal viewing distance. In fact, I found it quite disturbing with only one DVD I viewed, which I'll discuss later.

Another artifact I saw was what I call "micro-crosshatching." This effect appears to me as some sort of interference pattern, which occurs between edges of objects on the screen and what appears to be the interlacing of the panel. Luckily, this was more of a close-up phenomenon and not apparent at my normal five-foot viewing distance.

I want to spend a moment covering uneven phosphor-wear, called "burn in." Hitachi has provided several features to minimize the possibility of permanently scoring the panel, though I want to warn you that all plasmas are highly susceptible to it and one should be both aware of it and take the following steps to minimize it.

First, do not use the option in the set's menu to make the 4:3 sidebars black instead of gray, as this will guarantee eventual burn-in. The best preventative is to not use the 4:3 aspect at all, and to turn down the contrast to a more accurate 50% level.

Next, *do* use the "screen saver" option. This option orbits the picture by 2 pixels up, down, and across to minimize a sharp burn-in line appearing on the screen. Hitachi offers three choices: orbit once, twice, or three times per hour. Choose the third. If you ever want to check for burn-in and minimize or eliminate it (depending on the severity), there is a "wipe" position. It puts up an all-white screen for twenty minutes. If you have burn-in, you'll see it when the wipe screen appears, and using the wipe function can smooth out a mild uneven phosphor wear.

Before describing the 42HDT20's DVD performance, let me explain what happens when the AVC 20 controller encounters a standard definition 480i signal (such as a DVD). The image is first de-interlaced and converted to 480p, utilizing motion detection for video-based sources, or 3/2 pulldown cadence detection for film-based sources if (and only if) the Movies video preset mode is engaged (note that a 480p signal skips the de-interlacing process). The signal is then upscaled to 540p, and then to 1080i. The upconverted 1080i signal is then displayed using the 1080i HD signal processing described earlier.

I put in a number of DVDs including my old-new standby, the Superbit *The Fifth Element*, as well as *Harry Potter and the Sorcerer's Stone*, *Jay and Silent Bob Strike Back*, and others. I observed several items of interest. First was that using my DVD player in its progressive mode definitely made a significant difference in picture quality. The progressive position was clearly sharper and more natural looking. The better the disc quality, the better the overall picture. *The Fifth Element* was magnificent. With *Harry Potter*, Robbie Coltrane's Hagrid character seemed to put a spell on the panel. His multi-patterned dark coat and dark beard brought out the worst of the panel's false contouring. In other scenes, the film looked bright, sharp, and colorful.

With HDTV sources the picture was very compelling. The 1024 vertical lines of resolution provided a pleasant surprise; the panel was noticeably sharper than a 768-line panel I compared it with. The bright, sharp images really packed a punch, especially when I compared them side-by-side with my reference 34" direct-view set. I also discovered that both HBO's and CBS' upconversion of native 480i content to 1080i provided a virtually artifact-free picture that was truly outstanding.

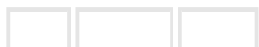
Conclusion

Hitachi has made performance and convenience advances in the 42HDT20 that should please everyone. Its noise-free color, tremendous brightness, near jet-black blacks, and 1024x1024 resolution raise the performance bar substantially for panels in this size category. While the AVC20 scaler isn't perfect, it does lift the bar even further when directly compared with the other internal and external original-equipment plasma scalers I've observed. The inclusion of DVI/HDCP should ease concerns about future-readiness. There are a few areas that leave room for improvement, but taking everything into account, this set provides a look, feel, and picture that will thrill most viewers. I enjoyed watching it, and put it high on my recommended plasma list.

Calibration

IRE Before After

20	6470	6540
25	6320	6570
30	6450	6500
35	6470	6420
40	6450	6480
45	6470	6510
50	6520	6510
55	6640	6630
60	6510	6510
65	6510	6520
70	6530	6510
75	6460	6610
80	6660	6600
85	6500	6520
90	6500	6550
95	6530	6530



100 6550 6550

SPECIFICATIONS

Hitachi 42HDT20 42" 16:9 plasma display panel

Number of pixels: 1024 x 1024

Sound: SRS w/matrix surround

Dimensions: 40 9/16" x 25 1/16" x 3 9/16"

Weight: 86 lbs. (with stand and speakers)

AVC20 Audio Video Control Center

Reception system: NTSC

Tuner: VHF, 2-13; UHF, 14-69; CATV, 1-125

Rear inputs:

Input 1, component video and RGB 15-pin sub-D with audio;

Input 2, component video and digital RGB via DVI 1.0 with HDCP with audio;

Input 3, composite/S-video/audio;

Input 4, composite/S-video/audio

Front input: Composite/S-video/audio

Dimensions: 16 15/16" x 4 3/4" x 11 1/16"

Weight: 9 lbs.

Manufacturer Information

Hitachi Electronics

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San Diego, California 92154

(800) Hitachi

www.hitachi.com/tv

Price: \$8000