

What is the difference for LCD and CRT monitors on technical performances? Is it possible that the CRT will be replaced by LCD monitors?

A: Three years ago, it was once pointed out in a text on discussion of this question that LCD monitor, compared with CRT, still existed shortcomings in certain specification fields, such as brightness, contrast, visual angle, response time, lifespan and production, which had limited its promotion. But as the fast development of LCD technology, it was believed that it will develop fast and take up more and more markets of monitor. It was also estimated that the CRT will be replaced by LCD in the coming three or five years or even be eliminated in some market totally. While today, as the great development of advanced technology in color, brightness, contrast, visual angle (nearly 180°) and the response time which can let eyes of people be adaptable totally, LCD has tried its best to eliminate its shortcomings. Moreover, with its advantages in thin design, environmental friendly, and energy-saving, it is very possible that the CRT will be replaced by LCD in the near future. In European countries, due to the components with lead in CRT, which is contradictory with the ROHS principle, so the CRT has been regarded as an exception temporarily. But with forbidden one day in the future in some countries or regions. But for the VOOK professional LCD monitor, it will appear to more and more consumers due to its more fashionable, excellent, and more reasonable and project-oriented electric performance and appearance design.

What is the difference among LCD monitor, LCD display and LCD TV?

A: The author has mentioned this difference in before texts for several times. Besides the difference in style and function of input signal, there are mainly three aspects in their performance difference, which are picture definition, color reducibility and reliability compared with the CRT accordingly. But for LCD monitor, its difference between LCD display and LCD TV is not only these dynamic and static picture display and curtain-walled structure features, so there are higher requirements on its visual angle, brightness and contrast that those of LCD display and the higher requirements on color display ability, response time and resolution than those of LCD TV.

Can the LCD display with AV input be called LCD monitor in current market? What is the difference between professional LCD monitor and those kinds of monitors?

A: The LCD display with AV input in current market is to realize the AV input function by equipping a video recorder in the driven circuit of display. This kind of monitor does not take the working requirements of 24 hours per day or 365 days per year into consideration, which means the safe electric performance and good heat emission design are not taken into the consideration for the design of the machine, and its power is often DC 12 V (used the outside-equipped power adapter 220V AC/12V DC), it can not meet the requirements of electromagnetism interference (EMI) and electromagnetism compatible electron agnetic compatibility (EMC) for professional monitors. So we can definitely say that those monitors can not be used for LCD monitors.

VOOK professional monitors, adopts the excellent engineering science and Human Factors Engineering Structure and beauty crafts into the appearance design, and can be fixed through various constant working performance, built-in power, low ripples switch power and electric performance that meet EMC standard are all features that can not be met on other LCD displays. Furthermore the professional LCD monitor of VOOK chose the PANEL with high brightness, high contrast, broad visual angle and low response time; its self-explored HDVM digital engines greatly increased the resolution and reducibility of the monitor, and produced a more excellent monitoring picture in VOOK professional LCD monitors.

Both of the LCD and PDP belong to Flat Panel Display components, so what is the difference between them? Why there is only LCD monitor but PDP monitor?

A: PDP is constructed of two glass panels with a neon/xenon gas mixture injured in between. Voltage is applied between the electrodes to cause discharge and ultra-violet light. So once let one of the pixels works constantly under high brightness, which means let this pixel discharge under long term high voltage bombardment, then the discharging ability for the phosphor on its surface will fast decrease, in a word, the static picture with high brightness may accelerate the aging of the phosphor of the plasma pixels. There will be dark area left in the screen even if the PDP is power off, which is so-called plasma stigma.

But for LCD-TFT, its working process is done in the LCD panel with depth below 1 cm, a team of plywood was formed by two class substrates, color filter, and Alignment Film. The liquid molecules between crystal and liquid were filled in the substrates. Differences on light transmit will appear when the crystal molecules swirls 90 degrees regularly under the effects of electric fields of different current. Two color deflection panels were covered in the surface of the substrate; each pixel of the picture is composed by color filtering chips of the sub-pixel with R, G and B three colors and supported by crystal molecule and FET crystal electrode. The back side of the PANEL is back light, the light from this power released from the below polarizing panel first and then through the on and off control on FET electrode to realize the vertical and horizontal arrangements of this crystal pixel, and used this theory to control each pixel to form the needed picture.

So from the theory perspective, the crystal of the LCD panel will not fatigue. As the increase of its working period, the radiation efficiency of the lighting tube in the back light of the panel will decrease or even become broken (the whole brightness will become decreased or dark then), but now the lifespan for the code cathode vacuum tube used in the back light power can be up to 30000 hours (even if it is used for above 30000 hours, the brightness of the panel will not be lower than 60% of the brightness before). Correspondingly, if the PDP works for hundreds of thousands hours to display the same static picture, the spot with high displaying the same static picture, the spot with high displaying brightness will become burned and cause the PDP reproducing static pictures. That is to say, the flat panel monitor used by CCTV sub branches can only adopt the LCD but not PDP, or else the PDP screen will be fatigue soon. So, there are only professional LCD monitors in the range of VOOK product but no PDP monitors.

What are the factors that affecting the display quality of the LCD monitor? How to choose an ideal LCD monitor?

A: The display effects of LCD monitor is decided by the LCD panel and driven circuit (including A/D switch, digital video decode, digital video processing and other circuits) and other aspects. Different LCD monitors should take on different LCD panels and driven circuit strategies. The display effects will also be different due to brightness, contrast, visual angle, response time and performance of bandwidth of the driven circuit for different panels. Just like the CRT monitor, there will be obvious difference of the picture effects if adopting different tubes and decode strategies. So the most simple and effective way to determined the performance of two monitors. That is to say, do not excessively rely on the those exaggerated promotions of LCD products done by some monitor factories, such as "mobile contrast with 3000:1", "super-high color over 68.6 billion", "picture display with 1200P", "solely-owned high quality picture with six basic color" and so on, which are all words traps used by some factories for puzzling consumers.

How to adjust the color temperature of the LCD? Is there any relationship with 16, 24, 32 bit colors index.

A: As far as we know, all of the colors in nature are composed by R, G, B three primary colors and they controlled the degree of mobile static current in driven circuit of the monitors, which will produce the change of color temperature of the screen. So the manufacturer of monitors will adjust the color temperature according to certain standard before the machine is delivered, and different people may have different feeling towards the screen color temperature due to their own different affections. The current universal standard for color temperature is 9300 K or 6500 K, so both of these two standards are preserved in OSD for choices of customers before the machine is delivered, and there is also RGB independent adjusting way for customers to choose their own favorite color temperatures. So when you feel that the color of monitor can not be up to your requirements, you can open the OSD of the machines, and adjust it accordingly. In CRT monitors, the three basic colors in different degrees can compose up countless colors. But the color of LCD is decided by the digit number of IC in the driven circuit and the color number that can be reproduced by the LCD panel, such as the color processing abilities of many LCD driven chips.

Have been above 24 digits, but due to the highest color digits reducibility for current LCD Panel is only 16770000, so its display results only can be up to 16770000. In a word, each pixel in the LCD panel can display 16770000, but it has no relationship with the color temperature, its use are to make the color of the monitor be more finer. Here we must emphasis again that no matter how much color does one sub pixel have, and no matter how beautiful the picture is in the screen, those colors or even the whole picture are all dynamically composed by the R, G, B three basic colors. For the green, purple and yellow three medium colors added in the R, G, B which is promoted by some factories is actually the transition color for R, G, B. There is no definition for the green, purple and yellow three colors to be basis. The so-called six basic colors totally make no sense.

Why is it so less discussed on response time of CRT monitor, but as an important specification for LCD?

A: The CRT radiated through bombardment of the electron beams to the fluorescence powder on the screen, the radiation occurred when the electron beams bombardment takes place, and it disappeared when the electron beams disappeared. Usually the color persistence of the fluorescent screen is smaller than 1ms, and it can not be felt through usual vision. So the response time from dark to bright or bright to dark for CRT monitors will not necessary for discussing (say: Tr or Tf). But for LCD, the crystal, as its decisive material, will need a certain period when switch from vertical collocation to horizontal collocation (from bright to dark) or switch from horizontal collocation to vertical collocation (from dark to bright) under the effects of current field due to its own degree of viscosity. So the response time for LCD to switch between bright screen and dark screen occurred (say: Tr or Tf), which is also called Grey to Grey.

The response time for LCD panel in early times was between 30 ms and 60 ms due to the limitation on its crafts technology, which always caused the tailing phenomenon when reproduced the fast moving picture. In order to improve this defect, the recent LCD manufacturers have taken a lot of efforts on increasing the response speed from the early 60ms, 30 ms and 25ms to current 16ms, 12 ms and 8 ms; the tailing phenomenon has been almost disappeared and has little difference with response time for CRT. We must stress out one point that the viscosity of the crystal not only affects, the response time but also affects the color saturation and visual angle of the LCD. The thicker of the viscosity, the fresher of the color. The visual angle will become broader and the response time will be postponed relatively. Reversely, the thinner of the viscosity, the lighter will be the color, and the visual angle will also become narrow relatively. So, the response time and color visual angle for LCD panel is contradictory with each other in crafts for LCD panel. Considering that people will choose the panel according to their visions, choose the panel with response time below 16 ms and broad visual angle above 150 degrees which people will not have the visual uncomfortable feeling towards the light field changes and can also guarantee the clearance and stability of the monitor and its good visual effects.

What is the difference on refresh frequency between LCD and CRT? Why is there no flicker feeling of LCD picture?

A: The theory for refresh frequency is different between LCD and CRT. For CRT, the refresh is operated through dividing the picture into 625 scanning lines to refresh, but for interlaced scanning, the picture is divided into two fields to refresh, scanning the odd lines in the odd field and scanning the even lines in the even field, the two fields combined together to finish the whole refresh process of a picture. So due the lines switching between odd and even field, the line spacing flicker phenomenon was caused; meanwhile due to its scanning speed of 25 frames per second, the whole screen flicker will also be occurred; while the progressive scanning technology for CRT is to realize repeatedly refresh of one line or one field through digital processing, and eliminate the screen flicker through increasing the H. frequency and V. Frequency. But when refresh the whole picture of LCD, people will not feel the flicker as long as the refresh frequency is above 60 Hz(60 frames per second), this will also be a strongpoint for LCD to replace the CRT in the near future.

Sometimes there will be bright or dead pixel and mono-color pixel or mono-color dead pixel in some LCD screens; Will those pixels affect the lifespan of LCD panel?

A: The pixel appeared under R, G, B screen and bright screen of LCD panel are so-called dead or mono-color dead pixel; and those pixels appeared under dark screen or R, G, B color bright pixel are so-called bright pixel or pixels without color. This kind of pixel defects are formed because of the stove or interception happened to one of the R, G, B three sub-pixels or all of them in a certain pixel. The manufacturer of the LCD panel will define the number of pixels and their positions that allowed appearing in the specifications of products at different levels.

Like what showed in picture in picture below. For products at A level, the specification is defined at 3, 3, 5 standard, which means three-mono-color pixels are allowed to appear in none A block (say: B block. And the mono-colors) and three mono-color dark pixels are allowed to appear in the whole screen (the three dark pixels can be converted into one dark pixel with three colors), and the mono-color bright pixel plus the dark pixels should be five defective points. So, the bright or dark pixels of the LCD screen can be inspected by this standard too. And since all of those pixels are all caused because of the defects of this pixel unit itself, the lifespan of LCD panel will not be affected.

What is the meaning of physical resolution for LCD panel? How to adjust the resolution of monitors?

A: The physical resolution of LCD panel refers to the number of pixels in H and V. matrix of LCD panel which is also called standard resolution. Such as resolution for 15" is often 1024×768; 1280×1024 for 17" and 19" panel, 1280×1024 for 20" panel and 1366×768 for 26", 32", 40" and 46" panel. The higher of the resolution, the finer will be the display effects. When the LCD monitor is used under VGA (or DVI) input mode, its resolution should be adjusted in line with its physical resolution in order to reach the best display effects. When the two resolutions is not in line with each other, the driven circuit of monitor will rearrange the pixel in the three V. matrices of screen according to the setup of resolution through the interpolation operation, so that some colors of units around will be changed and formed the final effects of input picture. Because of the dislocation luminescence from pixel allocation, the display under non-best resolution will be a little rough or even with overlap and vague feeling. So only under the standard resolution mode that defined by the LCD panel, there will be the best display effects. Surely you do not need to worry this problem when the LCD monitor is working under the video input mode.

What are the meanings of marked brightness and contrast for LCD monitor? Are there any relationship with brightness and contrast of LCD panel? Is the brightness and contrast the more the better when adjusting the LCD monitor?

A: The marked brightness for LCD monitor is decided by the marked brightness and contrast of the panel it used, so for LCD monitor, a much broader visual angle and higher brightness and contrast are required because it is frequency used for watching the fixed video picture at long distances. For PC display, the ideal pictures can be showed if it meets the required brightness and contrast of 200cd/m² and 300:1 respectively. But for monitors, the brightness and contrast should be not less than 300cd/m² and 450:1 accordingly in order to meet the requirements. So, the indexes of the panel used by LCD monitors should be bright than that of PC display. Some manufacturer modified the back light in order to increase the brightness of monitor and added the number of lamp tubes of the back light to increase the efficiency of luminescence in order to increase the brightness of the panel. But it is not for sure that the higher of the brightness and contrast the better will the picture. The quality of picture is not only related to the brightness and contrast but also the definition, color reducibility, and SNR (single to noise ration) specifications. Similar with adjusting to CRT monitor, when adjust the LCD monitors, it is also not for sure that the higher of the brightness and contrast the better will the picture. The normal adjusting effect is to realize the gradual changing process of the display results to reproduce from black to white or from white to black, which also means to watch whether it is average transmission for pictures under bright and dark transmitting. And watch whether the picture is bright but not glare and clear but not crude. What we must point out is that some manufacturers overly exaggerate their indexes when describe the brightness and contrast of their own products, such as "brightness: 2000cd/m², contrast: 5000:1" and so on. Actually if the index would reach up so high, then the screen must be like a searchlight, which will be impossible for you to look at its picture.

Why are there different kinds of proportions between width and height for LCD monitor? Will it cause the picture distortion?

A: The specification of LCD monitor is decided by the panel it used. Among the VOOK LCD monitors, the W to H proportion is 4:3 for 15" and 20", 5:4 for 17" and 19" and 16:9 for monitors above 26", but camera, as the front equipment for monitor, the Width to Height proportion of its target surface is usually 4:3, so when adopted the panel with 5:4 proportion, there will be vertically lengthened feeling, but since the proportion is with little difference, so there will be no obvious distortion phenomenon. But for screen at proportion of 16:9, which has a big difference with 4:3, the whole picture reproduced in its screen feels obviously compressed. But the recent available LCD panels are all this kind specification, so VOOK LCD monitors managed to eliminate this distortion by reallocating the picture, which to effect two segmentations in picture with 16:9 proportion (forming two pictures with 8:9 proportion each in the whole screen) or effect six segmentations (forming six pictures with 5.3:4.5 each in the whole screen) like showing as below:

Try to make the picture be close to proportion of 4:3, which will not only decrease the picture distortion but also realize the multi-picture processing effects for LCD monitor. While the multi-picture processing function is only a choice for you within OSD menu, if you want to enjoy the broad picture taken up the whole screen and do not care the so-called distortion, it is also available for you to choose the single picture function.

Are the resolution and definition for LCD monitors the same?

A: The resolution of LCD monitor is mainly decided by the physical resolution of LCD panel; it reflects out the number of pixels of Panel's Horizontal pixel matrix. The practical resolution for LCD monitor refers to the preciseness of the picture produced from front

equipment (the monitor) under the VGA or DVI input modes. We have mentioned in Question 10 it is better to keep the practical resolution of LCD monitor be in line with the physical resolution of panel when using the LCD monitor in order to reach the best resolution or the best showing results.

The definition of LCD monitor refers to the clearness of its picture when it is under video display (say under VIDEO input/S terminal output/RGB or YPbPr), and it is mainly decided by the bandwidth of channel band pass in video decode processing of the driven circuit and the resolution of the panel (also called pixel dot pitch). On one hand, the bandwidth of the channel band pass should meet 1 MHz=78 lines(for PAL) or 65 lines(for NTSC) on the other hand, the number of horizontal pixels in the screen must be not less than the lines for horizontal definition. Since there is a standard specification for panel resolution in recent market, so the definition is mainly decided by the function and the characteristics of the driven circuit. For traditional monitors, their definitions are usually defined through vertical lines (such as 480 lines,720 lines and so on), as the development of the progressive scanning technology, the difference between interlaced lines and progressive lines is deprived from definition, such as 480i,480p,720p and 1080i,1080p, only when monitor that can realize the 1080 I displays, it can be defined as monitor with high definition. Just like the 20" and 20" to46" LCD monitors from VOOK, they have been able to realize the definitions of 1080i,1080p,780i,780p, so can be defined as monitors with high definition for sure.

Why does VOOK insist on using the built-in power instead of the external adapter?

A: In order to make the machine be portable and away from power trouble, a lot of monitors in recent market adopt the external AC power adapter, which means the machine use DC 12V input itself and supply power to the whole machine through the external AC 220V orDC 12V adapter. This kind of power supply is used on desk-top and available when there is no strong electromagnetism interference field existed around. But when it is used at factories or some spots with electron agentism interference signal and be sent to the machine inside through the 12V input cables and then affect the quality of picture or even make the machine stop working. So the LCD monitors of VOOK adopted the reliable built-in switch power instead that can meet the requirements of electromagnetism compatible and interference standard..

So it ensures the constant working of the machine no matter under what kind of environments and its much more coordinated appear once design is also more convenient for project mounting and operation.

The rear frame of LCD monitor becomes heated when being used for a period of time; will this affect the lifespan of the monitor?

A: The luminescence of LCD panel is realized through several lamp tubes (cathode vacuum tube). Because some of the tubers are fixed at the fringe of the panel, it is normal that the frame becomes heated when being used for a certain period. In the design of LCD monitors, VOOK applied the hydrodynamics theory to make the air whirlpool inside the space of the machine form the convection, and operate the heat emission through those metal parts inside at the same time, which all ensure the reliable and constant working of the machine. So it will not affect the lifespan of the monitor if the frame of the LCD feels a little heated by hand.

What kind of working environment does the monitor need? How to maintain the LCD monitor well?

A: The working environment for LCD monitor will often be defined in its product manual, such as its rating voltage, environment temperature and humidity. Besides this, the LCD monitor should also be located far away from overheated, over cold or places with strong magnetic field Maintain and clean the LCD CCTV monitor termly. When cleaning the screen, do clean it by using some special de-fluff soft duster cloth or wet tissue with litmusless detergent and wipe it with a soft, dry cloth as early as possible. There is a piece of PVC Protect Film covered on the surface of the screen; therefore, you should avoid using any corrosive detergent or impregnant for cleaning.