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# 19" Rack Mount Display Solutions: From 20.1" Legacy to Next Generation 21.3"

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Submitted by:



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## 1 Executive Summary

The 20.1" LCD has been the display monitor size of choice for many 19" rack mount installations for many years across military subsystem workstation console applications. The 20.1" LCD, however, is quickly becoming unavailable and should only be considered for spares, legacy support, or programs with very small production demands. For new projects, requiring years of fielding and support, one should consider alternative display solutions, such as 19" or 21.3" LCDs which are 19" rack mountable and are in the growth phase of their life cycle.

Argon can provide both alternative display solutions and has recently entered full production of the 21.3" rugged LCD for C4ISR applications. It has been specifically designed as a suitable form, fit and function replacement of many existing 20.1" solutions, with the added benefit of reduced power consumption, lower weight, an LED backlighting system and smaller depth.

This white paper briefly outlines the history of the traditional 20.1" display market and offers a forward looking solution path for 19" rack mount displays for future system designs.

## 2 Introduction

During the 1990's, there was a transition of display technology from CRT to LCD in military airborne, naval and landbased C4ISR applications. A key need was a main console CRT replacement which was 19" rack mounting, typically 9U high, minimum of 1280x1024 resolution, lighter weight and lower power consuming, among other options. In late 1996, the 20.1" LCD was introduced and within a few short years, several military display monitor suppliers were providing rugged versions. For the following 15 years the 20.1" display monitor was the gold standard for C4ISR operator positions.

One obvious reason for the choice of the 20.1" was that it was the largest viewable surface that could be ruggedized and still fit within a standard 19" rack. It is the de facto use of the 19" rack system in rugged applications that made the 20.1" particularly attractive. For example, for naval projects, the 19" rack system is commonly used as the installation means on board of the ship. But also on airborne and land based programs the flexible 19" rack system is often chosen as the installation platform.



Figure 1 : 20" Display Mounted in a 19" Console

To date, the 20.1" LCD has been the best fit and makes optimal use of the horizontal space in the rack. In most cases a vertical space of 9U ( $1U = 1.75" / 9U = 15.75"$ ) is allocated to the display.

As with most commercial technologies, which transition to the latest and greatest very quickly, the 20.1" LCD has been obsoleted by the LCD manufacturers. As LCD technology has come to dominate the television space, we see that the market trend has moved towards larger screen sizes and wide aspect ratios.

There remain tens of thousands of 20.1" rugged displays fielded in the military market, and while the 20.1" solutions will remain supported for many years, the 20.1" LCD is in the steep decline phase of its life cycle.

It is therefore not recommended to begin any new military program or technology update using the 20.1" LCD as the core component.

### **Now there is an alternative.**

In this document, Argon describes its short term and, long term solutions, for new programs or technology refresh activities. Our solutions can be implemented without impacting the existing system hardware, software and most qualification results.

## **3 Argon Solutions**

### **3.1 Past and Current Situation - ARD20 20.1" Rugged LCD Monitor**



**Figure 2 : Argon's Two Key ARD20, 19" Rack Configurations**

Over 10 years ago Argon developed the ARD20 as one of our solutions in the console market space. This unit came with several differentiators, including an 8U high version for compact 19" rack mount, a rugged hinge, 100% analog dimming (0 to 200 Nits), a fully enclosed unit (no air holes or internal fans), and a very small bezel width to maximize the viewing surface. This unit was qualified for airborne, tracked vehicle and naval (901D) applications. It is still in production.

Recently, Argon was contracted to provide a new 20.1" configuration which has been fully qualified to C-130 specifications (display shown on the right above). This display is a form, fit, and function replacement for many existing legacy 20.1" solutions fielded today. It is in full production.

Moreover, Argon has taken the advantages of new display technologies and has succeeded to reduce the power consumption, and weight of the display when compared with competitive solutions, even eliminating the CCFL backlight in most configurations.

For example, Argon is currently supporting Lockheed Martin for the United States Coast Guard HC-130J and HC-144A program with our 19" rack compatible variant of the ARD20.

### 3.2 Dealing with Limited Availability of the 20.1" LCD

While it is true that the 20.1" has not been manufactured by the OEM's for several years now, there are many units floating around the market in limited quantities, particularly at LCD distributors. Counterfeit versions are not an issue.

Argon has significant experience and skill in finding these panels and will continue to do so. We have been able to procure limited quantities of this panel size and have strategic stock for our running projects.

If it is imperative that your project remain with the 20.1" LCD, then Argon can, and will, support you for limited quantities. Depending on the project size, required quantities and program lead time Argon will advise if it is opportune to utilize a 20.1" panel for your particular project.

### 3.3 ARD19 19" Rugged Display Monitor –An Alternative

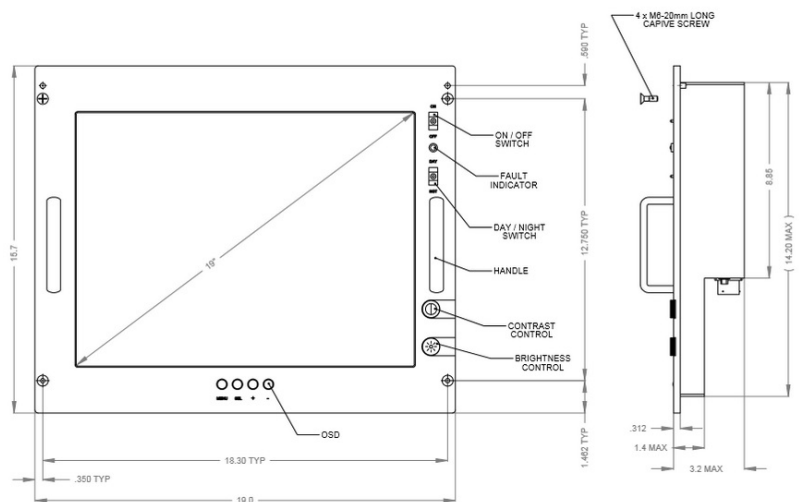
As an alternative solution to the 20.1" SXGA resolution display, Argon has developed and delivered a variety of 19" rugged display monitors.

The ARD19, which is a 19" rack mountable display, is equipped with a 19" LCD. This display offers a 1280 x 1024 resolution, which can be considered a suitable equivalent to the 1280 x 1024 resolution 20.1" panels.

For projects where the screen area can be smaller than 20.1", this alternative may be a good solution. The unit is equipped with all functions, interfaces and features that make it a form, fit and function replacement of many of the legacy 20.1" rugged displays.



Figure 3 : ARD19



The most recent version of the ARD19, shown above, has been selected by Lockheed Martin in support of the MH-60 AMCM project. The unit is currently in the design phase and full qualification is scheduled for Q2 2014.

### 3.4 Current and Future Situation – The ARD21 21.3” Rugged Display

Considered to be the Next Generation standard C4ISR rugged display monitor, the ARD21 is the wise choice for any new C4ISR program or technology refresh project where 19” rack mount is a must.

Argon has selected the latest 21.3” LCD, with LED backlighting and has developed a solution for form, fit and function replacement for most legacy 20.1” rugged display solutions. With the new ARD21, Argon is able to offer a superb replacement alternative for the older 20.1” rugged displays. Its larger screen size, reduced weight and power consumption, new LED backlight system, and many other features outperform any previous 20.1” display system.

In addition, Argon has made the unit half the weight, power, and depth of many existing 20.1” solutions.

In late 2013, the ARD21 entered full rate production. Argon is proud to announce that our launch customer is the Boeing Company, and that the ARD21 was selected (and qualified for) the AWACS Block 40/45 Full Rate Production program.

The ARD21 Technical Specification details the product and the environments to which it has been qualified.

In addition, Argon has successfully completed the Mil-S-901D test on the ARD21.



Figure 4 : ARD21 with 21.3” LCD, Designed For 19” Rack Applications

## 4 Conclusion and Comments

The 20.1" LCD is quickly becoming unavailable and should only be considered in quantities for spares or other support. Any new project should consider an alternative, such as a 19" or the new 21.3" LCD.

Argon has developed and has entered full production of the 21.3" rugged LCD for C4ISR applications. It has been specifically designed as a suitable form, fit and function replacement of many existing 20.1" solutions, with the added benefit of reduced power consumption, lower weight, an LED backlighting system and smaller depth.

As is the tradition and business model of Argon, we can, and will, customize these products in order to ensure that your project needs are fulfilled. Different options, such as touch screen, high brightness, and NVIS compatibility are typical options that Argon can support.

**For more details on the ARD21, and any other Argon product, check out our web site at [www.argoncorp.com](http://www.argoncorp.com) or contact us for a detailed technical specification.**