

# Rugged Military ACH2000 Flat Panel Display

## User's Guide For ACH2000 Chassis Mount



## Table of Contents

### **Section 1 - Introduction**

1.1	Overview .....	3
1.2	Specifications .....	4
1.3	Interface Signals .....	4
1.4	Video Formats .....	5

### **Section 2 - Installation**

2.1	Unpacking .....	6
2.2	Installation .....	6

### **Section 3 - Operation**

3.0	Introduction .....	8
3.1	Built-In-Test .....	8
3.2	Controls & Indicators .....	8
3.3	Status Indicators .....	9
3.4	Mode Indicators .....	10
3.5	Power Management .....	10

### **Section 4 - Maintenance**

4.1	RFP/20A Adjustment .....	11
4.2	Preventive Maintenance .....	12
4.3	Corrective Maintenance .....	13
4.4	Replaceable Parts .....	13

### **Section 5 - Drawings**

## **Section 1**

### **INTRODUCTION**

#### **1.1 OVERVIEW**

The AYDIN rugged 20" flat panel LCD monitor offers the user superior image quality over a wide viewing angle, in a small compact package. AYDIN's Autosync, TFT high contrast LCD monitor enhances color intensity providing a truer representation of colors.

Created for today's demanding user applications AYDIN's line of LCD monitors offer an ideal choice for users with space, weight and power consumption constraints who require high quality imagery.

##### **1.1.1 PHYSICAL DESCRIPTION**

This monitor is packaged in a rugged aluminum enclosure that can be rack mounted, suspended or desk-top mounted. Forced air cooling is provided by two DC fans mounted on the rear panel. All controls and indicators are front panel mounted. BNC, triax or HD15 (Hi-density DB15) connectors are provided at the rear of the unit for the video inputs.

The monitor is comprised of an active matrix, thin film transistor (TFT), liquid crystal panel structure, LSI drivers that switch the TFT array, and a backlight assembly. The thin film transistor panel structure is created by sandwiching liquid crystal material in the narrow gap between the TFT array glass substrate and a color filter glass substrate. After the LSI drivers are connected to the panel, the backlight assembly is attached to the backside of the display panel.

RGB (Red, Green, Blue) video information from a suitable source is modulated into a format compatible with active matrix addressing by an onboard signal processor and sent to the LSI drivers, which in turn address the individual TFT cells.

Acting as an electro-optical switch, each TFT cell controls light transmission from the backlight assembly, when activated by the data source. By regulating the amount of light passing through the array of red, green and blue dots, color images are generated on the screen.

The two models, RFP/20A and RFP/20B, differ in the backlight electronics employed. The RFP/20A is supplied with standard backlight electronics which allow adjustment down to approximately 30% of maximum. The RFP/20B is

supplied with enhanced electronics providing approximately 50% more brightness and full range dimming adjustment.

## 1.2 SPECIFICATIONS

<b>Brightness:</b>	RFP/20A	20 fl min.
	RFP/20B	30 fl min.
<b>Brightness Range:</b>	RFP/20A	30% - 100%
	RFP/20B	0% - 100%
<b>Contrast Ratio:</b>	100:1 Typical	
<b>Dot Pitch:</b>	0.312mm	
<b>Display Resolution:</b>	Horizontal	: 1280 dots
	Vertical	: 1024 lines
<b>Active Display Area:</b>	Horizontal	: 15.7" (399 mm)
	Vertical	: 12.6" (319 mm)

### Viewing Angles:

≤ 160° typical for accurate viewing; the display is best observed if the viewing angle is limited to 80° up, down, right and left.

### Power Requirements:

90 - 132/180 - 264 VAC autosyncing @ 47/440 Hz, typical consumption is 90 watts in ON mode, <25 watts in energy saving mode.

### Physical Dimensions: (W x H x D)

19.0 x 15.72 x 6.36 inches / 482.6 x 399.2 x 161.5 mm

**Weight:** 29 lbs / 13.15 kg

### Environmental:

Operating Conditions: +0 to 50 deg C, 5% to 95% RH, 0 to 25,000 ft. Alt.  
Storage Conditions: -20 to 60 deg C, 5% to 95% RH, 0 to 45,000 ft. Alt

### 1.3 INTERFACE SIGNALS

#### Video

Input: Analog, Red, Green, Blue

Impedance: 75 ohms

#### Sync

Separate: TTL level

Horizontal: Positive / Negative

Vertical: Positive / Negative

Composite: TTL level

Positive / Negative

Composite Sync on Green video: 0.3V p-p negative (Video 0.7V p-p Positive)

### 1.4 VIDEO FORMATS

The monitor will display VGA (640 x 480), SVGA (800 x 600), XGA (1024 x 768) and SXGA (1280 x 1024). SXGA has a 5:4 picture aspect ratio and will fill the 15.7" x 12.6" active picture area. VGA, SVGA and XGA have a 4:3 picture aspect ratio and the picture height will be 11.8" leaving a 0.4" unused dark band at the top and bottom.

## Section 2

### INSTALLATION

This section contains the procedures for installing and verifying the operation of the AYDIN AMLCD monitor. Minor adjustments may be required for specific video sources or to customize the displays appearance to user/operator requirements. Complete adjustment procedures are provided in section 4.

#### 2.1 Unpacking

All monitors are shipped completely assembled in individual shipping containers unless incorporated into a system rack by AYDIN.

#### CAUTION

**If the outer shipping carton shows any sign of damage, do not unpack the carton unless the responsible shipping agent is present. Notify AYDIN Contracts Department as soon as possible. Note the Model and Serial numbers from the tag attached to the rear panel of the unit for factory identification.**

To unpack the equipment, cut the reinforced sealing tape or bands; carefully open top container and remove the packing material.

Lift the unit carefully out of the shipping container and place it on a firm surface.

##### 2.1.1 Inspection

After unpacking the AMLCD unit, visually inspect the monitor for any indication of damage which may have occurred during shipment. Any damage should be reported to the responsible shipping agent.

#### CAUTION

**Under NO circumstances should power be applied if the unit is damaged!**

## 2.2 Installation

### 2.2.1 Video Connector Configuration

The Model RFP/20A and RFP/20B are available from the factory with either of three video input connector configurations. The three configurations are identified by the last digit of the monitor part number.

PN 355-0371-501: 15S HD D-subminiature Female (std. VGA) connector (RFP/20A)

PN 355-7010-501: 15S HD D-subminiature Female (std. VGA) connector (RFP/20B)

PN 355-0371-502: (5) BNC connectors (RFP/20A)

PN 355-7010-502: (5) BNC connectors (RFP/20B)

PN 355-0371-503: (5) Three-lug miniature Triax connectors (Trompeter 70 Series) (RFP/20A)

PN 355-7010-503: (5) Three-lug miniature Triax connectors (Trompeter 70 Series) (RFP/20B)

### 2.2.2 Power

Chassis Connector: J6 P/N MS3102A-10SL-3P

Cable Connector: P6 P/N MS3106A-10SL-3S

Connector Pins:  
A AC Input  
B AC Input/Rtn.  
C Chassis ground

Fuse: 1.5A SLO-BLO 250V 3AG

Auxiliary Chassis Ground: E1 ¼-28 Stud

### 2.2.3 Mounting

#### 2.2.3.1 Standard Rack-Mount

Sheet 2 of drawing #353-0179 in Section 5 illustrates the standard rack-mount configuration using accessory kit #354-0275-501.

## Section 3

### OPERATION

#### 3.0 INTRODUCTION

The AYDIN rugged 20" flat panel AMLCD monitor is provided with built-in-test (BIT). The values of specific operation parameters can be adjusted by the user and offer fast, accurate control of the video image. The front panel controls include brightness, horizontal positioning, vertical positioning and image adjustment that improve focus, clarity and stability.

#### 3.1 Built-in-Test (BIT)

- a) Fans  
Fan RPM is monitored. The FAN FAULT indicator on the control panel will turn on if either fan slows below 1900 RPM. (Normal operation is 3100 RPM).
- b) Overtemperature  
The air temperature inside the monitor chassis is monitored. The OVER TEMP indicator on the control panel will turn on if the internal air temperature rises above 55°C.
- c) Video and Synchronization  
An internal test pattern generator is installed to provide an off-line test of the video channels and various modes of synchronization. The test pattern generator is enabled by depressing the BIT ON/OFF pushbutton on the control panel sequentially selects one of three test patterns:
  - 1. Crosshatch, sync on green, 76.5 kHz H, 72 Hz V
  - 2. White Field, separate composite sync, 70.6 kHz H, 66.4 Hz V
  - 3. Color Bars, separate H and V sync, 31.2 kHz H, 66.2 Hz V

#### 3.2 Controls and Indicators

##### Controls

- a) POWER ON/OFF  
Rocker switch located on top of chassis.
- b) Pushbuttons located on control panel:

##### Lamp Test

Lights the eleven (11) LED indicators on the control panel.



### BIT ON/OFF

Enables the internal test pattern generator.

### BIT STEP

Sequentially steps through the three available test patterns. (Crosshatch, white field, color bars) when BIT is ON.

### ↑ (UP)

Increases function value of adjustment mode selected.

### ↓ (DOWN)

Decreases function value of adjustment mode selected.

### SELECT MODE

Selects the function to be adjusted by the Up and Down Pushbuttons (brightness, horizontal coarse, horizontal fine, vertical position, horizontal position, master reset).

### RESET

Resets the function value of mode selected to factory nominal. All function values are reset to factory nominal when in RESET mode.

## **3.3 Status Indicators**

LED indicators located on control panel provide information on the operating conditions of the unit.

### OVER TEMP (Red)

Warning that internal temperature is  $\geq 55^{\circ}\text{C}$ .

### FAN FAULT (Red)

Warning that fan speed is  $\leq 1900$  RPM.

### BIT ON (Amber)

Indicates that the external video input is disabled and the internal test pattern generator is enabled.

### NO SYNC (Amber)

Indicates that the monitor cannot synchronize to the video input and has entered the power-save mode.

POWER (Green)  
Indicates power ON.

### **3.4 Mode Indicators**

The following are MODE indicators selected by the SELECT MODE pushbutton.

BRIGHT (Green)  
Indicates that the up/down pushbuttons control brightness for the RFP/20A. On the RFP/20B the UP/DOWN pushbuttons are always enabled for brightness..

COARSE (Green)  
Indicates that the up/down pushbuttons alter the total horizontal clock count.

FINE (Green)  
Indicates that the up/down pushbuttons adjust the horizontal clock delay.

VERT POS (Green)  
Indicates that the up/down pushbuttons adjust picture vertical position.

HORIZ POS (Green)  
Indicates that the up/down pushbuttons adjust picture horizontal position.

RESET (Green)  
Indicates that the RESET pushbutton will reset all adjustments to factory nominal.

### **3.5 Power Management**

When Horizontal or Vertical Sync is not detected, the unit will revert to a power saving mode. The green POWER status indicator will extinguish and the amber NO SYNC indicator will light.

When the Horizontal or Vertical Synchronization frequencies being supplied to the unit are not within the range of the AMLCD monitor (H-Sync Freq: 23Khz-80Khz, V-Sync Freq: 56 Hz-76Hz), the unit will go into it's power save mode.

## Section 4

### MAINTENANCE

Field Maintenance should be limited to front panel adjustments, external cleaning, air filter inspection and cleaning, and fuse replacement. Any action that requires opening the monitor chassis should be deferred to the depot or factory.

#### 4.1 ADJUSTMENT

The SELECT MODE pushbutton enables six adjustment modes sequentially: BRIGHT, COARSE, FINE, VERT POS, HORIZ POS, RESET.

The SELECT MODE pushbutton is used to select the parameter to be adjusted and the UP/DOWN pushbuttons are used to make the adjustment. The monitor will store the adjustment when the adjustment mode is exited either by depressing the SELECT MODE pushbutton, or by taking no action allowing the display to automatically store and terminate the adjustment sequence after a five second time-out.

The RESET pushbutton will initialize the setting for the adjustment mode selected. If the RESET pushbutton is depressed when in the RESET mode, all parameters will be initialized.

Following are the adjustment modes selected by the SELECT MODE pushbutton:

BRIGHT: Indicates that the up/down pushbuttons control brightness.

COARSE: Indicates that the up/down pushbuttons alter the total horizontal clock count. Use this adjustment to set the correct horizontal picture size and uniformity. If this adjustment is way out, you may have to go back and forth between the COARSE and HORIZ POS adjustments.

FINE: Indicates that the up/down pushbuttons adjust the horizontal clock delay. Adjust this for sharpest image.

VERT POS: Indicates that the up/down pushbuttons adjust picture vertical position.

HORIZ POS: Indicates that the up/down pushbuttons adjust picture horizontal position.

**RESET:** Indicates that the RESET pushbutton will reset all adjustments to factory nominal.

## **4.2 Preventive Maintenance**

The only periodic maintenance recommended is EXTERIOR SURFACE cleaning when necessary, and the periodic inspection and cleaning of the air filter.

### **4.2.1 Air Filters**

Depending on the environment, the air filters on the rear panel should be inspected periodically and cleaned as required with clean, dry, low pressure air or rinse with water and dry thoroughly.

### **4.2.2 Surface Cleaning**

The EMI window and exterior surfaces may be cleaned with standard non-abrasive glass cleaners applied with a soft cloth to avoid scratching the anti-reflective coating on the glass panel.

**NOTE: INTERIOR CLEANING OF THE MONITOR IS NEITHER  
REQUIRED NOR RECOMMENDED.**

### **4.2.3 Image Persistence**

Image persistence is the occurrence of a ghost image that remains on the display screen even after the display monitor has been turned off. Unlike cathode ray tube monitors that permanently burn the image into the phosphors, with liquid crystal displays, image persistence is not permanent. LCD's suffering from image persistence can be cleared by turning off the display monitor for a period equivalent to the duration in time that the offending image was displays. If the image was displayed for one hours, turn the monitor off for one hour to erase the ghost image.

**NOTE: The use of a screen saver is recommended whenever the  
screen is idle.**

### 4.3 Corrective Maintenance

The only field corrective maintenance recommended is fuse replacement and damaged air filter replacement. Any other corrective maintenance should be deferred to the depot or factory.

#### 4.3.1 Troubleshooting (No Picture)

a) If no front panel indicators are lit and LAMP TEST does not light the indicators, the most likely cause is no power input:

- 1) Is power connected?
- 2) Is the POWER switch ON?
- 3) Is the fuse OK?

If the answers are yes, the most likely problem is a failed power supply in the monitor.

b) If the NO SYNC indicator is lit, most likely the monitor is not receiving a video input or the video input is not a format recognized by the monitor.

- 1) Try the BIT test patterns.
- 2) If the BIT test patterns do not display and the NO SYNC indicator stays lit, the monitor is faulty.
- 3) If the BIT test patterns display correctly, check that the video input cables are connected properly and that the proper video signals are being supplied.

### 4.4 Replaceable Parts

#### Fuse

Description:	Fuse, Glass, 3AG Slo-Blo, 1.5A
Aydin P/N:	111-005-022
Manufacturer's P/N:	LITTLEFUSE (FSCM 75915) # 313 01.5 BUSSMAN (FSCM 71400) # MDL 1 ½

#### Air Filter

Description:	Filter, Air Foam, Alum. Frame 5" x 5"
Aydin P/N:	111-082-006
Manufacturer's P/N:	UNIVERSAL AIR FILTER (FSCM 58860) Use Aydin P/N to order

## **Section 5**

### **DRAWINGS**

Accessory Kit Parts List #354-0275-501

Installation Drawing #353-0179