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**HiTech Electronic Displays  
PRE-Installation Manual  
For  
PhotoBlazer and Sunblazer  
LED DISPLAYS**

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## Document Information

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### **CONFIDENTIAL**

**This document is provided for authorized installers of HiTech Electronic Displays systems only.**

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## Revision History

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<b>Date</b>	<b>Revision</b>	<b>Changes</b>	<b>Author</b>
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## Purpose

The expressed purpose of this '**HiTech Electronic Displays PRE-Installation Manual for PhotoBlazer and Sunblazer DISPLAYS**' is to assist the customer and/or the installer with the successful implementation of a **HiTech Electronic Display system**.

This document offers a general overview of the recommended method of installation of **SunBlazer** and **PhotoBlazer** products. Our intention is to achieve 100% success with our customers when using our displays.

Drawings provided in this manual are general in nature; the **Installation Manual** enclosed with the display will be specific to the requirements of the display being installed.

## Introduction

Throughout this document there will be **CRITICAL** issues discussed for the dealer to consider prior to shipment of the display. Consideration of these issues will make the installation of the display much simpler, cost effective, and give greater assurance of success.

**HiTech Electronic Display PhotoBlazers & SunBlazers:** are available in full-color (RBG) & monochrome (both single and 32 shade optional) displays. Either type of display can utilize the HX-1 (32 shade capability per color) or Z-series (single shade per color) CPU (Control Processing Unit).

Regardless of the type of CPU employed by the display, the User's Computer must meet or exceed the requirements listed in this document.

## **THIS DOCUMENT DOES NOT ADDRESS HX2 VideoBlazers.**

**When ever possible it is advised to 'Pre-Test' the display prior to transportation to the installation location. This step will allow the installer to identify issues that may have resulted from shipping, and at this point are easily remedied.**

This guide has been developed with the input and guidance from numerous customers who install HiTech Electronic Displays regularly.

**THE INSTALLER MUST HAVE THE "PRE-INSTALLATION MANUAL" AND THE "INSTALLATION MANUAL" ON-SITE WHEN INSTALLING A HITECH ELECTRONIC DISPLAY!**

## Receiving Your Display

**This is a CRITICAL procedure.**

It is important that the installer inspect the contents of their package immediately once the display arrives. Please note any visible damage on the 'Bill of Lading' prior to accepting the delivery. At this time, verify that the correct display has been received and ALL items listed on the 'Packing List' are included. This process should be done at the time of receipt, but must occur before the display is transported to the site for installation.

**When opening the crate in which your display is delivered in, use care! Remember that it is likely you will be re-using the crate to store and transfer the display to the installation site. Take care to assure that the display replaced back in the crate identically as it was received. HiTech uses hardware that should make this simple to accomplish.**

### ***Other Critical Considerations:***

- 1) Displays that are ordered from **HiTech** are shipped "**F.O.B.**"- **Freight On Board**. This means when a display is shipped from HiTech to a dealer, liability of ownership of the display is assumed by the dealer. The actual title to the display is NOT complete until final payment is made.
- 2) The packaging of your display is performed by trained professionals to withstand normal delivery stress. Normal procedures are that the documentation (installation manuals, instructions, user manuals, software) shares this container (or accompanies it in a separate container). As the recipient of the display, you are responsible for **OPENING** and inspecting your shipment. Immediately, verify that the items listed on the packing list, and the items you require for installation are present. It is **CRITICAL** that you determine if any physical damage has occurred during shipment as soon as possible. The shipper's liability may be in question if you not comply with this instruction. **Liability under F.O.B. terms become yours once the package (your display) has been shipped.**
- 3) After proper receipt and external inspection from the freight carrier, this item should be immediately opened and inspected closely to insure that NO HIDDEN DAMAGE has occurred. Should any damage be found, immediately call the carrier and CEASE any further handling of the display until an inspector has evaluated the shipment. Once it is confirmed that no physical damage exists, it is strongly recommended that the display be connected to proper AC power. **HiTech** normally provides AC service 'pigtail(s)'; these can be configured with a plug and used for testing purposes. The display, once power is applied and 'turned-on', the StartUp sequence begins. This sequence includes the following:
  - A) **CPU Memory**- This number will begin the sequence (such as \*1088) with Text based displays (**SunBlazers**). With shaded

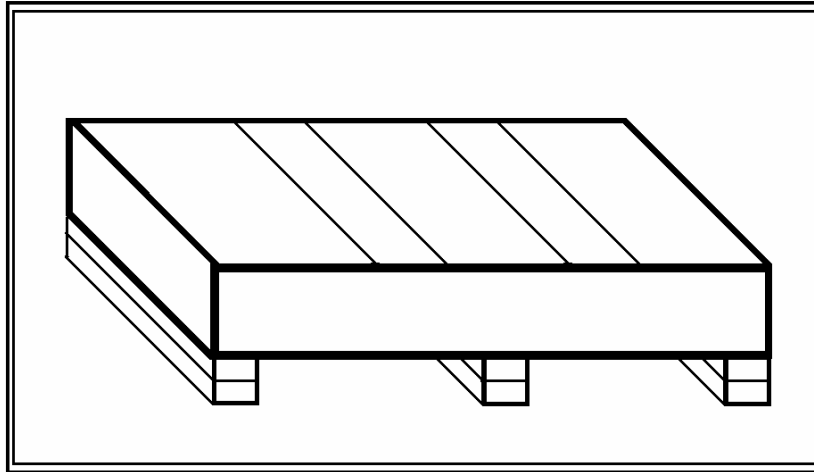
displays for graphics (**PhotoBlazers**) the number will occur later in the sequence (such as **128mb CF**).

- B) **HITECH-** All **SunBlazer** and **PhotoBlazer** operating firmware is the whole property of **HiTech Electronic Displays** of Clearwater, Florida and an authorized copy of this programming allows your display to work properly.
- C) **Firmware Revision-** Different displays use different programming for their Communication Processing Units (CPU) to receive and display information to the LED panels. Any service your display requires will be based on this number.
- D) **ID Number-** For a display that will stand alone, this usually will read **ID= 1**. For displays that are in use with multiple display systems, the number will correlate- **ID= 2, ID= 3**, and so on- to the identification number HiTech has provided for the CPU.
- E) **Baud Rate-** This is the 'Bits Per Second' that the display needs to be communicated to. If your personnel are equipped to attempt communication to the display, this information is needed to set up the control computer that any user wishes to use to display message with the software. The **Baud Rate** displays during the StartUp as **19200, 57600, 115200 bps** and is determined by the system of communications your sign is expected to use.
- F) **Communication System-** Most displays communicate through a Direct Connect mode.
  - **Cable** connected displays are normally Direct Connect or RF modem equipped.
  - **Local Area Network** produced displays will show "**LAN**" during the StartUp.
  - **Modem** Displays that communicate using a telephone number will display **Modem**. Until communications for the telephone modem equipped display is connected, the display will show **No Modem** after trying to locate the dial tone associated with this type of equipment. Once this is provided- **No Modem** should cease displaying on the end of the StartUp.

After the StartUp sequence is complete, the display will do one of two things, go dark since no play files are present or begin displaying pre-loaded playfiles.

## Important Storage Information

If installation is not immediate, you will need to store your unit. These following instructions can prevent damage caused by improper storing of the unit. You will have received the display(s) in a crate similar to the one in this illustration.



**HiTech Display Crate  
Laying Down**

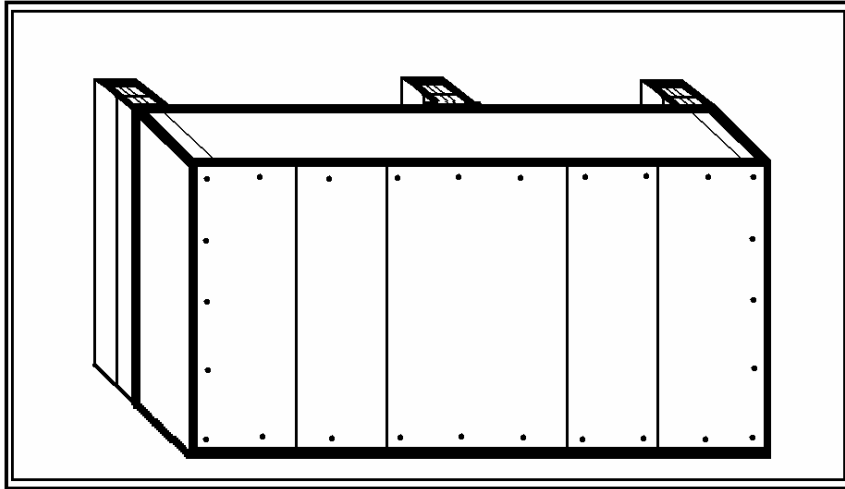
First, return the unit to the shipping crate (**pay close attention to the internal packaging**) and re-seal the case. You may choose to keep the documentation and peripheral equipment outside of the crate until time of install, but **REMEMBER** this material must be on hand for the installation.

Second, store the crate in an upright fashion as depicted in the illustration below. Pay close attention to the orientation of the display in the crate,

**YOU MUST STORE THE CRATE SUCH THAT THE  
DISPLAY IS IN THE UPRIGHT POSITION.**

This illustration assumes awareness of which side of the re-crated display is the “TOP” of the display and which is the “BOTTOM” of the display. Store the display upright with the “TOP” as shown. Brace this crate to protect the display from tipping over and damaging it.

**IT IS HIGHLY RECOMMENDED THAT THE UNIT BE STORE  
INSIDE. IF THE CRATE IS STORED OUTSIDE AND THE DISPLAY  
IS NOT CORRECTLY ORIENTED WATER DAMAGE CAN OCCUR.**



**HiTech Display Crate  
Upright for Storage**

## **The HiTech Model Number**

On the cover of each **Installation Manual** the installer will discover a HiTech Model Number. The installer may find this number useful for ensuring the display meets the needs of their customer prior to the installation.

**(Example):**                    **032-0160-090-DR00-NHA-MS-48-HX1**

**032** means the sign is **32 Pixels High**.

**0160** means the sign is **160 Pixels Wide**.

**090** means the **Pitch** is **.9 inches** from pixel center to pixel center.

**DR00** means you have a **4 LED Diamond RED** pixels.

**NHA** means the cabinet is a **NEMA** style cabinet (perforated door).

**MS** means this 2 sided display is set as a **Master/ Slave** configuration.

**48** means the display communicates via an **RS485 cable** connection.

**HX1** means this display set runs on an **HX1 Communication Processor**.

If you discover any of the characteristics of the display are different than you expected during the inspection of the display you received- please have this number and your **Work Order** number ready and call **Customer Service**.

## **Pre-Installation Checklist**

Provided here, the installer will find a **Pre-Installation Checklist for HiTech Displays** (Page One and Page Two) designed to insure that the equipment can be installed successfully.

Several items must be reviewed in advance:

- 1) HiTech displays must **NEVER** be welded in any way. The heat and /or electricity required to weld **CAN CAUSE EXTREME DAMAGE TO ELECTRONIC PARTS AND WILL VOID THE WARRANTY.**

Whether or not immediate damage occurs, undue stress has been placed on the electronic components and the HiTech Warranty is immediately voided.

- 2) The cabinet must **NEVER** be drilled or pierced in any form or fashion. Such actions will immediately void the HiTech Warranty.

The display is environmentally controlled internally and built to be weather-resistant. Any breach of the cabinetry can cause water, weather or foreign material contamination that will **DAMAGE** the display

**NOTE: All HiTech OUTDOOR displays are engineered with Installation rails or other pre-designed methods of attachment. An example is provided in this document to assist installers. Using this model can help to avoid any potential for electronic damage.**

**DO NOT WELD ON ANY HITECH DISPLAY CASE FOR ANY REASON. Furthermore, DO NOT DRILL OR PIERCE any HiTech MAINBODY case. Any of these actions will immediately VOID the Warranty.**

If, due to extenuating circumstances the above type of action is required, the installer **MUST** request and receive a HiTech Electronic Display Engineering Exception authorization form signed by HiTech Electronic Display's Chief Engineer. Only the Chief Engineer can sign this form and this form must be requested from the Technical Education Department by the project manager. Warranty is void without this action being certified prior to committing an act of this nature.

To use the next chart properly, the installer should recognize and understand the headings in the left column of the '**Pre-Installation Checklist**'. Each major heading is further defined into sub-headings located in the second column under '**Subject**'. These sub-headings may be further delineated by a three digit modifier. For example- **3.3** is further modified by part **3.3.1**.

The chart provides the installer, in column 3, with '**the Question**', and then the offers the most pertinent '**Subject**' (column 2) that pertains. In column 4 '**Your Objective**' gives guidance to the installer towards resolving the '**Question**'. The checklist is circular in nature, allowing you to start at any point and be directed to the correct response or action.

**Each heading is explained in greater detail throughout the body of this document.**

Pre-Installation check list:	Subject	the Question	Your Objective	Check
1.1 Permit:	for install	Can you install this display here?	Permitting the placement of a display is the responsibility of the owner. <b>See 1.1</b>	
1.2	for usage	How can you use this display here?	Local ordinances may control the length, style, transitions or color of an LED display message. <b>See 1.2</b>	
2.1 Mechanical:	Ventilation	Can the displays BREATHE?	Clearance between 'Back to Back' displays and proper ventilation of the enclosures is a MUST. <b>See 2.1</b>	
2.2	Structural	Will the displays be safe to hang?	Weight, Size and Superstructure are critical in regarding hardware and method for display attachment. <b>See 2.2</b>	
2.3	Required tools	Are you prepared to properly install?	Installers <b>will</b> need some specialized tools listed in this document. <b>See 2.3</b>	
3.1 Electric:	Service	Is display 110 or 220 VAC? Is service available?	HiTech builds for either option. You can insure your display is correct. <b>See 3.1</b>	
3.2	Grounding	Is FIELD GND required to be at "0" volts?	YES. The GREEN wire is critical to communications and the operation. <b>See 3.2</b>	
3.3	Wiring:	What Gauge is required for proper service?	Follow NEC Standards and drawings in the Installation Manual. <b>See 3.3</b>	
3.3.1	Conduit	Is conduit water-tite and how much distance?	Conduit protects electrical and communications wiring and SHOULD NOT share same conduit. <b>See 3.3.1</b>	
3.3.2	Circuit Breakers	Are breakers adequate and independent?	Dedicated isolated circuits to the junction box are prescribed. <b>See 3.3.2</b>	
3.3.3	Communication Equipment	Is electric service available for external equipment?	Comm. Equipt. Requires electric service to operate. <b>See 3.3.3</b>	
4.1 Communication:	RS232	What is the maximum distance of a RS232 cable?	50 ft. or less? Operating traits limit distance. <b>See 4.1</b>	
4.2	RS422/485	What is the maximum distance of a RS422/485 cable?	4000 ft. or less using shielded cable. Operating traits limit distance. <b>See 4.2</b>	
4.3	Ethernet:	What is the maximum distance for an Ethernet cable?	338 ft. or less. Operating traits limit distance. <b>See 4.3</b>	
4.3.1	IP Address	What is an IP Address? How do I get one?	A distinct number that identifies a network device. Network Administrator is required to assign this. <b>See 4.3.1</b>	
4.4	Fiber Transceiver	Are there any special concerns when running fiber optic cable? What is the maximum distance of a fiber run?	A Fiber Installer (specialist) is required to terminate and test. 6000 Feet. Fiber is not provided or terminated by HiTech. <b>See 4.4</b>	
4.5	Fiber Ethernet	Have Ethernet and Fiber issues been qualified?	<b>See 4.3 &amp; 4.4 &amp; 4.5</b>	
4.6	Phone Modem	What is required to implement this protocol?	Quality phone line and number must be provided. Dedicated telephone lines are suggested. <b>See 4.6</b>	

Pre-Installation check list:	Subject	the Question	Your Objective	Check
4.7	RF Modem	What is required to implement this protocol?	'Line Of Sight' for both antennas (NO PHYSICAL BARRIERS PRESENT) and proper orientation is critical. <b>See 4.7</b>	
4.8	RF Ethernet (802.11)	What is required to implement this protocol?	<b>See 4.3 &amp; 4.7 &amp; 4.8</b>	
4.9	Cellular Ethernet:	What is required to implement this protocol?	This is a hardware & service solution. A cellular modem, monthly service & an internet connection are required. The device requires an IP Address (from by the service provider) <b>See 4.9</b>	
4.9.1	Cellular service	Has the service surveyed the site?	Cellular data service is not available everywhere. A survey (done by the service provider) is required. <b>See 4.9.1</b>	
4.9.2	Internet service	Is internet service required to communicate to display?	It is critical for remote operation of a display that utilizes an IP Address, such as a cellular modem. <b>See 4.9.2</b>	
5.1 Computer:	Operating system	What operating systems does HiTech support?	Microsoft Windows only. <b>See 5.1</b>	
5.1.1	Minimum Requirements	What are the MINIMUM requirements for the user's computer?	<b>PLEASE SEE 5.1.1</b>	
5.2	Connectivity	How does a User's computer talk to the HiTech display?	Many communication choices avail with their own benefits & requirements. Connectivity depends upon the User's Computer, connectivity options, distance & environment. <b>See 5.2</b>	
5.2.1	Location	Does the location of the User's computer matter?	Yes. Numerous communication protocols are available. Distance from & environmental conditions surrounding the User's computer will often determine the type of Communication Equipment that will be required. <b>See 5.2.1</b>	
5.2.2	IT Access	What applications require IT access or intervention?	If an IP Address or inter access is necessary, this MAY require intervention by the Network Administrator. <b>See 5.2.2</b>	
5.2.3	Electric	Does the communication equipment require electrical service?	Each solution has its own particular need for power. Some are self-contained (powered by the computer or network) and others require external power sources <b>See 5.2.3</b>	
5.2.4	Ports	What is a Port? And is one required?	A User's computer has multiple communication connection 'Ports'. A successful installation WILL require a free 'Communication Port'. The most common type of connection is a Serial connection, which utilizes a DB9 cable. <b>See 5.2.4</b>	

## Instructions for Using the Checklist

The Check List/Instructions are written with linear logic and should be followed numerically.

### **The Installation Manual and the PRE- Installation Manual MUST be On-Site during installation of any HiTech Electronic display.**

#### **1. Permit**

- 1.1 **for install-** Licensing the installation prior to purchasing a HiTech manufactured display is HIGHLY recommended. This is **NOT** HiTech Electronic Display's responsibility. Be certain that a permit is attainable prior to committing your resources.
- 1.2 **for usage-** Being allowed to install this display does not mean that your user is allowed to use all of the capabilities of the display in every location. Local ordinances have occasionally prohibited or limited certain functions or color use, which are standard features in a HiTech display. It is in your best interest to understand the limitations of any such regulation.

#### **2. Mechanical**

- 2.1 **Ventilation-** Within the **Installation Manual** the installer will find mechanical drawings that specify the necessary distance that is required for Back to Back displays. Adhering to this requirement is a necessity to prevent damage to the electronics of the display. (You may request mechanical drawings in advance of the delivery of your display.)

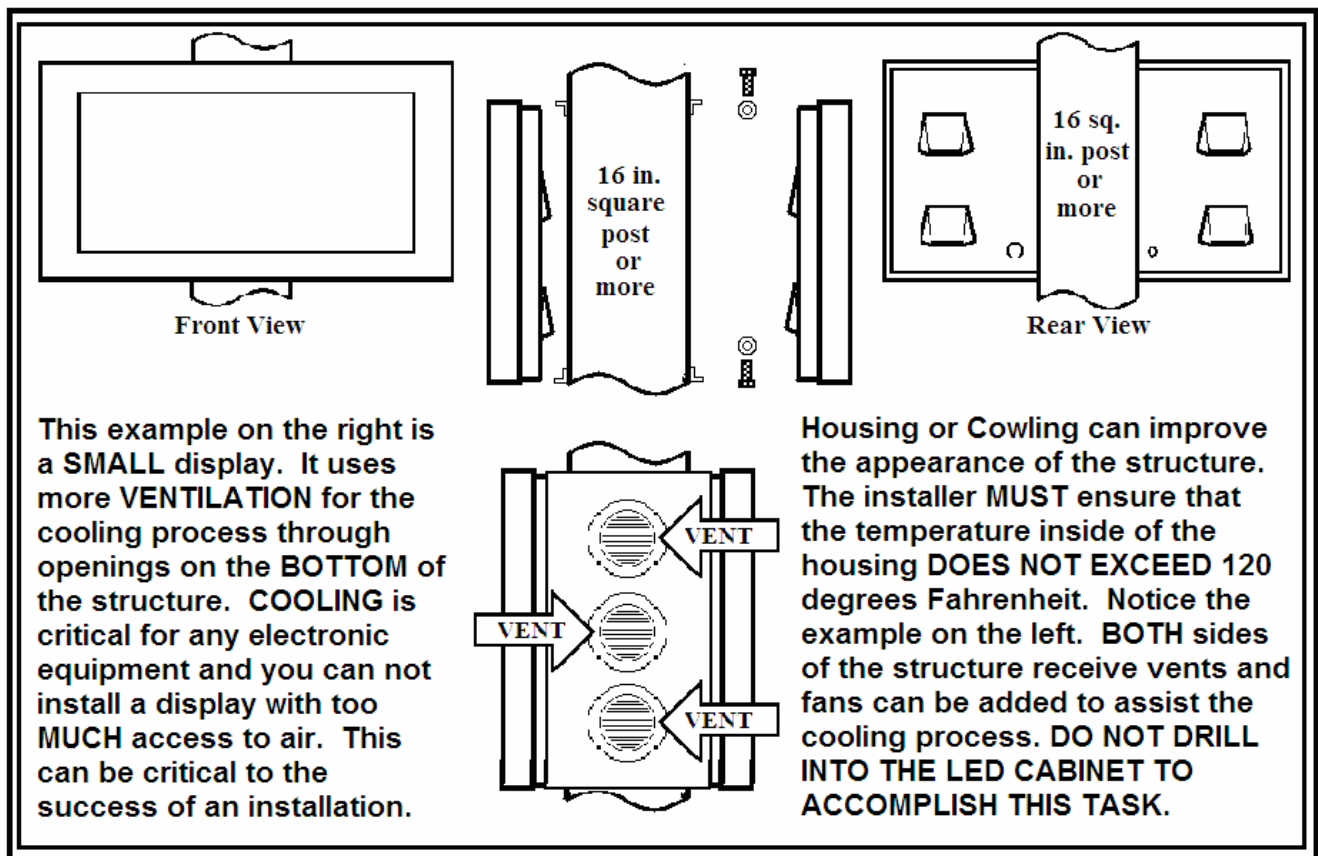
The installer is responsible for assuring not only that the 'outside' air can reach the vents on the display(s). But that such access provides for the proscribed CFM circulation required by HiTech. Extreme consideration for ventilation must be given when any 'housing or cowling' of the display is intended. Any enclosure to a display must have proper vent holes and screens allow for proper 'Breathing' of the display. See the example given for guidance.

#### **IMPROPER VENTILATION WILL VOID YOUR WARRANTY!**

Proper venting of a HiTech Display will assure that the 'ambient' temperature inside of the housing will not exceed

**120 degrees Fahrenheit.**

Proper ventilation will assure that the electronics maintain a temperature that is NEVER detrimental to the electronic components.



- 2.2 **Structural**- Structural considerations can be determined by using the drawings provided in the **Installation Manual**. Following normal industry installation guidelines is expected and assistance can be provided by our Customer Care Division. Attention to details such as, **NO WELDING**, not puncturing the cabinet, wind loads and superstructure viability are expected.

The **Installation Manual** includes a drawing that depicts the mounting of the display on one or two posts. These drawings can be adapted to your circumstances in most situations.

- 2.3 **Required Tools**- In most instances normal hand and power tools will be all that is required. HiTech's experience is that most installers are usually prepared with these tools as expected prior to an installation. Several specialty tools that may be required in addition to an installer's normal inventory include:

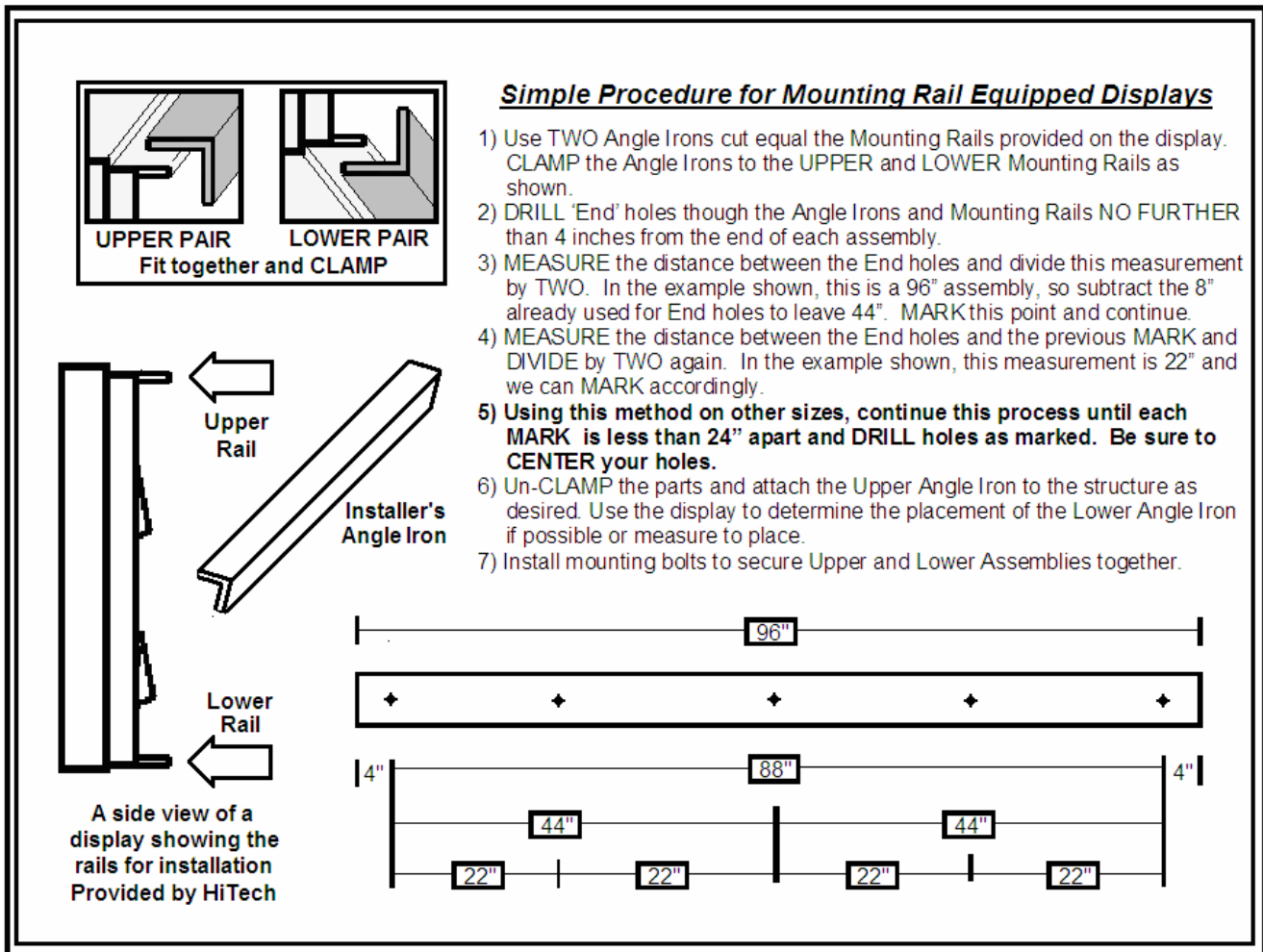
Jeweler's type screwdriver- Phillips and Common

Digital Voltmeter- must read AC and DC voltages to the second decimal place minimum.

#### **HIGHLY RECOMMENDED-**

**HiTech Display Tester HT-1 Display Doctor**-This tool can substantially reduce troubleshooting with unforeseen

difficulties that the installer may experience with the User's Computer or Communications Equipment.



### 3. Electric

3.1 **Service-** Insure the electric service you are providing to the display is the SAME as the electric service the display requires. The service required for this display can be verified by checking for the stickers on the back of the display cans and the mechanical drawings. Please note, these stickers can be lost or damaged during shipment.

**3-wire, 220 vac:** AC 'pigtailed' electrical wires provided will be color coded **1 RED, 1 BLACK, 1 GREEN.**

**4-wire, 220 vac:** AC 'pigtailed' electrical wires provided will be color coded **1 RED, 1 BLACK, 1 WHITE, 1 GREEN.**

**3-wire 110 vac:** AC 'pigtailed' electrical wires provided will be color coded **1 RED, 1 WHITE, 1 GREEN.**

**Be cautious NOT to misconnect an electric service for 220 VAC to a 110 VAC display or 110 to 220. The display will be damaged and will void the warranty.**

3.2 **Grounding-** Proper grounding must be accomplished utilizing a viable 'Field Ground'. This is integral to the proper operation of the display. HiTech provides for the field ground of the display using the GREEN wire. The installer should verify with the electrician that field ground is properly wired.

To insure proper compliance with this action, the installer should perform the following test on the aluminum case.

- 1) **Set the Digital Voltmeter for AC voltage measurement with a range higher than the voltage the display is operating under. For example: The display operates on 115 VAC. Set the Digital Voltmeter for 200 VAC.**
- 2) **Find (2) two points on the aluminum case of the display that are not painted. Connect your probes to these two places.**

**There MUST not be any AC voltage present!!!!**

If there is voltage present IMMEDIATELY contact your electrician.

3.3 **Wiring-** The required wire gauge for electrical service to the display is provided for in the **Installation Manual**. Should any discrepancy between the Installation Manual and NEC code exist, NEC code should be followed.

3.3.1 **Conduit-** Conduit used for the purpose of wiring the electric service should be in compliance with all local codes. Conduit must be water tight. Communication wires should never share the electric service conduit. A separate conduit must be provided.

3.3.2 **Circuit Breakers-** To better maintain and service a display, HiTech recommends that each display face utilize an independent electric service.

3.3.3 **Communications Equipment-** May be either internal and/or external to the display. The external communication equipment for your display- such as RF Modem (sender), External Telephone Modem, and 485 Converter- will require separate electric service. This can be accomplished using a normal 110 VAC service plug. Remember that the communication cable, also known as data line, **MUST be in a separate conduit from the electric service**. HiTech recommends that the electric and data cable are installed at a minimum of 6" apart. Fiber does NOT have this limitation.

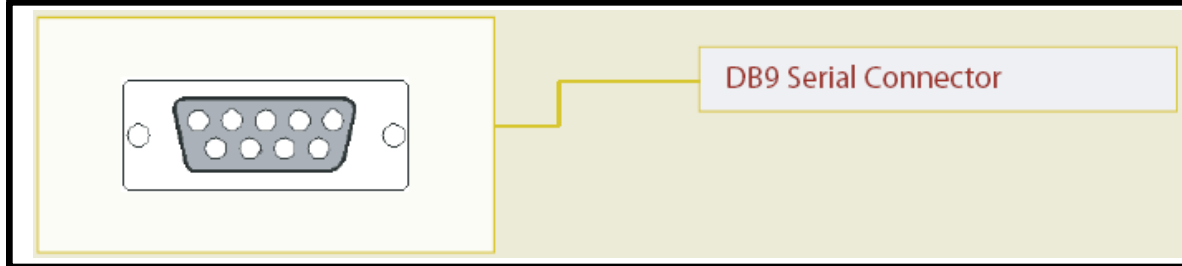
## 4. Communication

This checklist provides information for NINE different types of communication from the User's Computer to the display. The display will use ONE of these communication options. The **Installation Manual** will have drawings particular to the communication package being installed.

On the **Pre-Installation Checklist**, go to the system listed under "**Subject**" that pertains to your displays. Next, read the "**Question**" and the "**Objective**" to the right and read the instructions given here that relate to this communication.

4.1 **RS232**- A Serial Communication method is the basis of most Communications Systems used for HiTech displays. The installer should be familiar with these requirements.

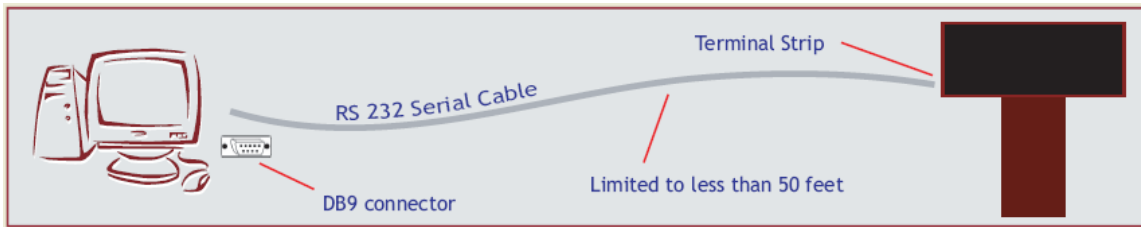
**DB9 Serial Connection**- A NINE pin data based connection may or may not be available from the User's Computer. If the Users computer does not have a DB9 Serial connector available, a Desktop Computer normally has a slot available of a PCI card with a DB9 adapter or and laptops can normally accept a PCMCIA card to provide this connection. HiTech's Customer Care Division can recommend a supplier for this part should one be required.



A user can also opt to use a USB to DB9 converter commonly called a PDA Download Converter. This part is available from most large electronic stores. HiTech does not recommend this adapter due to intermittent failures that have been experienced with different computers and adapters.

**Distance**- RS232 communication uses (2) unshielded wires plus a signal ground to achieve communication. The limits for the distance between a User's Computer and communication equipment for engaging the display is 50 feet. The same restriction of 50 feet exists should RS232 be used for the primary system to the display.

**Splicing**- Splicing will reduce the effectiveness of this communication option dramatically. RS232 is a Point-to-Point solution, the user cannot to connect to multiple drops or control points.



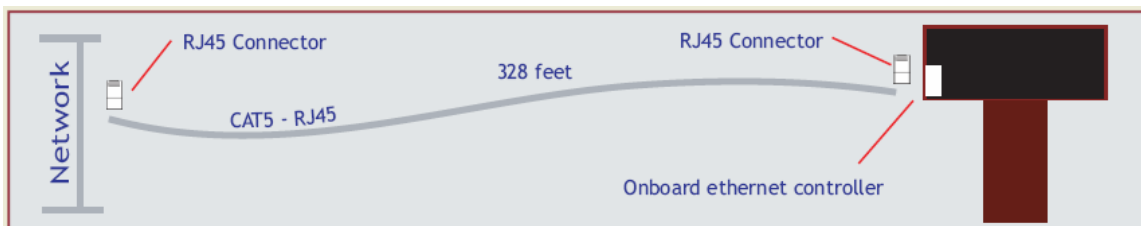
### RS232 Communication to the display

- 4.2 **RS422/485-** 485 communication utilizes a converter box (located near the users computer) to convert from RS232 to RS485 communication. RS422 operates in similar fashion to RS485. RS422/485 communication utilizes one driver and is capable of controlling one or multiple displays.



Notice that a 485 converter is required in this cable system; it can be located no more than 50 feet from the User's computer. From the converter to the display, HiTech specifies running Belden 9830 shielded cable, which has the capability of being run to 4000 feet. If the cable is NOT shielded the length of the run is dramatically reduced.

- 4.3 **Ethernet-** Utilizing a network solution for the purpose of communicating to a display has become more popular. Our customers have more desktops and laptops utilizing network communication than ever before. Utilizing the same network makes them more efficient. **HiTech** has several solutions designed specifically to work in this environment.



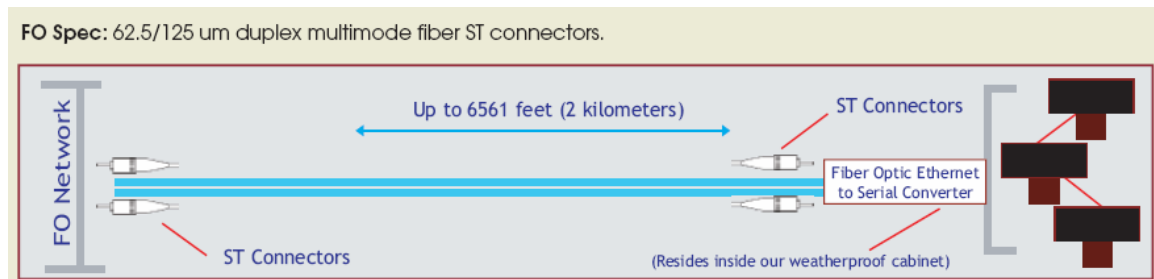
- 4.3.1 **IP Protocol-** If the communication solution utilizes a network to communicate to the display; the customer must provide access to the person who is responsible for the IP addresses on their network. It is imperative this person be available at all times during the installation process.

An IP Address is a unique identifier of a device on a network. The IP protocol allows the device to communicate on the network, with a 32 bit identifier such

as “220.120.8.16” or four numbers equal to or less than 255 separated by decimal points.

**NOTE: This address must be provided accurately by the user for purposes of communicating to the display in Ethernet configurations.**

- 4.4 **Fiber Transceivers-** HiTech does not install, supply or terminate fiber optic cable. A technician specializing in fiber cable must be on-site to install, terminate and test the run.
- 4.5 **Fiber Ethernet-** This format for communications allows the Ethernet address to connect to the Fiber link through the User’s network. All of the previously discussed criteria must be met for this system to operate successfully.



**Fiber Optic Spec.: 62.5/125 um duplex multimode fiber ST connectors.**

- 4.6 **Phone Modem-** Telephone line quality is imperative for the operation of this mode of communication. A telephone number should be available at the display for this purpose. A dedicated line is strongly suggested.



- 4.7 **RF Modem-** Generally, the user will connect a transceiver via RS232 port on their computer. This limits the distance from the computer to the transceiver to 50 feet. It is critical that this transceiver be able to “see” the display from this location. Often the antenna for this unit will be outside of the store or location that will transmit to the display.



**An example of a transceiver or RF modem**

**Blockage**

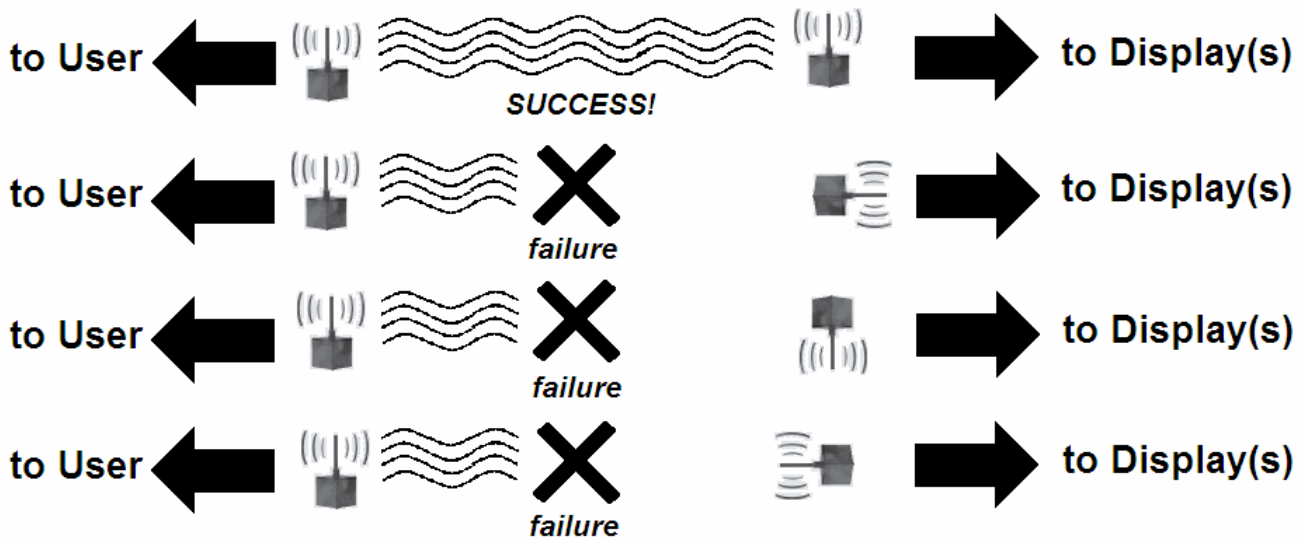
Blockage refers to anything which will stand between the TWO transceivers. BOTH TRANSCEIVERS SHOULD BE OUTSIDE BY HITECH INSTRUCTIONS. A wall, a tree, lead glass, or a passing truck will cause failure between the transceivers in operation.

**Height**

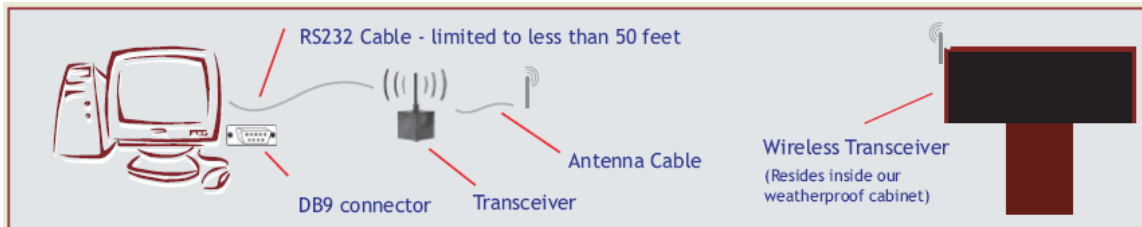
Having your antennas at the same height will dramatically improve their ability to communicate with each other. The higher they are placed, the less likely a passing truck failure is to occur.

**Perspective**

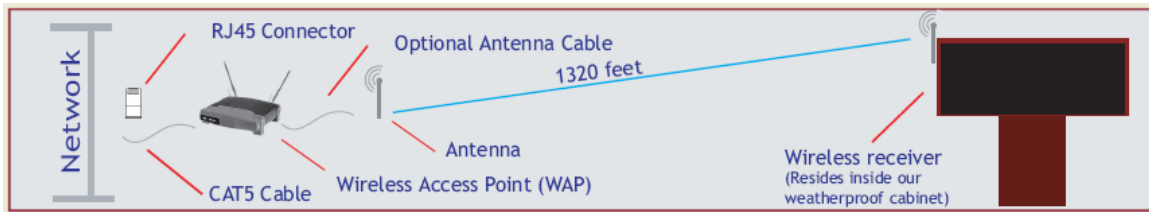
This term relates to the 'antenna' on TWO transceivers. When we say perspective, we are asking if the antenna matches at both ends of our communications loop. The example shows our antenna is "up". For the perspective to be correct, the matching antenna should also be "up".



This "Line of Sight" criteria must not be blocked in any way to ensure optimal communications. Perspective and similar heights can also be critical- if one antenna points "up" then the other antenna should also point "up".



4.8 **RF Ethernet (802.11b)** - This form of communication uses RF so Line of Sight between antennas must be clear. Since Ethernet connects to a Wireless Access Point (WAP), a Network Administrator will also be required to assign an IP address, SSID and encryption.



RF Ethernet requires a Wireless Access Point with a clear Line of Sight to the display, TCP/IP Network with static IP address(es), port forwarding may be required, Qualified MIS personnel to implement the Network installation.

- 4.9 **Cellular Ethernet-** Cellular Ethernet is highly effective in the control of multiple locations from a single user who is remote to the sites. It can also be highly useful where geographic distance or terrain structures create LOS (line of sight) issues prohibiting the use of standard wireless communication equipment. Cellular Ethernet is designed to enable two-way communications between remote locations, allowing for the transmission of data from any internet-enabled computer to a remote display. The cellular modem will require activation from a cellular carrier, i.e. Sprint, Verizon, Cingular.



- 4.9.1 **Cellular Service-** Prior to the installation of this type of communications the provider will assess if cellular data service is available for this user at this location. This survey is **REQUIRED** before installation.

- 4.9.2 **Internet Service-** The user must have Internet access to use this form of communication.

## 5. User's Computer

With the display and the communication system working properly, the User's computer is the final part of the installation for review. The operating system of the user's computer and the connectivity provided are critical to the installation.

### 5.1 Operating System

HiTech displays and software are compatible with Microsoft operating platforms only.

### 5.1.1 Minimum Requirements

The following chart describes the minimum requirements for a User's computer plus the recommended requirements for a User's computer. The successful operation of the software and communication is dependent on these requirements.

Minimum System Requirements	Recommended System Requirements
Windows 98 Second Edition, Windows NT 4.0 SPA6 or greater, Windows 2000, Windows XP (Home/Pro), or	Windows 98 Second Edition, Windows 2000, Windows NT 4.0 SPA6 or Windows XP (Home/Pro)
Pentium Class 166 megahertz (MHz) processor	Pentium Class or AMD Athlon K6 266 MHz processor or faster
64 MB RAM	128 MB RAM
256-color video card	US Robotics V.Everything External Modem (where applicable)
130M Free space (300Mb Required during installation after IE5.0 and MDAC installed)	130M Free space (300Mb Required during installation after IE5.0 and MDAC installed)
Internet Explorer 5.0 or higher, MDAC (Included in with the Complay3.0 Install)	10/100 Ethernet Network Adapter (where applicable)
56K Modem/ 10/100 Network Card, or RS232 Connection Method (Depending on the Display Connection Method)	RS232 Serial Port on your PC (some computer may need an USB to Serial adapter)

## 5.2 Connectivity

Several areas regarding connectivity have been discussed in the previous section 4. "Can the User's computer connect to the display?" This question is a simplification of our goal and is dependent upon the user's computer meeting the operating requirements and communication equipment connections.

### 5.2.1 Location

The location of the User's computer often determines the requirement for communication equipment. Line of Sight and/or distance to the display should be determined prior to this installation for optimal usage of the display.

### 5.2.2 IT Access

Many users require assistance/authorization from IT personnel to install software and communication equipment. It is advisable to have a network Technician available during these installations.

### 5.2.3 Electric

Usually, the user's computer has electric service provided. Make sure that service is also available for any communication equipment that may be required as well.

#### 5.2.4 Ports

In most communication situations a (DB9) serial port will need to be available on the user's computer. Network displays and Cellular modems do not generally require a serial port.

### About Temperature Probes

The User may desire to display the current temperature on their display(s). The ability to accomplish this depends upon an optional piece of equipment HiTech offers called a **Temperature Probe**. It is critical that the installer plan the placement of this probe prior to the installation of our displays.

The **Installation Manual** will offer several options for installing this equipment. Several considerations should be made in advance though.

- 1) The **Temperature Probe** must be connected to the **Master** display via a cable provided for this purpose. If housing or cowling is applied to this installation, the installer must provide an opening for this cable to allow the **Temperature Probe** to be mounted outside of the housing.
- 2) This equipment must not touch the metal of the display or any other material that could transfer heat to this sensor. A mounting device is provided with the probe.
- 3) The **Temperature Probe** should NOT be mounted in direct sunlight. Mounting the **Temperature Probe** without allowing shading will cause temperature inaccuracies for the user.

### Conclusion

PhotoBlazers and SunBlazers are designed as highly durable electronic equipment, designed to withstand most environmental concerns once properly installed. Adherence to the principles outlined in this document, and knowledgeable application of them, will do much to assure the end-user enjoys many years of trouble free usage.

HiTech values the partnership that exists with all of our clients. We will happily assist the installer and the end-user in reaching their goals as our customers.

Contact HiTech Electronic Displays Customer Care Division at (727) 531-4800 with any further questions.



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