Ultra™

Installation Instructions

Form TEEWA546A0

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Safety Information

For your safety, read this manual thoroughly before installation of the equipment.

Installation is intended to be performed by properly trained technicians. The safety messages presented here are reminders to the installer to exercise extreme caution during installation and training on the aligner.

There are many variations in procedures, techniques, tools, and parts for installation due to varied shop configurations. Because of the vast versatility of installation the manufacturer cannot possibly anticipate or provide advice or safety messages to cover every situation. It is the technician's responsibility to be knowledgeable of the equipment to be installed. It is essential to use proper service methods and perform installation in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area, the end user, the equipment or vehicle being serviced.

It is assumed that, prior to installation of the aligner, the operator has a thorough understanding of imaging alignment systems in general. In addition, it is assumed he has a thorough knowledge of the operation and safety features of the alignment rack or lift, and has the proper hand and power tools necessary to perform the installation in a safe manor.

These safety precautions should always be followed, including:

1. Read all instructions.
2. Care must be taken as burns can occur from touching hot parts.
3. Do not operate power tools or equipment with a damaged power cord or if the equipment has been dropped or damaged until it has been examined by a qualified serviceman.
4. Do not let cord hang over edge of table, bench or counter or come in contact with hot manifolds or moving fan blades.
5. If an extension cord is necessary, a cord with a current rating equal to or more than that of the equipment should be used. Cords rated for less than the equipment may overheat. Care should be taken to arrange the cord so that it will not be tripped over or pulled.
6. Always unplug equipment from electrical outlet when not in use. Never use the cord to pull the plug from the outlet. Grasp plug and pull to disconnect.
7. Let equipment cool completely before putting away. Loop cord loosely around equipment when storing.
8. To reduce the risk of fire, do not operate equipment in the vicinity of open containers of flammable liquids, such as gasoline.
9. Adequate ventilation should be provided when working on operating internal combustion engines.
10. Keep hair, loose clothing, fingers, and all parts of body away from moving parts.
11. To reduce the risk of electrical shock, do not use on wet surfaces or expose to rain.
12. Use only as described in this manual. Use only manufacturer's recommended attachments.
13. **ALWAYS WEAR SAFETY GLASSES**. Everyday eyeglasses only have impact resistant lenses, they are NOT safety glasses.
14. Know and understand the proper operating procedures for all power tools used.

IMPORTANT!! SAVE THESE INSTRUCTIONS
DO NOT DISCARD!!

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Contents

INTRODUCTION

An Ultra™ aligner is installed much the same as conventional imaging machines, however there are unique considerations which must be addressed. Follow these instructions carefully for a successful installation.

An Ultra™ system normally does not require RCP calibration at installation. The camera beam is pre-assembled and is factory calibrated and can be placed into service shortly after installation and setup. Camera subassemblies do not have to be replaced as a pair. It is possible to replace camera assemblies individually. A field “RCP” calibration procedure must be performed whenever a camera is replaced, moved or disturbed.

Two types of camera beam mounts are available at this writing, a rigid single column support, and a movable beam support. While this document focuses primarily on the rigid support, many issues are discussed that may be relevant to the installation with a movable beam support. Refer to the moveable beam manual for details of its installation in the event of its purchase.

These instructions cover the main topics of Ultra™ installation:

- ⇨ Preparing for installation
- ⇨ Qualifying the site for installation
- ⇨ Console assembly and setup
- ⇨ Placement/assembly base and support column
- ⇨ Camera Beam mounting procedure
- ⇨ Cable Connection
- ⇨ Initial operation of Ultra™ software

Before attempting installation, read these instructions thoroughly and understand the tasks involved. Review all requirements of installation to avoid oversights resulting in lost revenue, and lost customer confidence. Be aware of the environment conducive to the optimum performance of imaging alignment. Procure the necessary tools to do a quality job and last and most important, perform the installation safely by observing all precautions associated with the task at hand.

1. TOOLS AND EQUIPMENT REQUIRED FOR INSTALLATION

Study the list below and make procurement arrangements prior to installation. Time is poorly spent searching for proper tools once the project has begun. The check list below is comprehensive and based on actual installations in a variety of locations.

- ☐ T-handle Ball-end Hex Wrenches; 3/8, 3/16, 1/8, 3/32, 5/32
- ☐ #1 and #2 Phillips Screwdrivers
- ☐ Box End or Combination Wrenches: 3/4 - 7/8; 9/16 - 1/2; 7/16 - 3/8
- ☐ Tape Measure - Used To Square The Optics With The Lift Center Line, And For Camera offset
- ☐ Chalk Line - Used For Lift Center Line
- ☐ 2 Or 4 Foot Level - Leveling Support Column
- ☐ Tin Snips - Used To Open Carton Banding
- ☐ Box Cutters - Opening Cartons
- ☐ Electrical Tape - Secure Wires
- ☐ Plastic Wire Ties - Dressing Cables
- ☐ VOM - Verifying Supply Voltage
- ☐ 16 Oz. Hammer - Set Anchor Bolts
- ☐ Hammer Drill And Good 1/2” Bit
- ☐ Carpenters Pencil - Mark Support Location On Floor
- ☐ Calibration Bar - Checking the camera view or aim
- ☐ Glass Cleaner And Rags - Cleaning Of Targets After Install if Necessary
- ☐ Small Flashlight
- ☐ Adjustable Wrench
- ☐ Instructions

ASSEMBLY AND SETUP OF THE CONSOLE

Consoles are shipped mostly complete, however some minor assembly is required upon installation. Refer to the illustration below for a completed console. The installation personnel will be required to assemble the clamp hanger brackets to the cabinet, In addition, the computer and its peripherals must be placed into the console and wired together.

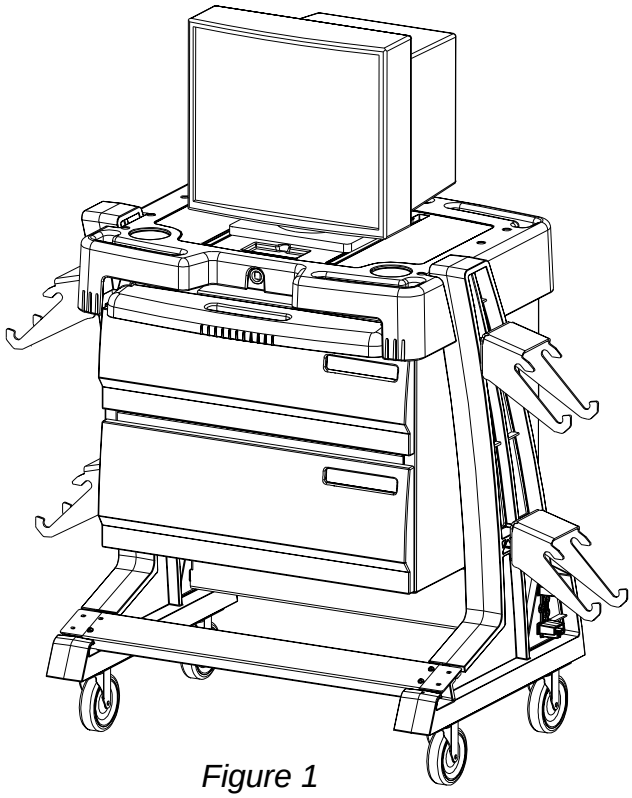

Figure 1

1. Remove the console from the skid.
2. Install the wheel clamp hanger brackets onto the side of the console.
3. Locate all cartons associated with the console and computer assembly.
4. Inspect each component for damage, notify shipping company immediately if dam aged, report any shortages to customer service.
5. Place the Monitor on the console top, secure with the sliding fasteners.
6. Remove the back panel from the rear of the console as shown in Figure 2.
7. Place the desktop PC into the top console shelf from the front.
8. Place the keyboard and the mouse on the sliding drawer. Feed the cables through the hole in the middle of the drawer. Secure cables to underside of drawer with plastic cable ties.
9. Place the printer in the bottom console drawer. Install toner cartridges and paper.
10. Route cables from each of the above peripherals to the rear of the PC. Refer to the drawing detail in Figures 2 and 3 for proper cable connections.

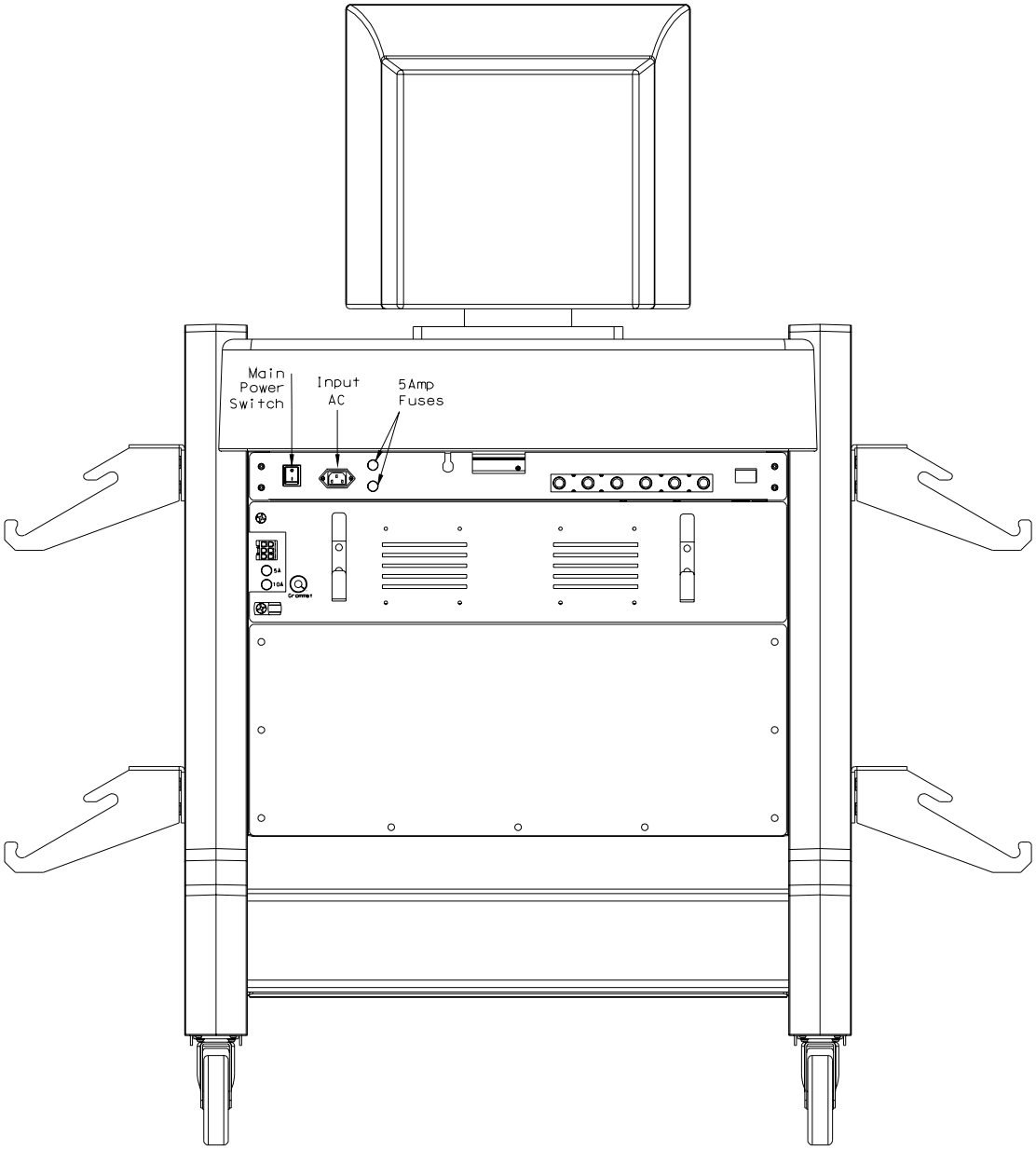

Figure 2 - Console rear view with PC access panel attached

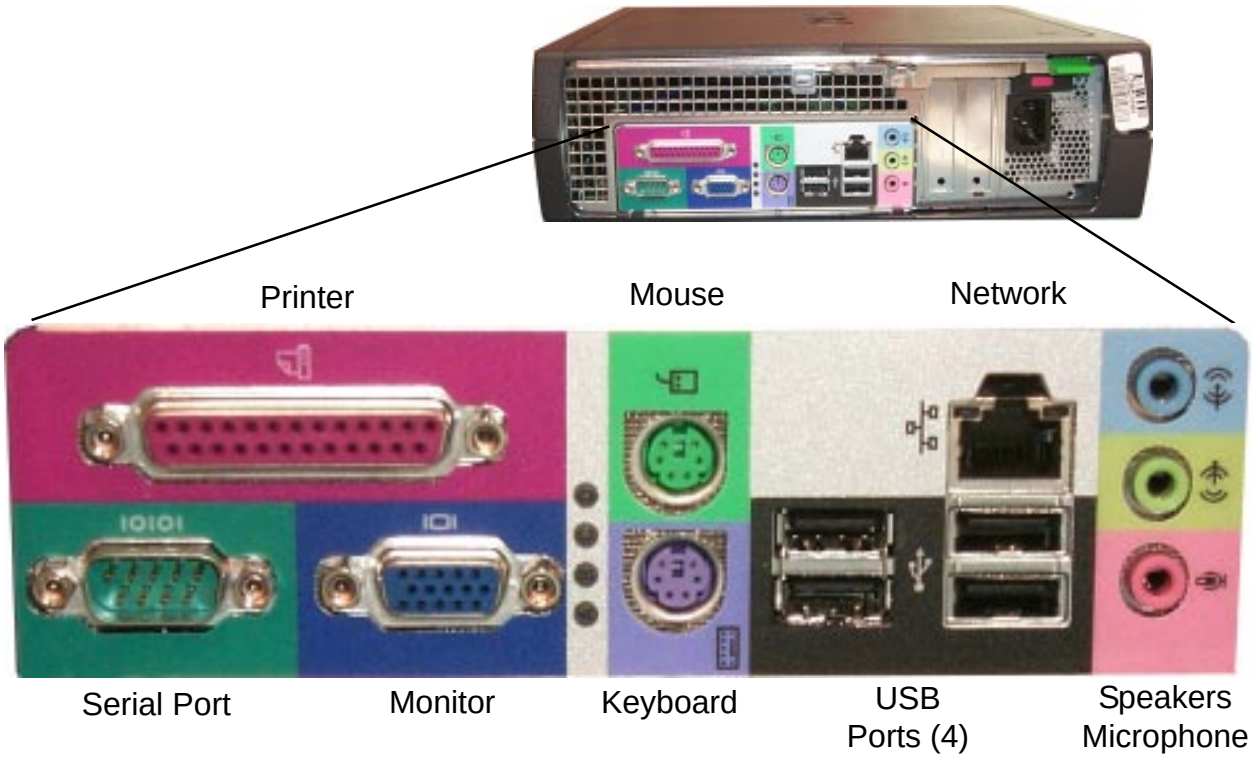

Figure 3 - Rear view of PC

NOTE: Check interconnect harnesses and cables before applying powering to PC.

Using the Console to View Camera Assembly Instructions

Once the Console is assembled, the PC can be booted and software configuration finalized. Verify proper PC operation before reattaching rear panel.

QUALIFY THE SITE FOR INSTALLATION

The Pre-Installation checklist was created primarily with sales personnel in mind, however it can be used as tool to verify bay conformance to requirements. Below are some key issues to consider for a successful installation. See Figures 4 and 5 on pages 9 and 10 for a typical bay layout.

Power Source

115 volts AC, 15 amp noise free dedicated service, assure a good ground

Rack integrity:

Is the rack/lift safe, are the lock mechanisms secure
Check for runway coplanar at all heights
Is rack relatively level - for ease of rollback
Turntable condition - free from binding, do they exhibit good rotational stability
Rollback requirements - is a kit required - acquire if necessary
Is the field of view conducive with imaging alignment (no obstructions)

Floor integrity:

Will the floor adequately support the rack, has a core test been performed?
Is the concrete properly cured, new flooring should be cured at least 28 days.
Are there any pipes, or wiring under the floor that could be drilled into?
Will the floor flex, crumble, are there expansion joints?

Environmental concerns

Inspect the area for heaters, reflections, adjacent machinery, fans, RFI etc.

Space requirements

Can the camera be positioned from the TT a distance from 90” to 120”
(108” - 114” recommended)
The distance between the tower baseplates of 81” to 93” (87” recommended)

Adjacent Power Noise

Look for motor noise/hash, shared processors, RFI

Ergonomics

Can the operator move about freely to work safely and view the CRT
Will the movable camera beam feature be utilized in the installation?

INSTALLATION BASELINE LAYOUT

These instructions assume a lift or rack is being used as the alignment surface. If the floor is to be used, identify the spot where the turntables will rest, and base measurements from that spot. Reference *Installation Dimensions Worksheet 1* for the following steps.

1. Determine the ***Lift Centerline***. Measure between runways front and rear and mark midpoints on both. A mark can be made forward of the lift by placing one end of a string at a spot on one side of the lift, placing a marker on the other end of a string, and scribing an arc forward of the lift across the centerline. Repeat scribing an arc from the same spot on the other side of the lift. The intersection of the two arcs is the lift centerline. Use a chalk line to snap a centerline between the marks, and project out at least 114 inches in front of the rack, or to the shop wall if closer. See *Figure 5*.

2. Determine the ***Turntable Centerline*** by raising the lift to the predetermined alignment height (step 1). Use a plumb-bob from the center of the turntable and mark a spot on the floor next to each turntable. Snap a chalk line through the marks to establish the centerline. Use the plumb bob on the outside of the turntables to mark a center spot on the floor on the outside of each runway (See *Figure 5*.

3. Determine the ***Turntable Height*** (the normal operating height of the rack). On a multilevel lift (i.e. parallelogram) put an average size car on the lift and raise it until the alignment technician feels comfortable performing wheel turns, rolling the vehicle back and forth, and making toe/camber adjustments from underneath. On other lifts/racks (such as a hoist rack) it is necessary to use the leveling leg height. Typical turntable height is from 30” to 36”. See Figure 4, page 9.

   Measure the distance from the floor to the top of the lift turntables, record this value in the worksheet as TURNTABLE HEIGHT, measurement “A”

   If the user will be operating the Ultra™ without the moveable beam option you may want to mark this height position so it is easy to raise the lift to this chosen height later – this is the height the operator must use when performing alignments. One way is to hang a chain from the lift so it hangs just off of the ground when the rack is at alignment height – this should be visible from the lift operation controls.

4. Determine the ***Installation Baseline***. The Ultra™ camera supports must be installed a minimum of 90 inches (2286 mm), and no greater than 120 inches (3048 mm) from the center of the turntables to the rear of the support base. The ideal distance for optimum performance is 108” - 114” (2743 - 2896 mm). Measure 108” – 114” (or whatever the space will allow within the above parameters) from the turntable centerline forward at two locations and mark these points. Snap a chalk line on the floor through these two points. This is the *installation baseline* (See *Figure 5*). Record this distance in the *INSTALLATION DIMENSIONS WORKSHEET 1* shown on page 8.

   Measure the distance from the Turntable Centerline to the Installation Baseline. Use this figure to determine value “B” in Worksheet 1

INSTALLATION DIMENSIONS WORKSHEET

Use the following table to enter measurements to determine height to setup camera pods.

1) Distance between the ground and the turntable top with the lift at preferred working height:

TURNTABLE HEIGHT = (A) _____

2) Distance from turntable centerline to the Installation Baseline: (Maximum = 120", Minimum = 90")

TABLE 1

BASELINE DISTANCE*	**CAMERA OFFSET HEIGHT (B)**
If at 90" (min)	22"
If at 100"	24"
If at 110"	26"
If at 120" (max)	28"

* Use the setting closest to actual

DESIRED CAMERA OFFSET = (B) _____

NOTE: RAISE LIFTS/RACK TO THE PREFERRED WORKING HEIGHT BEFORE MEASURING

4) Determine Camera Height (Add)

(A) Turntable Height _____ **inches**

(B) Camera Offset **+** _____ **inches**

(C) Overall Camera Height **=** _____ **inches**

Fine tuning of the camera position or camera view at the completion of installation

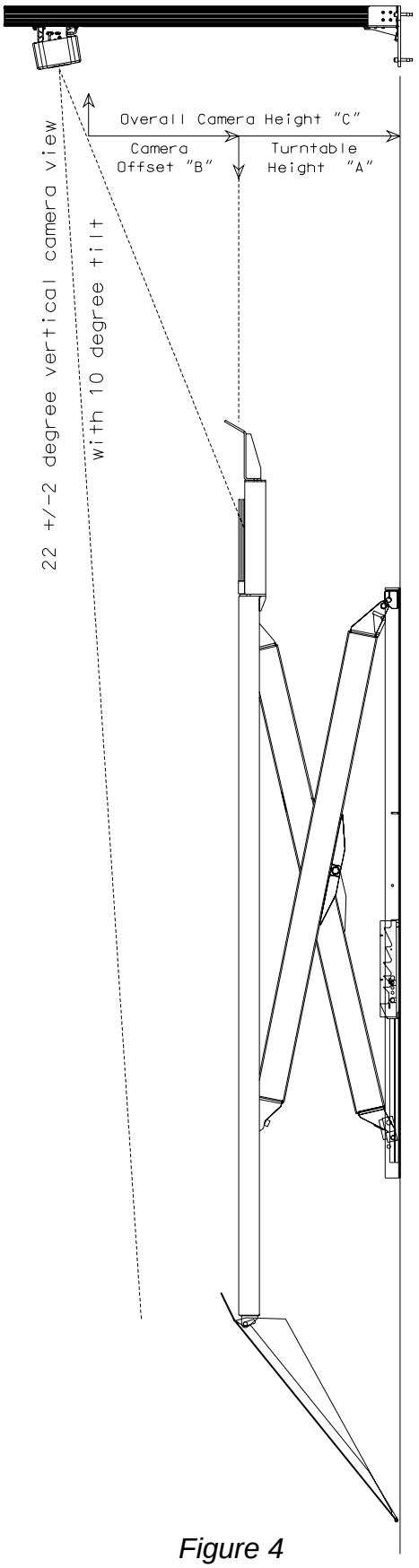
Overall Camera Height "C"
Camera Offset "B"
Turntable Height "A"
22 +/-2 degree vertical camera view
with 10 degree tilt

Figure 4

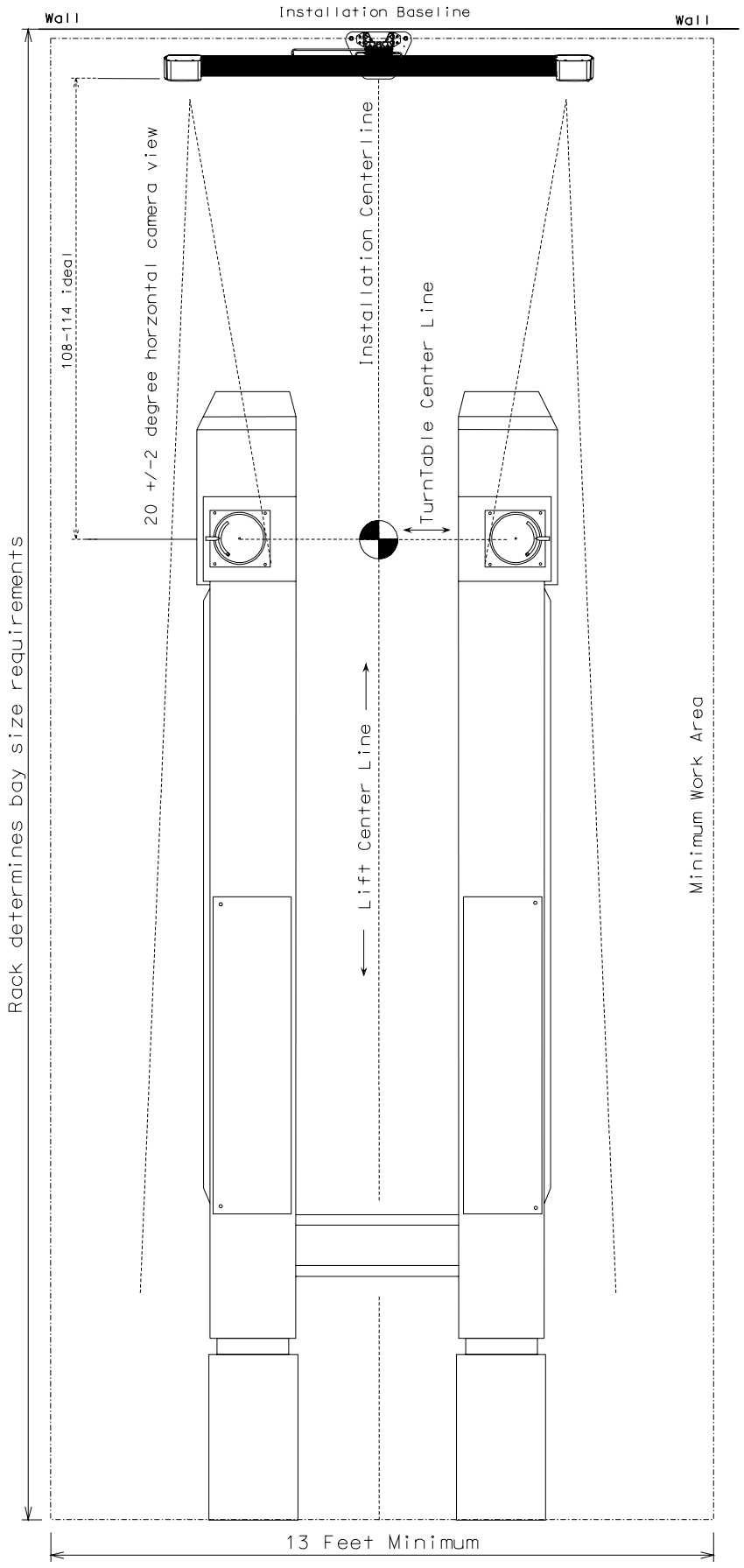
Wall
Installation Baseline
Wall
108-114 ideal
20 +/-2 degree horzontal camera view
Installation Centerline
TurnTable Center Line
Lift Center Line
Rack determines bay size requirements
Minimum Work Area
13 Feet Minimum

Figure 5

SUPPORT BASE AND COLUMN ASSEMBLY

The support base assembly is shipped pre-assembled, however in the event component assembly is required follow these instructions for proper procedures.

1. Loosely assemble eight (8) T-nuts onto the support bracket. Note the location of nut extrusions, they should face away from the support. Refer to Figure 6 for orientation. Do not tighten screws at this time.

2. Mount Support Bracket/T-nut assembly onto base plate as shown in Figure 6 and secure using seven (7) 5/16-18 cap screws. Snug but do not tighten, hardware will be tightened when support column is placed onto the base.

3. Position column/base assembly onto floor and square up with the installation baseline and lift center line using measurements made earlier. Refer to Figure x on page x for layout detail. Using a marker, mark the hole locations for the 3 mounting bolts with each plate.

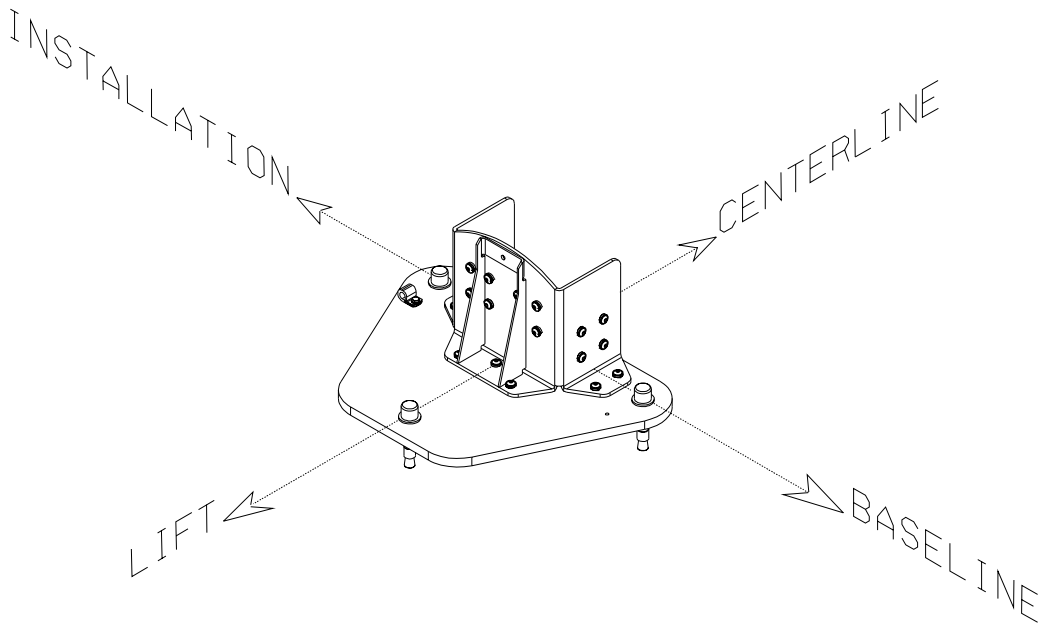

Figure 6

4. Using a rotary hammer drill equipped with a good 1/2 x 12 inch bit, bore one hole carefully. It is generally a good idea to drill all the way through the slab so that if the anchor must be removed later, it can be driven through the concrete and into the ground below. Clear debris before proceeding. Continue one hole at a time until all three are inserted.

   HINT: *Bore one hole, tap in an anchor bolt and lightly secure the base with this one bolt. Proceed boring another hole using the hole in the base as a guide.*

HINT: *Pour a small amount of water into the hole as it is being bored to significantly reduce concrete dust. Use a shop vacuum to clean area before proceeding.*

NOTE: *Do not pound anchors into holes. Excessive pounding will deform the anchor bolts and make future service difficult.*

! ! DO NOT BOLT DOWN PLATE PERMANENTLY AT THIS TIME ! !

3. Slide vertical support column downward onto the support/base assembly. Tighten support to column nuts firmly followed by tightening the support to base screws. Remove anchor nuts and lay base-column assembly over with the top resting on a support.

ATTACHING THE CAMERA BEAM

1. Pre-assemble hardware to the beam mounting block as shown in Figure 7. Use one (1) 5/16-18x1.0 inch carriage bolt, one (1) flat washer, two (2) flexible washers, one (1) spacer washer and one (1) ESNA nut in each of the four mounting holes.

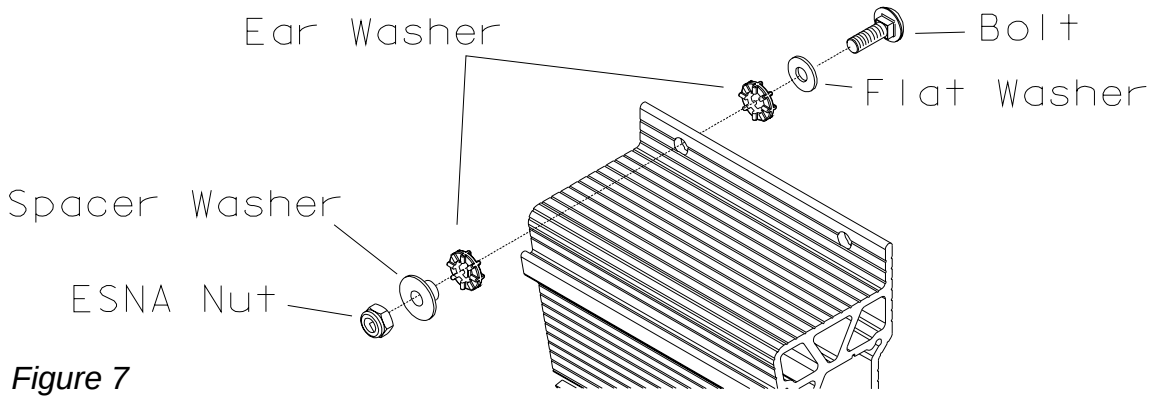

Figure 7

2. Slide the camera beam mount into the mating slots of the support column. Slide about three fourths the way down the column for now. Snug the two top ESNA nuts temporarily. This will make it easier to tilt the the column/beam assembly into place and onto the achors in the next step.

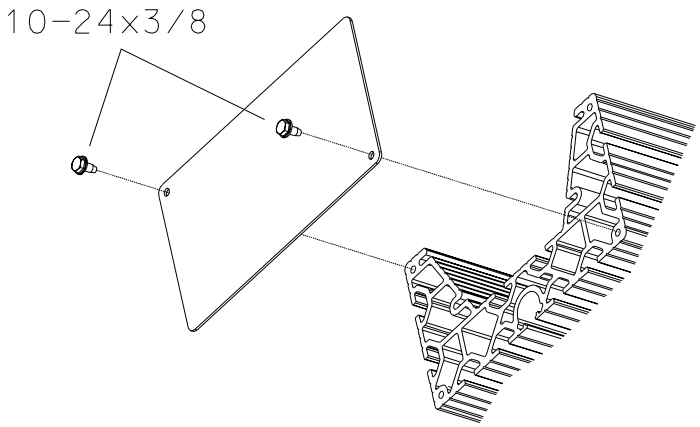

Figure 8

4. Install the top cover plate onto the support column using two (2) 10-24x3/8 self tap screws. Requires a 5/16 socket or nut driver. See Figure 8.
3. Raise the support column and beam assembly onto the anchor bolts and snug firmly.

NOTE: *Support and beam assembly may require final aim (squaring) once camera view is available. Final Leveling of the support and squaring of the camera beam will be performed once camera view is possible.*

4. Raise the camera beam to the desired height as recorded earlier in the *Installation Dimensions Worksheet*. Use a torque wrench with a 1/2 inch socket to tighten all four ESNA nuts to 40-50 in-lbs torque. Figure 9.

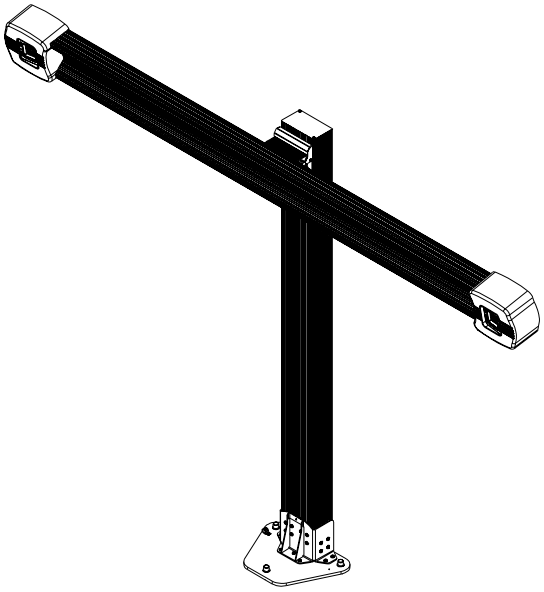

Figure 9

NOTE: *The ESNA nuts must not be overtightened. The purpose of the ear washer is to attenuate vibration of the beam*. *The spacer washers are used to prevent excessive crushing of the "ear washers".*

5. Install the upper and lower bracket covers onto the beam mount as shown in Figure 10. Loosen the hardware securing the communications board cover plate and slide the covers under the 10-24x3/8 self tap screws. Requires a 5/16 socket or nut driver. Make sure the covers do not contact the vertical support beam.

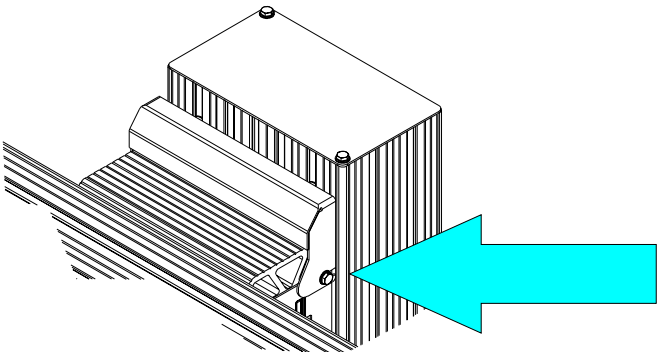

Figure 10

CABLE CONNECTION

1. Locate the gray sheathed power and interface cable assembly. Attach the power connector to the receptacle on the rear of the console. Route the USB cable through the grommet then to the rear of the PC. *NOTE: Grommet may require cutting.* Secure cable to rear of console with the strain relief. See Figure 11 below.

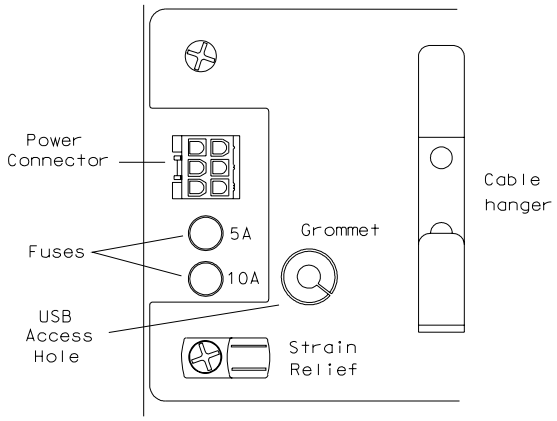

Figure 11

2. Secure the beam end of the power/USB cable to the camera beam strain relief. Connect the power connector to the communications board. Connect the USB connector to the USB input port. See Figure 12 below.

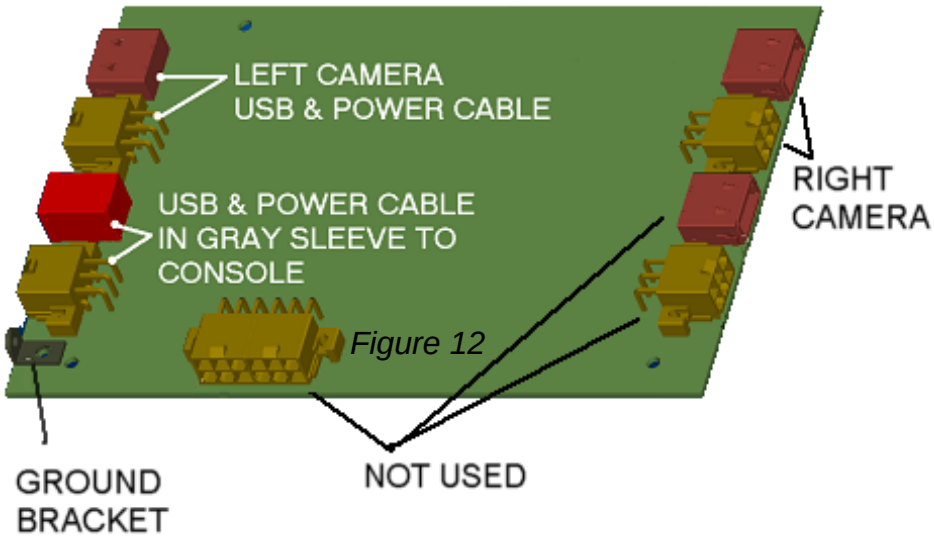

Figure 12

NOTE: Recheck all connections for mechanical and electrical integrity

3. Route main power/USB cable down left side of the vertical support by inserting cable into one of the support channels. Secure the cable to the support base with strain relief.

SYSTEM START-UP

1. Power up the console and monitor and follow directions for initial software setup if not already completed during console assembly. Software loading and initialization instructions are part of the console assembly.

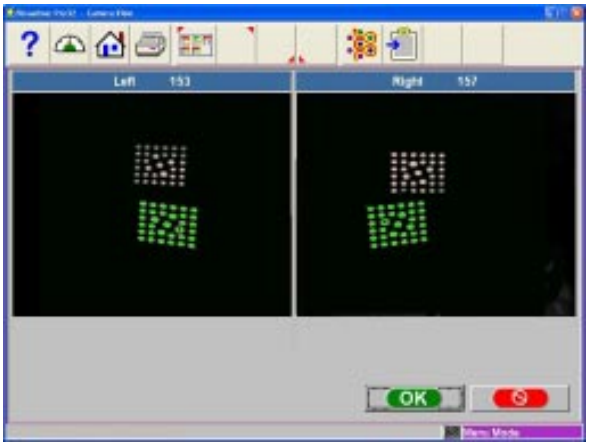

Figure 13

2. Navigate to the “Camera View” screen under the Maintenance Tab, see Figure 13. Place the front and rear targets on the alignment lift as are oriented during an actual alignment.

3. Raise the lift to the user preferred alignment height. (Same value as used for calculating camera offset in the installation worksheet) Make sure the target image in the Camera View screen shows the targets as centered both vertically and horizontally. Adjust the beam position as required to center the images. The Vertical support and camera beam should be level. Tighten base anchors to approximately 50 ft lbs.

   NOTE: *DO NOT MOVE OR ADJUST INDIVIDUAL CAMERA MOUNTING BRACKETS. IF A CAMERA VIEW REQUIRES ADJUSTMENT, THE VERTICAL SUPPORT SHOULD BE PIVOTED.*

   RELATIVE CAMERA POSITION (RCP) IS FACTORY PERFORMED, IF CAMERAS ARE DISTURBED, FIELD RCP MUST BE COMPLETED PRIOR TO TURNING THE UNIT OVER TO THE CUSTOMER.

4. Perform a Target ID on all four targets.

   NOTE: Target ID is required upon installation. If a target is replaced or serviced for some reason, ID should be performed again on that assembly.

SYSTEM TRAINING

Spend time with our new customer going over the software flow and operation of his new system. A few minutes here will save hours later for both you and the technician. Things to cover are outlined but not limited to the items below:

- ⇨ System features and specifications
- ⇨ Proper system start-up and shut down
- ⇨ Windows operation (if he has a desktop mode activated)
- ⇨ Software navigation
- ⇨ Setup, system interaction, preferences, features
- ⇨ Using Wizards
- ⇨ Perform an alignment
- ⇨ Navigation of the Ultra™ Pro32 software features

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