

Installation & Operational Manual
MasterRad30
Universal Radiographic System

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Introduction:

Important! .. X-ray Protection

X-RAY EQUIPMENT IS DANGEROUS TO BOTH PATIENT AND OPERATOR UNLESS MEASURES OF PROTECTION ARE STRICTLY OBSERVED

X-ray equipment if not properly used may cause injury. Accordingly, the instructions herein should be thoroughly read and understood before attempting to place this equipment in operation. We will be glad to assist and cooperate in placing this equipment

Although this apparatus I built to the highest safety and incorporated a high degree of protection against x-radiation other than the useful beam, no practical precautions to prevent the possibility of any persons carelessly, unwisely, or unknowingly exposing themselves or other to x-radiation.

It is important that everyone working with x-radiation be properly trained and take adequate steps to insure protection against injury. The manufacturer assumes that all operator and service personnel authorized to use, install, calibrate and maintain this equipment is cognizant of the danger of excessive exposure to x-radiation, is sufficiently trained and has the required knowledge for it. The equipment herein described which may result from exposure to x-radiation.

Various protective material and devices are available. It is recommended that such materials and devices be used

Intent of use :

MasteRad MX30 is intended for use by a qualified/trained doctor or technician on both adult and pediatric subjects for taking diagnostic radiographic exposures of the skull, spinal column, chest, abdomen, extremities, and other body parts.

Applications can be performed with the patient sitting, standing, or lying in the prone or supine position. Not for mammography.

Manufacturer Name : MedicatechUSA .

Manufacturer address: 50 Maxwell , Irvine , CA92614.

SECTION 1: INSTALLATION

TOOLS

The following hand tools are required for the installation:

- Standard service engineers tool kit.
- Electric drill motor and assorted bits.

Pre-installation checks

Prior to beginning installation, it is recommended to inspect the site and verify that the x-ray room complies with requirements such as:

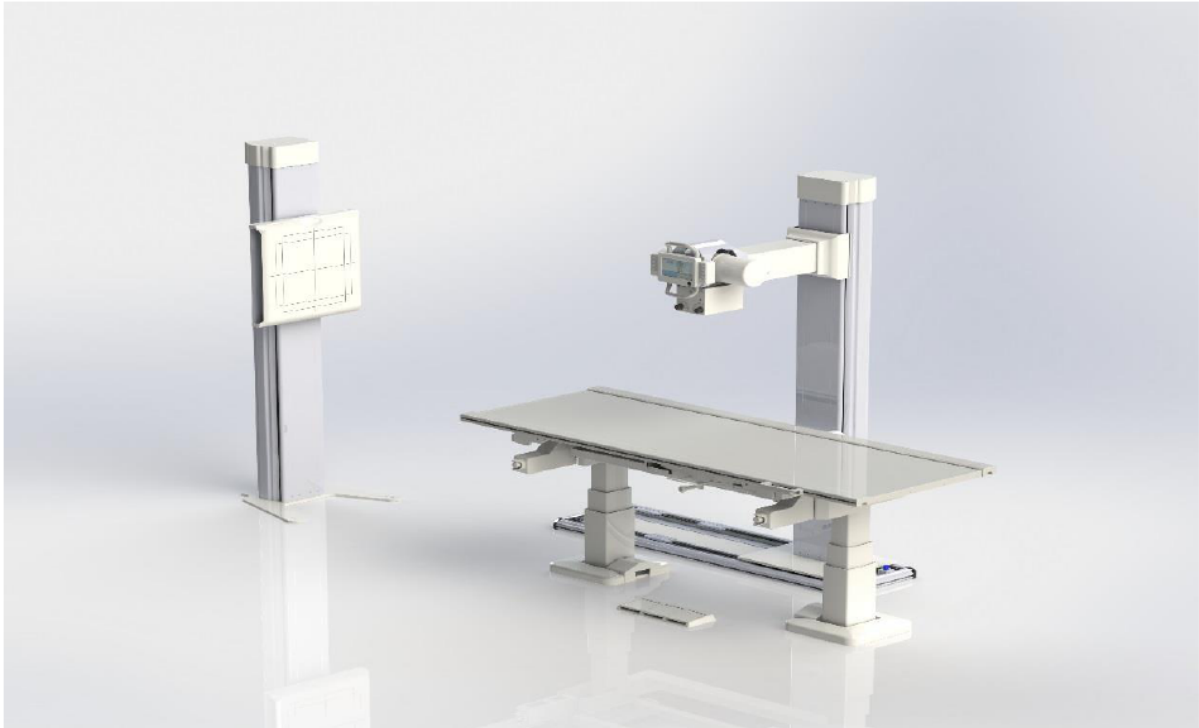
- Space requirements to allow installation and system movements must consider the maximum dimensions and travels of the equipment.

Maximum Height 96 in (8 ft)

Maximum Width 144 in (12 ft)

Maximum Length 180 in (15 ft)

- Conduits and walls are ready to install the system.
- Electricity installation:
 - Main supply: Single phase, 50/60 Hz
115/208/230/240 V ~
 - Minimum Power input required: 400 VA

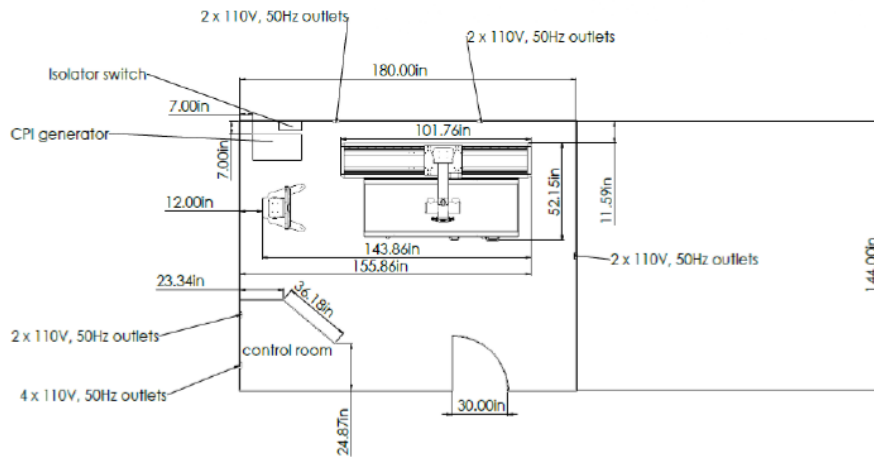


Hardware Installation:

Refer to the layout of the room (Figure 1)



240 Vac (30 A-40A)



Power requirements:
 1. 2x 110 , 50Hz outlets: on back wall (look at the drawing).
 1.3 Extra pairs its recommended
 2. 1x Isolator switch based on the generator specs.

medicatechUSA MEDICAL SYSTEMS		Medical system Min. Room size	
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Figure 1: Min. room size requirement

Locate the floor mount in the crate

Unwrap the floor mount.

Carefully remove the Aluminum Frame in the designated direction. (refer to the figure 2)



Figure 2: the label is located on the back of the floor mount.

Locate the screw labeled “remove the screws”

Unscrew the screws, in order to remove the 4 x brake strips and the floor mount white cover.

Map the location of the system:

Place the floor mount 12" from the back wall.

Make sure to leave room for the chest stand. Refer to the room layout (figure 1)

Mark the place of the anchor on the floor.

Using the 3/8" cement drill bit, Drill 7 mounting holes (refer to figure 2)

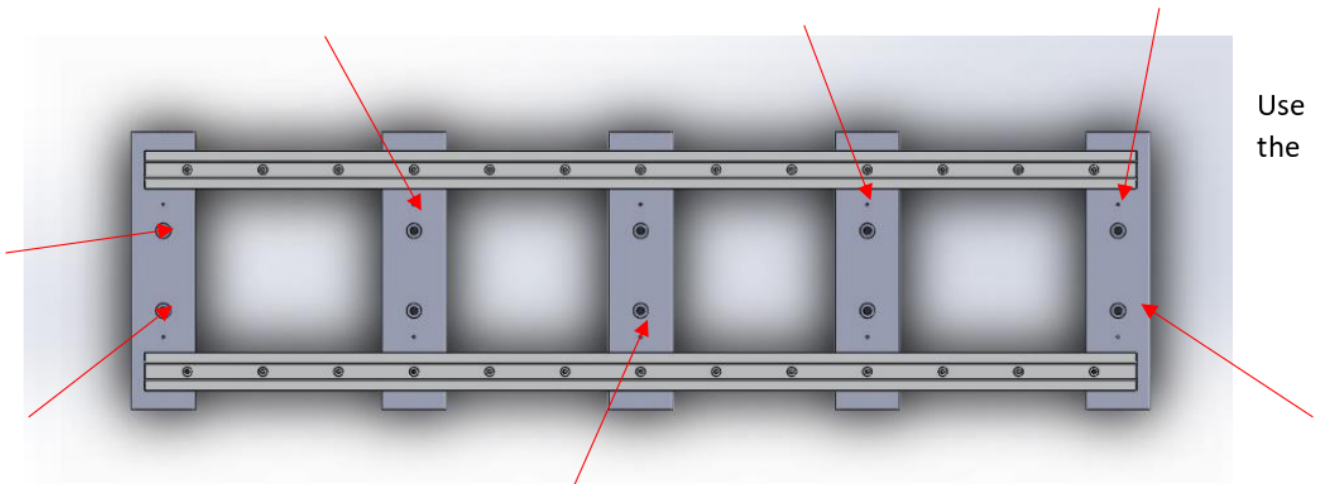


Figure 3: floor mount mounting holes

hammer to fix the anchor into the ground, **(Make sure that the anchors are deep enough in the floor, so it will clear the cover on top).**

Use a water level to test the 4 corners of the floor mount

NOTE: THIS STEP IS ESSENTIAL FOR THE X-ray PICTURE ALIGNMENT.

Place the top cover and the 4 brake strips using the provided screws. (refer to figure 3)

Place the tube stand on the floor mount (Figure 4) **(requires 2 people minimum)**

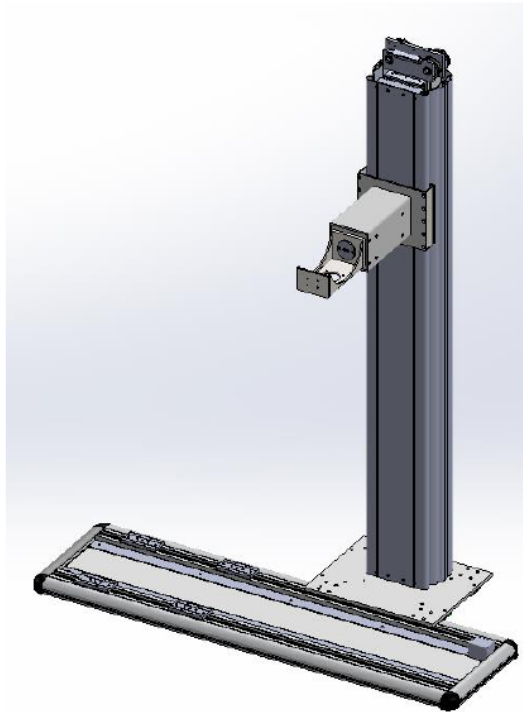


Figure 4: place the tube stand on the floor mount

Align the tube mount base with the 4 carts on the floor mount

Use the 16 xM6 screws to connect the tube stand to the floor mount. (Figure 5)

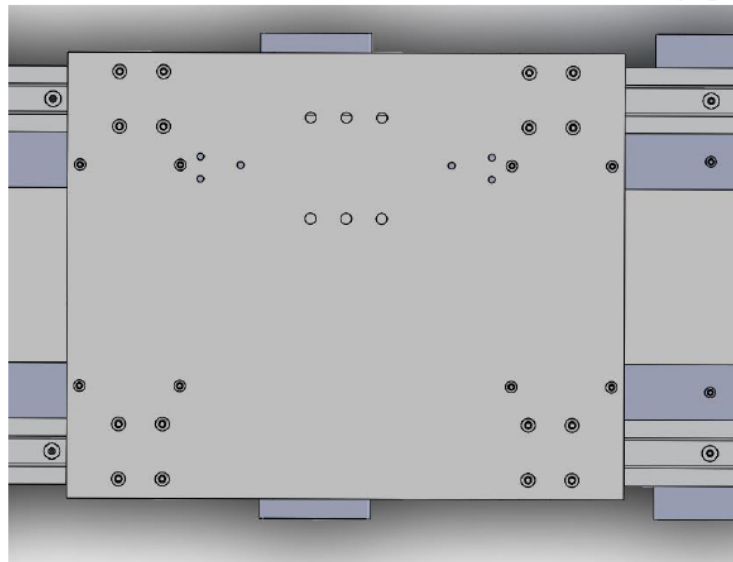


Figure 5: 16x M6 screws

Place the side covers simply by connecting them and place them around the floor mount same way as they were (refer to figure 6)

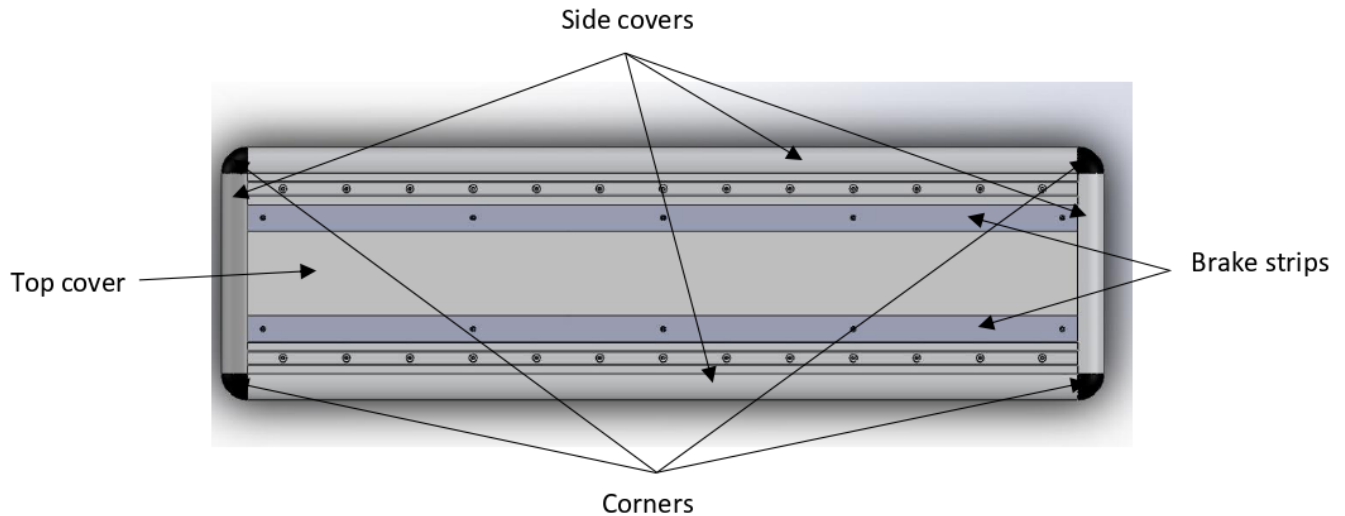


Figure 6: showing the top cover, brake strips, side cover and corner.

Tube, collimator, and generator installation

Place the tube on top of the arm.

Place the collimator ring at the bottom of the arm below the tube through the arm

Place the collimator below the arm as shown in the picture, then screw the collimator inside screws to fix the collimator to the collimator ring.

(refer to the collimator Manual)

Refer to the following pages for proper cable management and connections for the tube, collimator and generator

Collimator: (refer to the collimator manual)

Align the tube using the screws found with the metal plates inside of the blue binder. (note: there are two different types of screws used according to the type of X-ray tube).

There are two main tools used to install collimator;

Allenkey for screws

Allenkey for the mounting plate

remove the collimator mounting plate

connect the collimator mounting plate to the tube using the screws **previously used to align and keep tube in place**

place collimator on to mounting plate and tighten all four screws in order to secure collimator on the tube arm

connect collimator to CPI generator cable then other collimator cable located at the back of the table to foot pedal cable (there is only one way to connect the cables)



Figure 8: showing the 4 mounting holes at the bottom of the arm to mount the tube and the collimator ring

Tube: (refer to the generator and the tube manual)

Place tube on holder so that it is stable

Unscrew the tap (be gentle with cap screws as they are easy to strip)

Grey tube wire is connected to the tube with the wire side labeled 1,2,3, etc.

Connect the grey wire as follow inside the tube to its relative number: (refer to figure 10)

Black wire is 1

Red wire is 2

Yellow wire is 3

White wire is 5

Blue wire is 6

Get the wire through the built in zip tie in order to adjust the fix the wgrey wire in place inside the tube

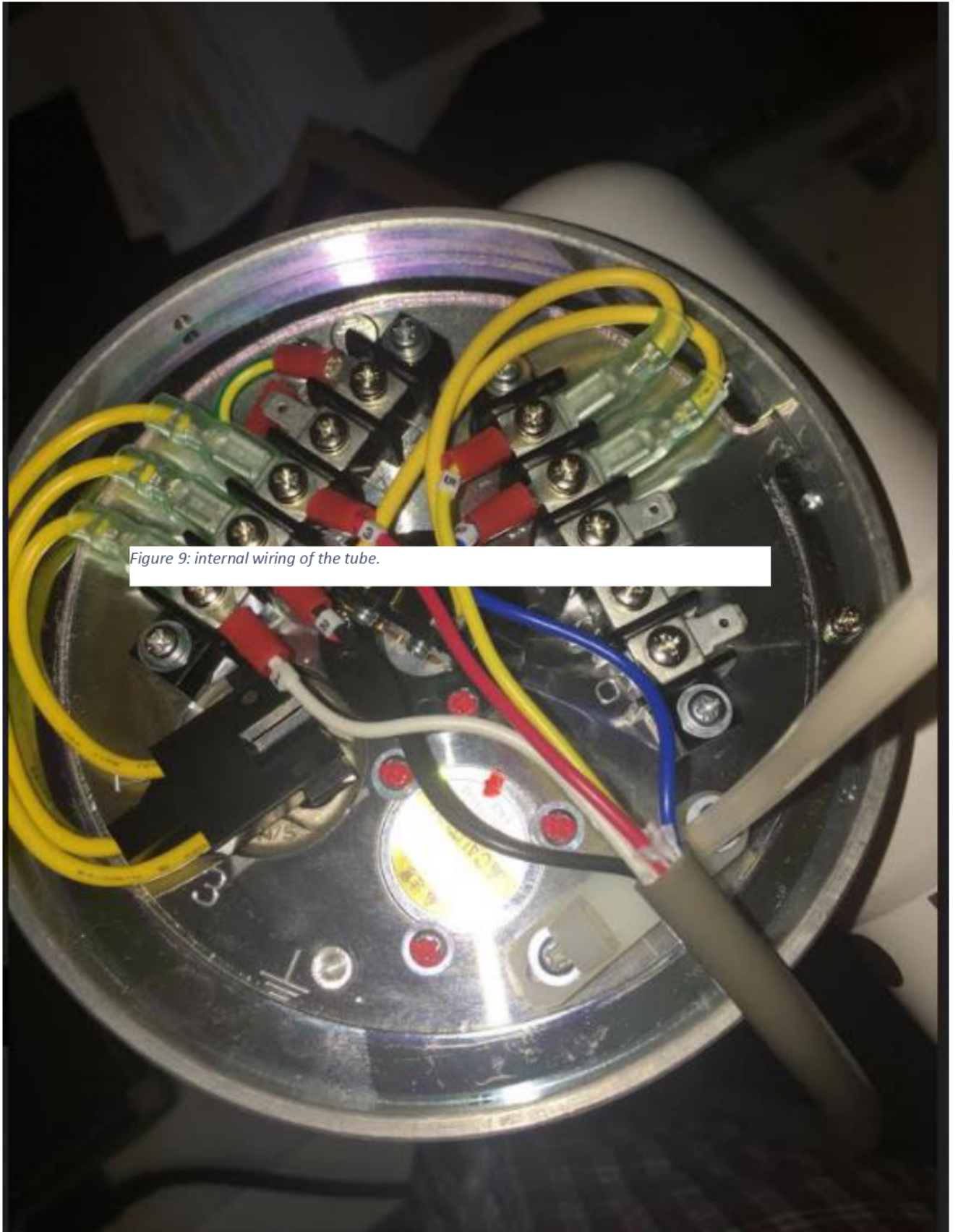


Figure 9: internal wiring of the tube.

Screw the cap back on

Feed the loose end of the grey cable through the arm and through to the bottom access point

Generator connections:

Connect the high-tension cables to the tubes.

Connect one cable to the positive end on the tube

Connect the second cable to the negative end on the tube.

Remove the cover for the electrical CPI generator

Connect the high-tension cable it their designate place,

Apply silicon on the top of the wire head and distribute it all over the head of the cable, you end up with a thin layer of silicon that cover the head of high-tension cable.

- 1.1.1.1 Connect the positive end of the cable to the positive end inside the generator and so for the negative



Figure 10: connecting the high tension cables to the generator

Close the generator cover

Organize the cables through the cable tray

Connect the power cable to the wall disconnect.

Note: most of the other wiring are connected for you as a courtesy.

Chest Stand mounting:

Place the chest stand 40" from the nearest edge of the floor mount.

Make sure it aligns with the laser and the lift field from the collimator.

Mark the anchor places.

Using the 3/8" cement drill bit (for any other types of flooring, please contact us for the appropriate fixture), Drill 4 mounting holes.

Use the 3/8"-16 anchors provided to fix the chest stand to the ground.

Electrical connections

Mount the relay box to the back of the tube stand

Connect the wires to the relay box as follow:



use the lemo connector (black wire with silver head)

Connect the cable to the back of the control panel.

Guided the cable through the top of the arm and to the back of the tube stand.

Connect the cable to the first top connector

Connect the floor mount draw wire sensor

Connect the tube stand draw wire sensor

Skip (option for measuring traveling sensor)
Connect the power off brakes of the tube stand
Connect the rotation brakes (wire from the arm)
Skip (option for measuring traveling sensor)
Connect the floor mount brakes
Skip (option for measuring traveling sensor)
Skip (option for measuring traveling sensor)
Power cable

Table mounting:



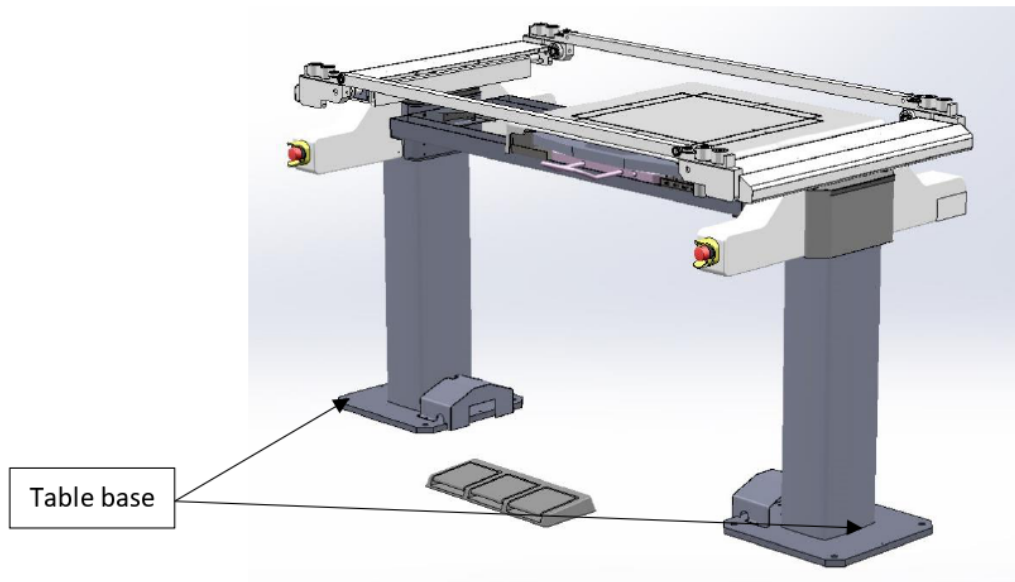
Figure 7: major medical table components

The tabletop is shipped not mounted to the table body.
Move the tube stand along the floor mount to its maximum distance away from the chest stand.
Make sure the table Bucky is at the maximum travel point away from the chest stand.
If the table bucky needs to move:
Plug the table to an electric source.
NOTE: the electric's outlets for the system are made in compliance with the country in which the system us sold to.
Locate the bucky handle on the table.
Press the button located on the handle, then move the bucky to the right position as you are pressing on the button.
Release the button to lock the bucky into position.

NOTE: THE BUCKY BRAKES MECHANISM USES PERMANET ELETCTROMAGENT. DON'T PRESS THE BUTTON THAT ENGAGE THE BRAKES OVER 20 SECONDS AS IT CAN DAMAGE THE BRAKES.

Place the table so the laser and the light field of the collimator aligns with the center of the bucky.

Locate the anchor's hole on the tables' bases.



Mark the anchor places.

Using the 3/8" cement drill bit (for any other types of flooring, please contact us for the appropriate fixture), Drill 8 mounting holes.

Use the 3/8"-16 anchors provided to fix the table to the ground.

Tabletop mount:

Locate the stopper on one side at the bottom of the tabletop.

The stoppers are on the bottom back side of the tabletop.

Take the stopper off by taking the 1x M5-0.8 x12 socket head mounting screw off.

Slide in the tabletop.

Place the stopper back on the tabletop.

Tethered DR Panel , workstation installation:

(Skip this step if you have a wireless panel)

DR Panel: (refer to figure 12)

Remove the DR panel from the packing (take care don't drop it or hit).

Connect the DR Panel to the power box to the 25 Pin connector's cable (female connector).

Connect the male side of the cable to the power box.

Position the DR Panel inside the table panel bucky.

Connect the cat6 cable from power box to the Ethernet port on the workstation.

To be able to use it, you need to power on both the power box and the workstation, then open Voyance software on the workstation (Kindly consult the user manual of Voyance for more details).



Figure 11: view of the DR power box connection



Tubes stand Control's Panel:

Connecting the control Panel to the relay Box is being done through the control cable to the back of the control panel

Section II: Operation:

1. please make sure that all the following items are connected to its appropriate power source:
 - a. Chest stand → 110 V outlet.
 - b. Control panel (located on the back of the tube stand) → 110 V outlet
 - c. Medical table → 110 V outlet
 - d. Generator → each model has its **own requirement**

NOTE: THE POWER REQUIREMENT IS SUBJECT TO CHANGE IN COMPLIANCE WITH THE COUNTRY'S POWER REQUIREMENTS

2. Locate the main power buttons on the following items:
 - a. Chest stand
 - i. The box is located on the **back of the chest stand**
 - ii. Turn the power button on
 - b. Tube stand, arm, and the floor mount
 - i. Locate the relay box on the back of the tube stand
 - ii. Locate the power button on the side of the box towards the bottom
 - iii. Turn the button on.
 - c. Control panel:
 - i. The control panel is located on the arm facing the operator.
 - ii. Located the power button with the power symbol.
 - iii. Turn the button on
3. Movements
 - a. Chest stand:

The chest bucky moves up and down manually, using power off breaks and counterbalance weight. The movement is triggered using the button located on the chest bucky handle.

 - i. To move the chest bucky,
 1. press on the button located on the chest bucky handle.
 2. Move the bucky to the desired position as you are pressing on the button.
 3. Release the button to fix the bucky in its current position.
 - b. Tube stand and arm

The tube stand and the arm movements are controlled by the control panel located on the arm facing the operator (look at section 7 in the top)

c. Table:

i. Tabletop:

The tabletop (floating) has a 4-way movement. The movement is controlled by power-off brakes. The movement is triggered by foot switch at the bottom of the table. Press on the footswitch, then move the tabletop while pressing on the footswitch. Release the footswitch to lock the tabletop in place.

WARNING: don't use the table rims as a grip to move the tabletop as it may hurt the operator

ii. Tabletop bucky:

The table bucky movement is controlled by power off brakes. The movement is triggered by the button located on the table bucky handle. Press on the button and move the bucky while pressing on the button. Release the button to lock the bucky in place.

4. Control panel Operation:

To turn on the panel press the power switch indicated in the picture below

To turn off keep pressing the power switch for 5 seconds till the screen goes off

Switch 1: to activate the movement of up/down of the column.

Switch 2: to activate the rotational movement of the column.

Switch 3: Not used.

Switch 4: to activate the movement of left and right of the column.

Handle switch to activate the above movements simultaneously.



Section III: Troubleshooting:

1. **Mechanical:**

a. Movements:

i. Up and down (applies for tube stand and chest stand):

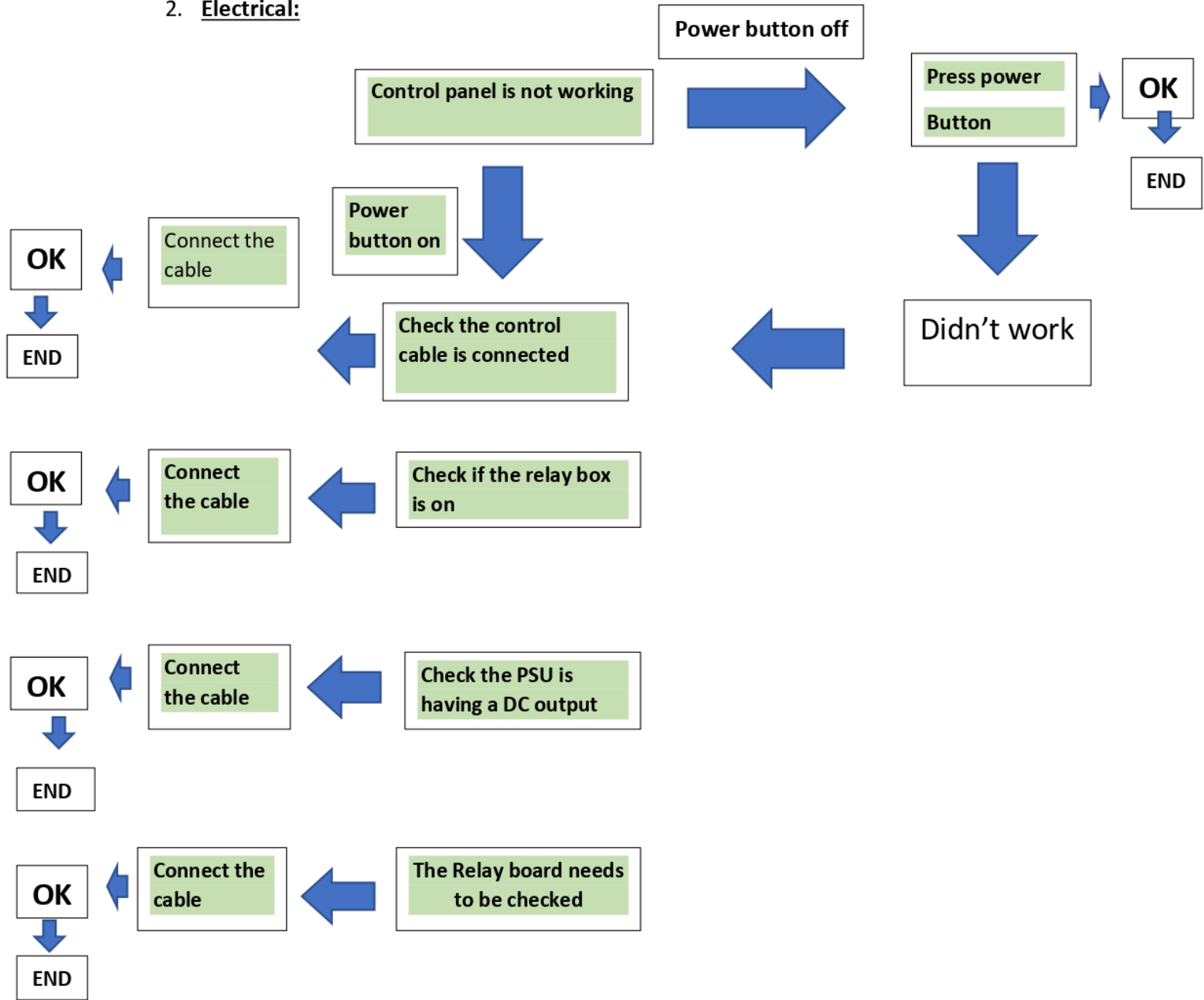
If you observe any struggle in the movement, check the following:

1. Check the brakes on the top of the column:
 - a. Locate the top cap of the column.
 - b. Locate the 4x flat head M4 screws on the top of the cap, take them off as well as the cap.
 - c. Press on button for up and down
 - i. Chest stand: the button in on the bucky handle.
 - ii. Tube stand: the button is located on the control panel.
 - d. If you hear a click when you press the button, then the electrics are good. Keep checking.
 - e. Otherwise, contact your distributor to fix this issue.
2. Check the pulleys at the top of the column:
 - a. Locate the top cap of the column.
 - b. Locate the 4x flat head M4 screws on the top of the cap, take them off as well as the cap.
 - c. Press the button for up and down
 - i. Chest stand: the button in on the bucky handle.
 - ii. Tube stand: the button is located on the control panel.
 - d. If the pulleys are rotating smoothly, then the pulleys and the bearings are ok. keep checking.
 - e. Otherwise, contact your distributor to fix this issue.
3. Check the Side bearing on the side of the column:
 - a. Locate the top cap of the column.
 - b. Locate the 4x flat head M4 screws on the top of the cap, take them off as well as the cap.
 - c. Locate the side aluminum on both sides of the column.
 - d. Locate the six (three for each side) flat head allen M4 screws on the back of the column that hold the sides.
 - e. Locate the 4 (2 on each side) flat head screws on the top
 - f. Take the side off.
 - g. Examine the system by going up and down.
 - h. Look for any obstacles.
 - i. If there is nothing in the way, then side bearings are ok. Keep checking
 - j. Otherwise, contact your distributor to fix this issue.

4. Check the counterbalance Teflon guides:
 - a. Locate the top cap of the column.
 - b. Locate the 4x flat head M4 screws on the top of the cap, take them off as well as the cap.
 - c. Bring the arm all the way to the bottom.
 - d. Locate the front cladding.
 - e. Locate the 8 flat head M4 (4 on the top and 4 at the bottom)
 - f. Take off the screws, then slide the front cladding up and out.
 - g. Look at the 4 Teflon guides on the counterbalance.
 - h. If there are marks on the side walls from the teflon or if the teflon parts are loose, then the teflon parts needs to be tighten more.
 - i. Otherwise, keep checking if the issue is not resolved.
- ii. Side to side (floor mount):
 1. Check the brakes underneath the tube stand:
 - a. Press on the button for the side to side movement
 - b. Check if the brakes are working
 - c. If yes, then the electrics are ok. Keep checking.
 - d. Otherwise, contact your distributor to fix this issue.
 2. Check the brakes's spring:
 - a. Look at the brakes on the bottom.
 - b. If the brakes are risen up towards the steel plate, then the springs are ok. Keep looking.
 - c. Otherwise, contact your distributor to fix this issue.
 3. Check if there is anything in the way of the:
 - a. The floor mount rail.
 - b. The brakes on the bottom.
- iii. Rotation:
 1. Jammed or hard to rotate
 - a. Locate the 8x M8 screws on the front side of the arm (4 on each side)
 - b. Loosen the screws and test the rotation.
 - c. If it works then it is not an electric issue.
 - d. Otherwise, it is an electric issue.

Call your distributor to fix the issue

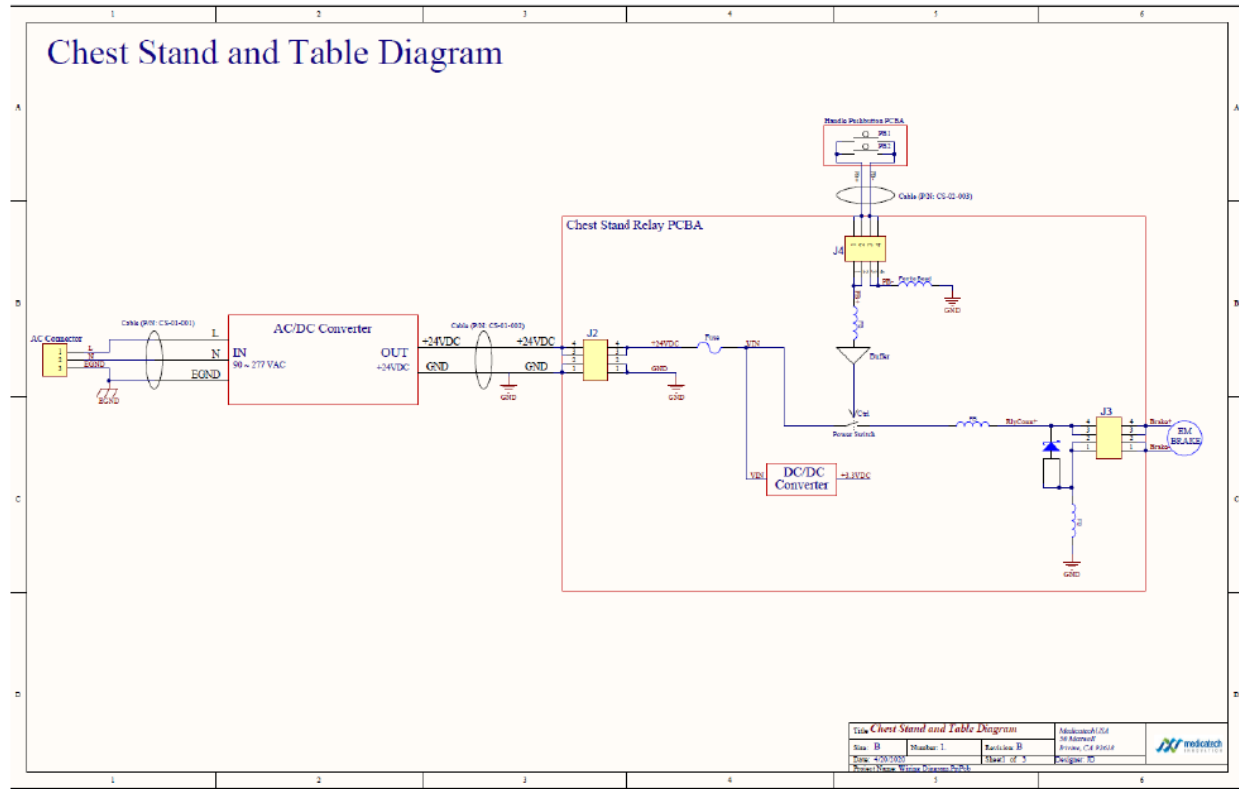
2. Electrical:



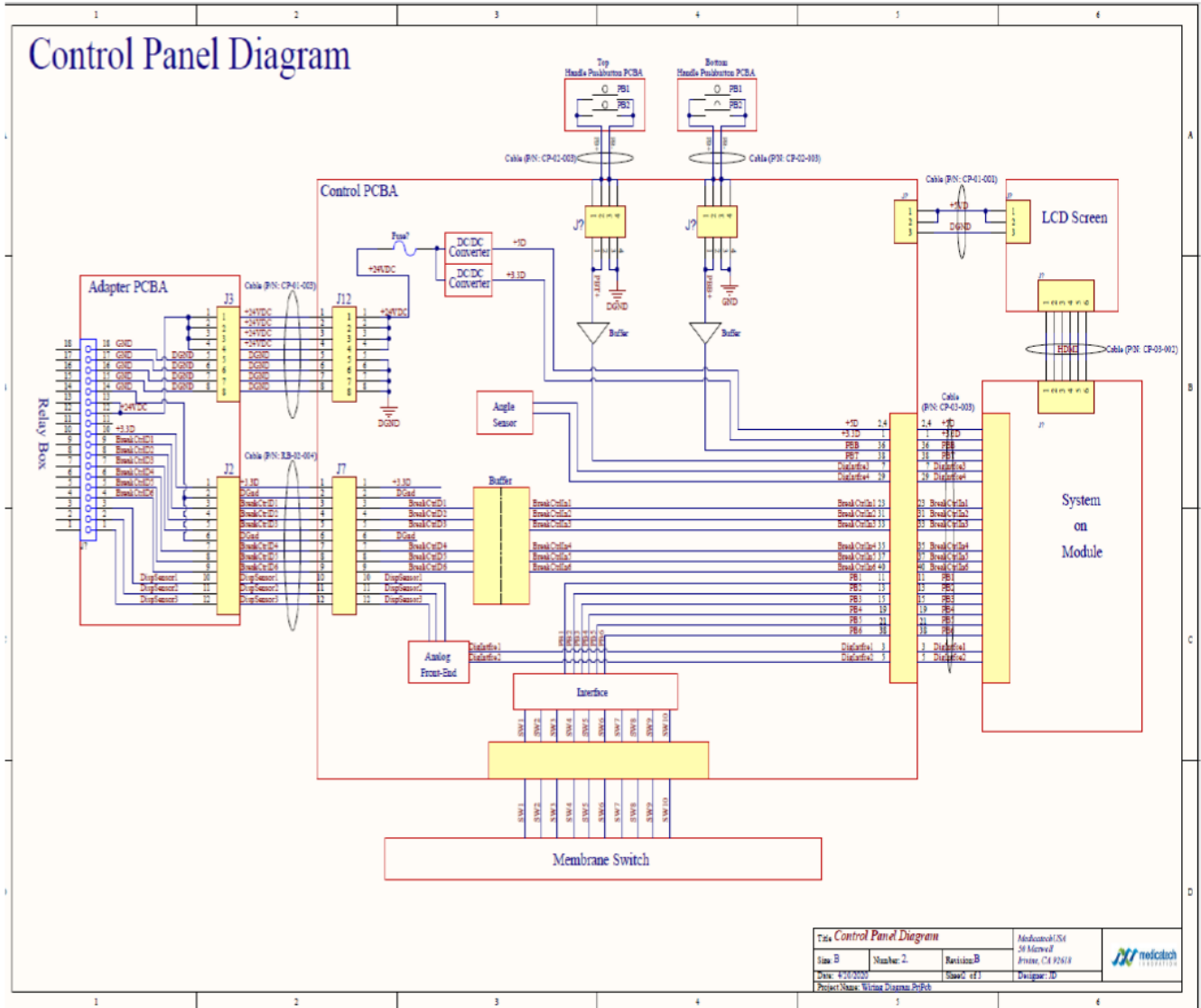
Section IV: Appendixes

Appendix I:

ELECTRIAL DRAWINGS



Control Panel Diagram



Title: Control Panel Diagram			Mediatech/USC 50 Merced St Palo Alto, CA 94301	
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Date: 4/20/2007	Scale: 1:1	Drawn: JF	Checked: JF	Div: JF
Project Name: Wireless Diagnostics P0708				

