Hamilton Technical Service Training

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About the Content

This presentation is a collection of videos taken from Hamilton's 2023 Authorized Channel Partner Technical Service Training Classes. The classes take place over 3 days, with the goal that every Channel Partner have at least one individual who can be the "certified" trainer for your organization.

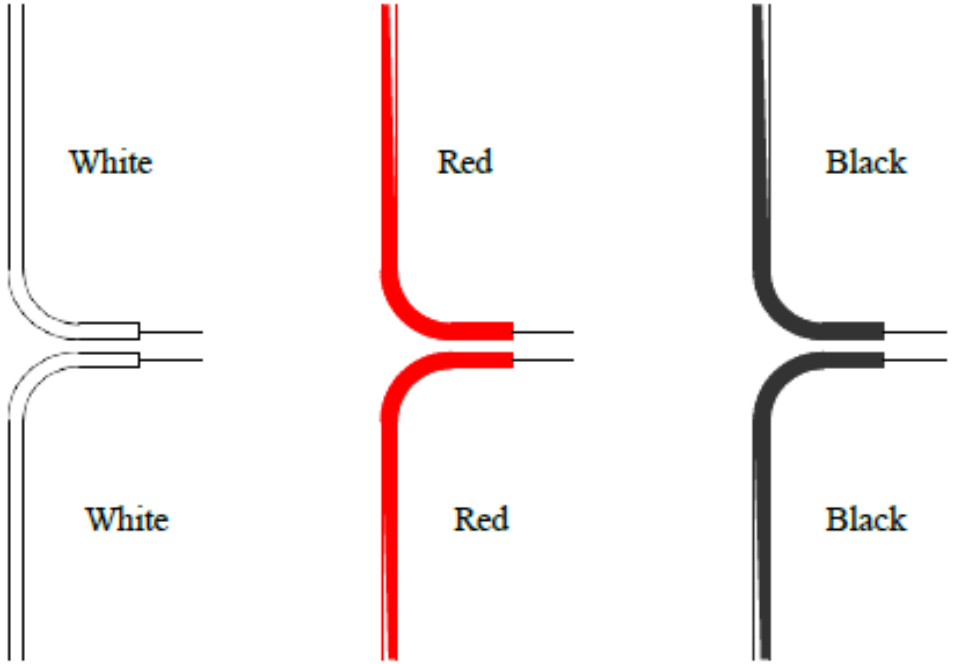
This is in no way the complete training course and is not meant to act as a replacement. This presentation is meant to highlight some of the more important parts of what is discussed during the classes for Channel Partners who missed the sign-up, can't travel, or are otherwise unable to have an individual attend the classes.

For more information and to register, reference the Technical Training Brochure (right), or visit Hamilton's Authorized Channel Partner portal at hamiltonsecuritysolutions.com

Teller Units

Old Style Board

New door switch wiring.



Existing wiring from old door switch

Properly Setting Teller Switch

Aajusting Teller Door Switch

The teller door switch should activate when the teller door is fully closed. The proper adjustment of this triggering point is important to the operation of the system. If the switch is set to trigger before the door is fully closed, the system will have an air leak, resulting in improper carrier movement. This switch signals the E0873 Control Board that the teller door is fully closed. The "Teller Send" & Link" LED's on the E0873 should be off when the door is open and light when the door is fully closed and sealed. The teller door switch signal to the E0873 must continually show the teller door is closed for not only the obvious teller send cycle, but also for teller recall and customer send cycles as well. If the teller door switch signals the teller door is open, the system will not operate.

Door Switch Adjustment
Figures #6 and #7 below show a properly adjusted door closed limit switch activated by the manual teller door. The door is shown completely closed and you can see how the roller of the limit switch sets into the small indentation on the teller door.

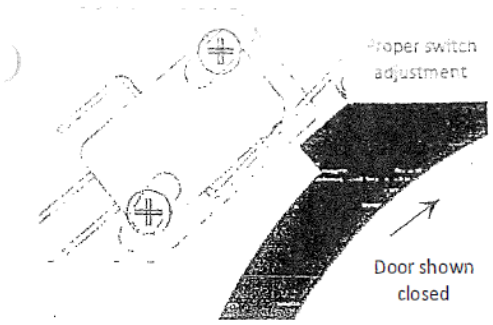


Figure #6

Figure #7

igures #8 and #9 below show a door closed limit switch activated by the manual teller door, but the roller is still setting on the leading ramp edge of the door. The door is shown completely closed but the roller of the limit switch does not reach the small indentation on the teller door. This can cause the switch to intermittently deactivate when the teller door moves or vibrates from the air pressure in the tube system. This switch should be adjusted so the roller of the limit switch sets in the small indentation on the teller door. Adjust the switch by loosening the two Phillips screws mounting the switch and rotating it around the teller door to the correct location.

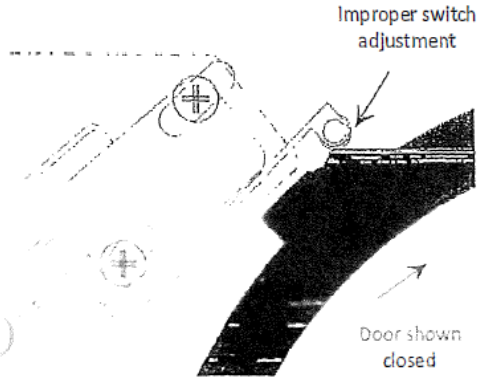


Figure #8

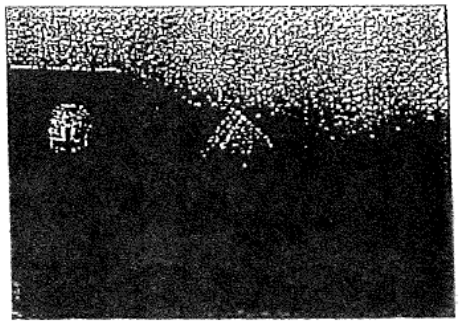


Figure #9

The manual teller door has freedom to move in and out when the door is completely closed. If you watch the door closely when the system is running, you will see the air pressure moving the door in and out. When setting the door switch, check to make sure when the door moves like this that the door switch is not deactivated or very close to being deactivated.

Closing Lanes

Standard Teller Operation

Door Position Switch

Closing the door on the teller unit automatically sends the carrier to the customer unit. The door position switch on the Teller Unit is activated when the door is completely closed. The system will stop running if the teller unit door opens at any time.

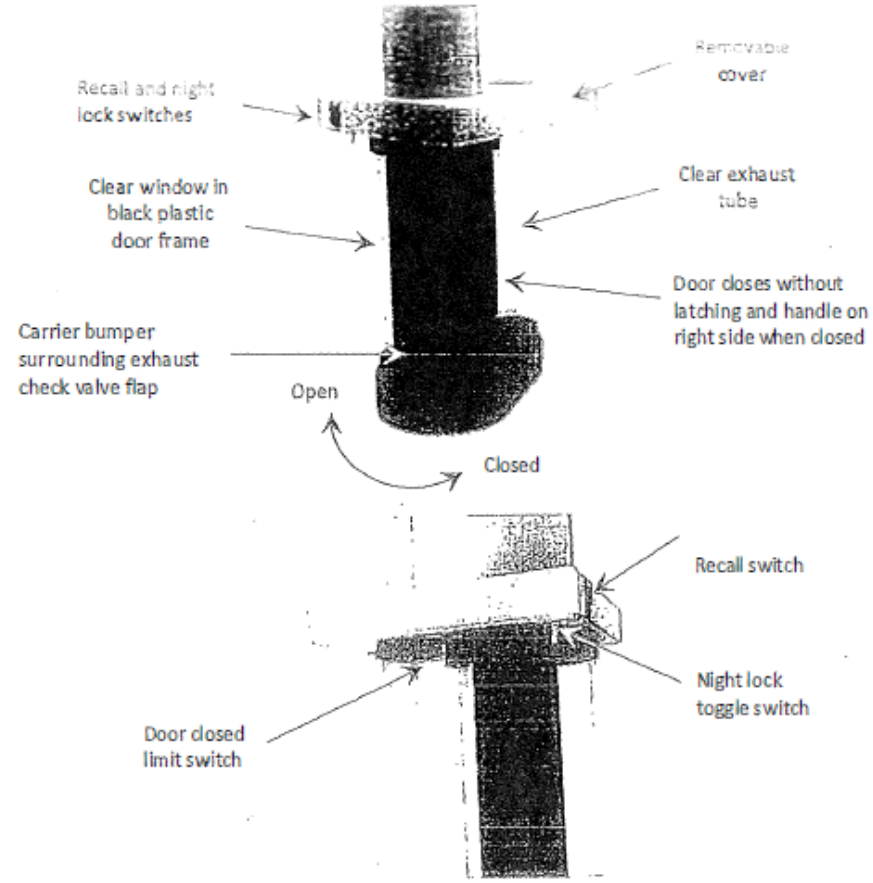
Recall Switch

Pressing the recall switch will call the carrier back to the teller unit. The teller unit door must be closed for this function to operate. Pressing the recall button during a teller send cycle will stop the vacuum motor and then start the pressure motor to return the carrier to the teller terminal.

Night Lock Switch

The night lock function is used to turn the lane off for the night or whenever the lane will not be used. The night lock function will close the customer unit door and call the carrier inside, if needed, to prevent outside use of the lane.

If there is a video monitor connected to the control circuit using Hamilton cable #E10036, the night lock function will also turn the video monitor off. Note, if multiple lanes are installed, each lane will have its own separate night lock switch..



HA-45, HA-1000, HA-50, Troubleshooting

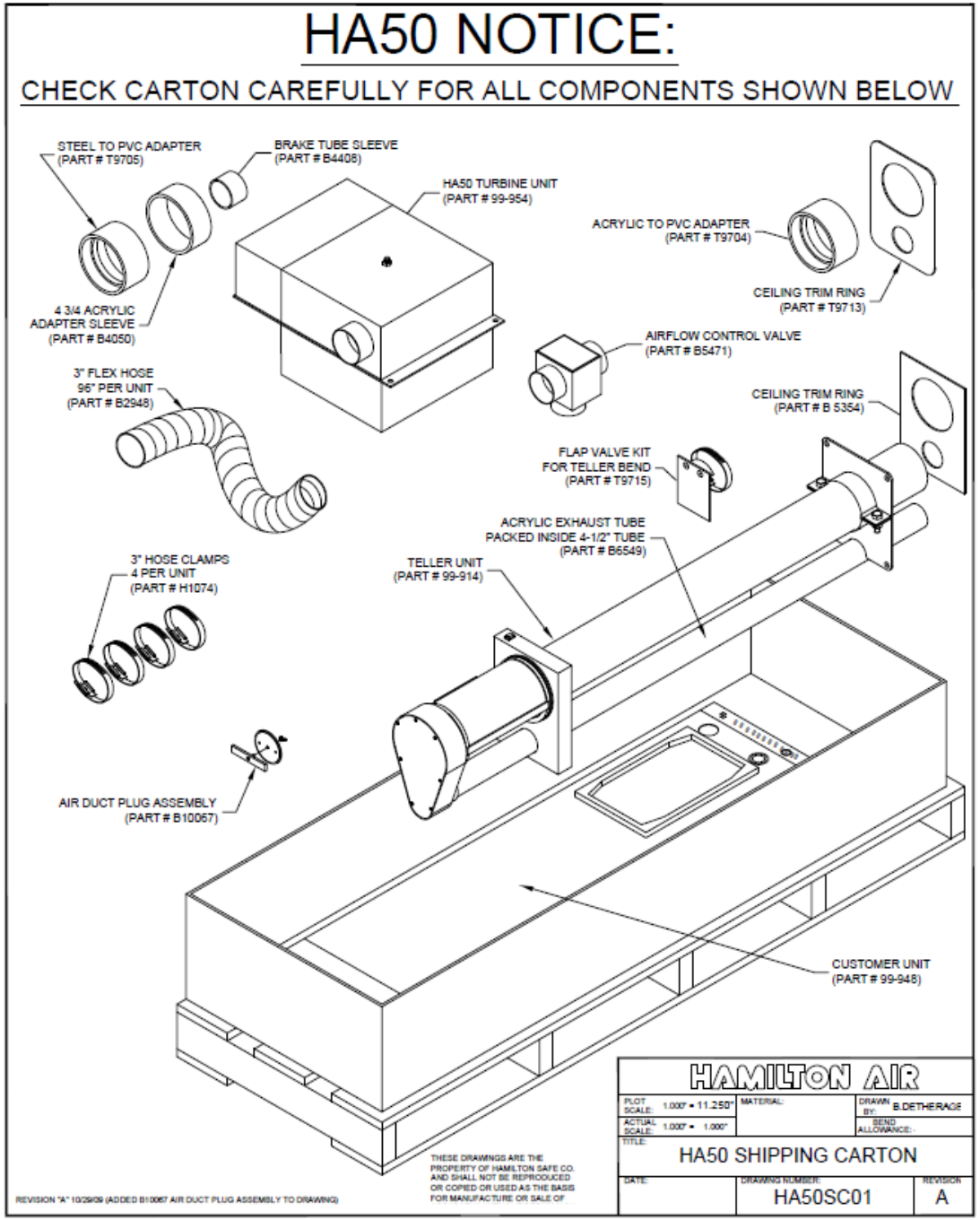
HA-45

HA-1000 (downsend)

HA-50

[HA-50 B5471]

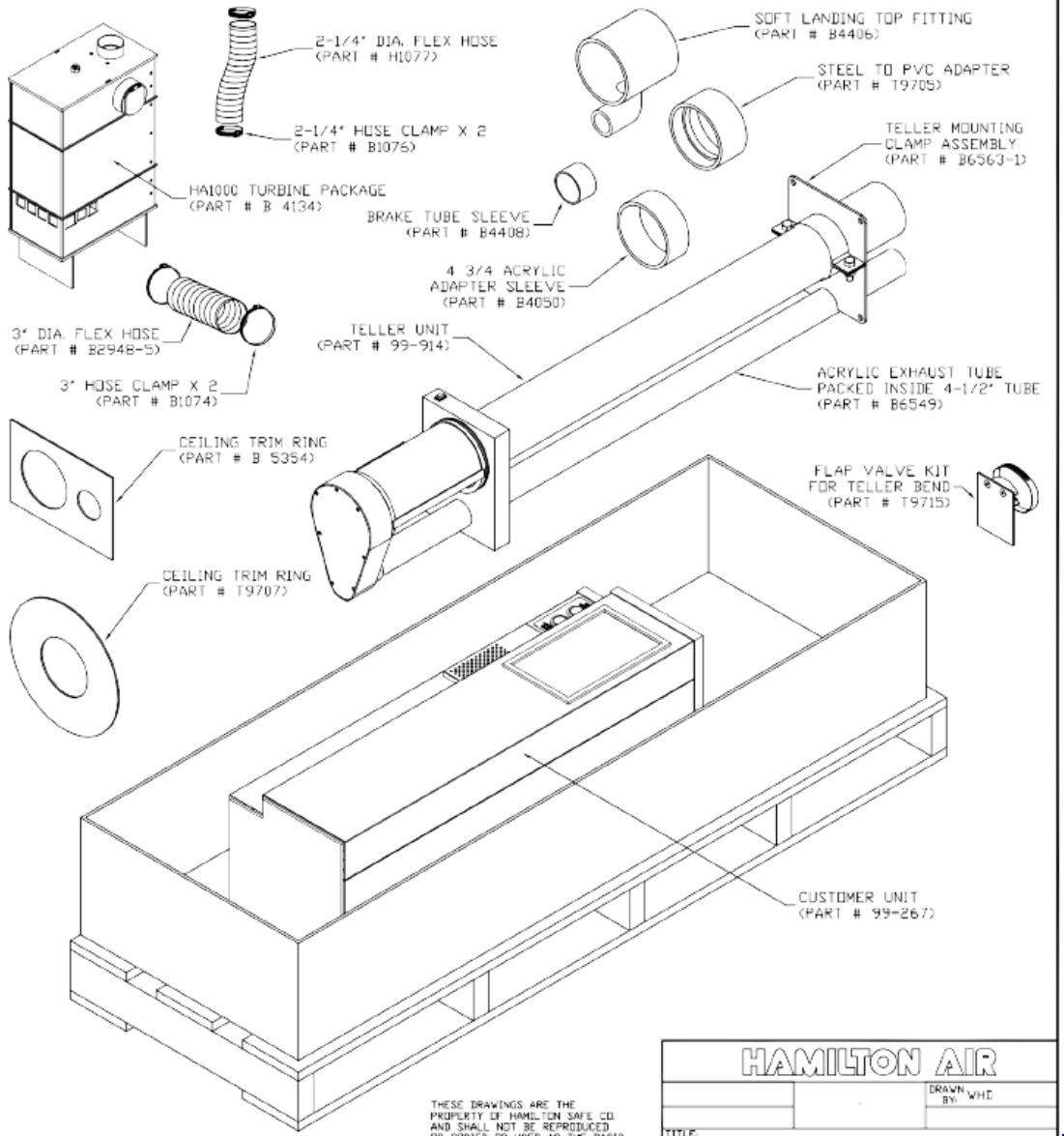
[HA-50 Turbine Set Up]



Check Valve

HA1000 NOTICE:

CHECK CARTON CAREFULLY FOR ALL COMPONENTS SHOWN BELOW



Adjusting limit Switches and Changing Motor – Cat 5

Limit Switch Adjustments:

Typical adjustment instructions for HA1000 and HA45
customer unit and motorized teller unit door motor limit switches.

Setting the depth:

The limit switches for both door open and close positions should be set so the switches activate when the switch roller drops approximately half the depth of the cam valley. Bend the switch arm up or down to set the activating depth of each switch. Below, figure #1 shows the switch roller in the valley at the maximum depth and figure #2 shows the roller at the maximum height, or outer diameter of the cam.

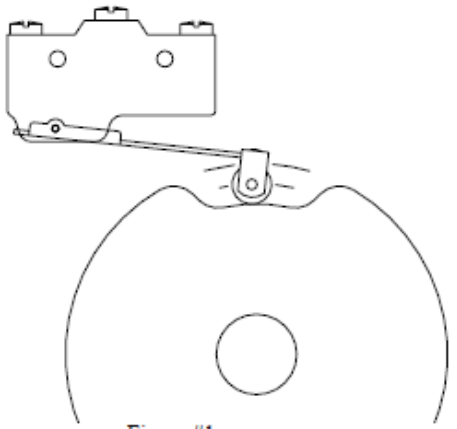


Figure #1

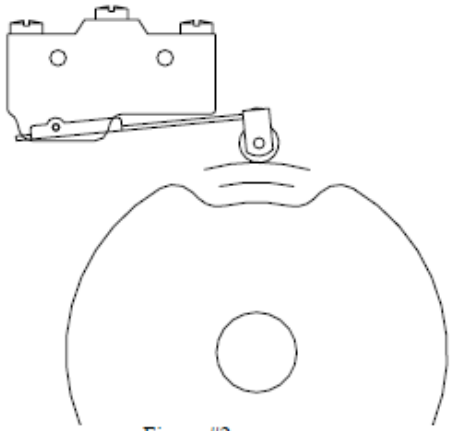


Figure #2

Figure #3 below shows the switch roller approximately mid depth of the valley where the switch should activate. There should be an audible click from the switch when it activates and deactivates.

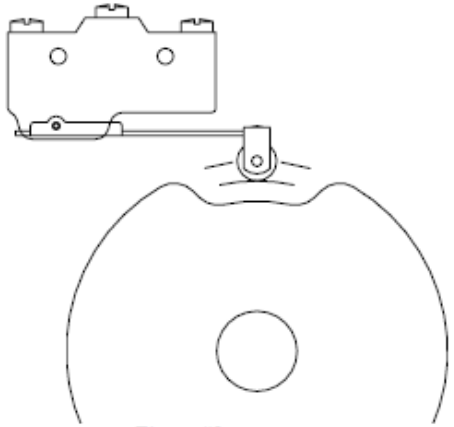


Figure #3

Note: Do not set the switch where the activation is too close to the bottom of the valley or the outer diameter of the cam. This can cause intermittent failures of the switches as the activation point within the switch can fluctuate slightly in varying temperatures. Setting the limit switches to mid depth will allow for these variations without failure.

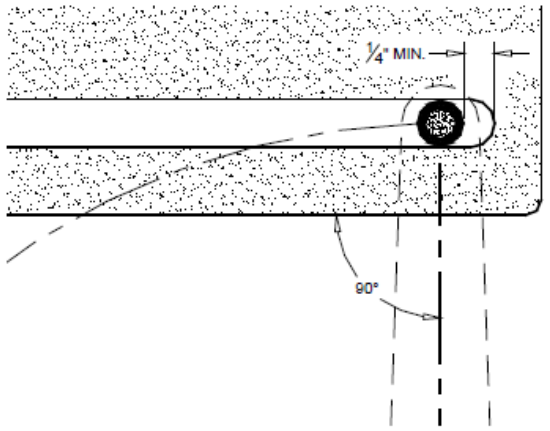
Proper Crank Arm Set Up HA-45 and HA-1000

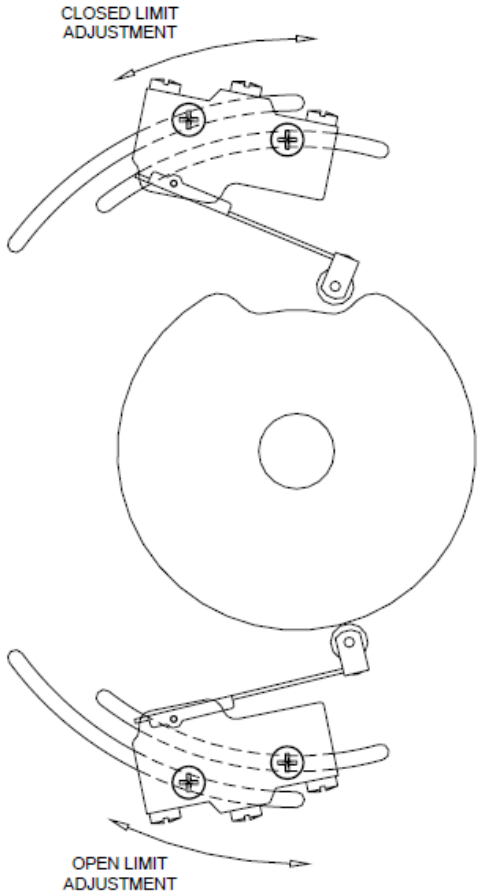
E0A73 C and T Boards

E0A73 Setting Switches

Setting the stopping point:

The door crank arm should pivot and stop with the crank arm vertical or straight up and down. The bushing on the end of the crank arm riding in the slot along the bottom of the door should not stop close to the end of the slot. There must be at least ¼" between the bushing and end If the slot when the door motor runs normally and stops with the switches. This should be set for both closed and open positions of the door.





To set stopping point of the door crank arm, adjust door limit switches by loosening the two screws holding the switch to the motor mounting plate and sliding the switch to the left or right so the door crank arm stops in the correct position as described above. This may take several trial positions of each switch to get the best setting.

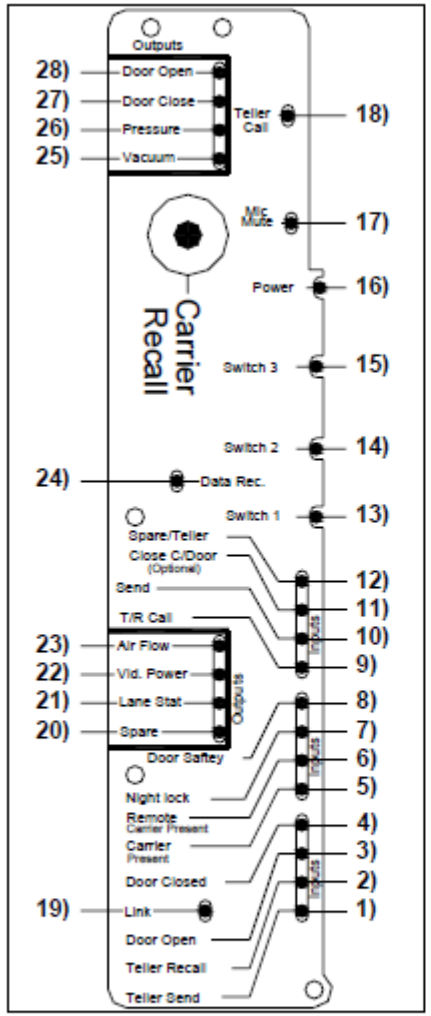
Description	Unit	Boards/Sys	Switch #1	Switch #2	Switch #3	JP1	JP2	JP3
HA1000/45/50	Customer	Single	OFF	OFF	OFF	ON	ON	ON
HA1000/45/50	Customer	Dual	OFF	OFF	OFF	OFF	OFF	ON
HA1000	Teller	Dual	OFF	OFF	ON	OFF	ON	ON
HA47	Customer	Single	OFF	ON	OFF	ON	ON	ON
HA33	Customer	Dual	OFF	ON	OFF	OFF	OFF	OFF
HA33	Teller	Dual	OFF	OFF	ON	OFF	ON	OFF
IRT5000	Customer	Single	OFF	OFF	OFF	ON	ON	ON
IRT5000	Customer	Dual	OFF	OFF	OFF	OFF	OFF	ON
IRT5000	Teller	Dual	OFF	OFF	ON	OFF	ON	ON
HT19	Control Unit	Single	OFF	OFF	OFF	ON	ON	ON
HT19	Teller	Single	OFF	OFF	OFF	ON	ON	ON

Single = One control board in the tube system, typically in the customer unit.

Dual = Two control boards in the tube system, one in teller and one in customer unit.

Door Lights

LED Light identification



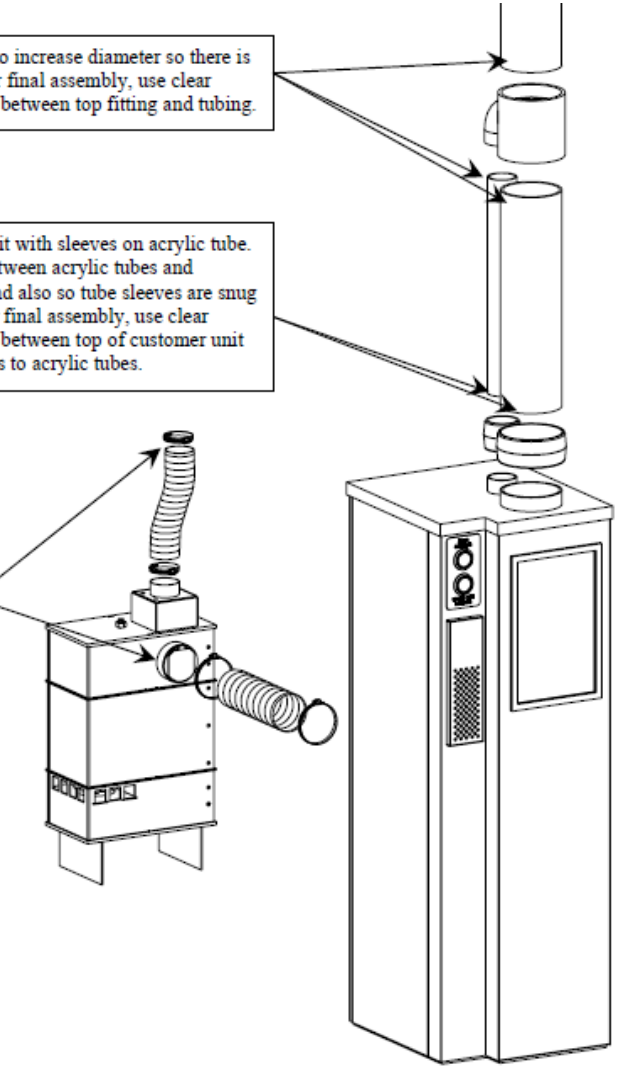
1) Teller Send – Lights when manual teller door is closed, off when manual teller door is open. Lights when teller send is pressed.
2) Teller Recall – Lights when manual teller recall is pressed.
3) Customer Door Open – Lights when door is NOT open, off when door is open.
4) Customer Door Closed – Lights when door is NOT closed, off when door is closed.
5) Carrier Present – Lights when customer carrier present switch is activated.
6) Remote Carrier Present – Lights when manual teller carrier present switch is activated.
7) Nightlock – Lights when night lock switch is activated.
8) Door Safety – Lights normally, off when door safety bar is activated.
9) T/R Call – Lights when call teller button is pressed on customer or when recall carrier is pressed on teller.
10) Send – Lights when customer send is pressed.
11) Close C/Door (Optional) – Lights when jumper is applied to pins #3 & #4 on J4, off when jumper is removed.
12) Spare/Teller – Lights when spare teller input is activated.
13) Switch #1 – Lights when Switch #1 is on.
14) Switch #2 – Lights when Switch #2 is on.
15) Switch #3 – Lights when Switch #3 is on.
16) Power – Lights when power is on.
17) Mic Mute – Lights when the microphone mute option is on and the system is running a carrier send cycle.
18) Teller Call – Lights when teller call is activated.
19) Link – Lights when manual teller door is closed, off when manual teller door is open. Lights when dual boards are connected and communicating properly.
20) Spare – Lights when spare output is activated.
21) Lane Stat – Lights when lane status output is activated.
22) Vid. Power – Lights when night lock is off and activates video power output to turn on the video monitor. When night lock feature is activated, video power is turned off to the monitor on this lane. Power to trigger video power is sent out J15.
23) Air Flow – Lights when airflow kit is triggered to operate.
24) Data Rec. – Not Used in single board system. Lights when dual boards communicate but remain on or off after any operation.
25) Vacuum – Output lights when vacuum motor is running.
26) Pressure – Output lights when pressure motor is running.
27) Door Close – Output lights when customer door motor is running closed.
28) Door Open – Output lights when customer door motor is running open.

Hooking Up Cat 5

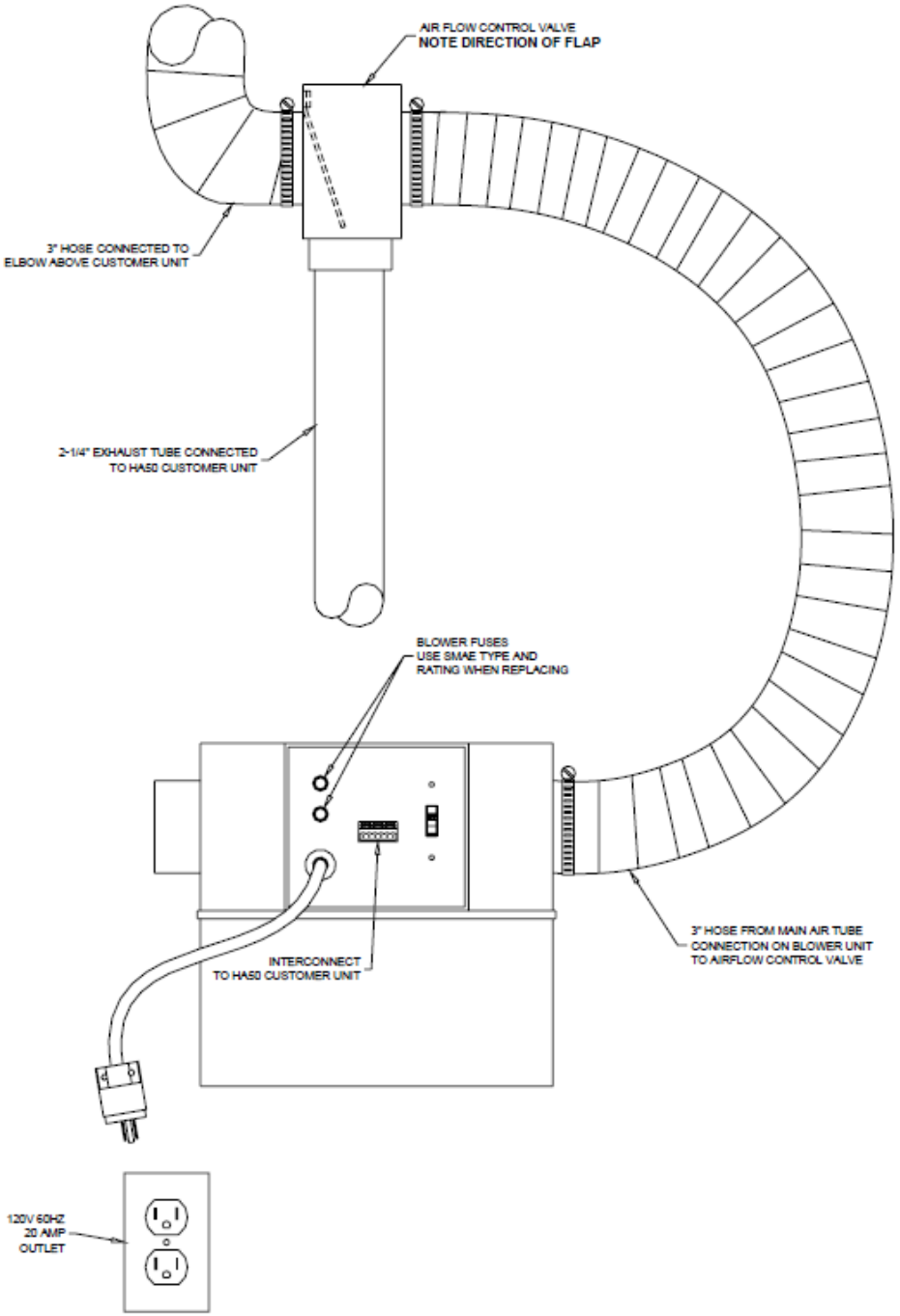
Wrap tube ends with vinyl tape to increase diameter so there is a snug fit inside top fitting. After final assembly, use clear silicone sealant around all joints between top fitting and tubing.

Set acrylic tubes on customer unit with sleeves on acrylic tube. Wrap vinyl tape around seam between acrylic tubes and customer unit to make air seal and also so tube sleeves are snug when slid down over joint. After final assembly, use clear silicone sealant around all joints between top of customer unit and tube sleeves and tube sleeves to acrylic tubes.

Check all hose connections from turbine for proper fit and seal. If turbine unit press fits into customer unit, check seal ring between turbine and customer unit for proper fit and seal.

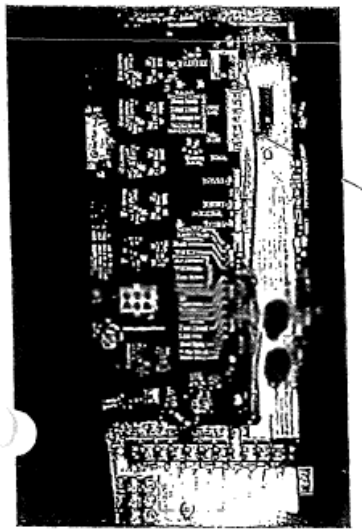


HA1000 Customer unit shown.



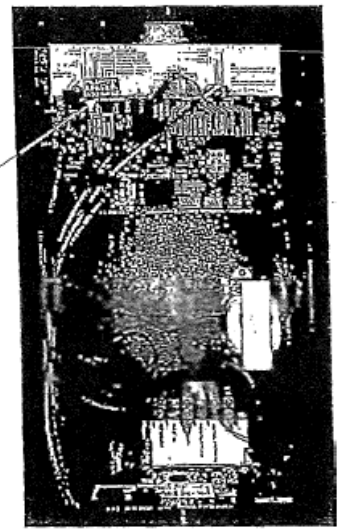
Hooking Up Cat 5 continued…

HA45/50 Control Panel



Audio Cable

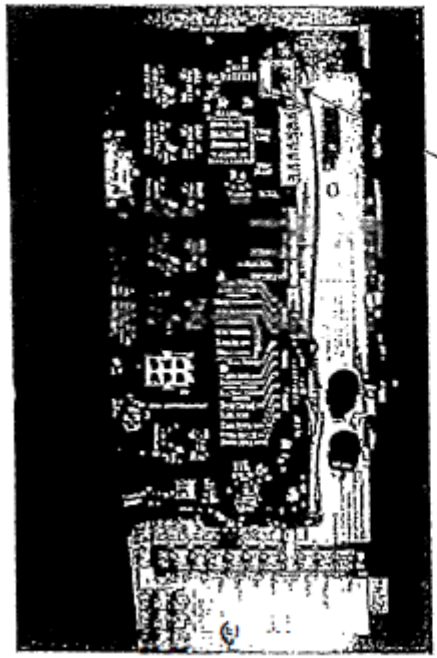
HA1000 Control Panel



To terminate the end of the audio cable to theE0873 control board, you will first need to strip the outer case of the E0680 cable back about 3 inches. A radial wire stripper is designed to cut the outer jacket without nicking the wires inside. Strip the individual end of each conductor back about 1/4 inch. Tighten the stripped wires into the appropriate screw terminations of the connector.

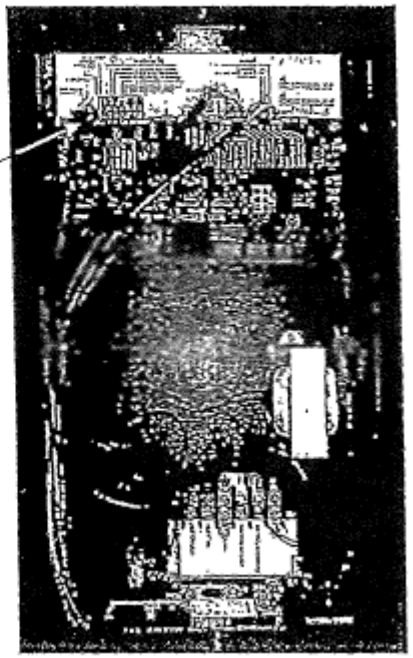
Pin 7 – Speaker negative – 16 AWG, Black
Pin 6 – Speaker positive – 16 AWA, White
Pin 5 – Teller Call Button – 20 AWG, Black
Pin 4 – Teller Call Button – 20 AWG, Green
Pin 3 – Microphone negative – 20 AWG (shielded) Black
Pin 2 – Microphone positive – 20 AWG (shielded) Red
Pin 1 – Microphone Shield – Connect at Matrix end; cut and tape at Customer end

HA45/50 Control Panel



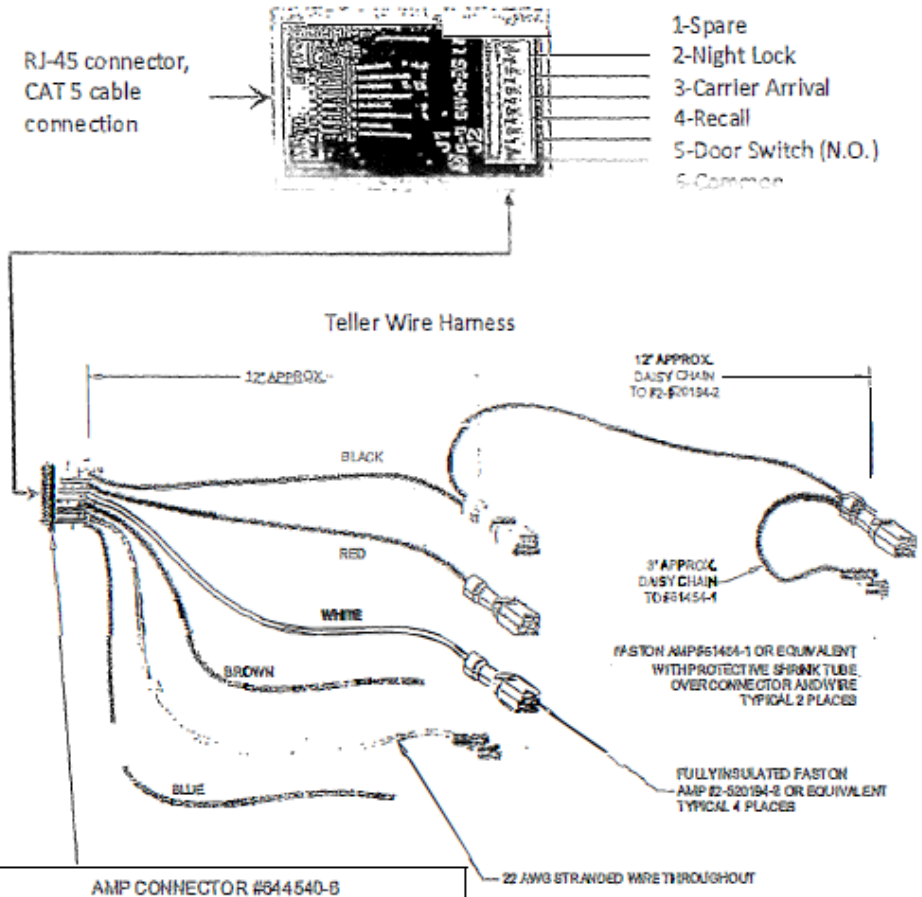
CAT 5 Interconnect Cable connection

HA1000 Control Panel



Hooking Up Cat 5 continued…

Teller Connection Board 3E0882



AMP CONNECTOR #644540-6

	WIRE COLOR	TERMINATION	CONNECTION
PIN #1	BLUE	--	SPARE
PIN #2	GREEN	#61454-1	NIGHTLOCK
PIN #3	BROWN	--	CARRIER ARRIVAL
PIN #4	WHITE	#2-520194-2	RECALL
PIN #5	RED	#2-520194-2	DOOR (N.O.)
PIN #6	BLACK	#2-520194-2	COMMON

(1) Score the CAT 5 cable jacket 3 inches from the end, and then bend the jacket at the cut line until the jacket slides off.

(2) Separate the pairs, sorting the leads in the pattern shown above and described in the pin-out chart.

(3) Form wires into a flat ribbon and pinching the cable at the edge of the jacket, cut the leads off, evenly, 1/2" from the jacket. Continue holding the wires securely at the edge of the jacket.

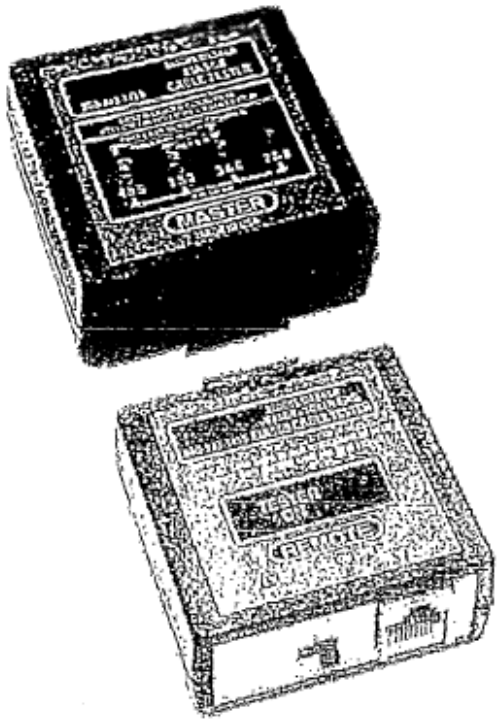
(4) Slip the ribbon of leads into the RJ-45 connector as shown, with the spring tab down. Be certain that you can see the copper ends of the leads at the end of the RJ-45.

(5) Holding the cable tightly into the connector, crimp it.

(6) Check to see that the copper leads have not slipped back and gently pull-test the crimped connection.

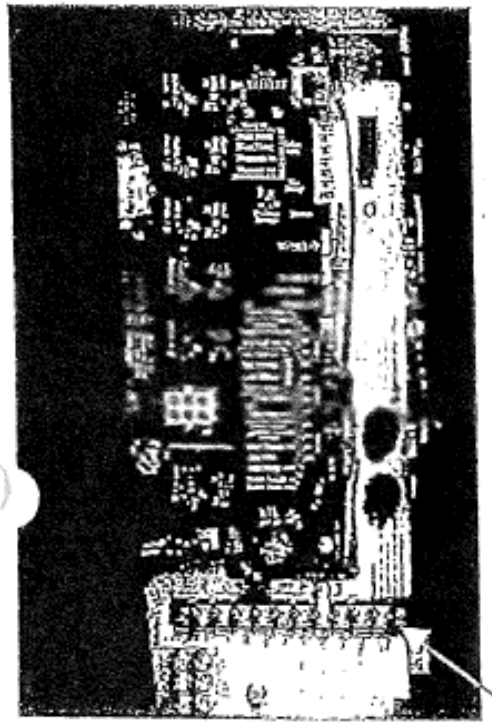
(7) After finishing both ends of your CAT 5 cable, plug the cable into the cable tester below and verify its integrity.

Hamilton CAT5 cable tester, part number E10059, tests the cable and connectors. Testing before connecting can prevent damage; and a functionally tested cable ensures proper operation the first time. The Hamilton CAT5 cable tester checks for opens, shorts, and cross-wiring. The CAT 5 cable is plugged into the separate Master and Remote test units. Because the units are separate, you can test installed cable between the customer and teller area, for example. The Master unit's four LEDs indicate the condition of specific pairs: 4&5, 1&2, 3&6, and 7&8.

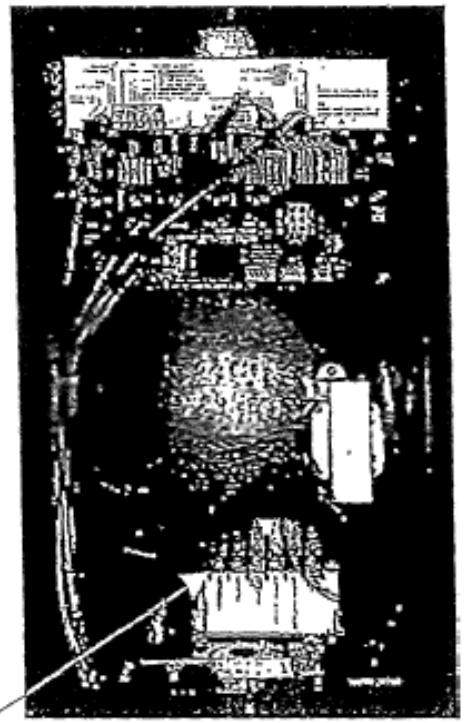


Hard Wired Power Connections and Conduit Kits

HA45/50 Control Panel



HA1000 Control Panel



HOT, NEUTRAL, and GROUND Terminals
120 Volts, 60Hz, 20 Amp Circuit

Don’t Turn Off Microphone Mute

Microphone Mute

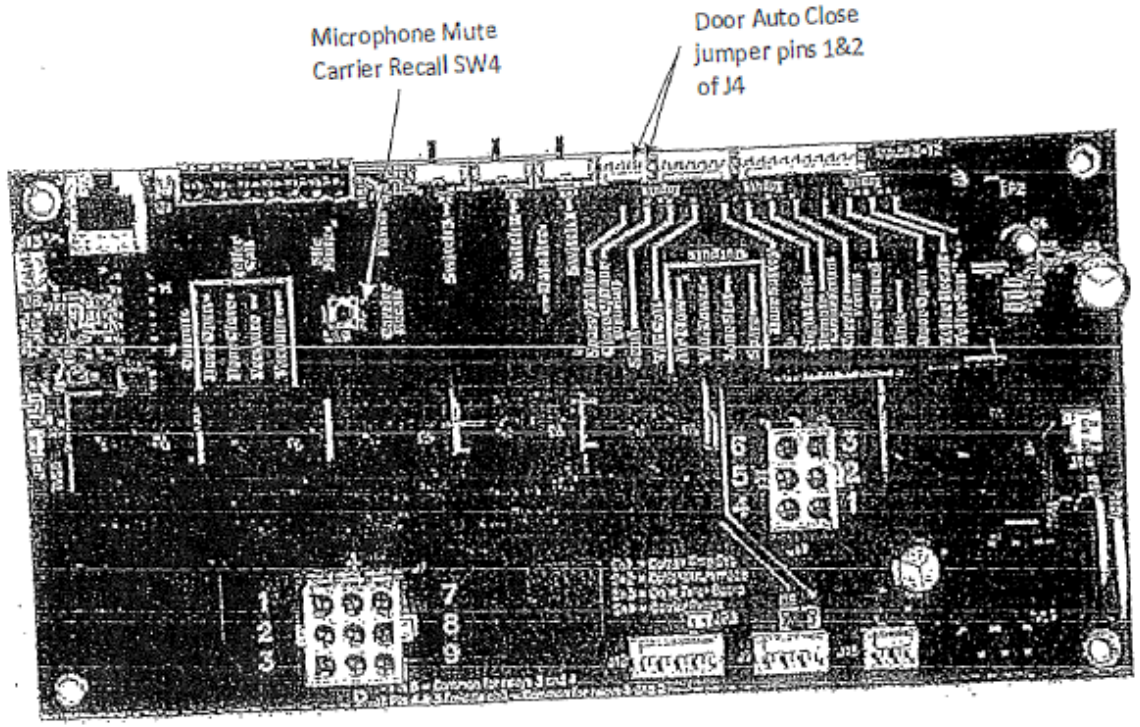
The E0873 control board can be set-up to mute the microphone during blower operation. If a unit is configured with the blowers located close to the microphone in the customer unit, muting will cut down noise for the tellers.
To Program Microphone Muting

- Press SW4 (Recall) on the customer unit control board to recall carrier to customer unit.
- Press and hold SW4 and press the teller call button on customer unit.
- The output LED for microphone mute will flash.

One flash = the microphone is set to mute.
Two flashes = the microphone is set to not mute
(Note: the input LED for the teller call button will light when the button is pressed. This is not the output LED for microphone mute and therefore not the LED that will signal the setting of microphone muting.)

- Repeat step #2 to toggle between settings as needed

(Note: SW4 and teller call must be released to toggle setting.)
System is now functional as normal with the new setting for muting the microphone.



HA1000 Changing Carrier Speed

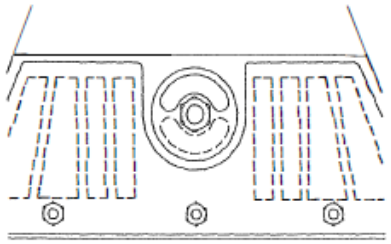
ner carrier landing speed

The carrier traveling towards the customer unit is being pulled by a vacuum motor connected to the air take off port. After the carrier passes this port, the carrier is no longer being pulled by the vacuum so the carrier must now free fall down the vertical tube. The rate of speed in which it falls depends on the air resistance created by the sealed customer unit and tubing.

A leaking customer unit or tubing from the customer unit to the air take off port will typically allow the vacuum motor to draw air in through these leaks. The air entering these leaking areas will travel up the acrylic tube towards the air take off port. This air travelling upwards in the vertical tube will cause the carrier to stop and hover or float. When the vacuum motor shuts off and the customer unit door starts to open, the air below the carrier is released rapidly allowing the carrier to drop exceedingly fast and land extremely hard in the customer unit. Hard landings like this can cause damage to the customer unit, carrier, or carrier contents.

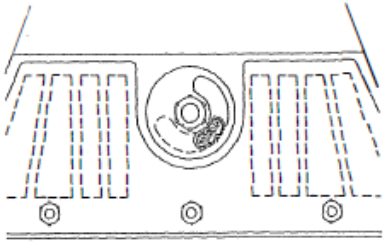
The leaky areas letting air into the customer unit or the tubing should be sealed off as best as possible. If the leaks are all sealed and the carrier still falls really slow or floats in the vertical tube, vacuum can be allowed to draw some of the air from below the carrier to increase the carrier landing speed.

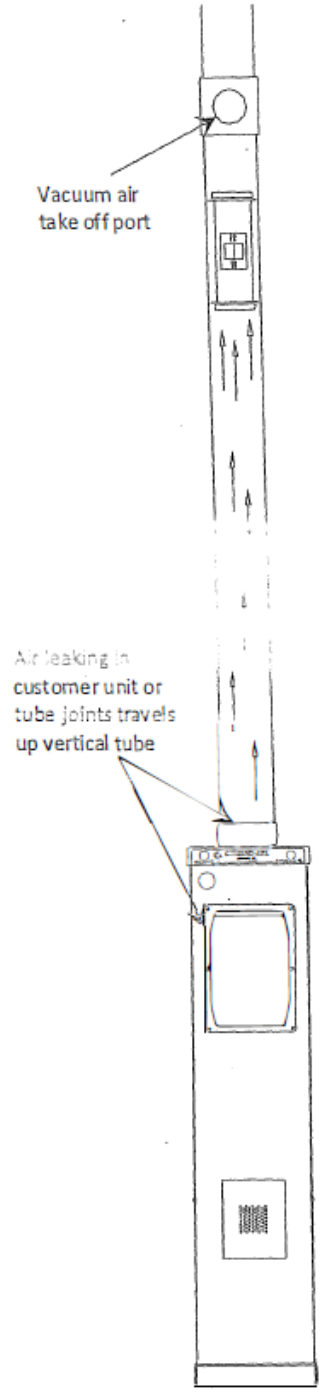
The HA45 customer unit has an adjustable valve for the purpose of setting the carrier landing speed. The valve is the small round gold colored disc located in the carrier compartment in front of the carrier landing pad.



The carrier landing speed valve shown to the left is completely closed.

Shown to the right, the valve has been rotated to open a section through the valve and increase the carrier landing speed.





Switches and Jumper Settings

Setting procedure for blower run time (Single time for both directions)

1. Restore to default run-time, as described above.
2. The carrier must be in customer unit with customer door open.
3. Turn SW1 to the "ON" position. (LED indicator will light)
4. Push and hold either "Customer Send" or "Teller Recall" button until carrier arrives in the teller unit. Releasing button stores the time for this cycle.

Note: For systems with carrier arrival switches at both ends, when the carrier arrives at the teller unit and activates the carrier arrival switch, the blowers will automatically turn off.

5. Turn SW1 to the "OFF" position to store the cycle time for both directions.

Note: For systems with carrier arrival switches at both ends, the system will now run until the carrier arrives and activates the carrier arrival switches at both customer and teller.

Setting Procedure for blower run time (Three Stage Cycle Time)

2. The carrier must be in customer unit with customer door open.
3. Turn SW1 to the "ON" position. (LED indicator will light)
4. Push and hold either "Customer Send" or "Teller Recall" button until carrier arrives in the teller unit.
5. Release the button to store the time for this cycle.
6. Push and hold either "Teller Send" or "Teller Call" button until carrier arrives in the clear acrylic tube on the customer unit.
7. Release the button to store the time for this cycle. (Turbines will shut off, customer door stays closed)
8. When carrier lands in customer unit, press and release "Teller Call" button to open the door. This stores a third time for carrier free fall time in the clear acrylic tubing.
9. Turn SW1 to the "Off" position for normal operation.

E0873 Control Board Setup Procedure

The E0873 control board is used in many different system configurations. Feature switches and jumpers are used to setup the control board for the type of system and the features needed.

Jumper Settings

The jumpers are used to set the control board for manual teller operation or for a dual board system where the teller unit also has a control board. Teller units that are motorized require the use of a control board mounted in the teller unit as well as the customer unit.

Jumper #1 (JP1) Manual Teller = JP1 – ON
Dual boards = JP1 – OFF

Jumper #2 (JP2) Manual Teller = JP2 – ON
Dual boards = JP2 – OFF

Jumper #3 (JP3) Manual Teller = JP2 – ON
Dual boards = JP2 – ON

Switch Settings

The switches on the control boards are used to set functions and test operations. There are three slide switches and one pushbutton switch located on the control boards. The three slide switches are labeled #1, #2, and #3 while the fourth pushbutton switch (SW4) is labeled "Carrier Recall". Momentarily pressing SW4 recalls the carrier to this end of the tube system.

Standard switch settings for Customer mounted control board

SW1 Switch 1: **Blower Run Time Set.**
"Off" is normal setting. Switching "On" enables blower "Time-Set" mode. See "Blower Run Time Set" for full instructions on setting blower run times.

Activate "Turbine Test Mode" by holding SW4 while switching SW1 "On" if customer door is open and turbines are connected to this control board. Send and teller call will activate the pressure and vacuum turbines.

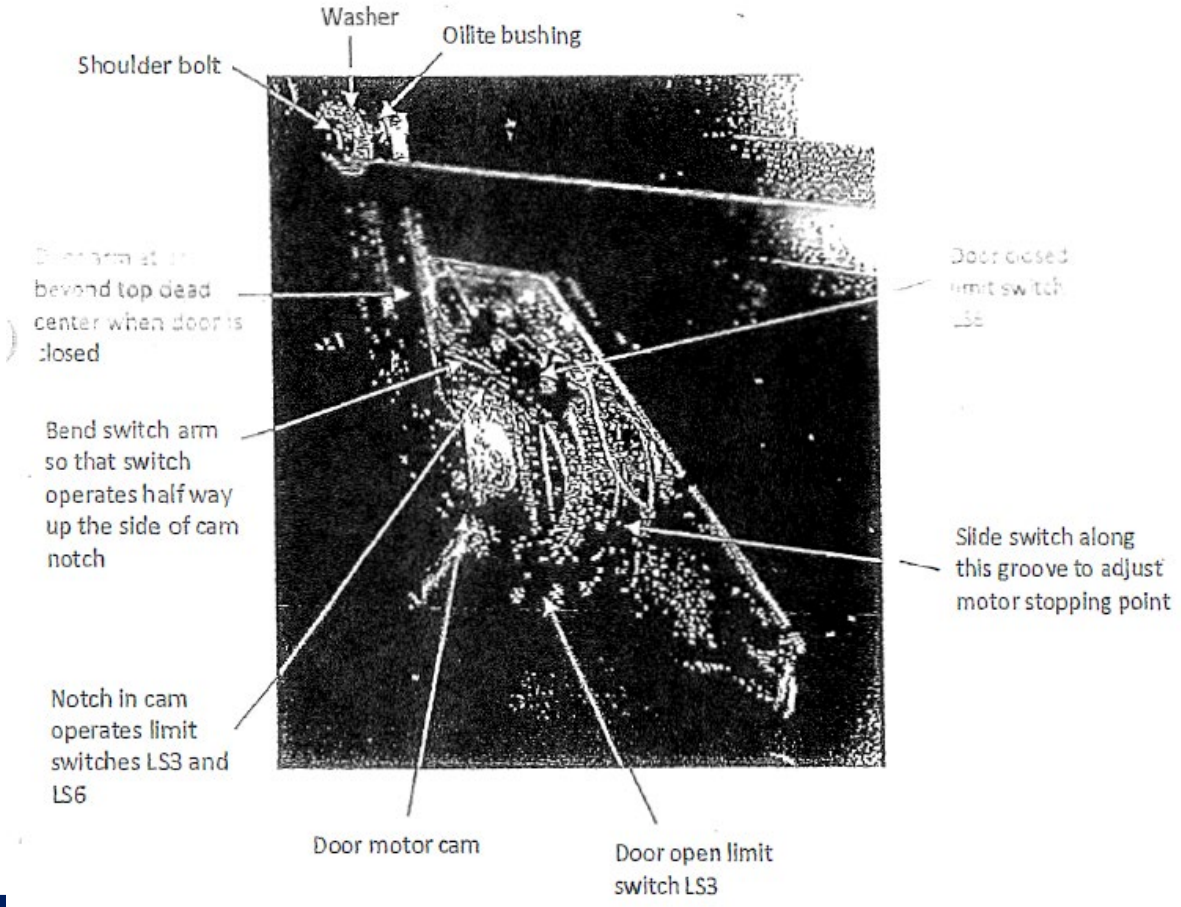
If SW3 is turned on before SW1, the unit will enter "Door Test Mode" which allows send and teller call buttons to manually operate the customer door motor open and closed.

SW2 Switch 2: **Turbine Mode.**
"Off" is normal setting with single stage turbine.

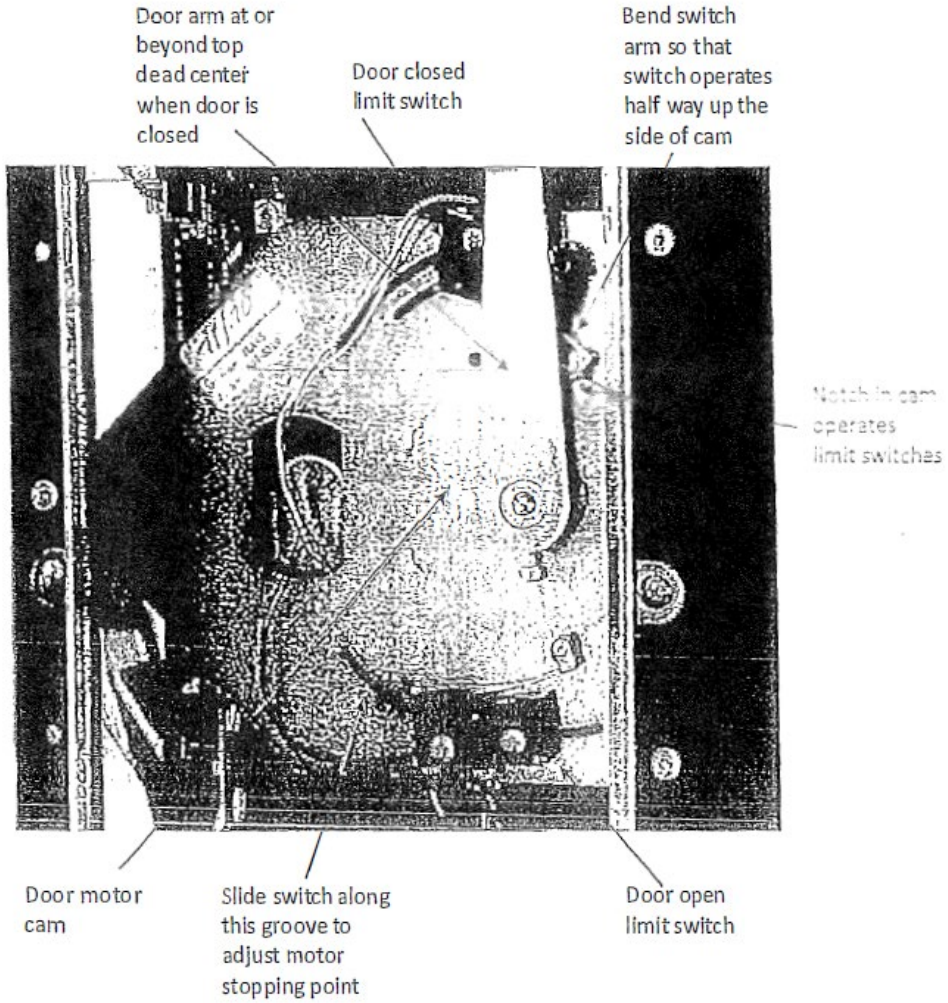
SW3 Switch 3: **Unit Selection.**
"Off" is normal setting for board mounted in customer unit.

Safety Bar and E0873 Troubleshooting

HA1000

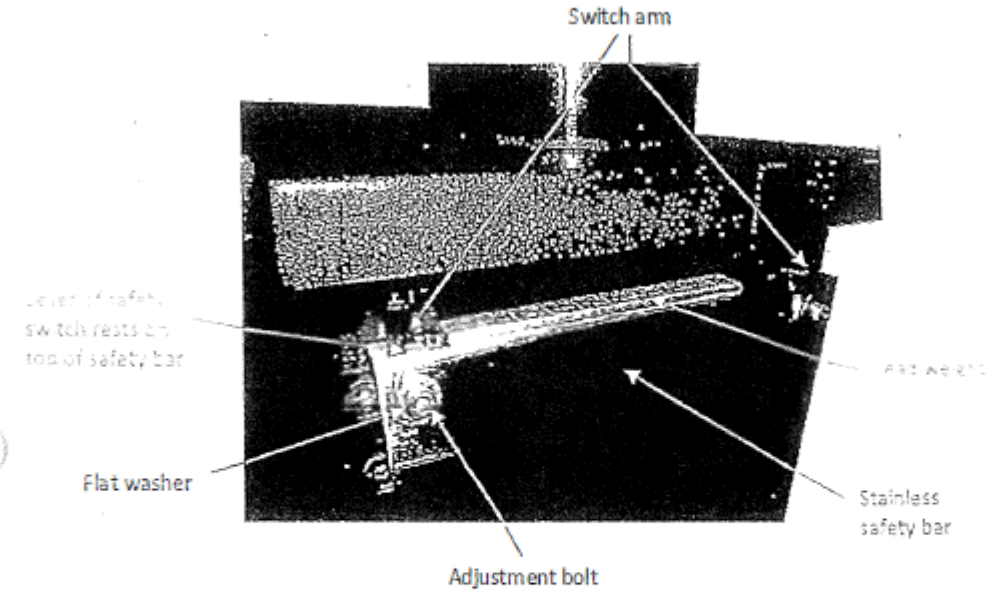


HA45/50



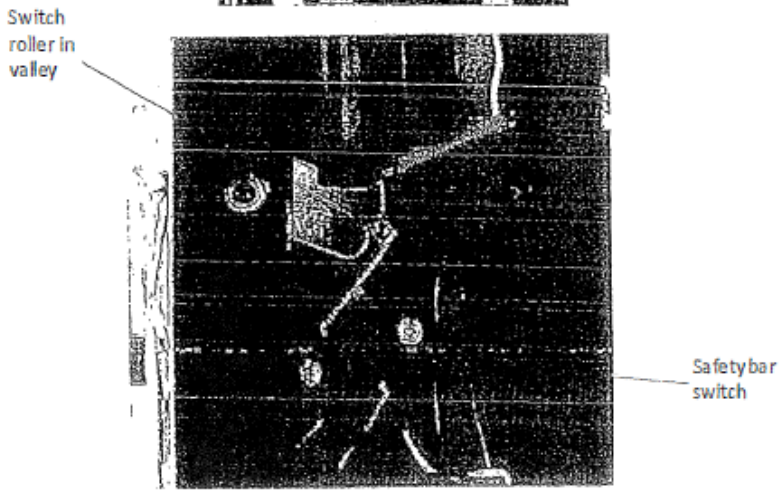
Safety Bar and E0873 Troubleshooting

HA1000



To adjust the safety bar, first make certain the rough side of the flat washer faces the adjustment bolt. Turn the adjustment bolt clockwise until it just traps the safety bar. Turn the adjustment bolt counter clockwise ¾ turn; this is the set point. Clean the area around the bolt, washer, and safety bar with a solvent. Do not use WD40 or other type of lubricant in this area. Check operation of the safety bar to see that it can be lifted completely and it falls easily when released. You want to make sure the safety bar cannot be wedged, tilted, or bumped in a manner that will cause it to become stuck in the raised position. Check this operation with all the cover panels installed also to make sure nothing interferes with the safety bar. After the bar is confirmed to operate properly without sticking, check the set points of the two safety bar switches. When lifting the safety bar, notice how far it will travel and adjust the switches so they activate when the safety bar is about half way up. If the switches activate very close to the bottom or the top of the safety bars stroke, bend the switch arm so the safety bar is about half way up when the switches activate.

After the bar is confirmed to operate properly without sticking, check the set point of the safety bar switch. When lifting the safety bar, notice how far it will travel and adjust the switch so it activates when the safety bar is about half way up. If the switch activates very close to the bottom or the top of the safety bars stroke, adjust the position of the switch by loosening its mounting screws and sliding the switch up or down depending on the direction that is needed. The roller on the safety bar switch should set in the valley of the cam when the safety bar is in its normal down position. As the safety bar is rotated upward in the front of the unit, the cam area is rotated downward activating the switch.



Safety Bar and E0873 Troubleshooting continued…

LED	Possible Problems	Possible Solutions
Teller Send OFF	Teller door open, bad CAT5 cable or connections, Teller door switch misadjusted,	Close teller door, test and repair CAT5 cable, Connect CAT5 cable, Adjust teller door switch
Link OFF	Teller door open, bad CAT5 cable or connections, Teller door switch misadjusted,	Close teller door, test and repair CAT5 cable, Connect CAT5 cable, Adjust teller door switch
Door Open OFF	Door completely open, Door open limit switch not on door cam, bad switch, switch misadjusted	Close customer door, test and adjust lower door open limit switch
Door Closed ON	Door not completely closed, Door closed limit switch misadjusted, bad switch	Close customer door, test and adjust upper door closed limit switch
Door Safety OFF	Door safety bar stuck up, safety switch bad or misadjusted	Free safety bar, test and adjust safety bar switch
Vid. Power OFF	Night lock is turned on	Turn night lock feature off
Close C/Door Optional	Option, jumper on J4 pins #3 & #4 turns on function	Option, jumper on J4 pins #3 & #4 turns on function
Power OFF	No power to unit, no power from transformer, transformer unplugged from board J6	Test and restore power to unit, test and replace transformer, connect transformer to board J6

Customer Single Board System

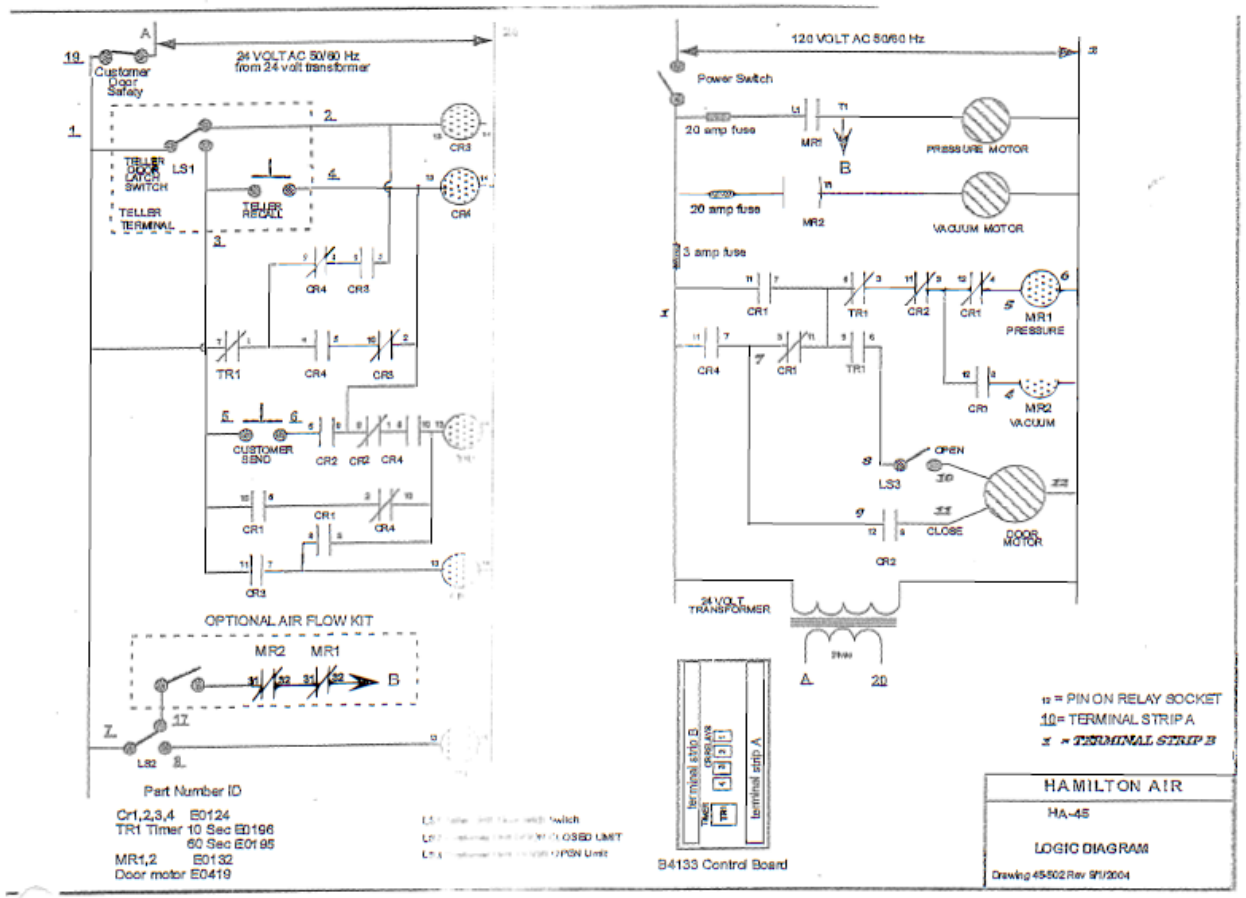
Customer Dual Board System

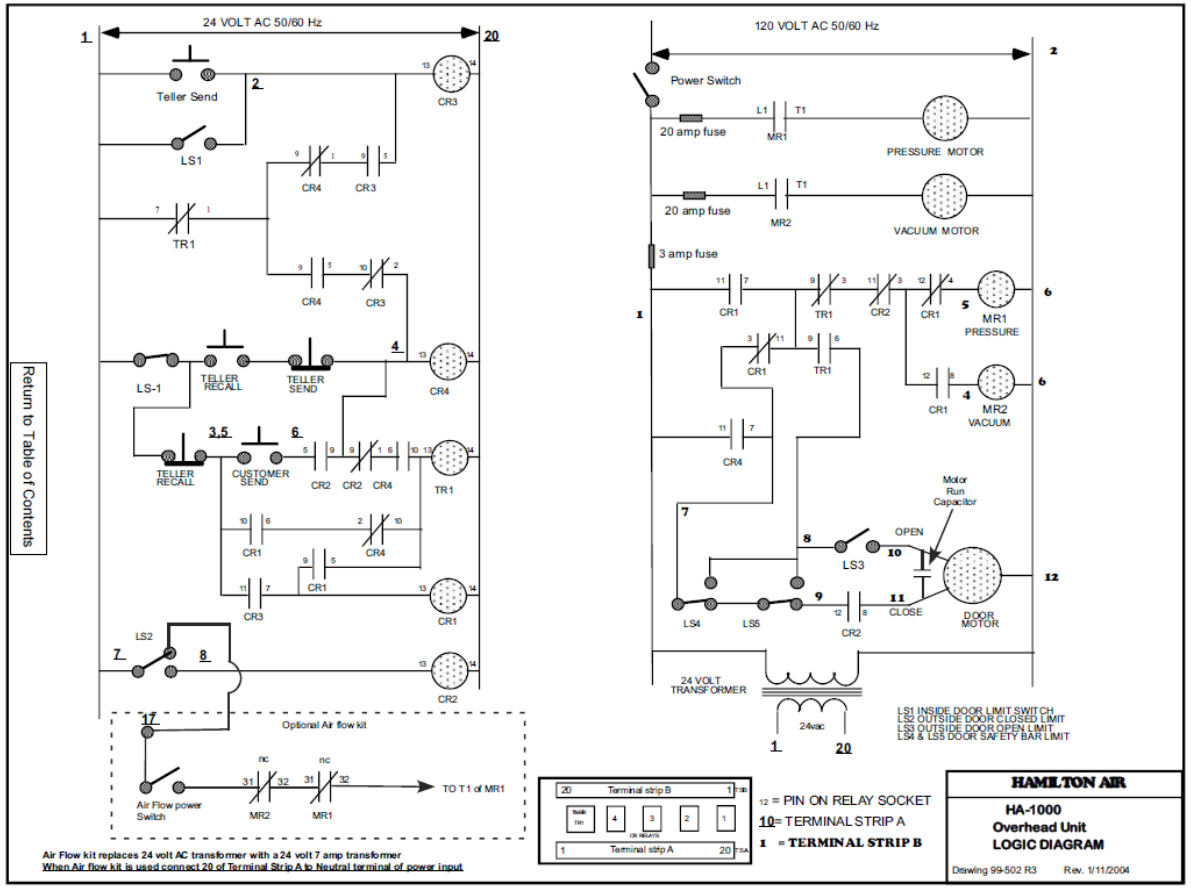
LED	Possible Problems	Possible Solutions
Link OFF	Bad CAT5 cable or connections, mismatched firmware in teller and customer, poor communication between teller and customer	Test and repair CAT5 cable, Connect CAT5 cable, change firmware chip to latest available in both customer and teller units
Door Open OFF	Door completely open, Door open limit switch not on door cam, bad switch, switch misadjusted	Close customer door, test and adjust lower door open limit switch
Door Closed ON	Door not completely closed, Door closed limit switch misadjusted, bad switch	Close customer door, test and adjust upper door closed limit switch
Door Safety OFF	Door safety bar stuck up, safety switch bad or misadjusted	Free safety bar, test and adjust safety bar switch
Vid. Power OFF	Night lock is turned on	Turn night lock feature off
Close C/Door Optional	Option, jumper on J4 pins #3 & #4 turns on function	Option, jumper on J4 pins #3 & #4 turns on function
Power OFF	No power to unit, no power from transformer, transformer unplugged from board J6	Test and restore power to unit, test and replace transformer, connect transformer to board J6
Data Rec.	Light flashes or flickers when teller and customer boards are communicating. This may result in the LED being ON or OFF when system is idle	If LED does not flash or flicker when buttons are pressed or switches are moved, check: power to both units, CAT5 communication cable, firmware in both units

LED	Possible Problems	Possible Solutions
Link OFF	Bad CAT5 cable or connections, mismatched firmware in teller and customer, poor communication between teller and customer	Test and repair CAT5 cable, Connect CAT5 cable, change firmware chip to latest available in both customer and teller units
Door Open OFF	Teller door in fully open position, door open limit switch misadjusted or bad	Test and adjust door open limit switch, Check power and connections to door motor
Door Closed ON	Teller door not in fully closed position, door closed limit switch not on cam, bad switch, switch misadjusted	Test and adjust door closed limit switch, Check power and connections to door motor
Switch #3 OFF	Switch #3 in OFF position	Move Switch #3 to ON position
Door Safety OFF	Door safety mechanism activated or stuck, door safety switch bad, switch misadjusted	Test and adjust door safety mechanism, test and replace or adjust door safety switch
Power OFF	No power to teller unit, no power from transformer, transformer unplugged from board J6	Test and restore power to teller unit, test and replace transformer, connect transformer to board J6
Data Rec.	Light flashes or flickers when teller and customer boards are communicating. This may result in the LED being ON or OFF when system is idle	If LED does not flash or flicker when buttons are pressed or switches are moved, check: power to both units, CAT5 communication cable, firmware in both units

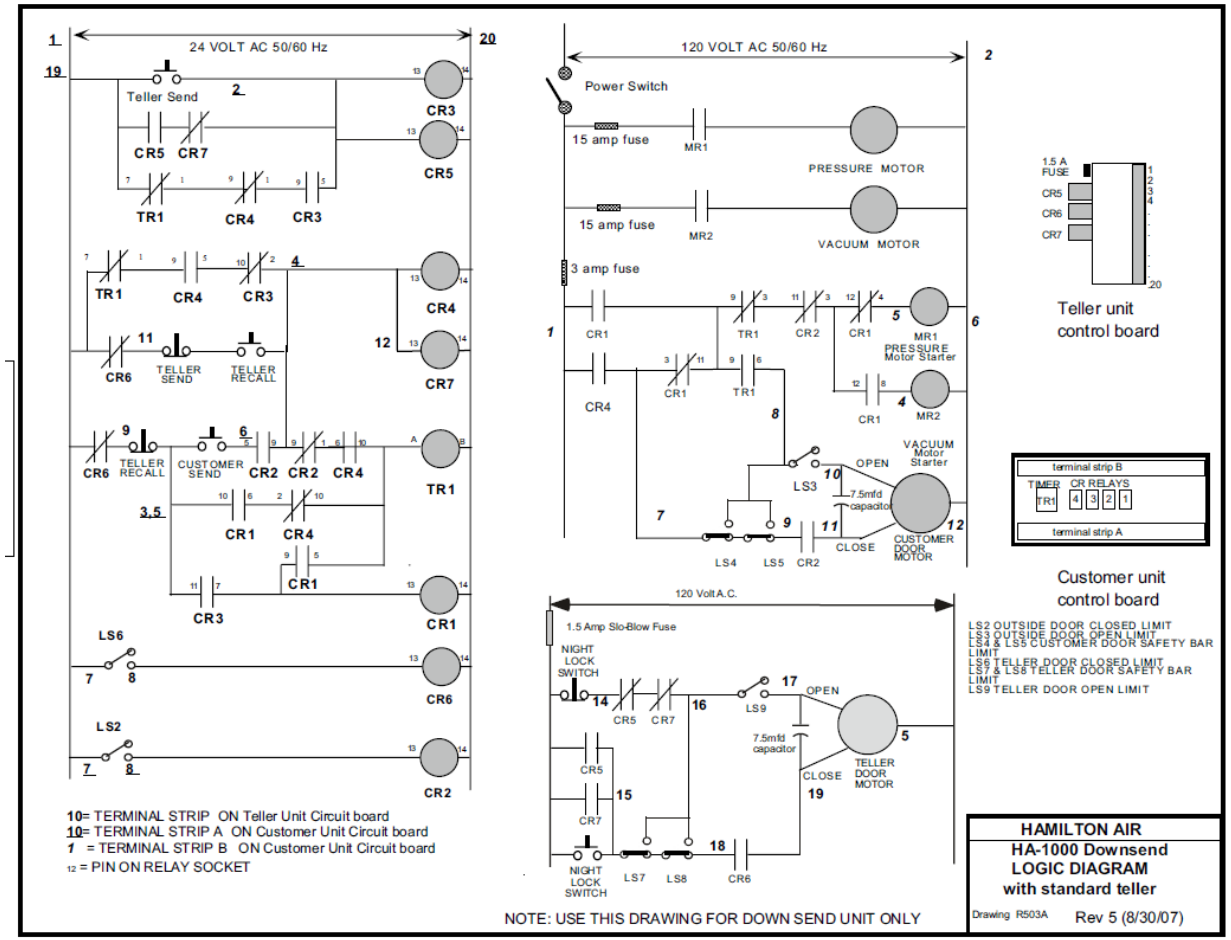
Teller Dual Board System

Schematics and Initial Startup Procedures





Schematics and Initial Startup Procedures continued…



Initial Startup Procedures

1) Check all connections, electrical and tubing.
2) Turn on power to customer unit.
3) The customer door will close if not already closed after the control board is fully started. It takes five to seven seconds for the control board to fully start.
4) Check LED lights on the customer unit control board. (Refer to instructions for the control board to confirm proper setup.) You should see Link, Teller Send, Door Open, Door Safety, Power, and Vid. Power LEDs on at startup. You may see Close C/Door also as an option.
   a. Note the Link and Teller Send LED lights activate when the manual operator unit door is closed. If these two LED lights are not on, confirm the manual operator unit door is fully closed and activating the switch.
   b. If the nightlock LED is on, the Vid. Power LED will not come on. Check the nightlock switch located on the manual operator unit.
   c. Door safety LED should always be on with exception of when the safety bar is lifted on the customer unit.
   d. Door open and door closed LEDs are on until the door is in that position. For example, both door open and door closed lights are on, when the door is fully closed, the door closed LED should go out. The door open light will remain lit. The same will happen when the door is completely open, the door open light should go out and the door closed light will remain on.
5) Test the operation by pressing the carrier recall button located on the customer control board. The vacuum motor should run for three seconds and the customer door should open. Now press the carrier send button located on the front of the customer unit. The customer door should close and the pressure motor should run for three seconds. Recall the carrier to customer unit again. Test safety bar but activating the safety bar while the door is closing. The door should return to open position after safety bar was activated.
6) Set blower run time.

HA-1000 XLR


HAMILTON AIR
HA1000-XLR
SEND
CARRIER
CALL
FOR SERVICE


SEND
CARRIER
CALL
FOR SERVICE
HAMILTON AIR
HA1000-XLR
SEND
CARRIER
CALL
FOR SERVICE

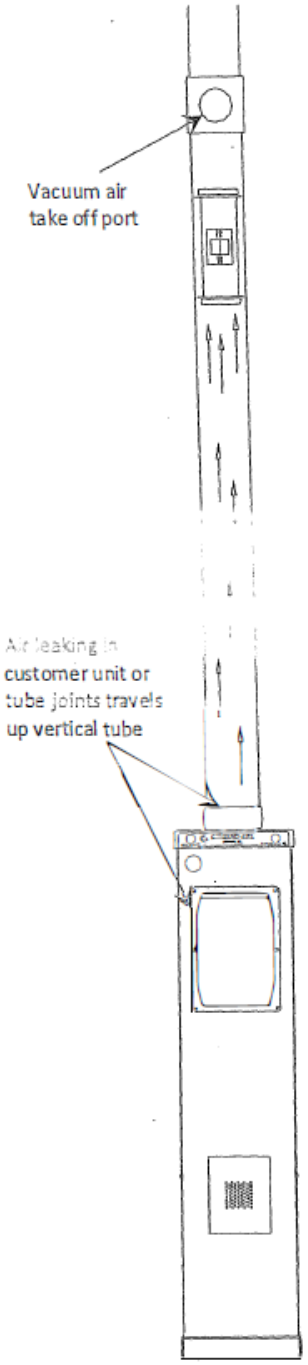
XLR Changing Carrier Speed

ner carrier landing speed

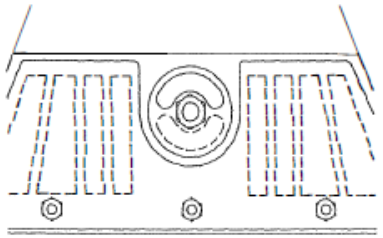
The carrier traveling towards the customer unit is being pulled by a vacuum motor connected to the air take off port. After the carrier passes this port, the carrier is no longer being pulled by the vacuum so the carrier must now free fall down the vertical tube. The rate of speed in which it falls depends on the air resistance created by the sealed customer unit and tubing.

A leaking customer unit or tubing from the customer unit to the air take off port will typically allow the vacuum motor to draw air in through these leaks. The air entering these leaking areas will travel up the acrylic tube towards the air take off port. This air travelling upwards in the vertical tube will cause the carrier to stop and hover or float. When the vacuum motor shuts off and the customer unit door starts to open, the air below the carrier is released rapidly allowing the carrier to drop exceedingly fast and land extremely hard in the customer unit. Hard landings like this can cause damage to the customer unit, carrier, or carrier contents.

The leaky areas letting air into the customer unit or the tubing should be sealed off as best as possible. If the leaks are all sealed and the carrier still falls really slow or floats in the vertical tube, vacuum can be allowed to draw some of the air from below the carrier to increase the carrier landing speed.

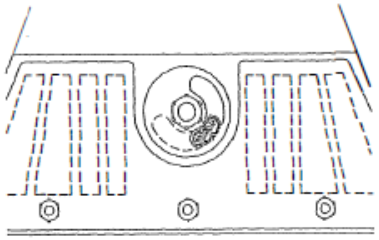


The HA45 customer unit has an adjustable valve for the purpose of setting the carrier landing speed. The valve is the small round gold colored disc located in the carrier compartment in front of the carrier landing pad.



The carrier landing speed valve shown to the left is completely closed.

Shown to the right, the valve has been rotated to open a section through the valve and increase the carrier landing speed.



Airflow Kit and Thermostat

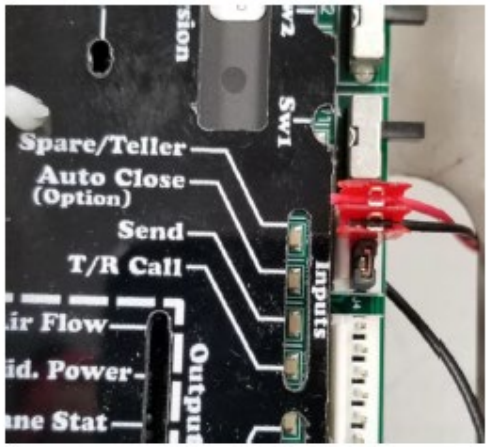
XLR Temperature

1: Kit contents

Thermostat, Hammond #SKT011419NO or equivalent
Cable, 2 cond. 4ft
Connector, 2 pos.
Mounting Rail with adhesive back
eProm chip with latest program (E0899)

2: Installation

1) Connect 2 position plug to J4 connector as shown, using the two pins closest to switch #1 labeled "Spare/Teller".



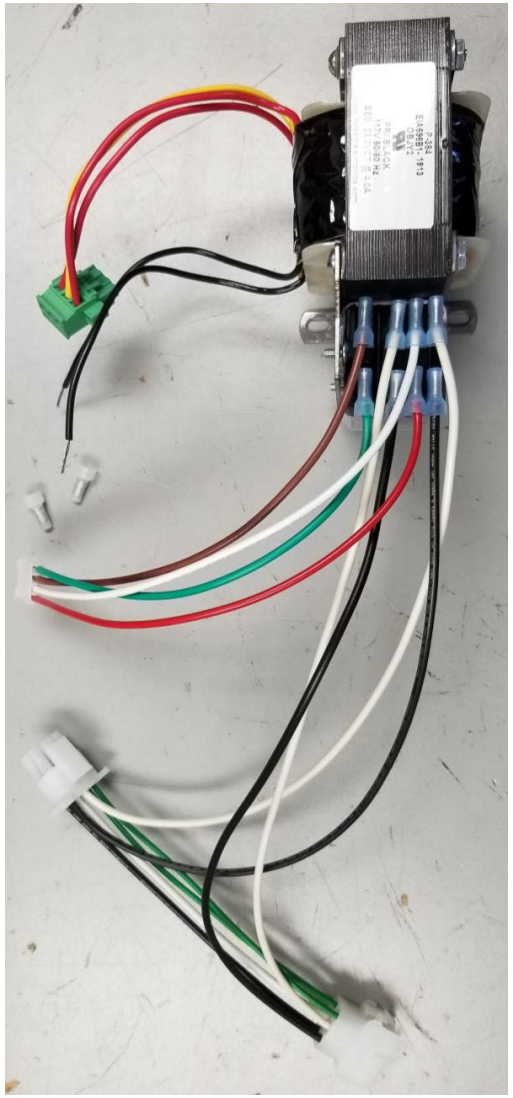
2) Locate the thermostat low towards the bottom of the customer unit. Use the mounting rail with adhesive to secure to frame or housing of unit.

3) Set temperature to desired setting.
   a. You want the lowest possible temperature without causing tube condensation. If there is tube condensation, raise the set point in small increments.
4) Refer to document #08-397 to install eProm chip with latest firmware.

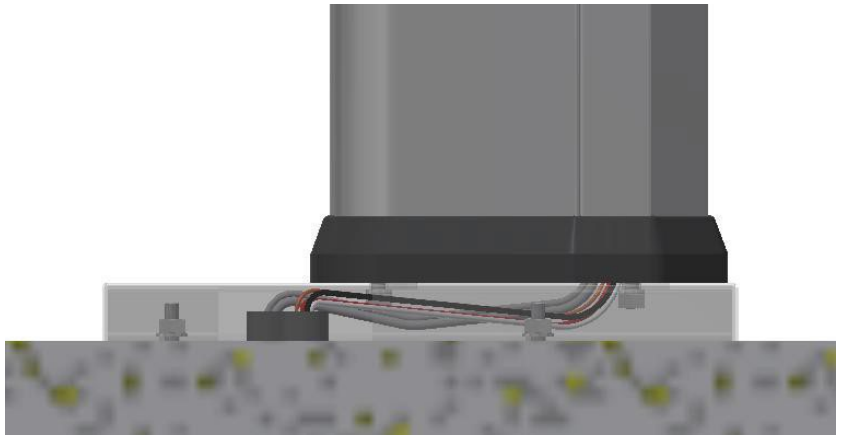
Airflow Kit and Thermostat continued…

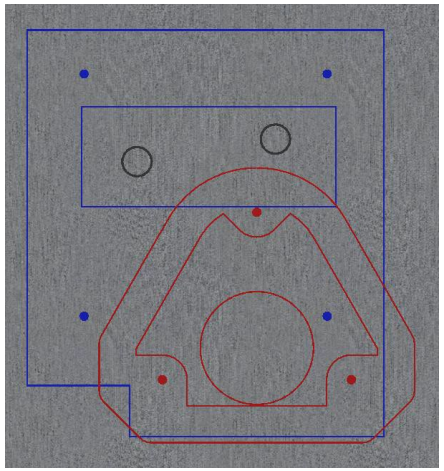
Kit Contents:

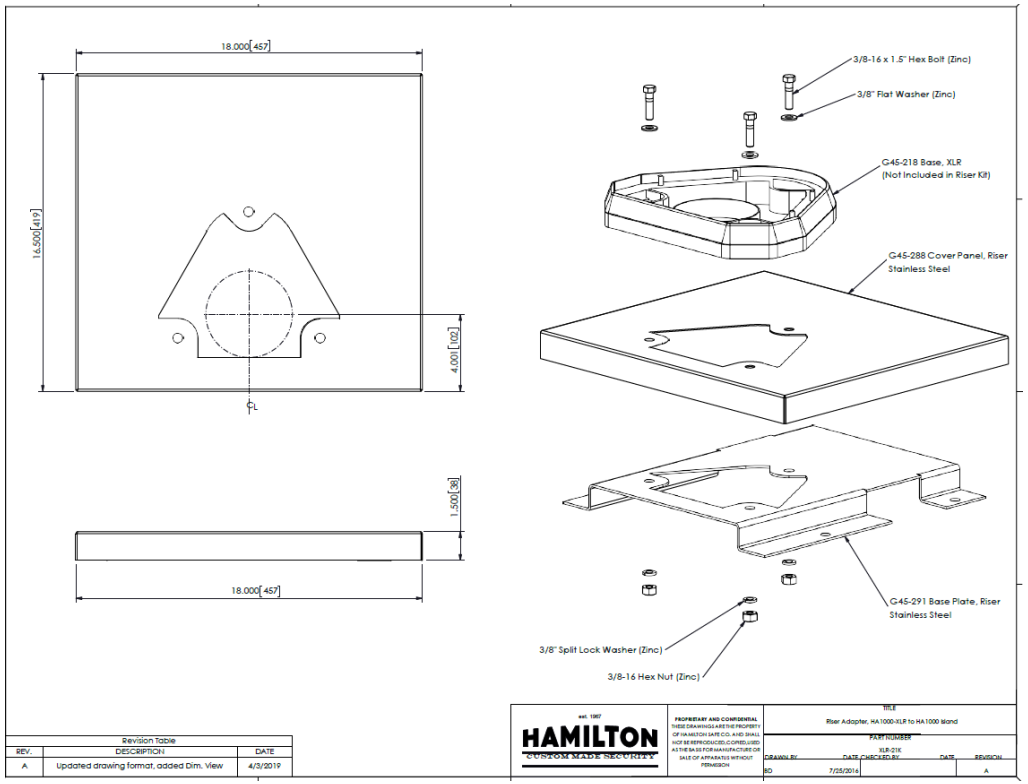
4A Transformer (E6031)
J6 connector (1835481)
J9 wire harness
Turbine “T” connector harness
(2) Wire crimp connectors

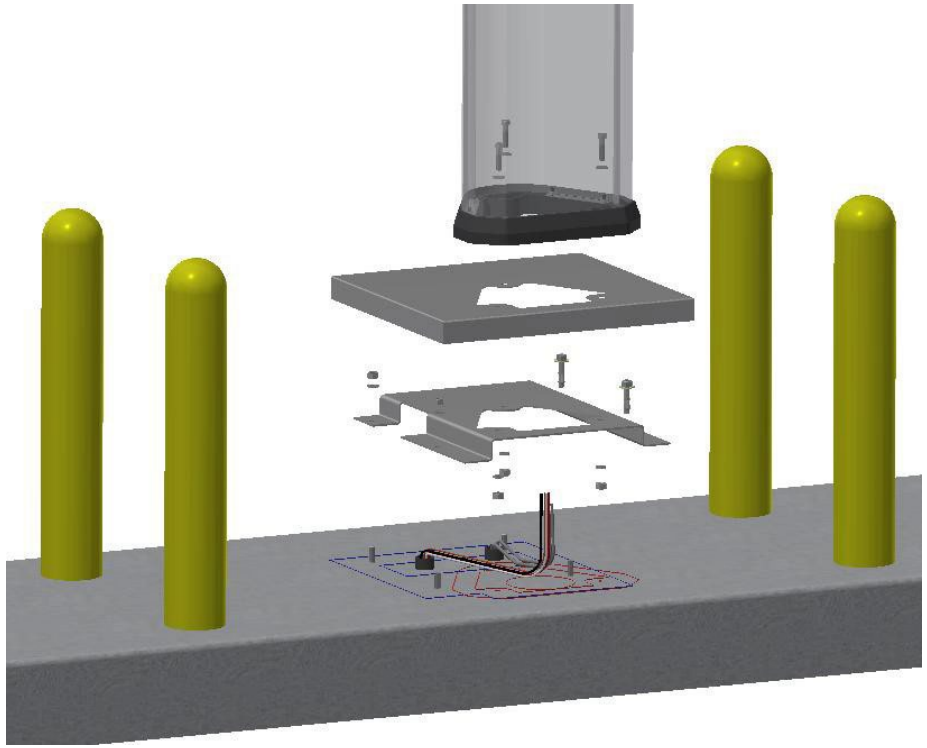


XLR Riser

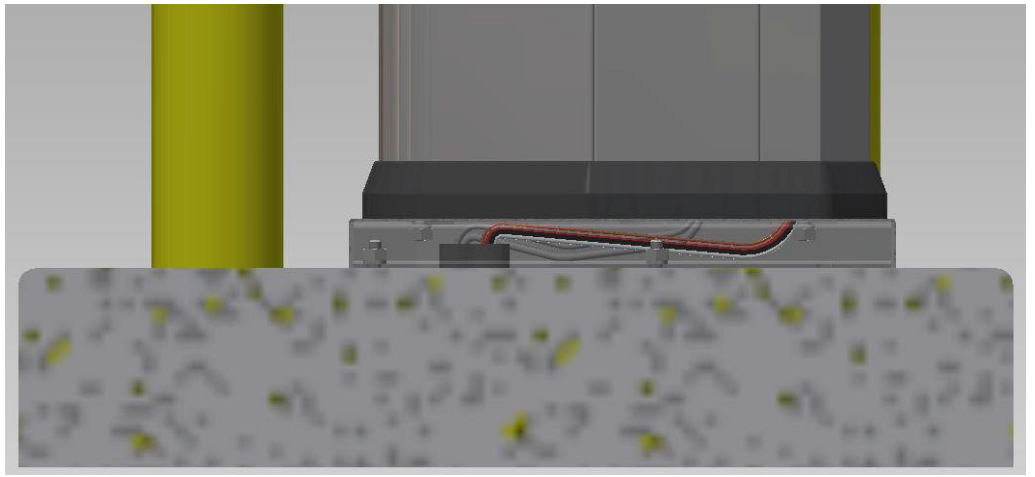


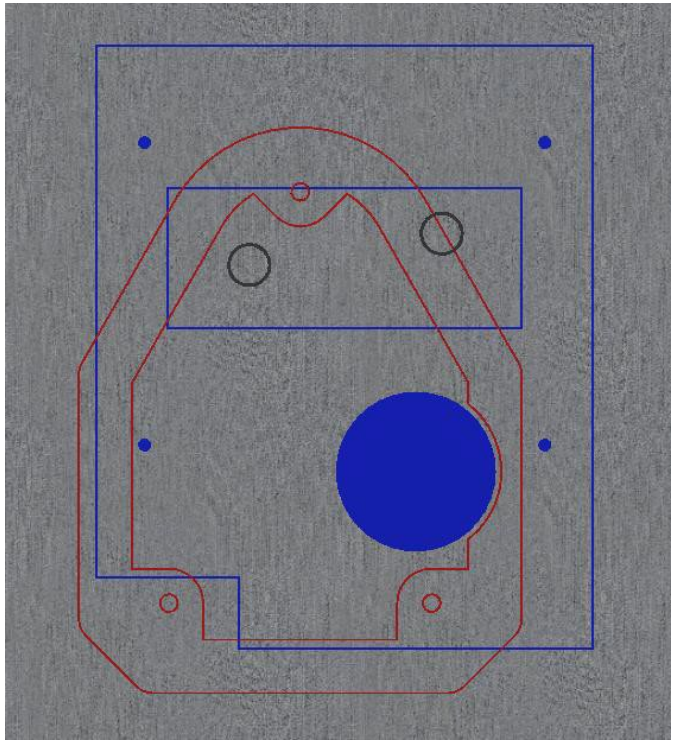


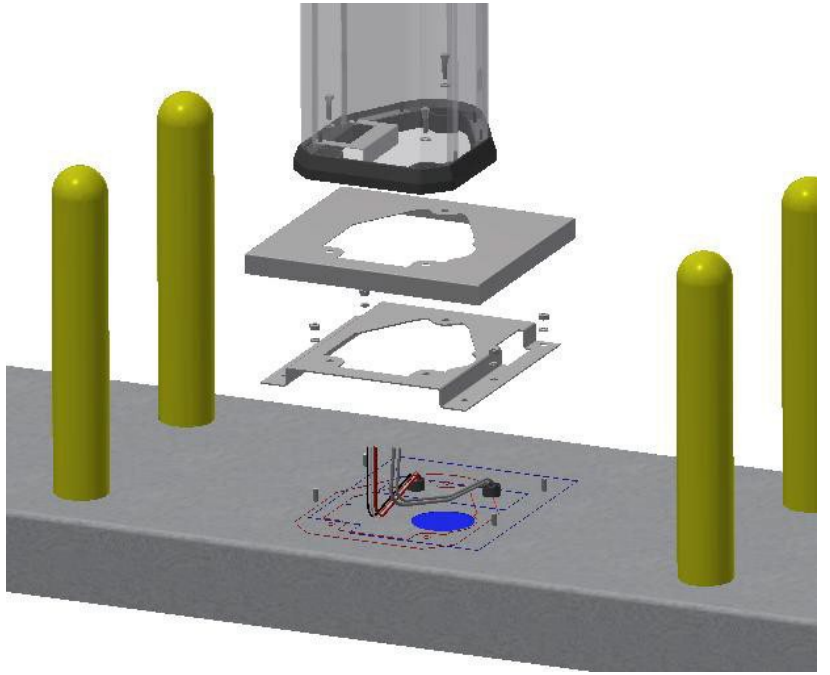

18.000[457]
16.500[419]
4.000[102]
1.500[38]
18.000[457]
3/8-16 x 1.5" Hex Bolt (Zinc)
3/8" Flat Washer (Zinc)
G45-218 Base, XLR
(Not Included in Riser Kit)
G45-288 Cover Panel, Riser
Stainless Steel
G45-291 Base Plate, Riser
Stainless Steel
3/8" Split Lock Washer (Zinc)
3/8-16 Hex Nut (Zinc)
Revision Table
REV. DESCRIPTION DATE
A Updated drawing format, added Dim. View 4/3/2019
HAMILTON
CUSTOM MADE SECURITY
PROPRIETARY AND CONFIDENTIAL
TITLE
Riser Adapter, HA1000-XLR to HA1000 stand
PART NUMBER
XLR-DTK
DRAWN BY
DATE
CHECKED BY
DATE
REVISION
RD
7/25/2016
A



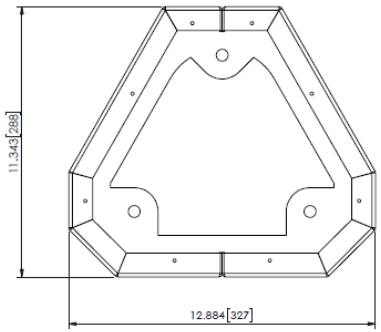
XLR Downsend and Truck Riser

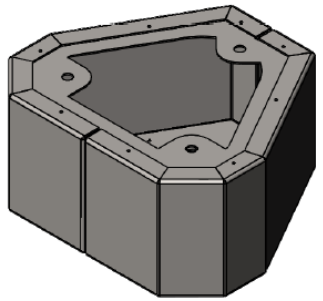


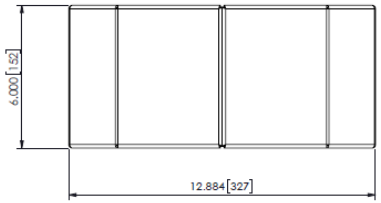


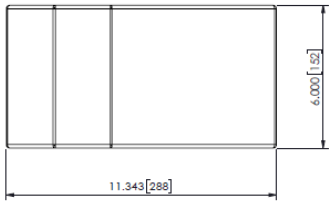


XLR Downsend and Truck Riser continued…









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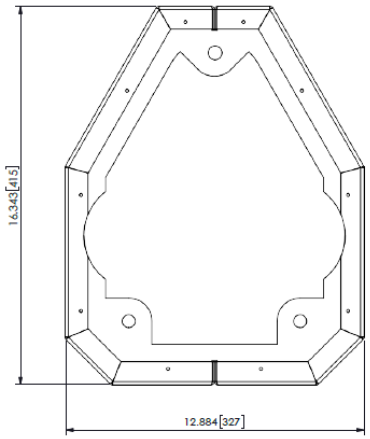
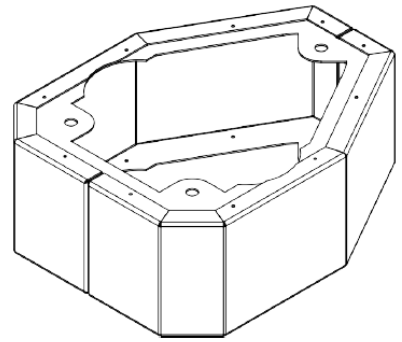
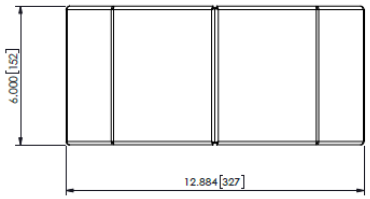
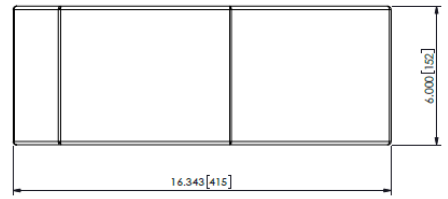
		DRAWN BY: BD DATE: 5/10/2019 CHECKED BY DATE	REVISION









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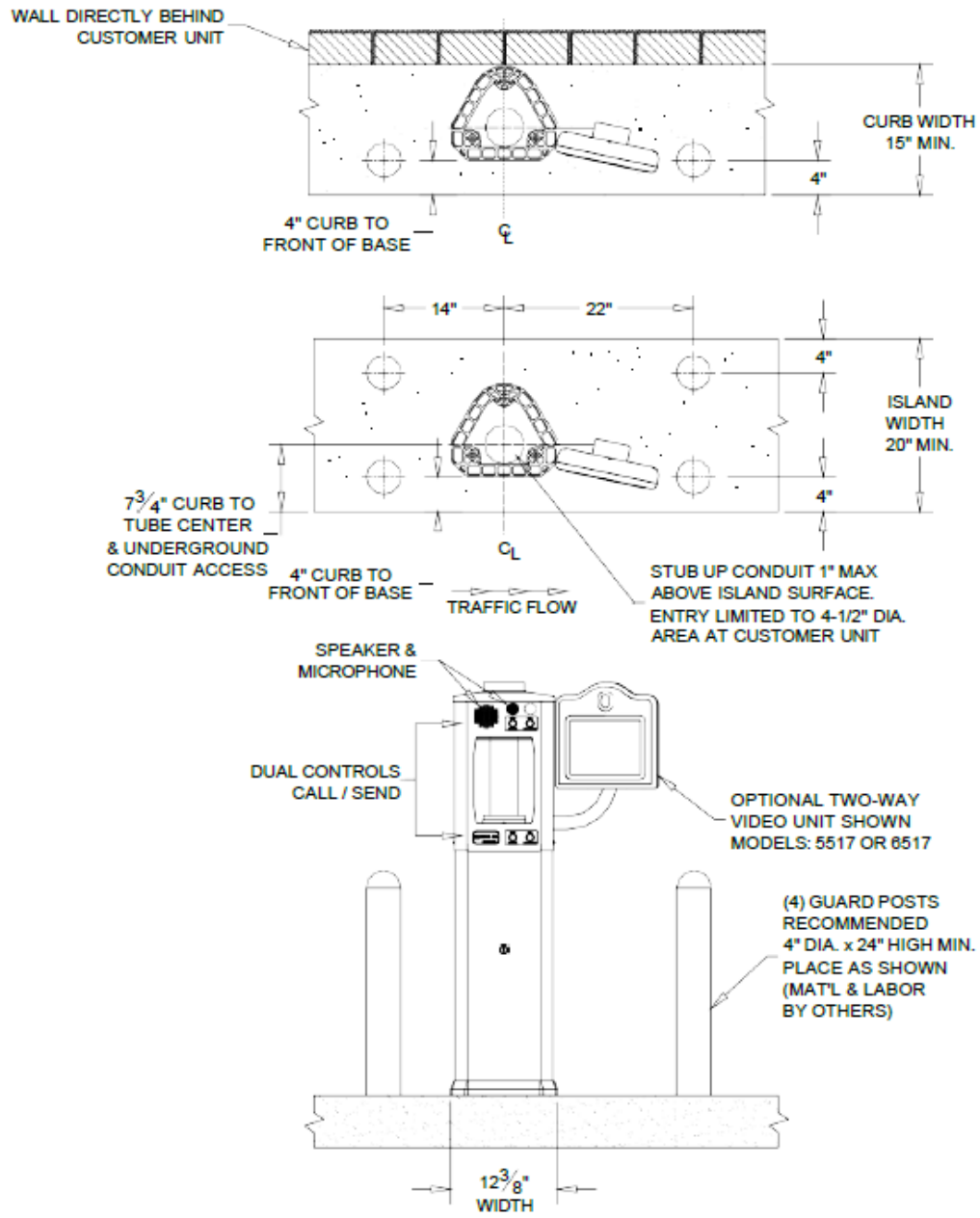
		DRAWN BY: BD DATE: 6/14/2019 CHECKED BY DATE	REVISION

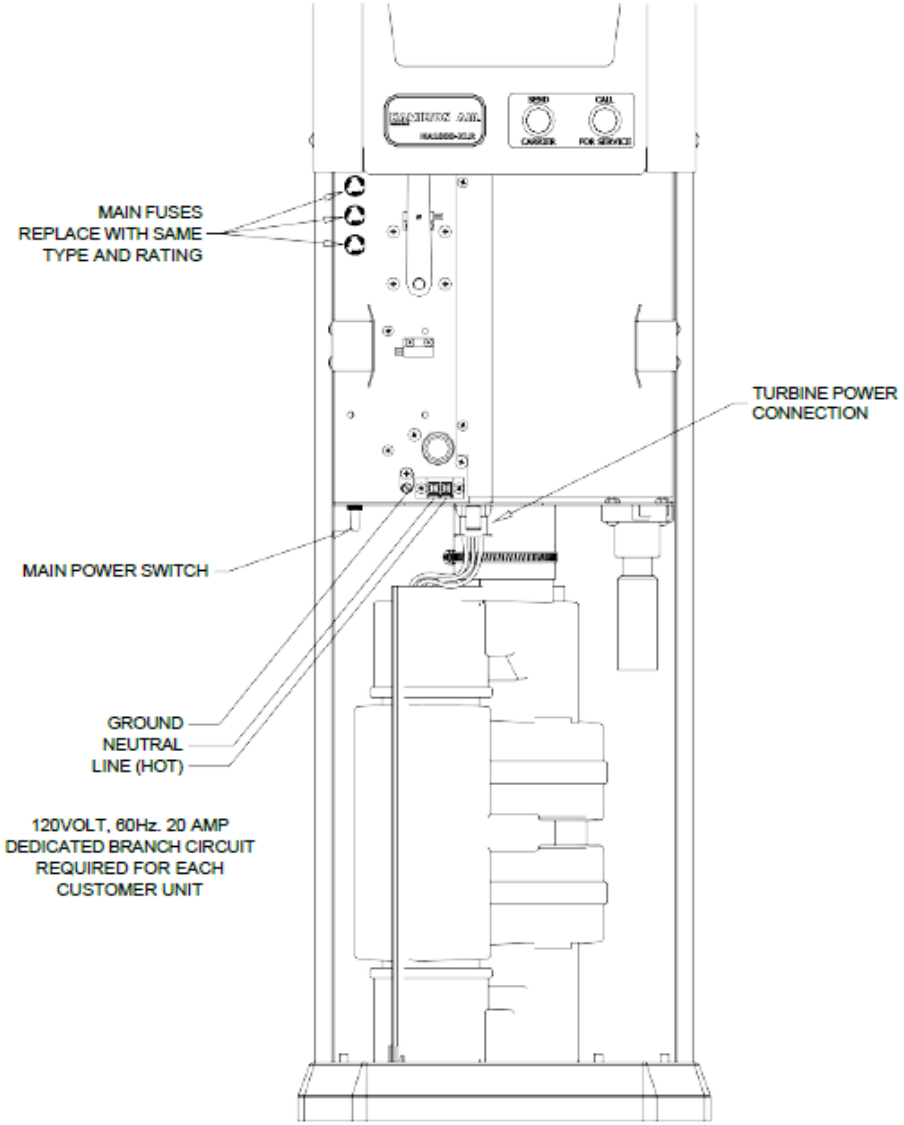
XLR Placement and Nylon Rubber

Customer Unit Details



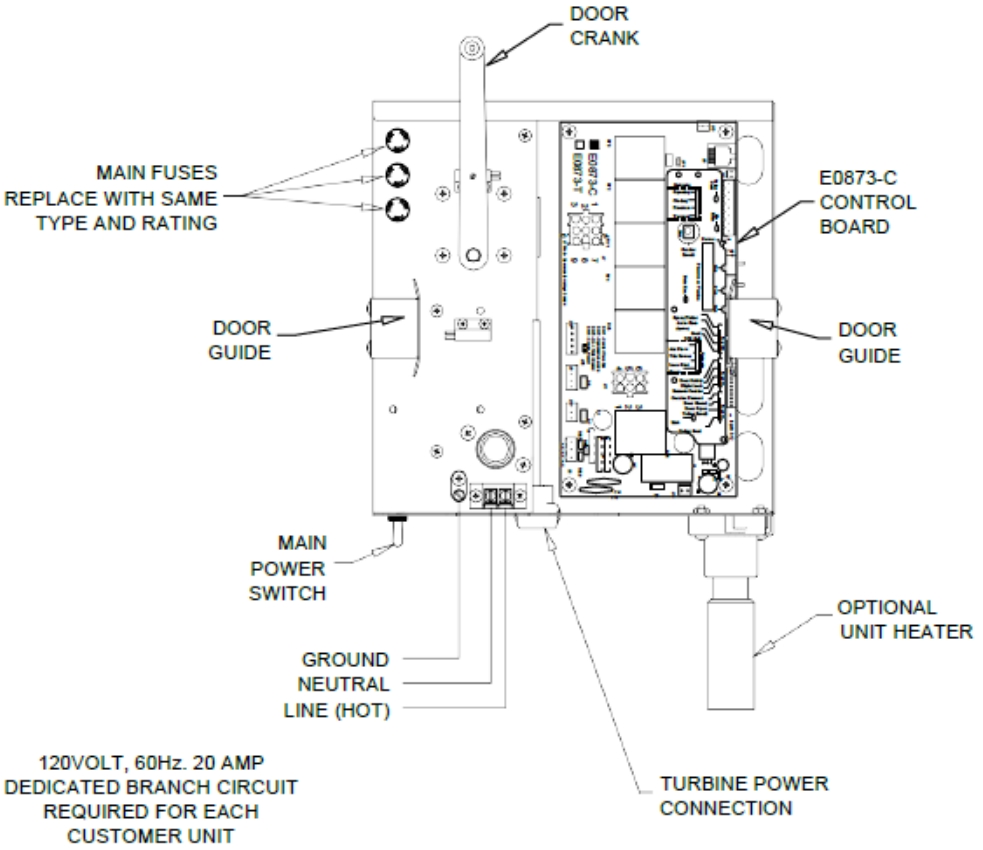
Door Guides

Customer Unit Power Connections



Transformer, Capacitor, Motor

Customer Unit Electrical Box Details



Motorized Door Troubleshooting

Troubleshooting the E0873

Motorized Door Test (Automatic):

1) Disconnect the interconnection cable from the board.
2) If the door is open, turn SW3 "ON", if door is closed, turn SW3 "OFF".
3) Cycle power "OFF" and back "ON".
4) Door should open or close depending on the setting of SW3.
5) Repeat test in both directions and on both tube stations if applicable.

Motorized Door Test (Manual):

1) Turn SW3 "ON" if not already "ON"
2) Turn SW1 "ON"
3) Send and Call or Recall activates the door manually. Releasing the button stops the door as well as tripping the limit switches.
4) Turn SW1 "OFF" and SW3 "OFF" for customer or "ON" for teller for normal operation.

Blower Run Test:

1) Test is performed on terminal that turbines are controlled from. This could be on either customer or teller station on a two board system.
2) Recall carrier to station that has turbines connected so that door will open.
3) Hold SW4 while switching SW1 "ON".
4) Pressing send and teller call or recall will activate the pressure and vacuum turbines.
5) Turn SW1 "OFF" to return to normal operation.

Restore Default Blower Run Times:

1) Turn power "OFF" to unit.
2) Turn SW1 "ON".
3) Turn power "ON" to unit.
4) Wait 10 Seconds for unit to initialize.
5) Return SW1 to "OFF".
6) Default blower run time is restored.

XLR Buzzing Noise

Troubleshooting Tips

- **System won't initialize (console lights continue to blink red or stay lit)** – The audio consoles, audio matrix and video matrix are all on an RS-485 communication bus through one of the wire pairs in the Cat 5 cables. A problem with any of these devices, including a damaged cable, can affect the RS-485 communications and cause a system wide failure like this. Power down and disconnect all but one audio console – also disconnect the video matrix if present. Power up and see if the system will initialize with a single console. *Initialization happens when the console LED's blink red several times, then turn solid green, and then go out.* If a single console initializes, power down and start adding devices back one at a time until it fails again to determine which device is at fault. If the first console failed to initialize, try a different one. If none of the consoles will initialize on their own the problem may be with the audio matrix. Don't rule out the possibility that a storm or power surge could have damaged multiple devices. Also be aware that some matrix failures only affect a particular console port so a known good console could be tried at each port.

- **Power supply issues** – Check power supplies while they are under load, or substitute with a known good supply. When a modern switching power supply fails it may still measure a full 12VDC when unplugged from the equipment because there is no current draw (load). Also make sure the power supply used is rated high enough for the current requirements of the equipment it is powering. Old Samlex power supplies (large heavy metal enclosure) should be watched closely and preferably replaced. As those linear supplies break down with age their output will not have clean DC current which will cause a system wide 60 cycle buzz in the audio. The output voltage will also slowly rise, sometimes to levels that can damage equipment.

- **Teller call issues** – The audio matrix sends a teller call signal to all audio consoles when it sees a "short" across terminals 3 & 4 of the lane connector. *Terminal 3 is at ground potential and that ground is transferred to terminal 4 when the call button is pressed.* If a call button won't work try unplugging the lane connector at the matrix and then plugging it back in. If a call tone is generated at that point then the teller call input was already shorted. This can happen with a stuck call button at the lane or a damaged interconnect cable. The cable may get accidentally skinned during pulling which may create a resistive ground on the wire going to terminal 4 of the matrix lane connector. The actual matrix can be tested by unplugging the lane connector and then using a screwdriver to momentarily short pins 3 & 4 on the lane connector socket to generate a teller call request.

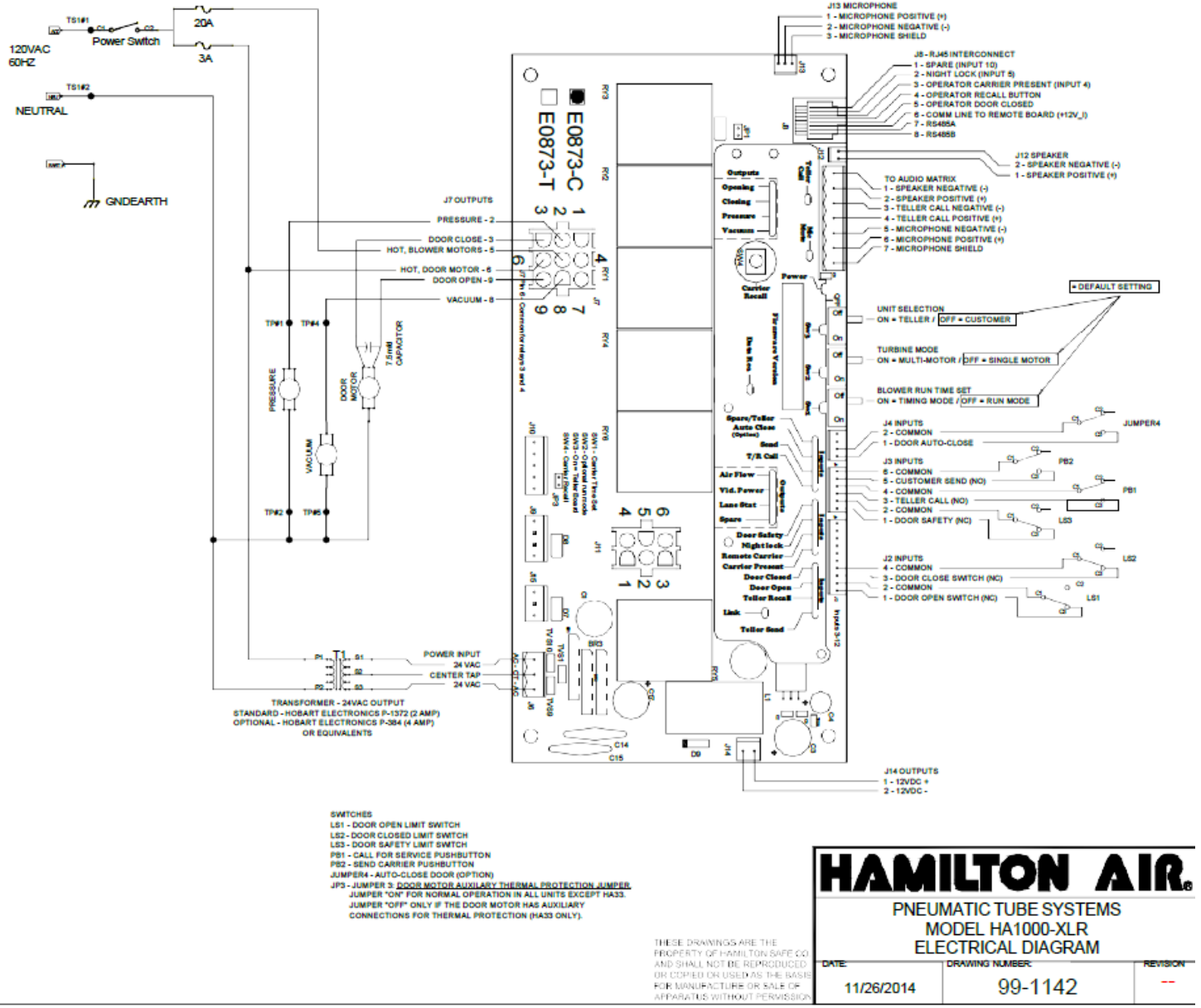
- **Audio issues** – All audio processing occurs in the console. The matrix connects a particular console to a particular lane. The main amplification for outgoing audio is in the matrix but the main amplification for incoming audio is in the console. Isolate audio problems by determining if the problem exists only when using a particular audio console or when communicating with a particular lane from any console. Before deciding that a console is bad, try plugging it into a different teller port of the matrix. Lane connectors can also be temporarily swapped at the matrix to see if a problem follows the physical lane or stays with the same lane number on the matrix.

  The lane speaker is not polarity sensitive but the lane microphone is. If the mic is wired backwards it will not work. The loss of incoming audio from a lane is generally caused by a bad microphone but a stuck muting relay in the pneumatic unit would keep the mic wires shorted. The audio matrix can be tested by temporarily moving a lane connector from a working lane to the lane number in question. You could also temporarily connect a spare mic or speaker directly at the matrix in place of the interconnect wires going to those devices at the lane.

  Intermittent problems with the quality of audio are often caused by overdriving the audio processor by setting volume levels too loud or speaking too close to the console mic with a loud voice. Lane units that have more echo, such as deal drawers, are also more likely to have issues with the audio. Make sure that the proper type of cable is being used. Many times when equipment is upgraded the old cabling from the matrix to the lane is reused. That cable may not be acceptable for the new system. See

High Volt vs. Low Volt Connections

Testing Boards and Fuses



Front of XLR Help Sheet

INTERCONNECT CABLE WIRING

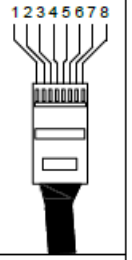
THIS CABLE IS A CATEGORY 5 (CAT5) CABLE WITH MALE RJ-45 CONNECTORS ON BOTH ENDS. BOTH OF THE CONNECTORS SHOULD BE WIRED IN THE STRAIGHT THROUGH DESIGN AS SHOWN.

HA1000-XLR

DOC. #08-380

J8 - RJ45 INTERCONNECT

WIRE	PIN #	TELLER CONNECTIONS
WHITE / ORANGE	1	AIRFLOW STOP (OPT)
ORANGE	2	TELLER NIGHT LOCK
WHITE / GREEN	3	TELLER CARRIER ARRIVAL
BLUE	4	TELLER RECALL
WHITE / BLUE	5	TELLER DOOR CLOSED / TELLER SEND
GREEN	6	COMMON
WHITE / BROWN	7	RS485 A
BROWN	8	RS485 B



CONTROL BOARD COMPONENT DESCRIPTION AND FUNCTION

SW1 SWITCH 1: **BLOWER RUN TIME SET.** "OFF" IS NORMAL SETTING. SEE "BLOWER RUN TIME SET" FOR FULL INSTRUCTIONS.

SW2 SWITCH 2: **TURBINE MODE.** "OFF" IS NORMAL SETTING WITH SINGLE STAGE TURBINE.

SW3 SWITCH 3: **UNIT SELECTION.** "OFF" IS NORMAL SETTING FOR BOARD MOUNTED IN CUSTOMER UNIT.

SW4 SWITCH 4: **RECALL SWITCH.** MOMENTARILY PRESSING SWITCH RECALLS CARRIER TO THIS END OF THE SYSTEM.

JP3 JUMPER 3: **DOOR MOTOR AUXILIARY THERMAL PROTECTION JUMPER.** JUMPER "ON" FOR NORMAL OPERATION IN ALL SYSTEMS EXCEPT HA33. JUMPER "OFF" ONLY IF THE DOOR MOTOR HAS AUXILIARY CONNECTIONS FOR THERMAL PROTECTION (HA33 ONLY).

OPTIONAL ANTI-CONDENSATION AIRFLOW FEATURE:

THE HA1000-XLR CAN BE EQUIPPED TO RUN AN AIRFLOW FEATURE FOR REDUCING CONDENSATION BUILDUP IN THE TUBES.

NOTE: UNIT MUST BE EQUIPPED WITH THE ANTI-CONDENSATION AIRFLOW FEATURE FROM THE FACTORY OR ONE ADDED TO A STANDARD UNIT. THE AIRFLOW FEATURE RUNS THE PRESSURE TURBINE MOTOR AT A REDUCED SPEED AND WILL ONLY OPERATE WHEN THE SYSTEM (EQUIPPED WITH FIRMWARE V1.71.01 OR LATER) IS IN THE NIGHT LOCK MODE. WHEN THE SYSTEM IS IN THE NORMAL RUN MODE, THE AIRFLOW FEATURE WILL NOT OPERATE.

TURN ON OR OFF THE OPTIONAL ANTI-CONDENSATION AIRFLOW FEATURE:

1) RECALL THE CARRIER TO THE CUSTOMER UNIT. (MAKE SURE CUSTOMER DOOR IS OPEN)
2) PRESS AND HOLD THE CARRIER RECALL BUTTON (SW4) ON THE CONTROL BOARD WHILE PRESSING THE CUSTOMER SEND BUTTON ON THE CUSTOMER UNIT.

THE AIRFLOW LED INDICATOR WILL FLASH TO INDICATE IF THE AIRFLOW FUNCTION IS ON OR OFF.

ONE FLASH = ON, TWO FLASHES = OFF

NOTE: TO TOGGLE THE FUNCTION ON AND OFF, BOTH SW4 AND CUSTOMER SEND MUST BE RELEASED.

THERMOSTAT, ANTI-CONDENSATION AIRFLOW:

J4 INPUT - PINS #3 AND #4

THE ANTI-CONDENSATION AIRFLOW FEATURE ONLY ACTIVATES WHEN AMBIENT TEMPERATURES ARE BELOW SET POINT. AMBIENT TEMPERATURES ABOVE SET POINT WILL SUSPEND ANTI- CONDENSATION AIRFLOW OPERATION.

EXAMPLE: THERMOSTAT SET TO 50 DEGREES.

TEMPERATURES ARE ABOVE 50 DEGREES, AIRFLOW OPERATION SUSPENDED.

TEMPERATURES FALL BELOW 50 DEGREES, THE AIRFLOW OPERATES NORMALLY.

BLOWER RUN TIME SET

TO RESTORE DEFAULT BLOWER RUN TIMES:

1) TURN POWER "OFF" TO UNIT.
2) TURN SW1 "ON".
3) TURN POWER "ON" TO UNIT.
4) WAIT 10 SECONDS BEFORE PROCEEDING.
5) RETURN SW1 TO "OFF".
6) DEFAULT BLOWER RUN TIME IS RESTORED.

SETTING PROCEDURE FOR SINGLE TIME USED IN BOTH DIRECTIONS.

1) BEFORE BEGINNING, THE CARRIER MUST BE IN CUSTOMER UNIT WITH CUSTOMER DOOR OPEN.
2) TURN SW1 TO THE "ON" POSITION. (LED INDICATOR WILL LIGHT)
3) PUSH AND HOLD EITHER "CUSTOMER SEND" OR "TELLER RECALL" BUTTON UNTIL CARRIER ARRIVES IN THE TELLER UNIT. RELEASING BUTTON STORES THE TIME FOR THIS CYCLE.
4) TURN SW1 TO THE "OFF" POSITION TO STORE THE CYCLE TIME FOR BOTH DIRECTIONS.

SETTING PROCEDURE FOR 3 STAGE CYCLE TIME.

SEE INSTALLATION / SERVICE MANUAL

AUTO DOOR CLOSE FUNCTION

THE UNIT CAN BE SET SO THE DOOR WILL AUTOMATICALLY CLOSE AFTER THREE MINUTES OF INACTIVITY. PRESSING EITHER CUSTOMER SEND OR TELLER CALL WILL OPEN THE DOOR.

J4 INPUT - PINS #1 AND #2

JUMPER (ON) FOR AUTO DOOR CLOSE

JUMPER (OFF) FOR NORMAL OPERATION

MICROPHONE MUTING:

1) RECALL CARRIER TO CUSTOMER UNIT. (PRESS SW4 "RECALL" LOCATED ON CONTROL BOARD)
2) PRESS AND HOLD SW4 AND PRESS THE TELLER CALL BUTTON ON CUSTOMER UNIT. THE OUTPUT LED FOR MICROPHONE MUTE WILL FLASH.
   ONE FLASH = SET TO MUTE.
   TWO FLASHES = SET TO NOT MUTE.
3) REPEAT STEP #2 TO TOGGLE BETWEEN SETTINGS AS NEEDED.
   (NOTE: SW4 AND TELLER CALL MUST BE RELEASED TO TOGGLE SETTING.)

TEST PROCEDURES

TURBINE TEST MODE

ACTIVATE "**TURBINE TEST MODE**" BY HOLDING SW4 WHILE SWITCHING SW1 "ON" IF CUSTOMER DOOR IS OPEN AND TURBINES ARE CONNECTED TO THIS CONTROL BOARD. SEND AND TELLER CALL WILL ACTIVATE THE PRESSURE AND VACUUM TURBINES.

DOOR TEST MODE

IF SW3 IS TURNED ON BEFORE SW1, THE UNIT WILL ENTER "**DOOR TEST MODE**" WHICH ALLOWS SEND AND TELLER CALL BUTTONS TO OPERATE THE CUSTOMER DOOR MOTOR OPEN AND CLOSED MANUALLY.

Tech Corner, Air Flow Kit

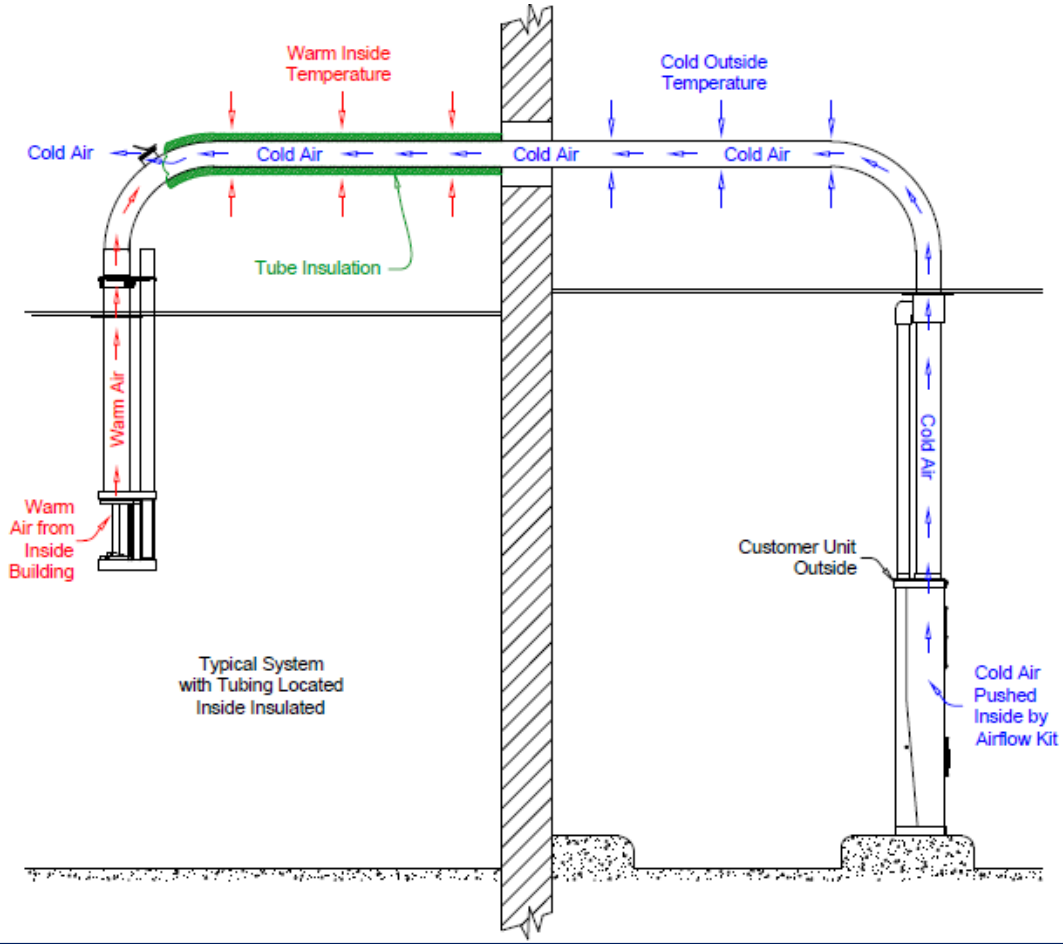
Airflow Kit Part Numbers:

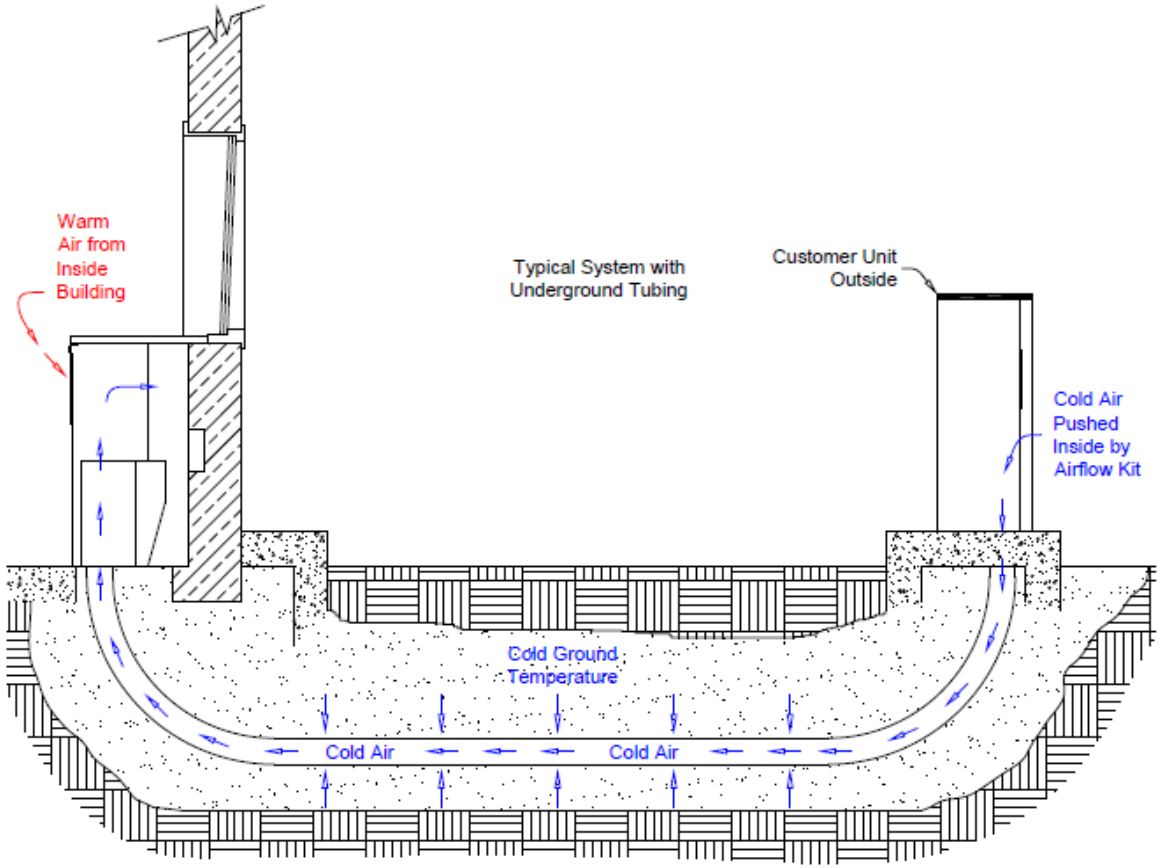
- HA45 uses Airflow Kit #**B10020**

- HA1000 uses Airflow Kit #**B10012**

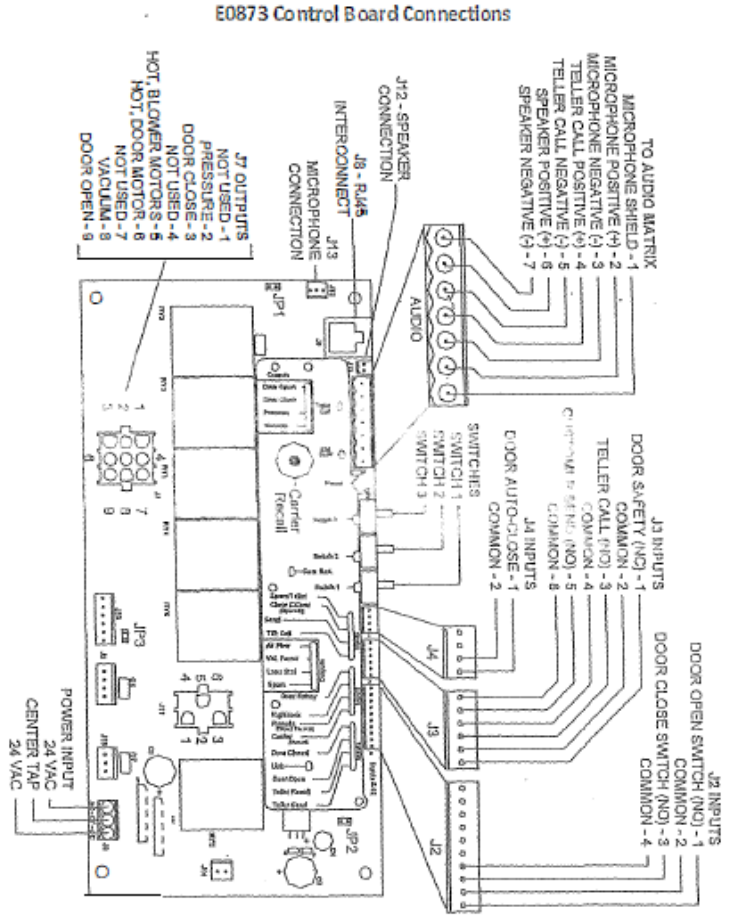
- HA50 uses Airflow Kit #**B6530**

Condensation in Overhead/Underground





J7 Plug and Transformer



Turbine Wiring

HA45/50

The only difference between the HA45 and the HA50 is the turbine mounting location and wiring. With the HA45 configuration, the turbine is mounted within the customer unit. With the HA50 configuration, the turbine is mounted remotely in the canopy, requiring an interconnect cable and a separate main power source. In both configurations, the turbine wiring connections are made at the terminal strip located below the E0873 control board in the control panel. The HA45 turbine configuration is wired directly to the terminal strip from the turbine located within the customer unit and the HA50 configuration requires terminating an interconnect cable at the terminal strip. Hamilton supplies a 7 conductor cable (E0853) for this purpose.

Plunger-Grabber Switch

99-920 Double-Sided Teller with
I/O wiring harness connected to 4-wire HA units.

Instructions for interconnecting CAT5 style double-sided teller terminal to four wire relay style customer unit with B4180-2 model relay control board.

The Double-Sided teller unit has four wires ran from the top of the tube to the switches location in the door latches and recall buttons. There is also a small toggle switch located inside the teller terminal between the latches to activate the night lock feature on the new I/O control boards. This night lock feature will not be used when connecting this teller to the old style relay controls.

Step 1) Remove the access panel with the night lock switch mounted to it in between the door latches/switches.

Step 2) Remove the green wire from the small night lock toggle switch.

Step 3) Connect this green wire to the open terminals on both door latches/switches. A jumper wire will have to be added to connect both terminals to the single green wire.

Step 4) Re-install the access panel back into the teller terminal.

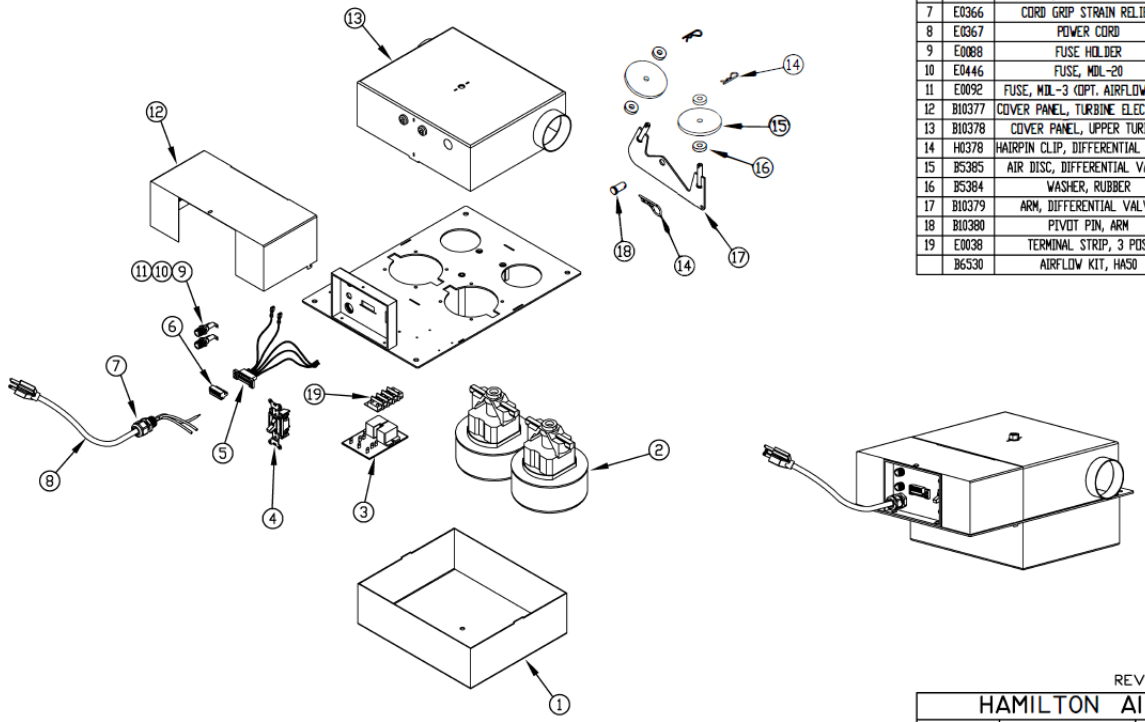
Step 5) Cut the connector from the four wires exiting the top of the double-sided teller terminal.

Step 6) Connect the four wires from the teller terminal to the four wire interconnect as shown in the below chart. Make sure the wires are connected to the proper terminals on the HA customer unit control board B4180-2 as shown below.

4 - WIRE INTERCONNECT TO I/O TYPE DOUBLE-SIDED TELLER (99-920)

4 - WIRE	99-920 DOUBLE SIDED TELLER	FUNCTIONS	TSA TERMINAL STRIP ON B4180-2 CONTROL BOARD
WHITE	BLACK	COMMON	TSA # 1
RED	GREEN	DOOR OPEN	TSA # 2
BLACK	RED	DOOR CLOSED	TSA # 3
GREEN	WHITE	TELLER RECALL	TSA # 4

Plunger-Grabber Switch

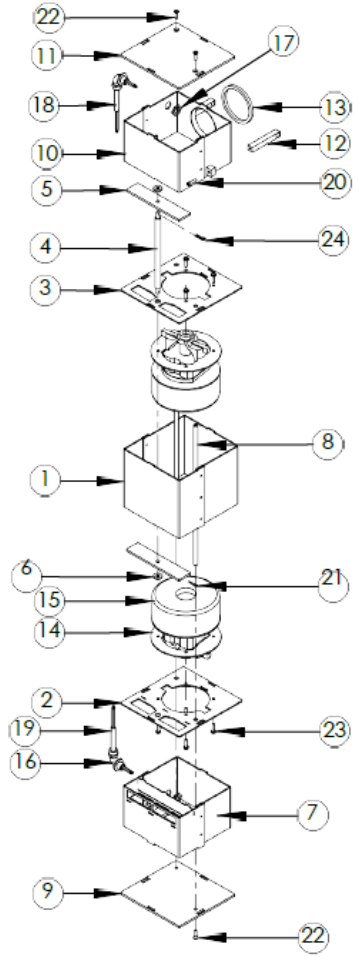


ITEM	PART NO.	DESCRIPTION	QTY.
1	B10376	COVER PANEL, LOWER TURBINE	1
2	E0118	TURBINE MOTOR	2
3	E10012	RELAY BOARD, TURBINE	1
4	E0628	POWER SWITCH	1
5	E10156	CONNECTOR, INTERCONNECTION	1
6	E10157	PLUG, INTERCONNECTION	1
7	E0366	CORD GRIP STRAIN RELIEF	1
8	E0367	POWER CORD	1
9	E0088	FUSE HOLDER	2
10	E0446	FUSE, MDL-20	1
11	E0092	FUSE, MDL-3 (OPT. AIRFLOW KIT)	OPT.
12	B10377	COVER PANEL, TURBINE ELECTRICAL	1
13	B10378	COVER PANEL, UPPER TURBINE	1
14	H0378	HAIRPIN CLIP, DIFFERENTIAL VALVE	3
15	B5385	AIR DISC, DIFFERENTIAL VALVE	2
16	B5384	WASHER, RUBBER	4
17	B10379	ARM, DIFFERENTIAL VALVE	1
18	B10380	PIVOT PIN, ARM	1
19	E0038	TERMINAL STRIP, 3 POS.	1
	B6530	AIRFLOW KIT, HA50	OPT.

REVISION "A"

HAMILTON AIR		
SCALE	PAGE 1 OF 1	DRAWN BY: VHD
DATE: 4/20/10		
TITLE: HA-50 TURBINE PACK DETAILS		
S / N KH5019 or 10001 -		DRAWING NUMBER B10004

REVISION "A" 8/20/12 (ADDED) WIRE DETAILS TO E10156, BOARD DETAIL TO E10012, QTY E10012 WAS 2)



ITEM NO.	PartNo	DESCRIPTION	QTY.
1	B10151	CENTER WRAPPER	1
2	B10152	VACUUM MOTOR PLATE LOWER	1
3	B10153	PRESSURE MOTER PLATE UPPER	1
4	B10154	VALVE SPOOL	1
5	B10155	AIR VALVE DISC	2
6	B10156	AIR VALVE WASHER	2
7	B10157	BOTTOM WRAPPER	1
8	B10158	TURBINE TIE ROD	2
9	B10159	TURBINE BOTTOM PLATE	1
10	B10160	TOP WRAPPER	1
11	B10161	TURBINE TOP PLATE	1
12	B10162	TURBINE RETAINING BAR	2
13	B10163	INLET/OUTLET TURBINE SEAL	1
14	B6441	TURBINE SEAL	2
15	E0118	TURBINE MOTOR	2
16	E10024	ELBOW, 90 DEGREE CONDUIT FITTING	2
17	E10025	3/8 CONDUIT NUT	2
18	E10068	PRESSURE TURBINE WIRE	1
19	E10069	VACUUM TURBINE WIRE	1
20	H0285	10-32 X .75 SOCKET HEAD CAP SCREW	2
21	H10051	HAIR PIN COTTER	1
22	H10052	10-32 X 3/4" SOCKET FLAT HEAD Z	4
23	H10054	10-32 X .75 TYPE F WASHER HEAD SCREW FZ	8
24	H9023	COTTER PIN	1

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DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ±
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±

MATERIAL
FINISH
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	DPC	11-20-2009
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

HAMILTON AIR CO.

HA45 REMOVABLE TURBINE EXPLODED VIEW

SIZE A | DWG. NO. B10014 | REV.
SCALE:1:20 | WEIGHT: | SHEET 1 OF 1

Plunger-Grabber Switch continued…

Customer Unit

Control Board Component Description and Function

SW1	Switch 1: **Blower Run Time Set.** "Off" is normal setting. Switching "On" enables blower "Time-Set" mode. See "Blower Run Time Set" for full instructions on setting blower run times. ●Activate "Turbine Test Mode" by holding SW4 while switching SW1 "On" if customer door is open and turbines are connected to this control board. Send and teller call will activate the pressure and vacuum turbines. ●If SW3 is turned on before SW1, the unit will enter "Door Test Mode" which allows send and teller call buttons to operate the customer door motor open and closed.
SW2	Switch 2: **Turbine Mode.** "Off" is normal setting with single stage turbine. "On" is normal setting with multi-blower turbine systems.
SW3	Switch 3: **Unit Selection.** "Off" is normal setting for board mounted in customer unit.
SW4	Switch 4: **Recall Switch.** Momentarily pressing switch recalls carrier to this end of the system.
JP1	Jumper 1: **Multiple Board Jumper.** Jumper "On" for normal operation in system with Manual Teller Unit. ●Jumper "Off" when used in dual control board systems.
JP2	Jumper 2: **Remote Input Jumper.** Jumper "On" for normal operation in system with Manual Teller Unit. ●Jumper "Off" when used in dual control board systems.
JP3	Jumper 3: **Door Motor Auxiliary Thermal Protection Jumper.** Jumper "On" for normal operation in all systems except HA33. ●Jumper "Off" only if the door motor has auxiliary connections for thermal protection (HA33 Only).
RY1	Control Relay 1: **Pressure Motor Relay.** Operates pressure motor.
RY2	Control Relay 2: **Vacuum Motor Relay.** Operates vacuum motor.
RY3	Control Relay 3: **Customer Door Close Relay.** Runs door motor closed.
RY4	Control Relay 4: **Customer Door Open Relay.** Runs door motor open.
RY5	Control Relay 5: **Spare Relay.** Not Used.
RY6	Control Relay 6: **Spare Relay.** Not Used.

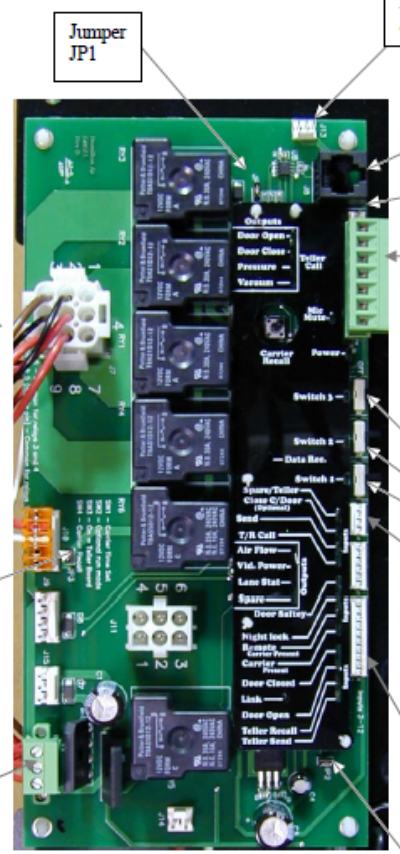
Teller Unit

Control Board Component Description and Function

SW1	Switch 1: **Diagnostic Mode.** "Off" is normal setting. Switching "On" enables "Door Test Mode" which allows send and recall buttons to operate the teller door motor open and closed. ●Activate "Turbine Test Mode" by holding SW4 while switching SW1 "On" if teller door is open and turbines are connected to this control board. Send and recall will activate the pressure and vacuum turbines.
SW2	Switch 2: **Turbine Mode.** "Off" is normal setting. ●"On" is normal setting for CM2 teller only.
SW3	Switch 3: **Unit Selection.** "On" is normal setting for board mounted in teller unit.
SW4	Switch 4: **Recall Switch.** Momentarily pressing switch recalls carrier to this end of the system.
JP1	Jumper 1: **Multiple Board Jumper.** Jumper "Off" for normal operation.
JP2	Jumper 2: **Remote Input Jumper.** Jumper "On" for normal operation
JP3	Jumper 3: **Door Motor Auxiliary Thermal Protection Jumper.** Jumper "On" for normal operation in all systems except HA33. ●Jumper "Off" only if the door motor has auxiliary connections for thermal protection (HA33 Only).
RY1	Control Relay 1: **Pressure Motor Relay.** Operates pressure motor.
RY2	Control Relay 2: **Vacuum Motor Relay.** Operates vacuum motor.
RY3	Control Relay 3: **Customer Door Close Relay.** Runs door motor closed.
RY4	Control Relay 4: **Customer Door Open Relay.** Runs door motor open.
RY5	Control Relay 5: **Spare Relay.** Not Used.
RY6	Control Relay 6: **Spare Relay.** Not Used.

Point-to-Point System

Hamilton Control Board Details



Additional Functions of E0873

Microphone Muting:

The E0873 control board can be set-up to mute the microphone during blower operation with certain systems that have the blowers located close to the microphone in the customer unit. The control board can also be set-up not to mute the customer microphone during blower operation for systems that are not affected by the blowers.

1) Recall carrier to customer unit. (Press SW4 "Recall" located on control board)
2) Press and hold SW4 and press the teller call button on customer unit. The output LED for microphone mute will flash.

One flash = the microphone is set to mute.
Two flashes = the microphone is set to NOT mute.

- (Note: the input LED for the teller call button will light when the button is pressed. This is NOT the output LED for microphone mute and therefore NOT the LED that will signal the setting of microphone muting.)

3) Repeat step #3 to toggle between settings as needed.
   - (Note: SW4 and teller call must be released to toggle setting.)
4) System is now functional as normal with the new setting for muting the microphone.

Point-to-point systems

The E0873 control board is designed to work with multiple types of systems. If the control board is powered with nothing connected to the door closed, door open, or safety bar inputs, it will default to the point-to-point settings. If this happens with the control board connected to a remote system, the door function will not operate. To regain normal settings after this happens, correct the connections and adjustments of the door closed, door open, and safety bar switches to insure that they are activating the correct inputs before powering the control board.

The standard operation of a point-to-point system is for the operator to push a button on the unit to send the carrier to the other end station. The carrier does not automatically send when the door is closed in this configuration.

With the control board, a choice can be made during set-up to have the carrier automatically send when the door is closed and to have the recall function.

Install a jumper on connector J4, Pins #3 and #4 to set automatic send and recall mode. Removal of this jumper sets operation to normal point-to-point mode where the recall button becomes the send button and the door does not automatically send carrier.

Additional Functions of E0873

Airflow operation:

The E0873 control board can be set-up to run an airflow kit for reducing condensation buildup in the tubes. Note: A separate airflow kit must be added to the tube system for this function to operate. The airflow function runs the pressure turbine motor on a larger 24VAC transformer. The airflow function is triggered three (3) minutes after the customer has closed and/or the blowers have stop running.

The airflow function can be turned on or off depending on the weather and need.

1) Recall the carrier to the customer unit. (Make sure customer door is open)
2) Press and hold the carrier recall button (SW4) on the control board while pressing the customer send button on the customer unit.

The airflow LED indicator will flash to indicate if the airflow function is on or off.
One flash = ON, Two flashes = OFF

Note: to toggle the function on and off, both SW4 and customer send must be released.

HA-16, HA-47, HA-33

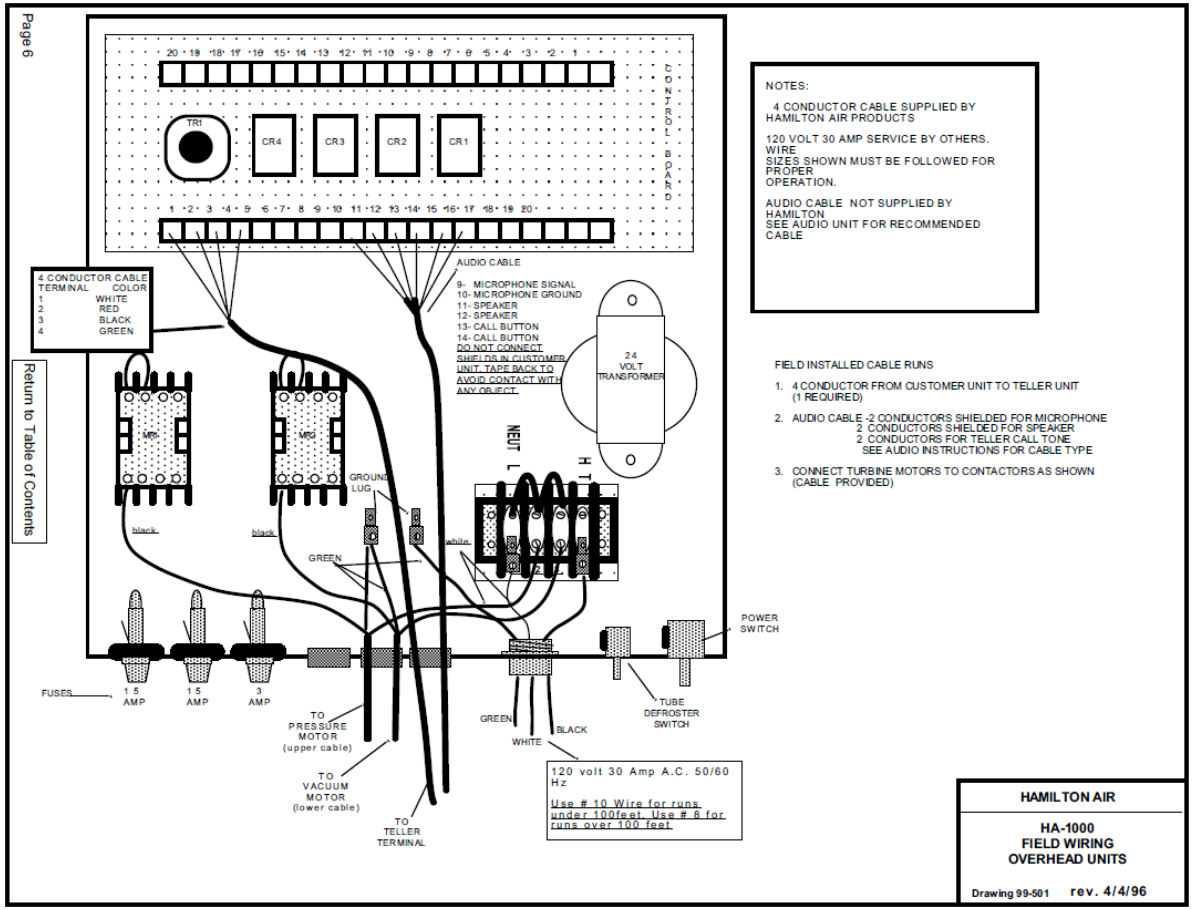
HA-16

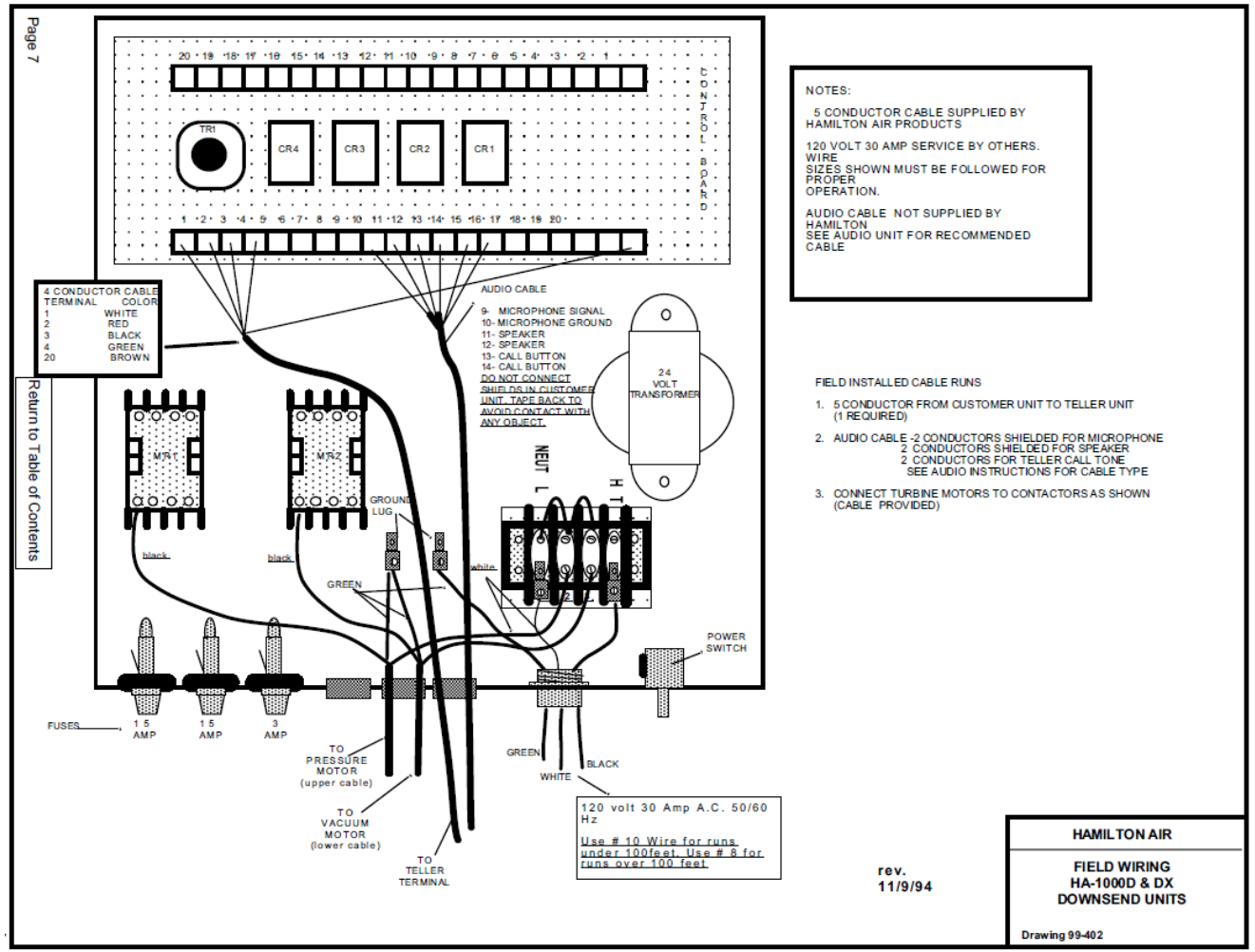
HA-47

HA-33

Old Relay Problem Solving

Old Relay Problem Solving 2





Downsend Brown Wire and Bury Tube Leak Prevention

NOTES:

1) OWNER'S GENERAL CONTRACTOR TO PROVIDE OSHA APPROVED TRENCH FROM UNDERSIDE OF OPERATORS AREA TO CUSTOMER UNIT ISLANDS. ACTUAL ROUTING OF TRENCH TO BE DETERMINED BY THE OWNER'S GENERAL CONTRACTOR. DEPTH OF TRENCH MAY VARY TO AVOID OBSTRUCTIONS BUT MUST NOT BE LESS THAN THE MINIMUM AS SHOWN IN THE DETAIL SECTION

2) BEFORE PNEUMATIC TUBES ARE INSTALLED; OWNER'S GENERAL CONTRACTOR TO CONSTRUCT ISLAND TEMPLATE SUPPORT SYSTEM, SET TEMPLATES IN PROPER RELATIONSHIP TO THE BUILDING AND SET TOP OF TEMPLATE LEVEL TO TOP OF ISLAND (STEEL TEMPLATE PROVIDED BY HAMILTON).

3) ELECTRICAL CONDUIT, LOW VOLTAGE CONTROL AND AUDIO CABLE CONDUIT AND OPTIONAL TELL-R-TV CONDUIT TO BE BURIED ABOVE THE PNEUMATIC TUBES AND MUST NOT INTERFERE WITH THE PNEUMATIC TUBES. (ALL BY OWNER'S ELECTRICAL CONTRACTOR)

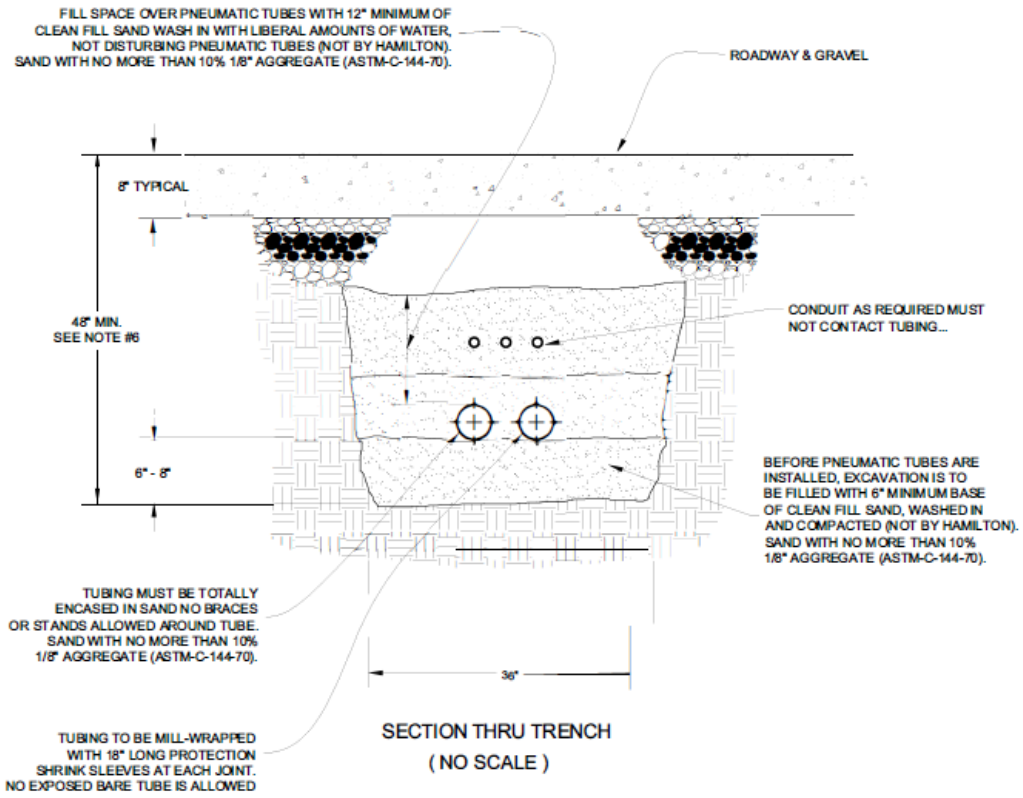
4) BEFORE CONDUIT IS INSTALLED, COVER PNEUMATIC TUBE WITH 3" TO 4" OF CLEAN FILL SAND (NOT BY HAMILTON). SAND WITH NO MORE THAN 10% 1/8" AGGREGATE (ASTM-C-144-70).

5) BEFORE PNEUMATIC TUBES ARE INSTALLED, EXCAVATION IS TO BE FILLED WITH 6" TO 8" MINIMUM BASE OF CLEAN FILL SAND, WASHED IN AND COMPACTED (NOT BY HAMILTON). SAND WITH NO MORE THAN 10% 1/8" AGGREGATE (ASTM-C-144-70).

6) 48" MINIMUM TRENCH DEPTH USING 30" RADIUS BENDS. ACTUAL DEPTH DETERMINED BY ARCHITECT BASED ON JOB SITE, SOIL, FROST LINE, CODE, ETC. ALWAYS LOCATE TUBES BELOW FROST LINE.

7) THE FOLLOWING NOT FURNISHED BY HAMILTON: CANOPY, SUPPORTS, ISLANDS, CONDUIT, HOLE OPENINGS, GUARD POST, SAND FILL, CHIPPING AND EXCAVATION. ALL FINISH BY OWNER'S GENERAL CONTRACTOR

8) THE OWNERS GENERAL CONTRACTOR IS TO SIGN BELOW BEFORE TUBING IS COVERED TO SHOW PRESSURE TEST WAS PERFORMED ONLY, NOT TO VERIFY TEST RESULTS.



SECTION THRU TRENCH
(NO SCALE)

TUBE PRESSURE TEST PROCEDURES:

1) ____ PRESSURE TEST TUBES BEFORE THEY ARE COVERED

2) ____ PRESSURE TEST TUBES AT 5 P.S.I. FOR 1 HOUR WITHOUT LEAKAGE

3) ____ PULL OR BLOW A CARRIER THROUGH THE TUBING

_____

SIGNATURE: (OWNERS GENERAL CONTRACTOR TO SIGN TEST WAS PERFORMED)

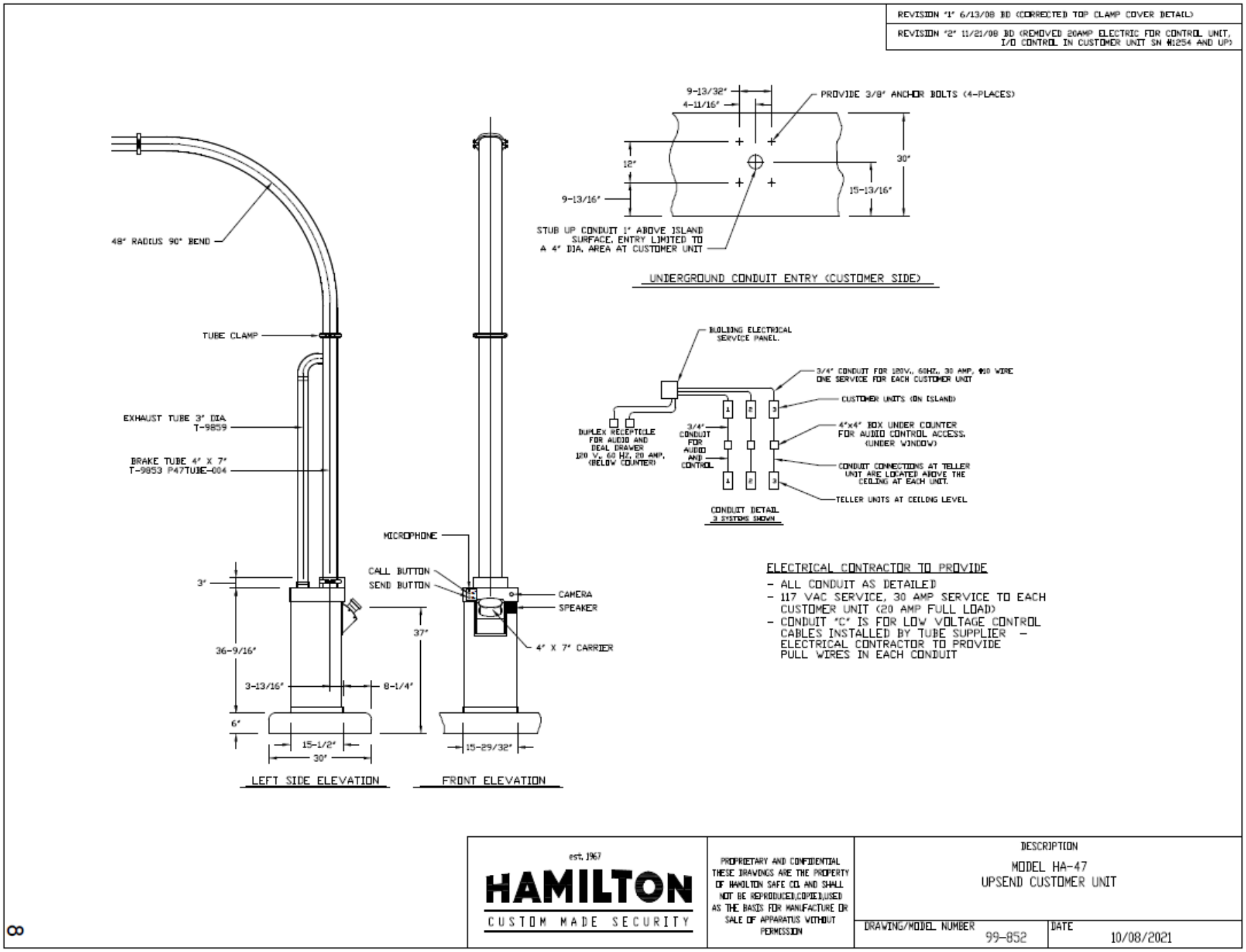
REV.-1	DATE: 4/30/04	CHANGED DIMENSIONS & NOTES...
REV.-2	DATE: 10/11/10	Added Specs to Sand use around tubes
REV.-3	DATE: 11/8/10	Added Notes #1 - #8

HAMILTON AIR

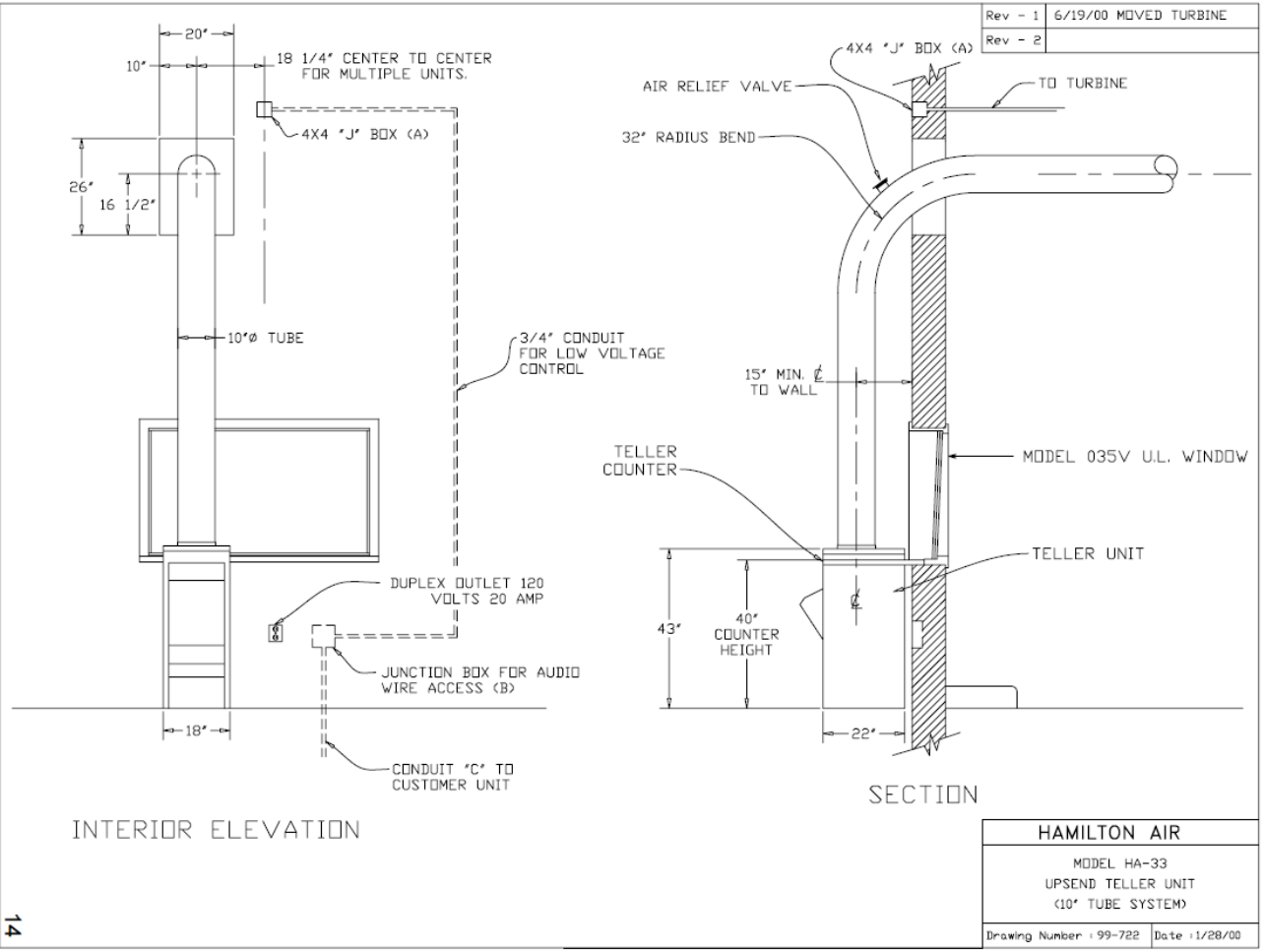
TYPICAL CROSS SECTION OF DIRECT BURIAL TUBING AND ELECTRICAL CONDUITS

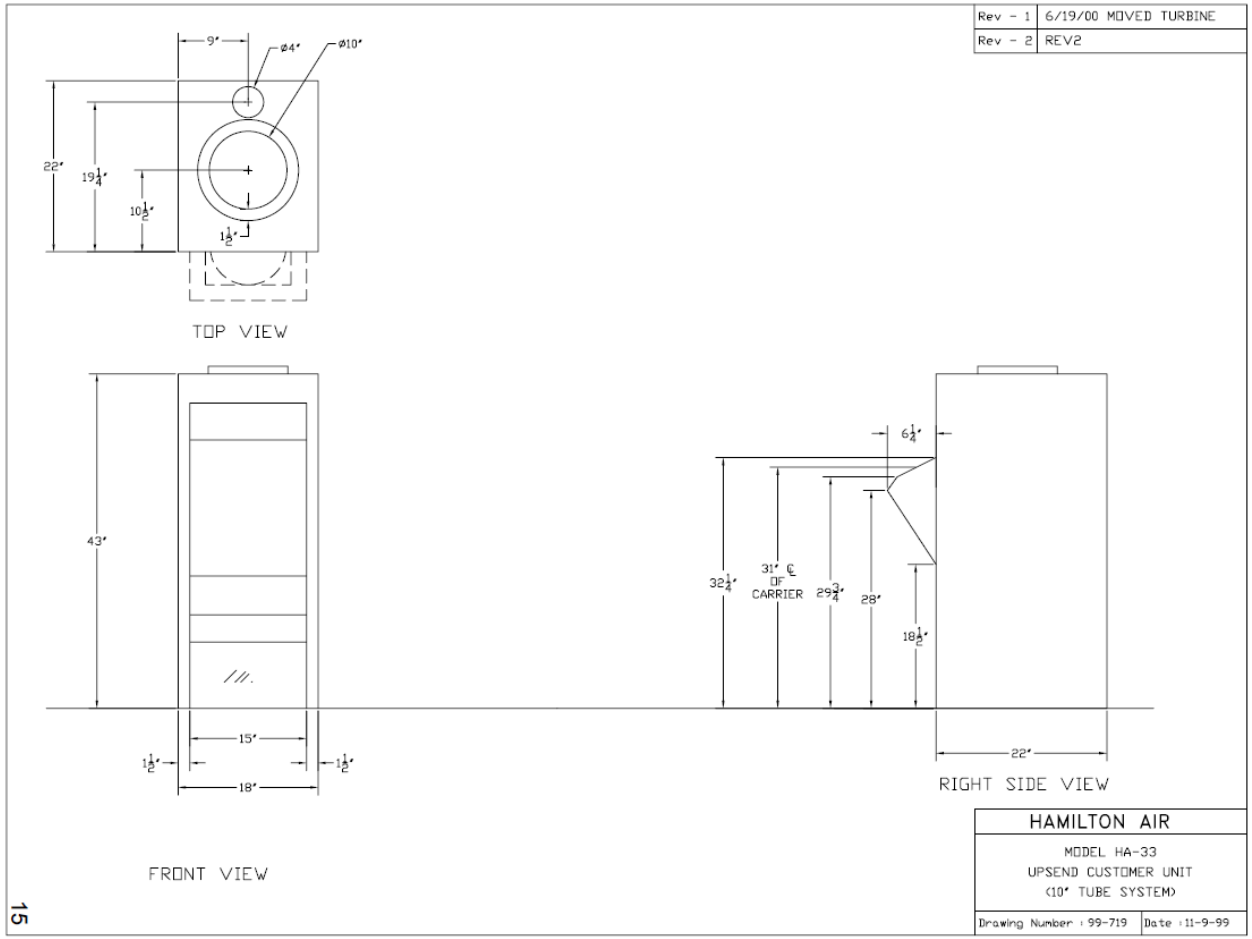
Drawing Number : 99-803 | Date : 10/10/01

HA-33 Left Wall

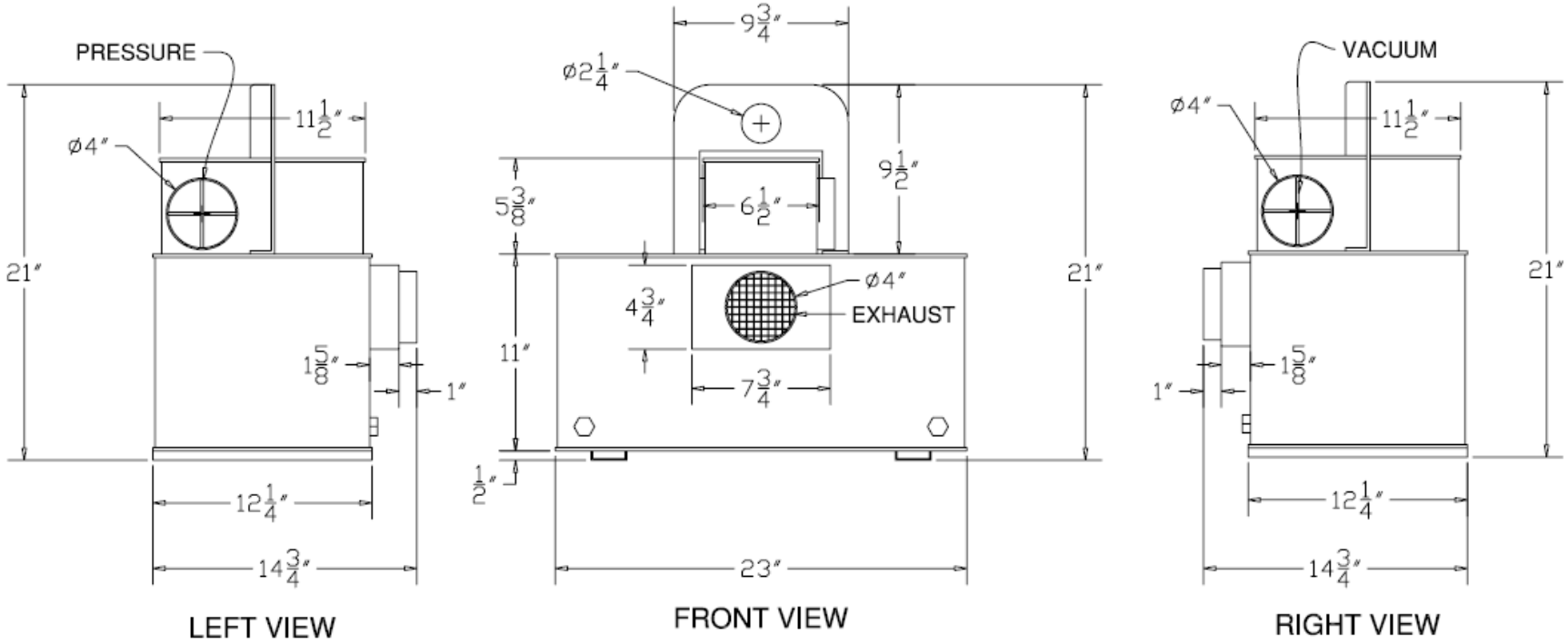


HA-33 and 36-Inch Island





Old Style Blower



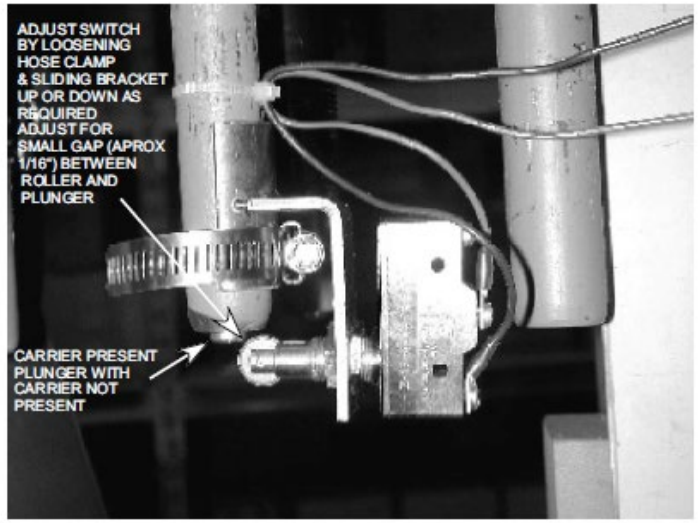
REV.-1	DATE:	
REV.-2	DATE:	
REV.-3	DATE:	

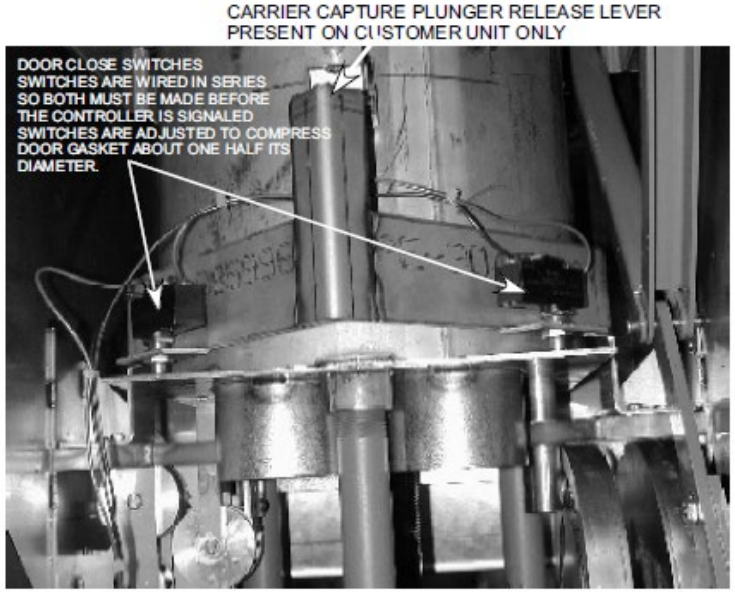
HAMILTON AIR

MODEL HA-33
TURBINE PACK
(10″ TUBE SYSTEM)

Drawing Number : 99-830 | Date : 7/10/02

Arrival Switch





DOOR CLOSED AND CARRIER ARRIVAL SWITCHES

33 switch adjust.cnv

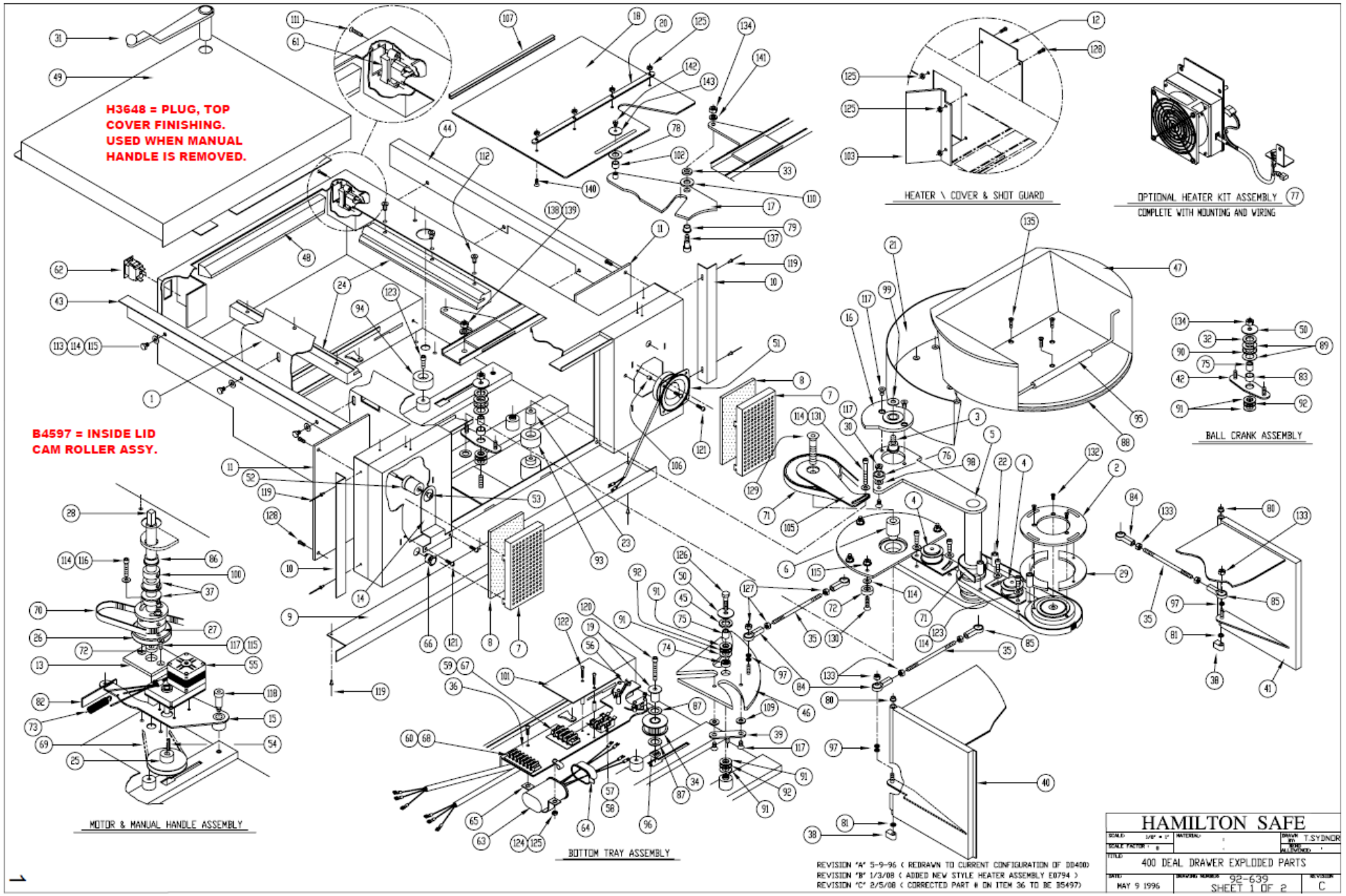
Setting Teller and Customer Switches

HA33-SERVICE OPTIONS

Teller				
Fuction	SW-3	SW-2	SW-1	Description
Run Mode	ON	OFF	OFF	Normal Operating Mode
Door Sevice Mode	ON	OFF	ON	Allows you to operate door in and out with send and recall buttons
Turbine Mode	ON	OFF	*ON	*Allows you to operate pressure and vacuum motors with the send and recall buttons
* You must have turbine connected at teller, carrier at teller, door open and hold in SW-4 when turning on SW-1 to enter this mode				
Customer				
Fuction	SW-3	SW-2	SW-1	Description
Run Mode	OFF	ON	OFF	Normal Operating Mode
Door Sevice Mode	ON	ON	ON	Allows you to operate door in and out with send and call buttons
Turbine Mode	OFF	ON	*ON	*Allows you to operate pressure and vacuum motors with the send and recall buttons
Timing Mode	OFF	ON	**ON	*Allow you to set the timing of the unit by pressing and holding the customer send button until carrier arives at teller and unit turns off than turn SW-1 OFF and the unit is timed.
* You must have turbine connected at Customer, carrier at Customer, door open and hold in SW-4 when turning on SW-1 to enter this mode				
** You must have, carrier at customer, door open before entering Timing mode by turning SW-1 on.				
Auto door closing after 3 min. Apply a jumper to J4 right 2 pins. Note: This is installed from factory.				
Set all switchs back to run Mode to exit any other mode.				

400DD Deal Drawer

400DD


H3648 = PLUG, TOP COVER FINISHING. USED WHEN MANUAL HANDLE IS REMOVED.
B4597 = INSIDE LID CAM ROLLER ASSY.
HEATER \ COVER & SHOT GUARD
OPTIONAL HEATER KIT ASSEMBLY
COMPLETE WITH MOUNTING AND WIRING
BALL CRANK ASSEMBLY
MOTOR & MANUAL HANDLE ASSEMBLY
BOTTOM TRAY ASSEMBLY
HAMILTON SAFE
400 DEAL DRAWER EXPLODED PARTS
T.SYDNOR
MAY 9 1996
92-639
SHEET 1 OF 2
C
REVISION "A" 5-9-96 (REDRAWN TO CURRENT CONFIGURATION OF DD400)
REVISION "B" 1/3/08 (ADDED NEW STYLE HEATER ASSEMBLY E0794)
REVISION "C" 2/5/08 (CORRECTED PART # ON ITEM 36 TO BE 35497)

400DD continued…

ITEM	PART NO.	DESCRIPTION	QTY.
1	B4600	DEAL DRAWER HOUSING SUB ASSEMBLY	1
2	B4601	TRAY MOUNT	1
3	B4602	UPPER BEARING MOUNT	1
4	B4603	BELT TENSIONING ASSEMBLY (SWING ARM)	2
5	B4604	SWING ARM SUB ASSEMBLY	1
6	B4605	SLEEVE SWING ARM ASSEMBLY	1
7	B4606	SPEAKER & MICROPHONE COVER	2
8	B4607	SPEAKER & MICROPHONE INSULATION PANEL	2
9	B4608	BOTTOM FRONT SS TRIM	1
10	B4609	SIDE FRONT SS TRIM	2
11	B4610	SPEAKER & MICROPHONE REAR COVER	2
12	B4612	HEATER OPENING COVER	1
13	B4613	LOWER BEARING MOUNT (MANUAL DRIVE SHAFT)	1
14	DD 049	MICROPHONE MOUNTING BRACKET	1
15	B4615	MOTOR BRACKET WELDED SUB ASSEMBLY	1
16	B4616	REAR DOOR CAM	1
17	B4617	REAR DOOR DRIVER WELDED SUB ASSEMBLY	1
18	B4618	REAR DOOR	1
19	B4619	AXEL DRIVE BELT TENSIONER	1
20	B4620	SHOT GUARD (REAR DOOR)	1
21	B4621	ROTARY DOOR WELDED SUB ASSEMBLY	1
22	B4622	SPACER (ROTARY DOOR MOUNT)	4
23	B4623	POST (PHASE ADJUST)	1
24	DD 130	DOOR GUIDE (UHMW) RIGHT & LEFT SIDE	2
25	B4626	MOTOR PULLEY	1
26	B4627	MANUAL SHAFT PULLEY	1
27	B4628	PHASING PULLEY (MANUAL HANDLE)	1
28	B4598	MANUAL HANDLE SHAFT WELDED SUB ASSEMBLY	1
29	B4630	RETAINER (TRAY)	2
30	B4631	RETAINER (DRIVER BEARING)	1
31	B4633	MANUAL HANDLE SUB ASSEMBLY	1
32	B4634	WASHER (BALL CRANK PRE LOAD) URETHANE	1
33	B4635	WASHER (REAR DOOR DRIVER) URETHANE	1
34	B4636	IDLER PULLEY	1
35	B4637	ROD (FRONT DOOR)	3
36	B5497	ELECTRICAL PANEL COMPLETE ASSEMBLY	1
37	B4639	UPPER LIMIT SWITCH CAM WELDED SUB ASSEMBLY	2
38	B4640	HINGE BLOCK (FRONT DOORS)	2
39	B4641	BRACKET (SPHERICAL ROD END)	1
40	B4642	LEFT HAND DOOR SUB ASSEMBLY	2
41	B4643	RIGHT HAND DOOR SUB ASSEMBLY	1
42	B4644	BALL CRANK	1
43	B4645	TRIM RAIL (LEFT SIDE)	1
44	B4646	TRIM RAIL (RIGHT SIDE)	1
45	B4647	WASHER (FRONT DOOR CAM) URETHANE	1
46	B4648	FRONT DOOR CAM	1
47	B4649	TRAY	1
48	DD 129	REAR DOOR EDGE BUMPER	1
49	B4651	TOP COVER	1
50	H0437	FENDER WASHER (McMASTER-CARR #90313A111)	2

ITEM	PART NO.	DESCRIPTION	QTY.
51	B4596	400DD SPEAKER SUB ASSEMBLY	1
52	B4111	MICROPHONE MOUNT (HAW033)	1
53	E0604	MICROPHONE SUB ASSEMBLY (HAW-055)	1
54	B4656	MOTOR KEYSTOCK	1
55	E0116	MOTOR (MERKLE KORFF #	1
56	E0173	MICRO SWITCH # (SS76-V3L-111-D8-BG)	2
57	E0641	FUSE (BUSSMAN (MDA3)	1
58	E0089	FUSE (BUSSMAN # MDA15)	1
59	E0037	TERMINAL BLOCK (CHINCH JONES # 3-142)	1
60	E0292	TERMINAL BLOCK (CHINCH JONES # 6-140)	1
61	E0172	MICRO SWITCH # 1NR91-5-W	1
62	E0171	MICRO SWITCH # LTILA51-1L-BL-RC-FN/BLK	1
63	E0123	CAPACITOR (GRAINGER # 6X654)	1
64	E0101	CAPACITOR BOOT (GRAINGER # 3X685)	1
65	E0105	CAPACITOR MOUNTING STRAP (GRAINGER # 3X684)	1
66	E0440	400 DD CALL BUTTON	1
67	E0038	MARKER STRIP (CHINCH JONES #MS-3-142)	1
68	E0293	MARKER STRIP (CHINCH JONES # MS6-140)	1
69	H1044	V-BELT (GATES #3L170)	1
70	H1043	TIMING BELT (GOODYEAR #367L050)	1
71	H1042	TIMING BELT (GOODYEAR #285L050)	2
72	H1071	BALL BEARING (# S3PP)	4
73	H1038	EXTENSION SPRING	1
74	H1073	NEEDLE BEARING (Y-84)	1
75	H1065	INNER RACE (# IRA-5)	2
76	H1064	BALL BEARING (# S3K)	1
77	E0794	OPTIONAL HEATER KIT ASSEMBLY	1
78	H1022	OILITE WASHER (# TT-1001)	1
79	H1023	OILITE FLANGED BUSHING # FF-520-10	1
80	H1024	OILITE FLANGED BUSHING # SF-812-4	2
81	H1025	OILITE WASHER # ST-814-2	2
82	B4662	MOTOR BRACKET SHOT GUARD	1
83	H1018	OILITE BUSHING # SS-1620-6	1
84	H1108	SPHERICAL ROD ENDS RIGHT HAND THREADS	3
85	H1109	SPHERICAL ROD ENDS LEFT HAND THREADS	3
86	H1061	OILITE FLANGED BUSHING # SF-2432-8	1
87	H1062	OILITE WASHER # TT-1002-1	2
88	B4568	TRAY BUMPER	1
89	H1078	THRUST WASHER # TRA-1018	2
90	H1079	THRUST NEEDLE BEARING # NTA-1018	1
91	H1080	THRUST WASHER # TRA-815	6
92	H1081	THRUST NEEDLE BEARING # NTA-815	3
93	B4657	FRONT BUMPER MODIFICATION	1
94	H1164	REAR BUMPER (McMASTER-CARR # 9540K36)	1
95	B4660	WINDWEIGHT SUB ASSEMBLY	1
96	H0438	T-NUT (McMASTER-CARR # 94750A588)	1
97	H0439	WASHER (McMASTER-CARR # 91124A060)	6
98	H0440	WASHER (McMASTER-CARR # 98017A199)	1
99	H0441	WASHER (McMASTER-CARR # 92141A031)	1
100	H0148	SHAFT COLLAR (GRAINGER # 2X370)	1

ITEM	PART NO.	DESCRIPTION	QTY.
101	B4664	LEXAN COVER (TERMINAL STRIP)	1
102	H1026	OILITE BUSHING (# AA-521-9)	1
103	B4661	HEATER AIR DEFLECTOR	1
104	--	--	--
105	B4595	PHASE ADJUSTOR WELDED SUB ASSEMBLY	1
106	H3012	STANDOFF Mc-CARR 1/4"OD X 1/4" LG. # 8 ID	2
107	--	--	--
108	E0600	DEAL DRAWER HEATER	1
109	H0446	WASHER McMASTER-CARR #98025A030	2
110	H1021	OILITE WASHER # TT-1001-1	1
111	H0624	# 6-32 X 3/4" PHILLIPS OVAL HD. (SS)	2
112	H0040	1/4-20 X 1" SOCKET BUTTON HD. (SS)	6
113	H0026	1/4-20 X 1/2" HHMS (PLATED)	6
114	H0012	1/4" DIA. FLATWASHER (SS)	18
115	H0105	1/4-20 SERRATED FLANGE NUT (PLATED)	12
116	H0449	1/4-20 X 1-1/4" SOCKET CAP SCREW (PLATED)	3
117	H0108	1/4-20 X 1/2" SOCKET FHMS (PLATED)	7
118	H0106	1/2 X 1" SHOULDER BOLT	1
119	H0351	POP RIVET # SSD42SSBS	7
120	H0046	1/4-20 X 1-1/2" SOCKET CAP SCREW (PLATED)	1
121	H0181	# 8-32 X 3/8" RHMS (PLATED)	4
122	H0147	# 6-32 X 1" RHMS (PLATED)	2
123	H0108	1/4-20 X 1/2" SOCKET CAP SCREW (PLATED)	8
124	H0271	# 10-32 X 5/8" RHMS (PLATED)	2
125	H0262	# 10-32 HEX NUT (PLATED)	10
126	H0339	5/16-18 X 1-1/4" HHMS (PLATED)	1
127	H0445	1/4-28 HEX NUT LEFT HAND THREADS (PLATED)	3
128	H0249	# 10-32 X 1/2" RHMS (PLATED)	8
129	H0416	1/2-13 X 2-1/2" SOCKET FHMS (PLATED)	1
130	H0509	1/4-20 X 1 SOCKET FHMS (PLATED)	4
131	H0448	1/4-20 X 2" SOCKET CAP SCREW (PLATED)	1
132	H0442	# 10-32 X 3/8" SOCKET FHMS (PLATED)	3
133	H0052	1/4-20 HEX NUT (PLATED)	5
134	H0331	5/16-18 HEX NUT (PLATED)	2
135	H0110	1/4-20 X 1-1/2" SOCKET FHMS (PLATED)	4
136	--	--	--
137	H0287	3/8 X 1/2" SHOULDER BOLT	1
138	H0305	3/8-16 HEX NUT (PLATED)	1
139	H0294	3/8" DIA. SPLITRING LOCKWASHER (PLATED)	1
140	H0435	# 10-32 X 1/2" SOCKET FHMS (PLATED)	4
141	H0324	5/16" DIA. SPLITRING LOCKWASHER (PLATED)	1
142	H0565	#10-32 X 1/4" PHILLIPS PAN HD. (PLATED)	1
143	H0564	# 10 DIA. FENDER WASHER (PLATED)	1

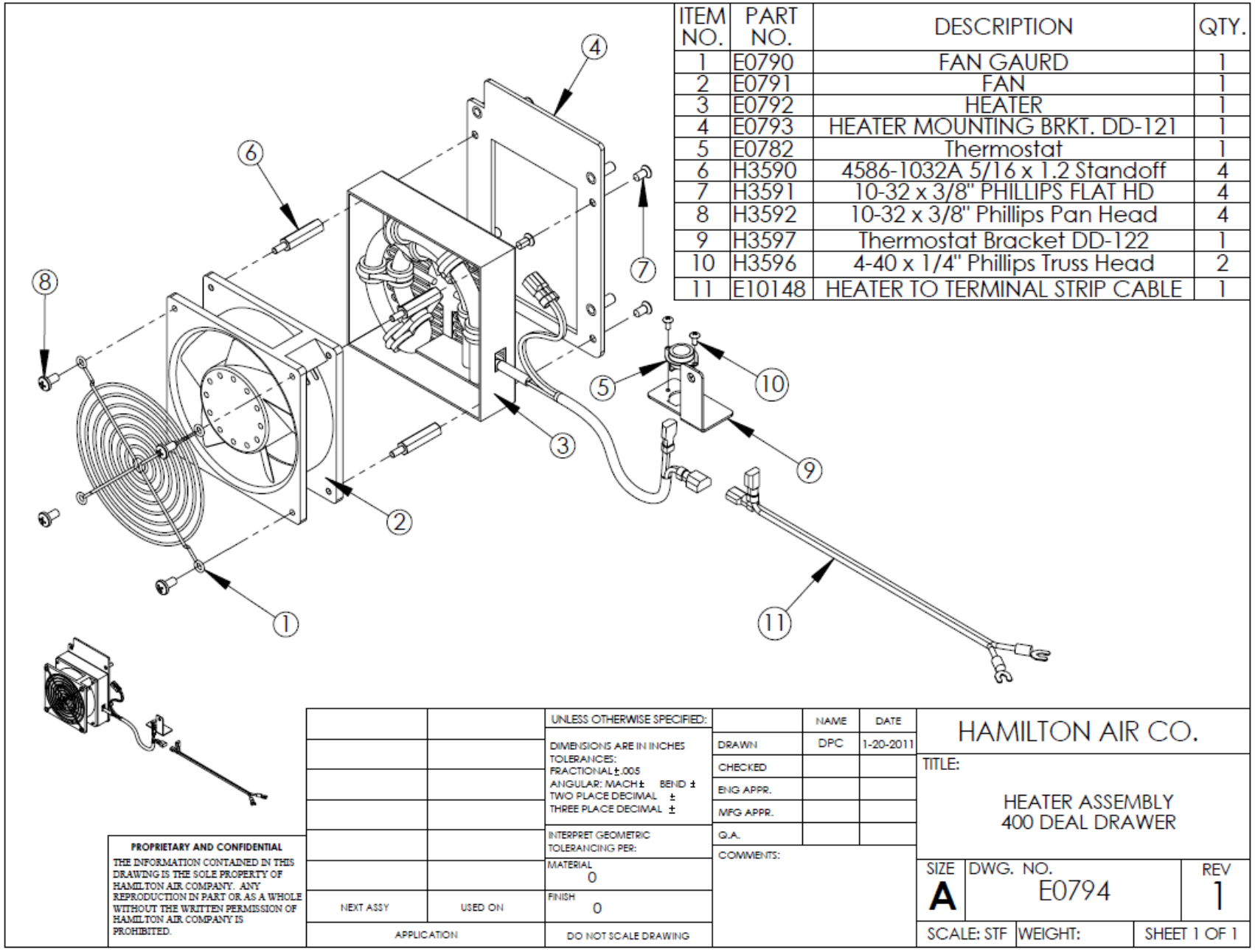
B4597 = INSIDE LID CAM ROLLER ASSY.
H3648 = PLUG, TOP COVER FINISHING.

REVISION "A" 5-9-96 (REDRAWN TO CURRENT CONFIGURATION OF DD400)
REVISION "B" 1/3/08 (ADDED NEW STYLE HEATER ASSEMBLY E0794)
REVISION "C" 2/5/08 (CORRECTED PART # ON ITEM 36 TO BE B5497)

HAMILTON SAFE

SCALE: 1" = 1"	MATERIAL:	DRAWN BY: T.SYDNOR	
SCALE FACTOR: 1		BEND ALLOWANCE:	
TITLE: 400 DEAL DRAWER EXPLODED PARTS			
DATE: MAY 9 1996	DRAWING NUMBER: 92-639-1 SHEET 2 OF 2	REVISION C	

400DD continued…



ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	E0790	FAN GAURD	1
2	E0791	FAN	1
3	E0792	HEATER	1
4	E0793	HEATER MOUNTING BRKT. DD-121	1
5	E0782	Thermostat	1
6	H3590	4586-1032A 5/16 x 1.2 Standoff	4
7	H3591	10-32 x 3/8" PHILLIPS FLAT HD	4
8	H3592	10-32 x 3/8" Phillips Pan Head	4
9	H3597	Thermostat Bracket DD-122	1
10	H3596	4-40 x 1/4" Phillips Truss Head	2
11	E10148	HEATER TO TERMINAL STRIP CABLE	1

PROPRIETARY AND CONFIDENTIAL

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NEXT ASSY | USED ON

APPLICATION

UNLESS OTHERWISE SPECIFIED:

DIMENSIONS ARE IN INCHES
TOLERANCES:
FRACTIONAL ± .005
ANGULAR: MACH ± BEND ±
TWO PLACE DECIMAL ±
THREE PLACE DECIMAL ±

INTERPRET GEOMETRIC TOLERANCING PER:

MATERIAL
0

FINISH
0

DO NOT SCALE DRAWING

	NAME	DATE
DRAWN	DPC	1-20-2011
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		

COMMENTS:

HAMILTON AIR CO.

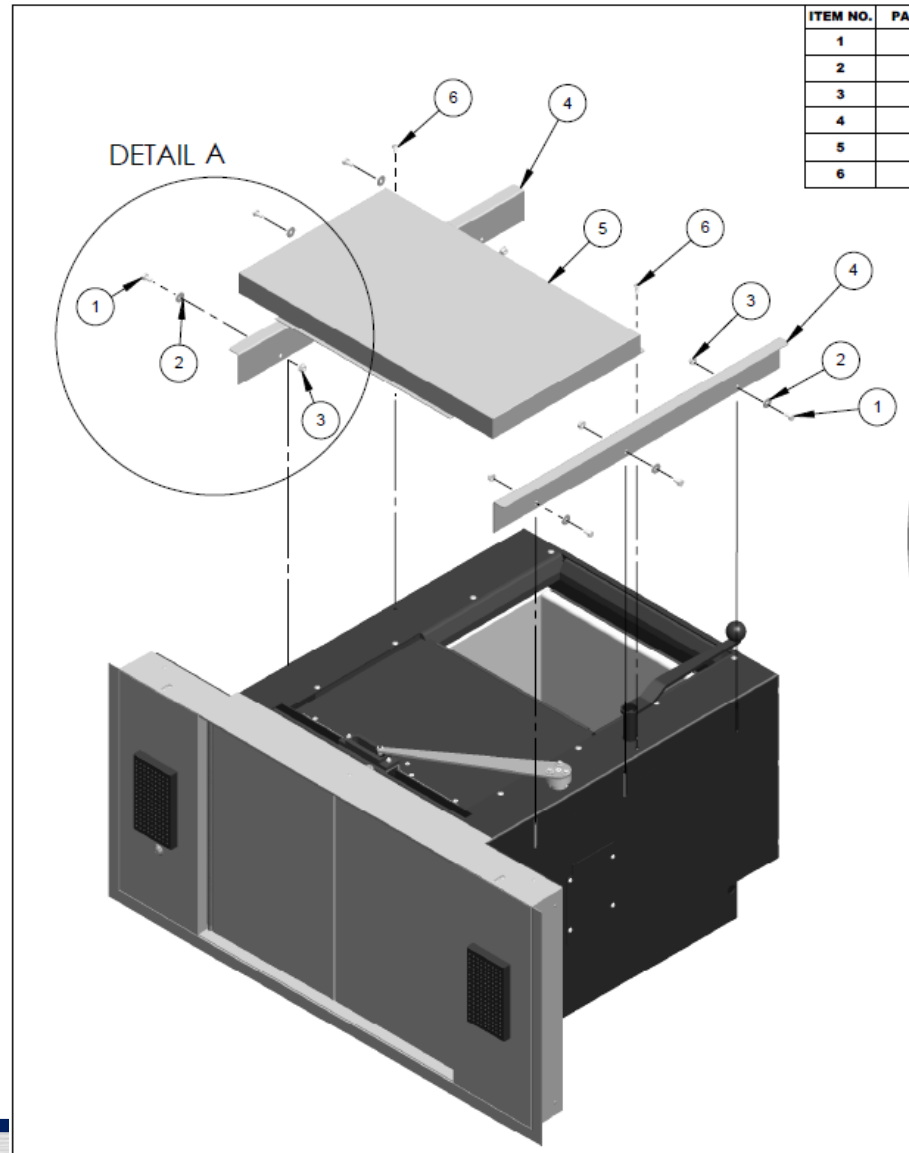
TITLE:
HEATER ASSEMBLY
400 DEAL DRAWER

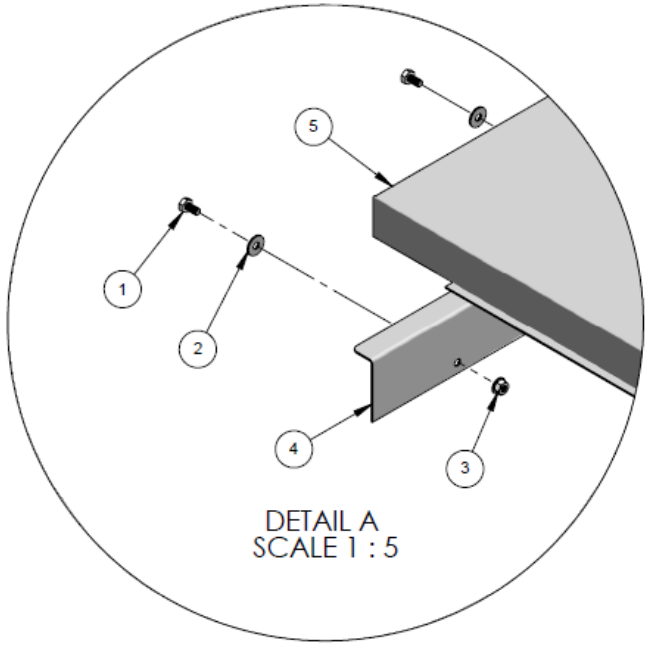
SIZE	DWG. NO.	REV
A	E0794	1

SCALE: STF | WEIGHT: | SHEET 1 OF 1

Chicken Drawer and Pharmacy Drawer

ITEM NO.	PART NUMBER	DRAWING NUMBER	DESCRIPTION	QTY.
1	H0026		1/4-20 X 1/2 HHMS ZINC	7
2	H0012		1/4 FLAT WASHER SS	6
3	H0105		1/4-20 SERRATED FLANGE NUT	10
4	B10085	CD18 056	TRIM RAIL (COUNTER TOP) (LEFT AND RIGHT)	2
5	B10081	HCD 086	TOP COVER	1
6	H0577		10-32 X 1/2 THMS SS	2





COUNTER TRIM

Rev - 1 -

Rev - 2 -

HAMILTON

DCD18
EXPLODED VIEW
PAGE 1 OF 18

Drawing Number : 96-331

Date : 2010

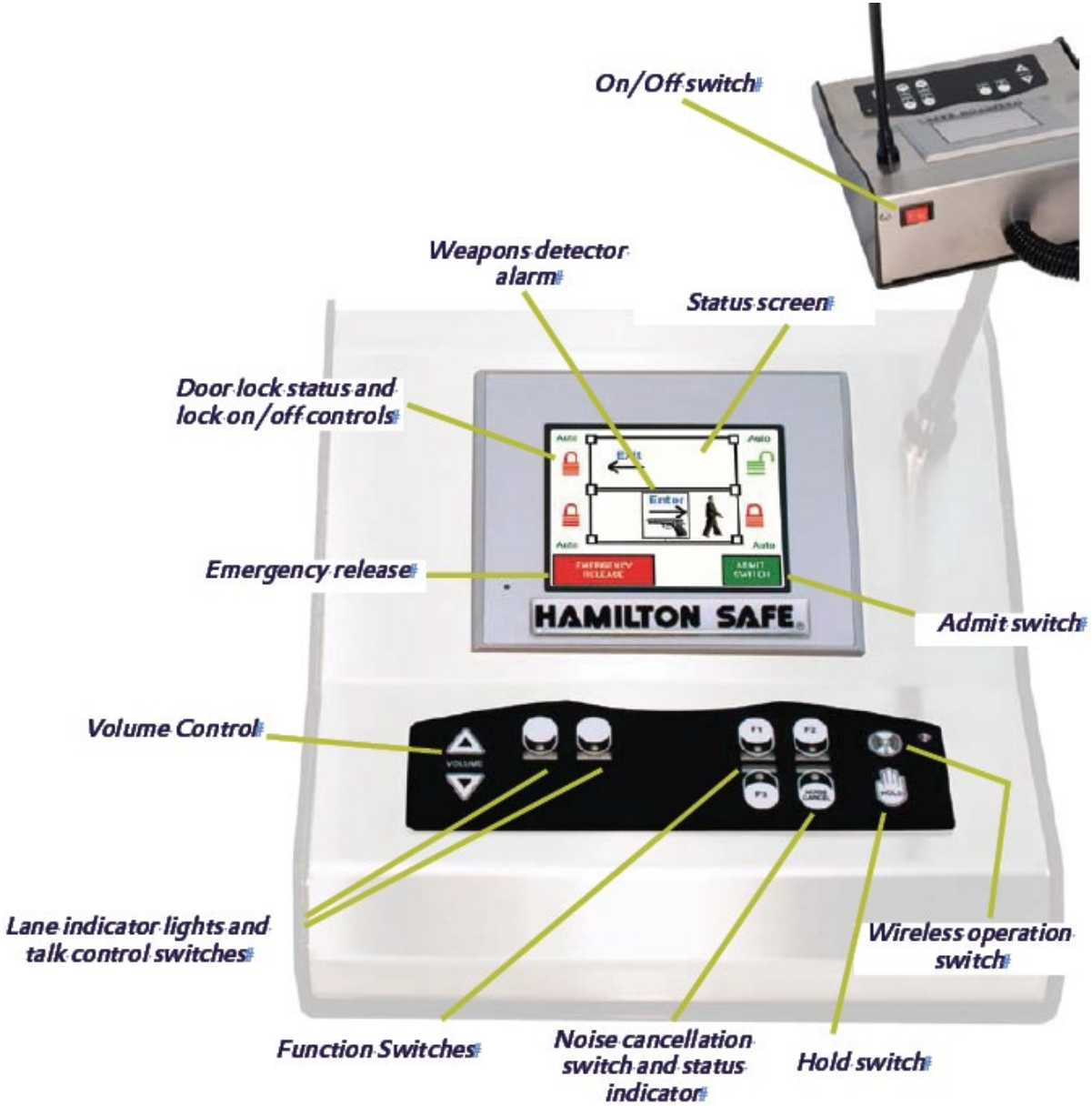
Drawer Belt Repair

Drawer Belt Replace

Drawer Belt Replace 2

Audio/Video (AV)

Basic Console Buttons



Cat 5

Drain Wire

Cable Considerations

Be sure to use the proper cable for connecting the matrix to the customer lanes. For audio it is **HIGHLY RECOMMENDED** to use Hamilton cable (E0680) for distances up to approximately 180 feet. This cable contains a 16AWG twisted pair for the speaker, a 20AWG twisted pair for the call button and a 20AWG twisted, shielded pair for the microphone. For distances over 180 feet it may be necessary to use a heavier gauge of wire for the speaker to prevent excessive loss due to the wire resistance.

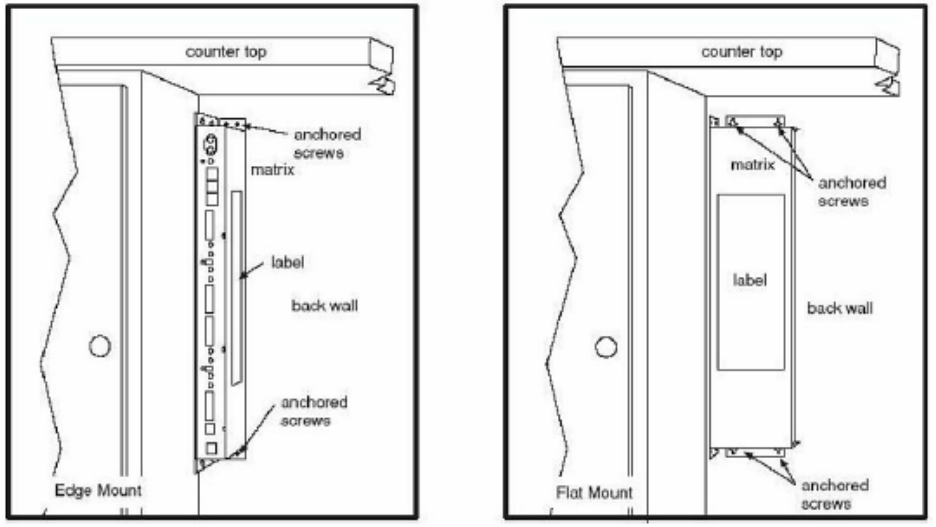
If you don't use E0680 cable, make sure the microphone pair is individually shielded with it's own drain wire. **DO NOT** use cable with an overall shield. **DO NOT** use cable with individually shielded pairs that have a common drain wire. If your cable has individually shielded pairs, with each pair having it's own drain wire, only connect the drain wire for the microphone pair. See the drawing and second bullet point on the next page for microphone shield connections.

Another option for audio is to use Category 5 cable (5E & 6 are also acceptable) for distances up to 1000 feet. Using this type of cable requires the Cat 5 Lane Speaker Driver Kit (E0958-KIT). 110VAC must also be available at the lane. This kit is also ideal for extending standard audio cable up to 1000 feet. See the section "Cat 5 Lane Speaker/Driver Kit Installation" for more information. ***Volumes must be kept low when using this kit with Cat 5 cable. The use of standard audio cable is recommended instead where possible.***

For video applications use 75 ohm coax cable designed for CCTV applications. Belden 1426A is a very good cable to use for reference. It has a solid copper center conductor and a copper braid providing 95% shielding. Another option for video is to use twisted pair cable with video baluns. The specifications of the video balun manufacturer must be followed as to the category of cable that is acceptable and whether power is required.

Matrix Installation

Mount the audio (and video) matrix in an accessible but out of the way location near where the consoles will be located. The drawing shows two mounting methods for all but the 5003 audio matrix which has a small plastic enclosure with mounting tabs.

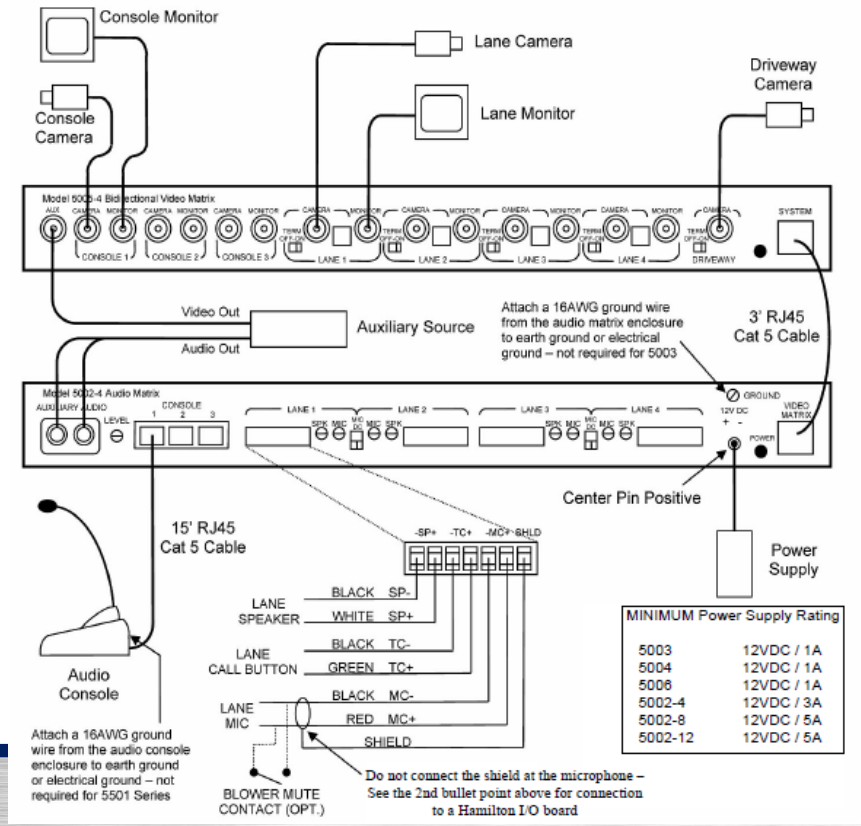


Audio Connections and Power Supply

Matrix / System Wiring Diagram

Refer to the drawing below for standard wiring connections. The drawing shows a 4-lane matrix but the same wiring applies to all versions. Observe the following guidelines.

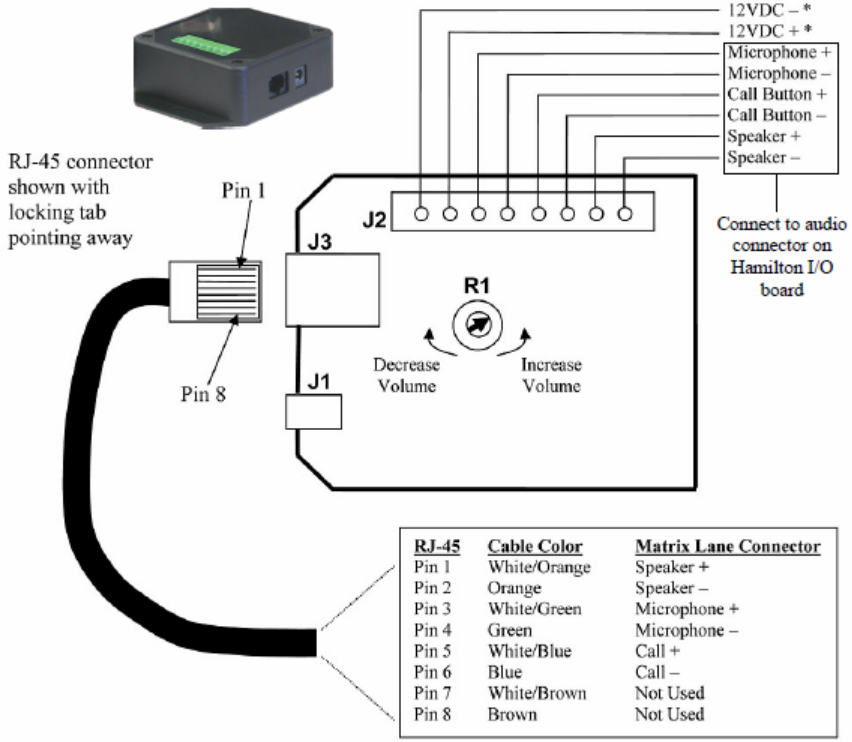
- The ground wire connection shown for the audio matrix is not required for the 5003 matrix.
- The drain wire (shield) for the microphone pair should not be connected at the microphone. However if an E0873-C I/O board is present in a Hamilton pneumatic unit the drain wire should connect to terminal 7 of the audio connector on that board.
- For audio-only systems the audio console(s) may be plugged into any of the console ports of the audio matrix. When video is used the console ports must match for a particular teller position. For example if the audio console is plugged into CONSOLE 1 of the audio matrix, the camera and monitor for that same teller must be plugged into CONSOLE 1 of the video matrix.
- The auxiliary video source, if used, must provide composite video.
- If auxiliary audio is used and the source only has a mono output, it may be plugged into either the L or R connector on the audio matrix. The LEVEL pot adjusts the volume of the aux audio.



Cat 5 Lane Speaker/Driver Kit Installation

The Cat 5 Lane Speaker Driver Kit (E0958-KIT) allows for the use of Category 5 cable from the matrix to the customer lane for distances up to 1000 feet. Cat 5e & Cat 6 may also be used. This kit is also ideal for extending standard audio cable up to 1000 feet. ***Volumes must be kept low when using this kit with Cat 5 cable. The use of standard audio cable is recommended instead where possible.***

- Install the E0958 enclosure inside the customer unit in a convenient location.
- Attach the cable from the matrix to the RJ-45 connector (J3) as shown below. *If standard audio cable is being used a short Cat 5 pigtail will be needed to splice the wires to the RJ-45 connector.*
- Attach the lane speaker, microphone & call button to the 8 pin connector (J2).
- Plug the 12VDC power supply into J1 (center pin positive) and into a 110VAC outlet in the unit. * If 12VDC is already available in the unit (1A min.) the E0958 board can be powered at the 12VDC terminals of connector J2. ***DO NOT connect power to both J1 & J2. Use one method or the other.***
- Set R1 on the E0958 board to maximum volume (fully counter-clockwise) and set the speaker gain pot on the matrix to 8:30. Only increase the speaker gain at the matrix if necessary and then in small 30 minute increments and retest. The E0958 board will boost the volume at the lane so keep the speaker pot at the matrix as low as possible. The lane microphone adjustment is made at the matrix as usual. (See the section "Adjusting the Audio System" later in this document.)



RJ-45	Cable Color	Matrix Lane Connector
Pin 1	White/Orange	Speaker +
Pin 2	Orange	Speaker –
Pin 3	White/Green	Microphone +
Pin 4	Green	Microphone –
Pin 5	White/Blue	Call +
Pin 6	Blue	Call –
Pin 7	White/Brown	Not Used
Pin 8	Brown	Not Used

Console Headset and Plugins

Wireless Headset Installation

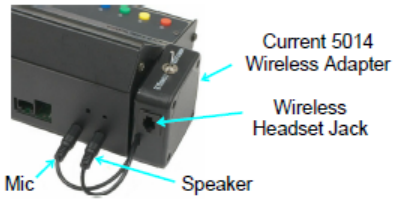
The following instructions apply to Plantronics CS540, CS50 & CS55 Wireless Headsets. There are many other wireless headsets on the market and many of these will most likely work fine but compatibility cannot be guaranteed. Wireless headsets can be used on 5501, 5001, 4001 & 3301 consoles. 3001 consoles typically experience volume issues with wireless headsets and are not recommended.

Lanes cannot be selected from the headset. All lane selections must still be made at the console when using headsets. Think of the headset as simply a different speaker & microphone. Also call tones will sound through the console speaker, not the headset, with all consoles having a built-in wireless headset jack. This is due to the board design and it cannot be changed.

All 5501 consoles and newer 5001 consoles have a wireless headset adapter/jack built in and do not use an external adapter. Older consoles will require a model 5014 Wireless Adapter to use wireless headsets. ***If a console has the adapter built in, do not use the 5014.***

Making the Connections

- Connect the AC Power Adapter to the power jack on the headset base unit.
- CS540 – Connect the provided phone cable between the back of the headset base unit and the headset jack of the audio console (or the 5014 adapter if required).
- CS50 / CS55 – Connect the provided short handset phone cable to the handset jack on the bottom of the headset base unit. There are two handset jacks; use the one with a complete picture of a telephone, not just a picture of a handset. Plug the other end of the cable into the headset jack of the audio console (or the 5014 adapter).
- The 5014 Wireless Adapter, if required, plugs into the back of the audio console using the speaker / mic phono jacks. Two types of 5014 adapters have been made.



Original 5014: Remove the (4) screws and cover from the 5014 and feed the console ground wire through the slot in the side of the case. Use the provided screw to attach the 5014 case with the ground wire to the console chassis. *(The wireless adapter label hides the screw hole in the photo.)* Replace the 5014 cover. **IMPORTANT:** The screw must be used to secure the adapter to the console chassis to prevent intermittent connections.

Current 5014: Attach the 5014 to the side of the console and flush with the rear as shown in the photo using the included double stick tape. Plug the labeled pigtail phono plugs into the phono jacks of the console. The speaker jack is closest to the adapter.

Initial Setup

- CS540 – On the bottom of the base unit set the Configuration Switch to the letter "A". Set both the Listening Volume and Speaking Volume dials to the number "3".
- CS50 / CS55 – Set the Configuration Dial on the left side of the base unit so the number "1" is facing to the front of the base. Set the switch on the right side of the base unit to the single tic mark.
- CS50 / CS55 – Set the Master Speak Volume located on the bottom of the base unit to the "B" position and the Master Listen Volume located on the back of the base to the number "2" position.

Fine Tuning the Volumes

- Make sure the speaker and microphone gain pots on the audio matrix have already been set for each lane while in Console Mode. Never adjust these pots while using the headset. (See the section "Adjusting the Audio System" later in this document.) You then switch to Wireless Mode and fine tune the wireless volumes to match the console volumes.
- CS540 – The rocker dial on the top end of the headset fine tunes the incoming volume. Be careful not to press in on this dial accidentally as this dial is also the mute switch. Changes to the volume dials on the bottom of the base can also be made if necessary.
- CS50 / CS55 – The up (+) and down (-) buttons on the back of the wireless base fine tune the outgoing volume. Each press of a button changes the volume one step. The rocker dial on the top end of the headset fine tunes the incoming volume. Be careful not to press in on this dial accidentally as this dial is also the mute switch.

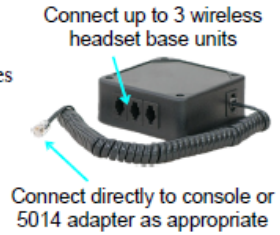
Changing Between Console & Wireless Headset Use

- With 5501 consoles – Press the Wireless button (picture of antenna) while no lane is selected. The yellow LED next to the button indicates wireless mode when lit.
- With newer 5001 consoles with built-in adapter – Press the Wireless/Camera button while no lane is selected. The yellow LED under the microphone boom indicates wireless mode when lit.
- With older consoles which require the 5014 Wireless Adapter – Use the toggle switch on the adapter to switch between console and wireless mode.

E10052 Wireless Expansion Adapter

The E10052 Wireless Expansion Adapter is used to attach multiple wireless headset base units to a single audio console. The adapter includes a short cable to connect it to the audio console. Additional jacks on the adapter are used to connect up to three headset base units.

When using the expansion adapter, if multiple headsets are active at the same time the volumes may be slightly reduced.



5512 Remote Handset Installation

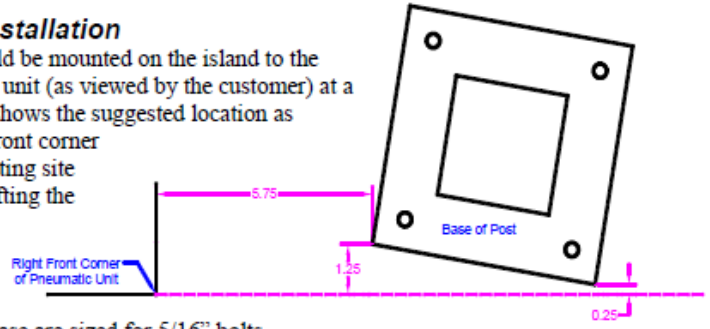
The Model 5512 Handset is a replacement for the older Model 5012W (wall mount) and 5012H (side mount) handsets. It provides customer privacy and can be used with 4000 and 5000 Series audio systems. The only operational difference is removing the handset of the 5512 from its cradle does not initiate a Teller Call like the 5012 did; a local call button must be used for this purpose. However, the remote station speaker and microphone are disconnected while the 5512 handset is off hook, just like the 5012. ***Important Note: The handset used with the 5512 is different from the 5012 handset and they are not directly interchangeable. Plus the current 5512 handset has a volume roller which allows a customer to increase the volume if necessary.*** Also note that local power was required for the older 5012 but is not needed with the 5512.

E0885 Kit

5617 Remote Video Unit Installation

The 5617 Remote Video Unit (15" LCD) is ordered either as a "post mount" or "side mount" version. *The housing types are not interchangeable.* The post mount version includes a 3" square x 36" tall post. The side mount version includes an arm for attaching to the flat top of a pneumatic unit. *The side mount version is not compatible with the HA1000-XLR.* Power must be provided directly at the pneumatic unit to avoid a voltage drop caused by wire resistance. Each 5617 is supplied with a 12VDC power supply (minimum 3A). With newer Hamilton pneumatic units that have an E0873-C I/O Control Board a Video Power Control Cable (E10036) is used to allow the tellers to control power to the LCD via the Night Lock switch. Systems that have older (or competitors) pneumatic units will use a Video Power Control Kit (E0885) instead. See the section "Video Power Control Wiring for 5517 / 5617" for more information.

Post Mount Version Installation



- The post mount 5617 should be mounted on the island to the right side of the pneumatic unit (as viewed by the customer) at a slight angle. The drawing shows the suggested location as referenced from the right front corner of the pneumatic unit. Existing site conditions may require shifting the location somewhat. Use the base of the post as a template for marking the hole locations for anchors. The holes in the base are sized for 5/16" bolts.
- Attach the 5617 to the post using the button head machine screws that are shipped installed in the enclosure. Apply a small amount of silicone sealer between the post and the enclosure.
- Attach the furnished 12" piece of liquid tite tubing and fittings between the pneumatic unit and the opening at the bottom of the post. Cables will route through this tubing.

Side Mount Version Installation

- The side mount version is NOT compatible with the HA1000-XLR.
- Use the template shipped with the 5617 to mark and drill holes in the top of the pneumatic unit.
- Attach the 5617 to the mounting arm using the button head machine screws that are shipped installed in the enclosure. Apply a small amount of silicone sealer between the arm and the enclosure.
- Attach the arm/enclosure assembly to the pneumatic unit using the included hardware. Apply a small amount of silicone sealer between the arm and the pneumatic unit. Cables will route through the arm into the unit.

Wiring

- The photo on the next page shows the inside of a 5617 unit with the back cover removed.
- Connect the monitor coax cable from the matrix to the RCA connector on the main board. A BNC to RCA adapter is included for this purpose.
- Connect the camera coax cable from the matrix to the yellow BNC flying lead.
- Connect the power supply cable and the E10036 cable (or relay trigger wires) to the relay board in the 5617 as shown in the section "Video Power Control Wiring for 5517 / 5617". Note that when using the E10036 cable with a post mount 5617 the cable will not be long enough. In this case cut the 2 pin connector off the cable and extend the cable length. Then attach the extended cable to the trigger terminals per the drawing. The trigger terminals and J3 on the relay module are common.

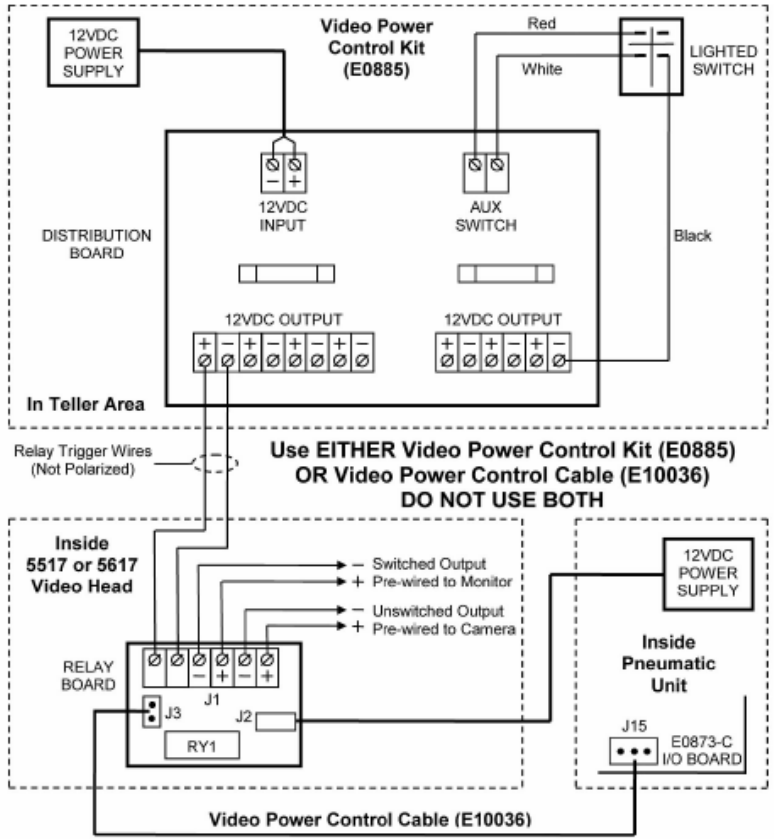
E0885 Kit Wiring Schematic

Video Power Control Wiring for 5517 / 5617

Either of two possible methods is used to control power to the LCD inside 5517 or 5617 remote video units. For Hamilton pneumatic units that have an E0873-C I/O control board use a Video Power Control Cable (E10036). All other pneumatic units will require the Video Power Control Kit (E0885). ***Use either a Video Power Control Cable or the Video Power Control Kit, but not both.*** Remember that either of these power control methods only controls the power for the LCD. The actual power for both the camera and LCD comes from the power supply that is plugged into the side of the relay board inside the 5517 or 5617 video head.

Refer to the drawing below which shows the wiring for both methods. Power to the LCD passes through the contacts of the relay inside the 5517 / 5617. When the relay is energized the LCD will be ON. When the relay is relaxed the LCD will be OFF. The camera power is not switched which allows 24/7 recording.

- When using the Video Power Control Cable, each lane will require a cable. The 3 pin connector on one end of the cable connects to J15 on the I/O Board and the 2 pin connector on the other end of the cable connects to J3 on the Relay Board in the 5517 / 5617. The Night Lock feature for the pneumatic unit is used to control the relay.
- When using the Video Power Control Kit, only one kit is required for the entire system. A wire pair connects from any of the 12VDC outputs on the Distribution Board in the teller area to the left two "trigger" terminals on the Relay Board in the 5517 / 5617. Wire gauge for this pair is not critical (22AWG is fine) since the relay coil only draws 22ma. of current. Multiple wire pairs can also be connected to the same 12VDC output of the distribution board if necessary. *Use caution to make sure these wires never touch each other which will blow the fuse on the distribution board. This sometimes happens when wires are disconnected to service or replace a video unit.* Be sure to follow the color code shown in the drawing when connecting the lighted switch to the distribution board.

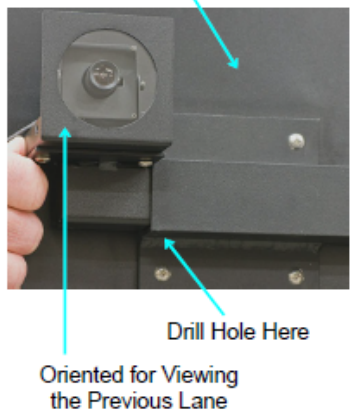


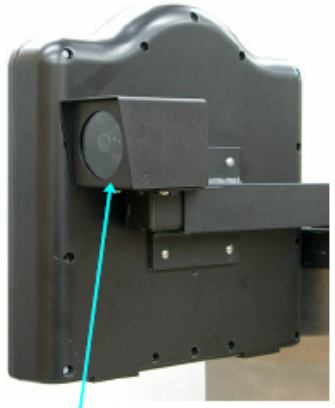
One Way Video

E0465-3WD-LP License Plate Camera Installation

The following instructions are for mounting the License Plate Camera assembly on the back side of a 5517 Video Unit that uses the standard mounting arm. This camera is used for viewing the rear license plate of a vehicle as it leaves the drive-up lane. It can be oriented to view the vehicle in the same lane as the 5517 it is attached to or the vehicle in the previous lane simply by shifting the camera housing 90° on it's bracket. See the photos below.

1) Remove the cover from the License Plate Camera assembly by removing the 2 screws from the rear of the housing. Pull the video/power cable up through the housing so it is no longer passing through the square tube on the bottom.
2) Remove the plastic end cap from the outer end of the 5517 mounting bracket.
3) Insert the square tube of the License Plate Camera assembly into the end of the 5517 bracket. While holding the assembly in place, drill a hole through the bottom of the 5517 bracket up through the inner bracket using a #29 or 1/8" drill bit. This hole will be used later to hold the assembly in place but for now remove the assembly.
4) A power converter is provided with the kit which converts 24VAC from the pneumatic unit to 12VDC for the new camera. Feed the barrel connector end of the power converter along with a video cable from inside the pneumatic unit up through and out the end of the 5517 mounting bracket.
5) Temporarily feed the power cable through the License Plate Camera bracket so it can be connected to the camera power cable. Slide the assembly back into the 5517 bracket. It will be necessary to slightly push the new video cable back into the bracket.
6) Connect the power converter input wires to the 24VAC terminals of the pneumatic unit. **IMPORTANT: If the "24VAC" source measures 26VAC or higher then add a 47 ohm ½ watt resistor in series with either wire to the power converter. This will lower the voltage and prevent possible damage to the power converter and camera.**
7) Connect a service monitor to the video pigtail which is still hanging out the top side of the License Plate Camera assembly. Adjust the camera bracket as necessary to get the proper view.
8) Disconnect the service monitor and power cables from the License Plate Camera pigtail and remove the assembly.
9) Feed the video/power pigtail cable back through the License Plate Camera bracket like it was initially and re-install the cover.
10) Attach the pigtail to the video and power cables and insert the License Plate Camera bracket back into the 5517 bracket. Secure it in place with the #8 x 3/8" stainless steel screw included with the kit.
11) Connect the remote end of the new video cable and check the new camera for proper operation.





Audio Matrix Dip Switches

Audio Matrix Switch Settings

Refer to the chart below for the dip switch pack located on the end of the audio matrix. Factory settings are shown in bold. *Cycle power to the matrix after making any changes to these switches.*

Feature	Switch #	Up (Off)	Down (On)
Lane Order [1]	1	**Normal**	Reverse
Console Limit [2]	2	**2 Per Lane**	1 Per Lane
Delayed Unmute [3]	3	No Delay	**1 Second**
Delayed Unmute [3]	4	**No Delay**	2 Seconds
Aux. Audio Mode [4]	5	**Normal**	Noise Abate
Call Tone Default [5]	6	**Normal**	Erase
Echo Canceller [6]	7	**Dynamic Learning**	Fixed Learning
Background Noise Cancellation [6]	8	Off at Startup [7]	**On at Startup**

[1] Determines whether the console lane buttons work from left to right (normal) or right to left (reverse) for 5001 Series and older consoles. **This switch must be UP for 5501 consoles.**

[2] Determines if more than one console can select the same lane at the same time. Volume levels will be reduced when multiple consoles select the same lane. This switch has no effect with a 5003 matrix.

[3] The mute circuit at the pneumatic unit creates a short across the lane microphone wires to mute the incoming audio while the blower is running. These switches determine the length of delay after the microphone short is removed until the incoming audio comes back on to allow for motor wind down time. The switches can be combined to give a 3 second delay.

[4] Noise Abate mutes the auxiliary audio (if used) until the call button is pressed or the lane is put on hold. This feature is generally used to prevent complaints from nearby businesses or residential areas. This switch has no effect with a 5003 matrix.

[5] This determines whether the call tone programming goes back to factory default (erase) when the system goes through a reset or whether the programming is saved (normal) and only applies to older matrixes. The programming is always saved with a 5000 Series matrix regardless of the position of this switch.

[6] These switches as listed are for features in all 5501 consoles and 5001 consoles that are revision 3.1 or higher. See an explanation of these features in the section "Echo Canceller & Background Noise Cancellation" later in this document. The echo canceller must be set for dynamic learning when using 5501 consoles.

[7] 5501 consoles with revision 2.4 or higher firmware do not allow background noise cancellation to be turned completely off. The "off" position with these consoles is actually "on partial".

MIC DC Switches: These switches only exist on older 5000 Series audio matrixes and are used to determine if the lane microphone is a Dynamic (UP) or Electret Condenser (DOWN) type. Since the electret type is standard (and recommended) this switch must be down or the mic will not work. *All matrixes manufactured in the last several years are hard-wired to this position and do not include the switches to avoid service issues.*

Audio Matrix Volumes

Audio Matrix Wireless Headset

Adjusting the Audio System

The speaker (SPK) and microphone (MIC) pots on the audio matrix provide the main volume adjustment for the system. (See the drawing in the section "Matrix / System Wiring Diagram".) There are a set of pots for each customer lane. The speaker pot adjusts the outgoing volume to the customer lane while the microphone pot adjusts the incoming volume to the teller. The best adjustments are made with one person at the audio console and another person in a vehicle at the customer lane.

- Adjust the SPK and MIC pots based on the orientation of a clock with 12:00 being mid range. Audio matrixes leave the factory with these pots set at approximately 10:00 which is usually adequate. Deal drawers may require a slightly higher mic setting.
- If wireless headsets will be used, make all matrix adjustments while in Console Mode using the console speaker and microphone, not the headset. After the matrix is adjusted satisfactorily then switch to Headset Mode and adjust the headset using it's own adjustments to balance the volume levels obtained with the console. Headset adjustment procedures are found in the section "Wireless Headset Installation".
- When using 5512 Remote Handsets, make all matrix adjustments while using the remote speaker and microphone at the lane (if present), not the handset. Then lift the handset off the cradle and use the pots on the handset board to balance the volume levels. See the section "5512 Remote Handset Installation".
- *When using standard audio cable:* Select a lane from an audio console and speak directly into the console microphone at the recommended distance *. Adjust the speaker pot on the matrix for adequate but not excessive volume at the lane. The default setting is ideal for many installations. Getting too close to the mic or setting the pot too high can have a negative effect and add static sounding artifacts to the audio.
  When using Cat 5 cable with the E0958-KIT: Set pot R1 on the E0958 lane module to it's maximum setting (fully counter-clockwise). Set the speaker pot on the matrix to 8:30. Select a lane from an audio console and speak directly into the console microphone at the recommended distance *. There should be adequate volume at the lane at this setting since the amplification takes place at the lane module. Only increase the speaker gain at the matrix if necessary and then in small 30 minute increments and retest. See the section "CAT 5 Lane Speaker/Driver Kit Installation". **The volume must be kept as low as possible when using CAT 5 cable.**
- With the lane still selected adjust the mic pot on the matrix for adequate but not excessive incoming volume while the person at the customer lane speaks toward the microphone. Make small adjustments at a time – approximately 30 minutes. Do not set the mic pot higher than necessary. Do not adjust the volume using the console volume arrows at this time. The console volume can later be adjusted by each teller for their individual preference. Note that any changes made using the console volume arrows will revert back to a default level whenever the system is reset.
- Do not automatically assume that all lanes should be adjusted to the same settings. Acoustics and other factors can vary from lane to lane, especially with deal drawers.

* The recommended distance for speaking into the console microphone is 1" to 2" on all consoles except for 5501 consoles that have revision 1.1 or 2.2 firmware. For those consoles the recommended distance is 3" to 6" unless the mic gain pot on the console has been adjusted as shown in the section "Mixing 5501 Consoles With Different Firmware Revisions".

Bottom of ECS Console Gain Pot

Firmware and ECS Console Sticker

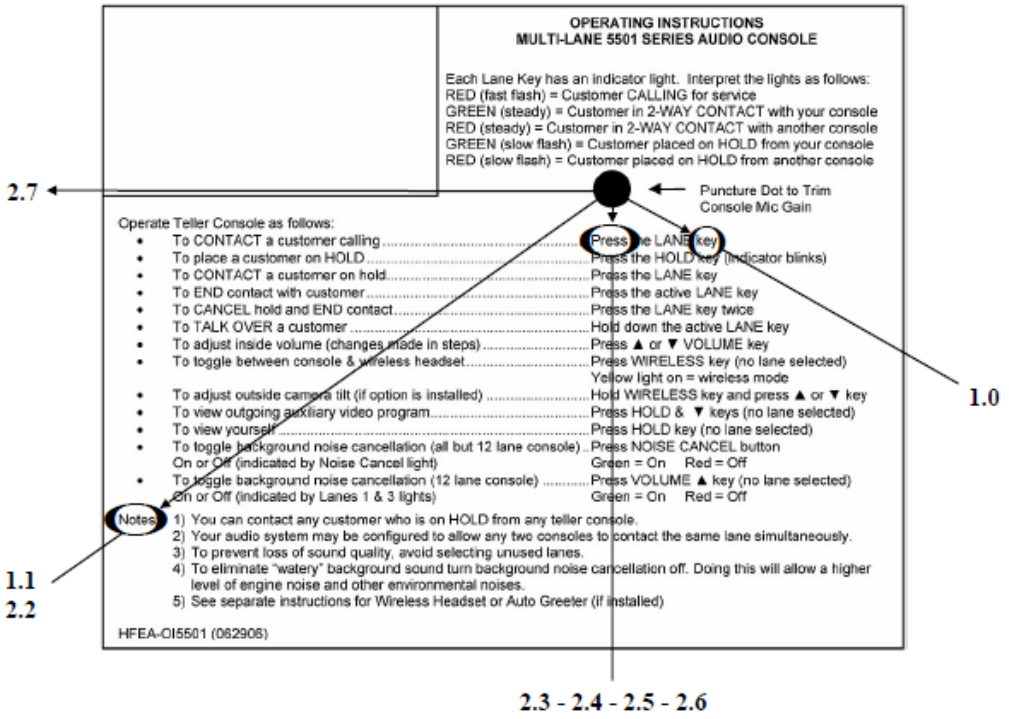
Mixing 5501 Consoles With Different Firmware Revisions

Audio adjustment issues can occur when 5501 consoles with different firmware revisions are mixed on the same system due to the difference in outgoing volume. The firmware revision is identified on the serial number label on the bottom of the console. The following provides a guide for adjusting the mic gain on each console so the volume levels are very close.

Puncture the black dot on the label on the bottom of the console. Run your screwdriver around the opening so you can see the arrow on the adjustment pot through the bottom of the circuit board. Adjust the pot so the arrow points as indicated below for the appropriate firmware revision in the console.

Firmware 1.0 – The arrow on the pot should point to the 4:00 position.
Firmware 1.1 & 2.2 – The arrow on the pot should point to the 7:30 position.
Firmware 2.3, 2.4, 2.5 & 2.6 – The arrow on the pot should point to the 6:00 position.
Firmware 2.7 – The arrow on the pot should point to the 9:00 position. *Consoles manufactured with 2.7 firmware will already have this pot adjusted to 9:00. Do not change the setting.*

Adjust the speaker and mic gain pots for each lane on the matrix to approximately 10:00. *12:00 is mid range.* Additionally make sure that feature switch #7 on the end of the matrix is in the UP position for dynamic echo canceller learning and switch #8 is DOWN for defaulting background noise cancellation to on. *Instruct the tellers that leaving background noise cancellation on allows these consoles to work much better.* Cycle power to the matrix and then test the system. The lane volume should be very close from each console when speaking 1" to 2" from the console microphone. Only make small adjustments at the matrix if necessary. These settings should provide good volume unless other problems exist.



Echo and Background Noise

Echo Canceller & Background Noise Cancellation

Feature Switches 7 & 8 on the audio matrix are used to set parameters for the audio processor in each audio console to control how the echo canceller and background noise cancellation work. The consoles look at the setting of these switches each time the system goes through a reset which happens when power is cycled or a console is "hot plugged" into the matrix. See the section "Audio Matrix Switch Settings".

Echo Canceller

When the teller speaks into the console mic the sound goes out the customer speaker, bounces off the customer vehicle, is picked up by the customer mic and then comes out the teller speaker. In effect, the teller hears their own voice. The echo cancellation circuitry in 5000 Series consoles is designed to eliminate this issue. The echo canceller can have either dynamic or fixed learning. Dynamic learning adjusts for the best possible cancellation setting while a lane is selected. Note that the console has to sample the echo before it can attempt to remove it. For this reason in extreme cases the teller may hear their own voice for the first couple of words or so while "learning" takes place. The learning time is increased as the amount of echo changes such as when speaking to a customer in a small vehicle (not much echo) followed by a customer in a panel van (lot's of echo). Deal drawers are also the most problematic for echo because sound bounces back and forth between the vehicle and the building/window. Another point to consider is that the audio processor will have a much more difficult time canceling echo if it is overdriven. This happens when volume settings are too high or when speaking too close to the microphone with a loud voice. This will also cause undesirable artifacts in the audio such as static or cutting out of the customer's voice. Fixed echo canceller learning is not recommended with 5501 consoles.

IMPORTANT: For the audio processor / echo canceller to work properly it is necessary that the lane microphone wire pair be properly shielded from the matrix to the lane. See the sections "Cable Considerations" and "Matrix / System Wiring Diagram" for more information.

Background Noise Cancellation

Background noise comes from a variety of sources. The background noise filtering in 5000 Series consoles works best at reducing constant and consistent sounds such as engine and muffler noise from a vehicle at the lane. Varying noise such as traffic from a nearby street can sometimes cause a side effect in the audio processor that most people describe as an underwater or gurgling sound. The symptom gets worse as the gains on the matrix pots are increased, the volume adjustment on the console is increased, or the level of the background noise increases.

Regardless of the default noise cancellation setting from the matrix, background noise cancellation can be toggled on or off * on a console by console basis with all 5501 consoles and most 5001 consoles (rev. 3.1 & higher). On all but the 12-lane version of the 5501, pressing the Noise Cancel button toggles this feature on (green LED) or off * (red LED). With the 12-lane version of the 5501 and most 5001's, press the Volume ▲ key while no lane is selected to toggle the feature which is indicated by the LED's for lanes 1 & 3 or 1 & 2 (green = on & red = off *). Changes of this feature made from a console only apply to that particular console and will always revert back to the current setting of dip switch 8 from the matrix whenever the system goes through a reset, such as following a momentary power outage. For this reason the technician should select the dip switch setting that corresponds to the most common setting used by the tellers.

* 5501 consoles with firmware revision 2.4 or higher do not allow background noise cancellation to be turned completely off. For these consoles a green LED indicates "on full" and a red LED indicates "on partial". All 5501 consoles work best with background noise cancellation turned on.

Troubleshooting Audio

Troubleshooting Tips

- **System won't initialize (console lights continue to blink red or stay lit)** – The audio consoles, audio matrix and video matrix are all on an RS-485 communication bus through one of the wire pairs in the Cat 5 cables. A problem with any of these devices, including a damaged cable, can affect the RS-485 communications and cause a system wide failure like this. Power down and disconnect all but one audio console – also disconnect the video matrix if present. Power up and see if the system will initialize with a single console. *Initialization happens when the console LED's blink red several times, then turn solid green, and then go out.* If a single console initializes, power down and start adding devices back one at a time until it fails again to determine which device is at fault. If the first console failed to initialize, try a different one. If none of the consoles will initialize on their own the problem may be with the audio matrix. Don't rule out the possibility that a storm or power surge could have damaged multiple devices. Also be aware that some matrix failures only affect a particular console port so a known good console could be tried at each port.
- **Power supply issues** – Check power supplies while they are under load, or substitute with a known good supply. When a modern switching power supply fails it may still measure a full 12VDC when unplugged from the equipment because there is no current draw (load). Also make sure the power supply used is rated high enough for the current requirements of the equipment it is powering. Old Samlex power supplies (large heavy metal enclosure) should be watched closely and preferably replaced. As those linear supplies break down with age their output will not have clean DC current which will cause a system wide 60 cycle buzz in the audio. The output voltage will also slowly rise, sometimes to levels that can damage equipment.
- **Teller call issues** – The audio matrix sends a teller call signal to all audio consoles when it sees a "short" across terminals 3 & 4 of the lane connector. *Terminal 3 is at ground potential and that ground is transferred to terminal 4 when the call button is pressed.* If a call button won't work try unplugging the lane connector at the matrix and then plugging it back in. If a call tone is generated at that point then the teller call input was already shorted. This can happen with a stuck call button at the lane or a damaged interconnect cable. The cable may get accidentally skinned during pulling which may create a resistive ground on the wire going to terminal 4 of the matrix lane connector. The actual matrix can be tested by unplugging the lane connector and then using a screwdriver to momentarily short pins 3 & 4 on the lane connector socket to generate a teller call request.
- **Audio issues** – All audio processing occurs in the console. The matrix connects a particular console to a particular lane. The main amplification for outgoing audio is in the matrix but the main amplification for incoming audio is in the console. Isolate audio problems by determining if the problem exists only when using a particular audio console or when communicating with a particular lane from any console. Before deciding that a console is bad, try plugging it into a different teller port of the matrix. Lane connectors can also be temporarily swapped at the matrix to see if a problem follows the physical lane or stays with the same lane number on the matrix.

  The lane speaker is not polarity sensitive but the lane microphone is. If the mic is wired backwards it will not work. The loss of incoming audio from a lane is generally caused by a bad microphone but a stuck muting relay in the pneumatic unit would keep the mic wires shorted. The audio matrix can be tested by temporarily moving a lane connector from a working lane to the lane number in question. You could also temporarily connect a spare mic or speaker directly at the matrix in place of the interconnect wires going to those devices at the lane.

  Intermittent problems with the quality of audio are often caused by overdriving the audio processor by setting volume levels too loud or speaking too close to the console mic with a loud voice. Lane units that have more echo, such as deal drawers, are also more likely to have issues with the audio. Make sure that the proper type of cable is being used. Many times when equipment is upgraded the old cabling from the matrix to the lane is reused. That cable may not be acceptable for the new system. See

Video Troubleshooting

the section "Cable Considerations". Sometimes volume levels for wireless headsets get set too loud. Make sure the volume pots on the matrix are set while using the console speaker and mic. Then switch to headset mode and adjust the volume levels on the actual headset assembly to balance them with the console volumes.

- **Video issues** – If video is missing or distorted the first thing is to make sure the cameras and monitors themselves are working properly. The service switch in the top left corner of 5517 customer video units and the service/mirror switch on the bottom of 5550 teller video units will connect the camera directly to the monitor and isolate that video unit from the video matrix and the interconnect video cables. With the service switch in the normal position *(pulled forward in 5517's)* you can disconnect the camera and monitor cables at the matrix and connect those cables together with a barrel connector. That will loop the camera back to the monitor using the interconnect cables while bypassing the video matrix. Interconnect cable issues are generally caused by improperly installed BNC connectors. A video patch cable can also be used directly at a video unit's BNC connectors to connect the camera to the monitor and verify the wiring inside the video unit is good. *Barrel connectors and patch cables are tools that should be carried by technicians installing or servicing this type of equipment.* Some video matrix issues can be isolated by swapping cameras or monitors between lanes or teller ports of the matrix.

  The auxiliary video (advertising) input of the matrix can be tested by temporarily moving a lane camera or teller camera to the auxiliary input. Remember that the auxiliary input must be composite video. If a particular source for the auxiliary video won't work through the matrix, but it will work when connected directly to a monitor, try changing feature switch #2 on the end of the video matrix to the opposite position.

  Also don't forget to check for the proper setting of the termination switches on the matrix. Improper termination can cause poor quality video and make it difficult to consistently lock onto lane cameras when that lane is selected by a teller. The section "Video Matrix Switch Settings" gives details about the termination switches and t-tapping video cables.

- **Wireless Headset issues** –Make sure the battery has a full charge before using the headset. The charging light on the base unit will blink while the battery is charging and will light steady when charging is complete. The Plantronics headsets are mated units so mixing up a headset with the wrong base unit will give the impression of a defective unit. Also the CS50 / CS55 headset can occasionally get into a state where it will not work – it may just produce loud static. To clear this condition put the headset through a reset as follows:
  1. Press both the talk button and the mute control button on the headset for 5 seconds. *The mute control is the volume dial pressed in.*
  2. When the talk indicator light on the headset blinks, release both buttons.
  3. Press the talk button again.
  4. Next reset the base unit by unplugging the power connector from the base for 5 seconds.

  If it is necessary to use an unmated headset and base, the units must be re-subscribed. With CS540 headsets simply placing the headset in the base automatically subscribes it. With CS50 / CS55 headsets follow these instructions:
  1. Place the headset in the charge cradle and leave it there for the entire procedure.
  2. Press and hold both talk volume fine tune buttons on the back of the base for 5 seconds until the power indicator flashes red.
  3. Press and hold the headset mute control button for 5 seconds until the talk indicator on the headset lights green. *Successful re-subscription is indicated when the power indicator light comes on steady and the talk indicator light goes off.*
  4. To complete the process, reset the base by unplugging the power connector from the base for 5 seconds, then reconnect.

E10188

Q. Incoming audio from deal drawers is sometimes too weak. What can be done to improve this?
A. Getting the microphone higher will make a big difference, particularly with 4 wheel drive vehicles where the microphone is often down at the door panel. Part number E10188 is an external deal drawer microphone in a small plastic enclosure (1" H x 1" W x 3/4" D) with a 15 foot shielded cable. This mic assembly will fit on the window sill of most deal drawers. The shielded cable should be routed directly to the audio matrix and wired in place of the existing mic wires. Do not connect the cable to the terminal strip inside the drawer.

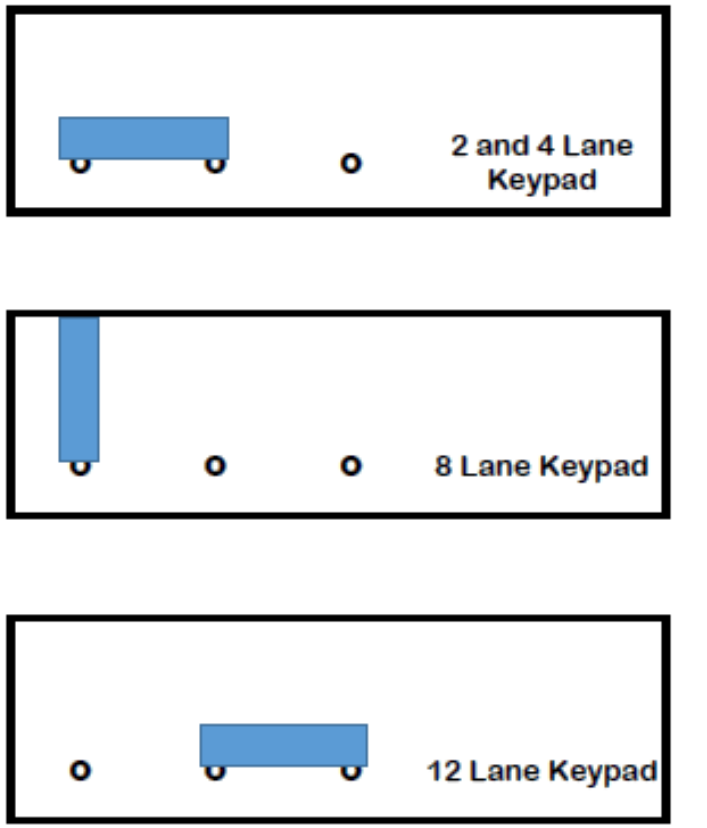
Q. I have received complaints that customers using the handset on a Hamilton IRT unit can hear other tellers speaking to other customers. What could cause this?
A. There are multiple things to consider for this issue as follows.
(1) Contact tech support (513-795-5332) with the model and serial number of the matrix to determine if that matrix needs a modification. Also look for any stickers on the matrix indicating an upgrade was performed at the repair center.
(2) If the handset board is a model 4012, remove the yellow wire coming from the handset and add a 6.8k resistor in series with the wire.
(3) If the handset board is a model 5012, look for resistor R11 near the terminal strip. If a jumper wire is installed instead of a resistor either replace the jumper with a 6.8k resistor or add the resistor in series with the yellow handset wire as in step 2.
(4) Adjust the speaker & mic gain pots on the matrix using the local speaker and microphone in the IRT, not the handset. Keep the gains as low as possible without the audio being too weak. Since the IRTs are installed indoors it is not necessary, nor desirable, for the speaker volume to be very loud.
(5) Lift the handset off the cradle and adjust the gain pots on the 5012 / 4012 board for adequate volume with the handset. As before, don't set the volumes louder than necessary.
(6) If the tellers sometimes use headsets don't overlook the possibility that the headsets are not adjusted properly resulting in excessive volume at the IRT.

Q. I am installing a Plantronics CS50 / CS55 wireless headset to an audio console and I can't get it to work. What could be wrong?
A. One possibility is the phone cable is plugged into the wrong jack on the base unit of the CS50 / CS55. Be sure to use the jack with the picture of a complete telephone, not the handset jack. It's also possible that the 5014 wireless interface adapter is being used where it is not needed. Many newer 5001 consoles and all 5501 consoles have a phone jack next to the RJ45 matrix cable jack. With these consoles the base unit of the wireless headset should plug directly into the console and the 5014 should not be used. Consoles without the phone jack will require the 5014. In this case the pins from the 5014 may not be making proper contact in the phono jacks of the console. Open up the console and loosen the 3 screws that hold the console board to the bottom of the chassis. Slide the board to the rear and tighten the screws. Plug the 5014 in and out of the console several times to help clean the contacts which may have gotten dirty or corroded over the years. It is also highly recommended to use a sheet metal screw with the original version of 5014 to secure it to the console. This is especially important with 5001-1 consoles. A slot in the 5014 allows the console ground wire to attach using the same screw.

Q. My Plantronics CS50 /CS55 wireless headset quit working and causes a loud static sound at the customer lane. What could be wrong?
A. Power surges or static electricity are the most likely causes of this symptom according to Plantronics tech support. Use the following steps to reset the headset and correct the problem.
1. Press both the talk button and the mute control button on the headset for 5 seconds. (The mute control is the volume control pressed in.)
2. When the talk indicator light on the headset blinks, release both buttons.
3. Press the talk button again.
4. Remove power from the base unit for 5 seconds and then power it back up.

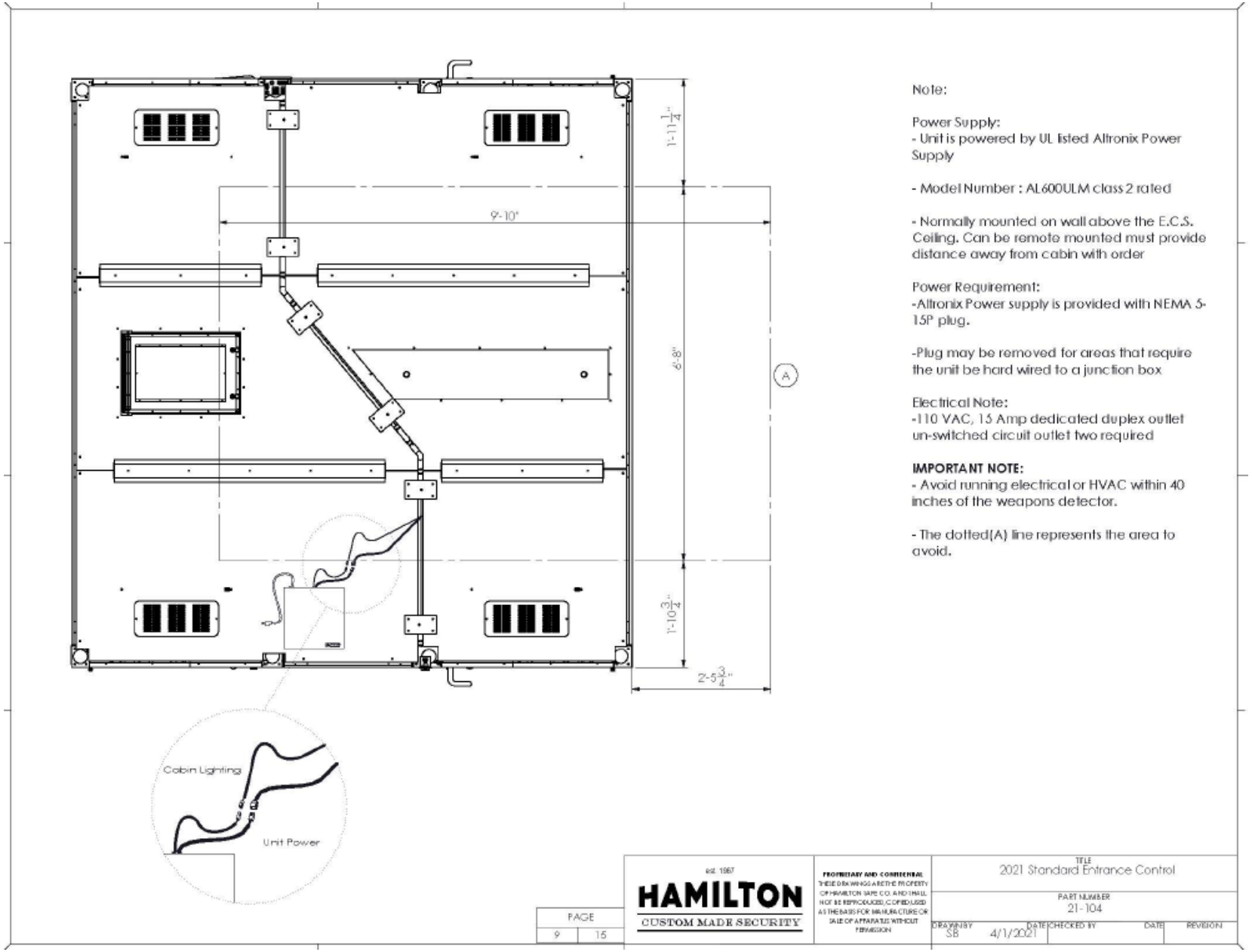
Console Jumper 2LN 12LN

Audio Console Jumper settings



Entrance Control System (ECS)

40 Inch Clearance



Note:

Power Supply:
- Unit is powered by UL listed Altronix Power Supply

- Model Number : AL600ULM class 2 rated

- Normally mounted on wall above the E.C.S. Ceiling. Can be remote mounted must provide distance away from cabin with order

Power Requirement:
-Altronix Power supply is provided with NEMA 5-15P plug.

-Plug may be removed for areas that require the unit be hard wired to a junction box

Electrical Note:
-110 VAC, 15 Amp dedicated duplex outlet un-switched circuit outlet two required

IMPORTANT NOTE:
- Avoid running electrical or HVAC within 40 inches of the weapons detector.

- The dotted(A) line represents the area to avoid.

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HAMILTON
CUSTOM MADE SECURITY

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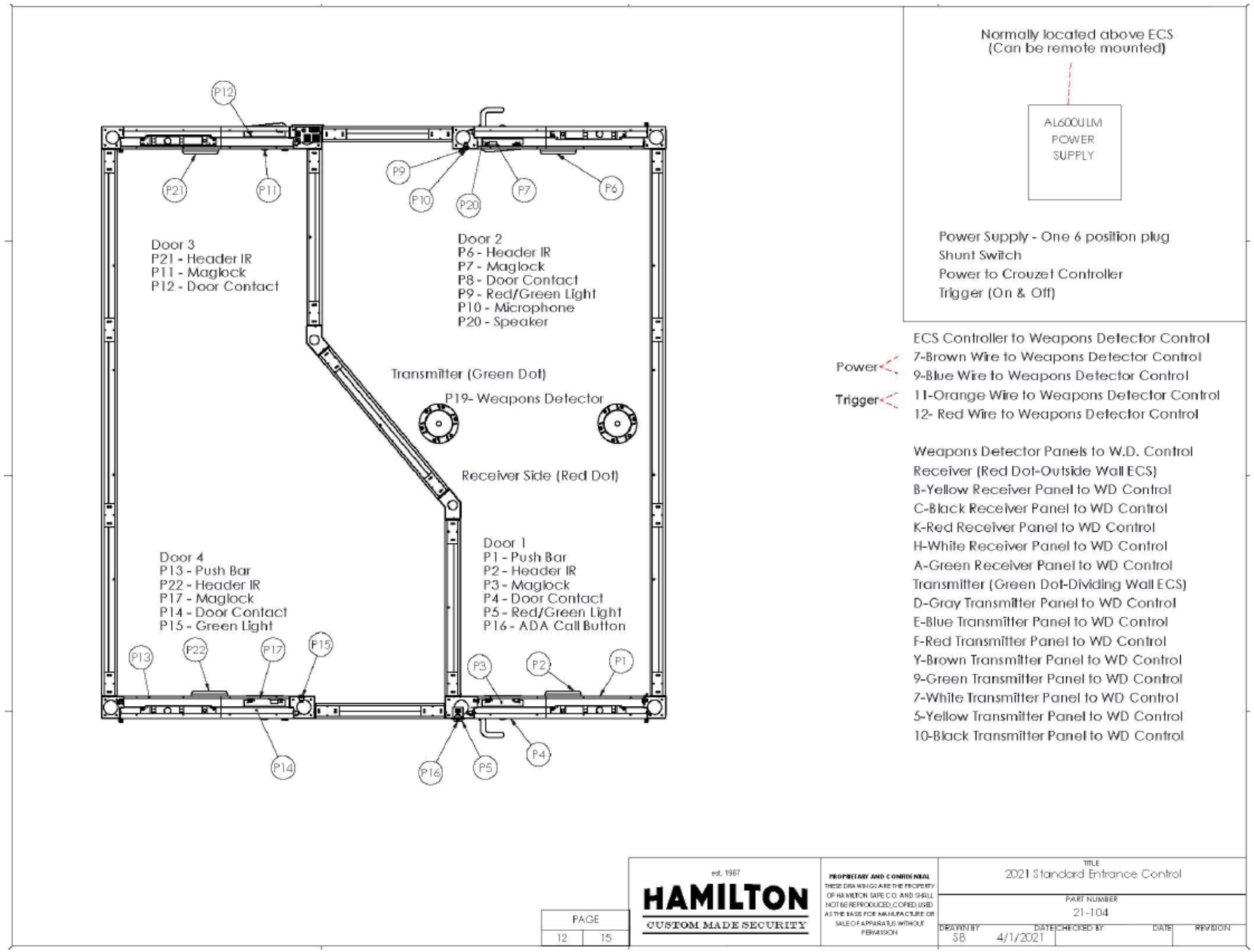
TITLE
2021 Standard Entrance Control

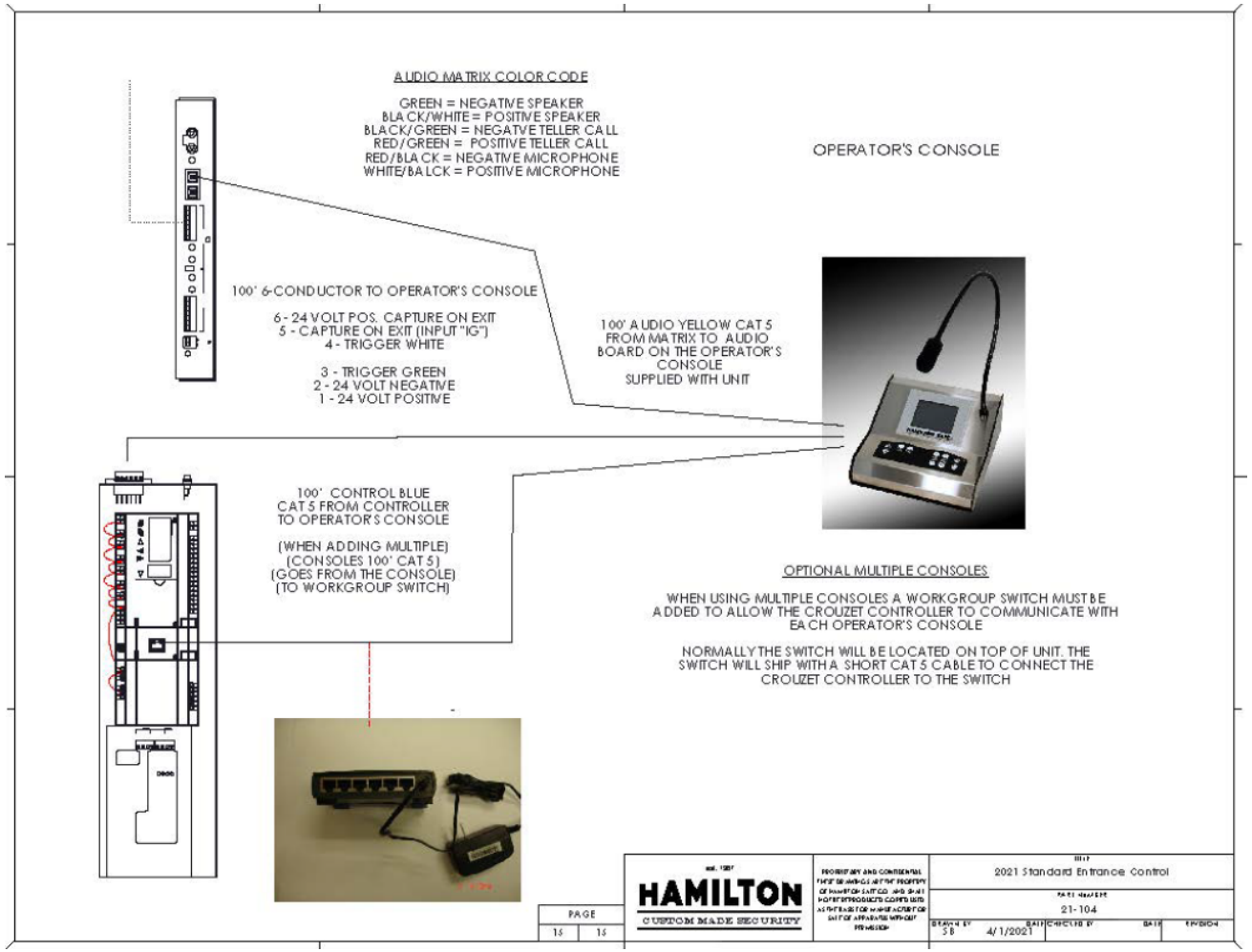
PART NUMBER
21-104

DRAWN BY	DATE	CHECKED BY	DATE	REVISION
SB	4/1/2021			

Door Labels, COE

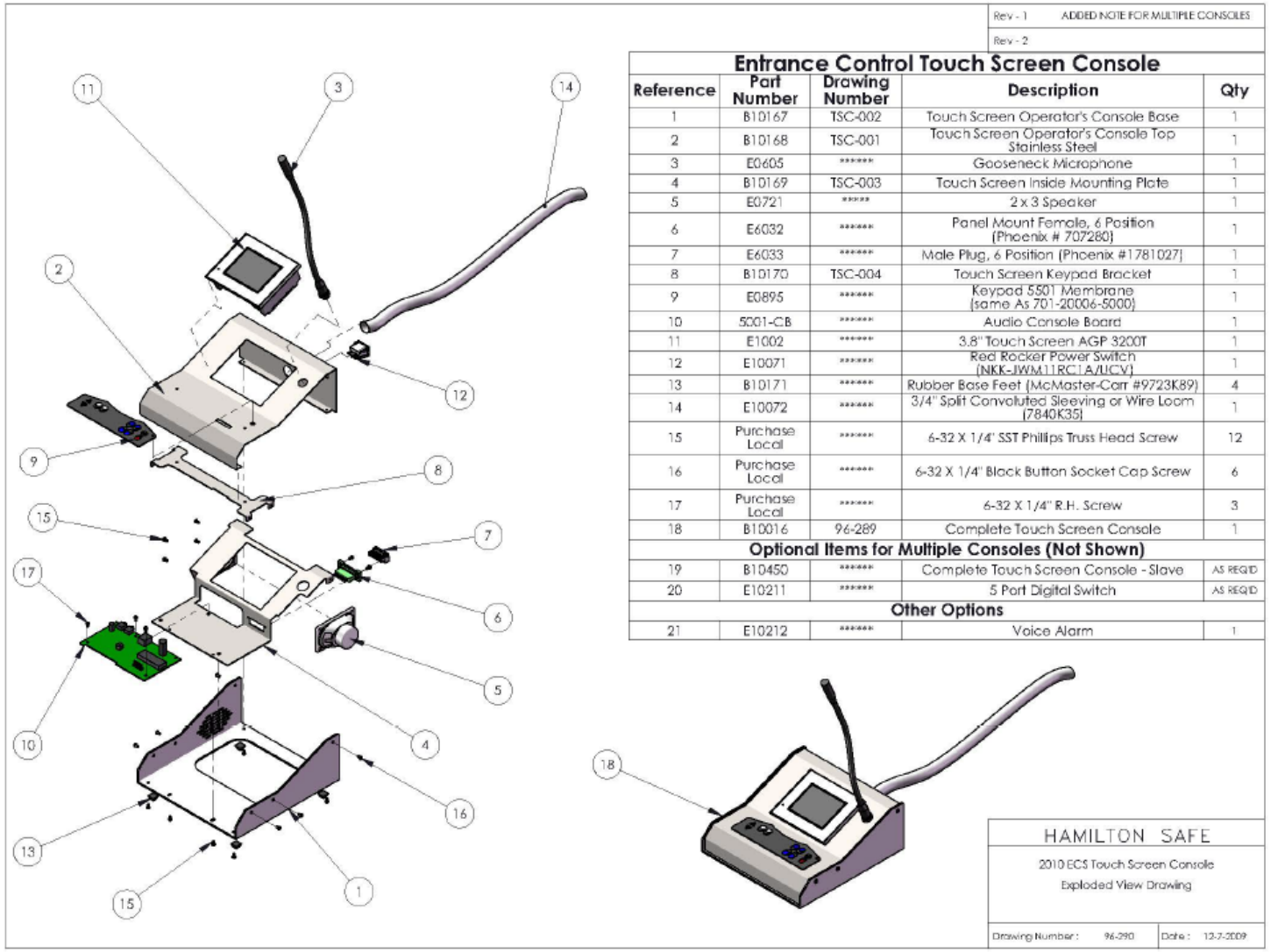


Wires and Console



Touch Screen Console

- Touch Screen – Controls the unit
- Standard 5001 Audio integrated into the console
- Power on off switch
- Connections = 2 Cat 5 and one 6 conductor



Rev - 1	ADDED NOTE FOR MULTIPLE CONSOLES
Rev - 2	

Entrance Control Touch Screen Console

Reference	Part Number	Drawing Number	Description	Qty
1	B10167	TSC-002	Touch Screen Operator's Console Base	1
2	B10168	TSC-001	Touch Screen Operator's Console Top Stainless Steel	1
3	E0605	******	Gooseneck Microphone	1
4	B10169	TSC-003	Touch Screen Inside Mounting Plate	1
5	E0721	*****	2 x 3 Speaker	1
6	E6032	******	Panel Mount Female, 6 Position (Phoenix # 707280)	1
7	E6033	******	Male Plug, 6 Position (Phoenix #1781027)	1
8	B10170	TSC-004	Touch Screen Keypad Bracket	1
9	E0895	******	Keypad 5501 Membrane (same As 701-20006-5000)	1
10	5001-CB	******	Audio Console Board	1
11	E1002	******	3.8" Touch Screen AGP 3200T	1
12	E10071	******	Red Rocker Power Switch (NKK-JWM11RC1A/UCV)	1
13	B10171	******	Rubber Base Feet (McMaster-Carr #9723K89)	4
14	E10072	******	3/4" Split Convoluted Sleeving or Wire Loom (7840K35)	1
15	Purchase Local	******	6-32 X 1/4" SST Phillips Truss Head Screw	12
16	Purchase Local	******	6-32 X 1/4" Black Button Socket Cap Screw	6
17	Purchase Local	******	6-32 X 1/4" R.H. Screw	3
18	B10016	96-289	Complete Touch Screen Console	1
Optional Items for Multiple Consoles (Not Shown)				
19	B10450	******	Complete Touch Screen Console - Slave	AS REQ'D
20	E10211	******	5 Port Digital Switch	AS REQ'D
Other Options				
21	E10212	******	Voice Alarm	1

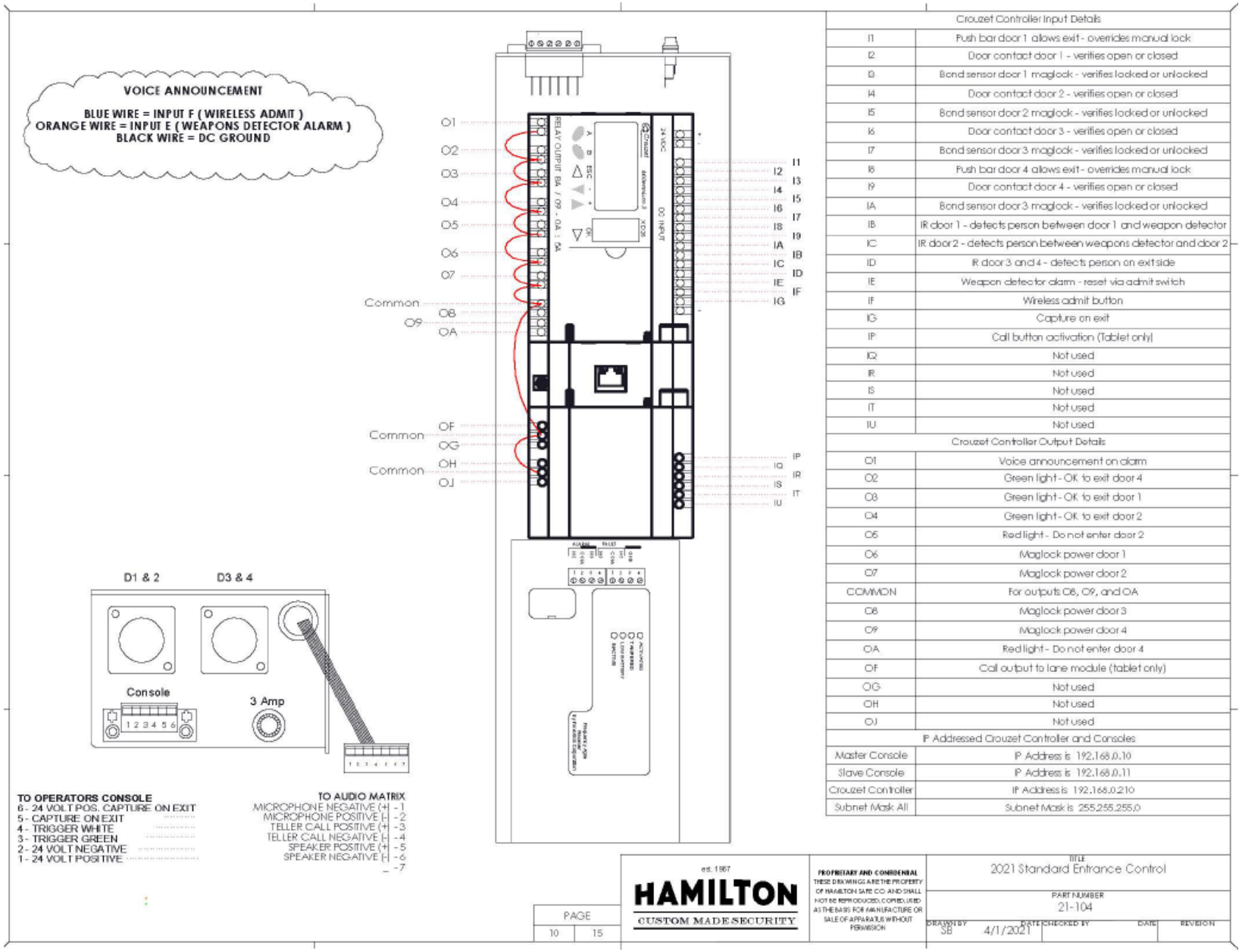
HAMILTON SAFE

2010 ECS Touch Screen Console

Exploded View Drawing

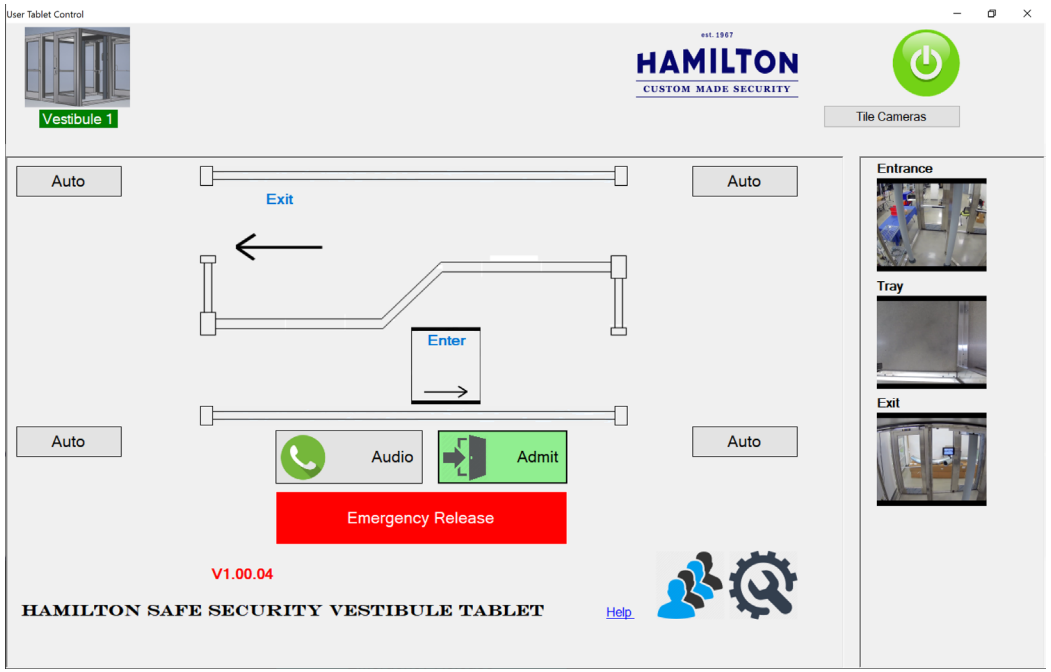
Drawing Number: 96-290 Date: 12-7-2009

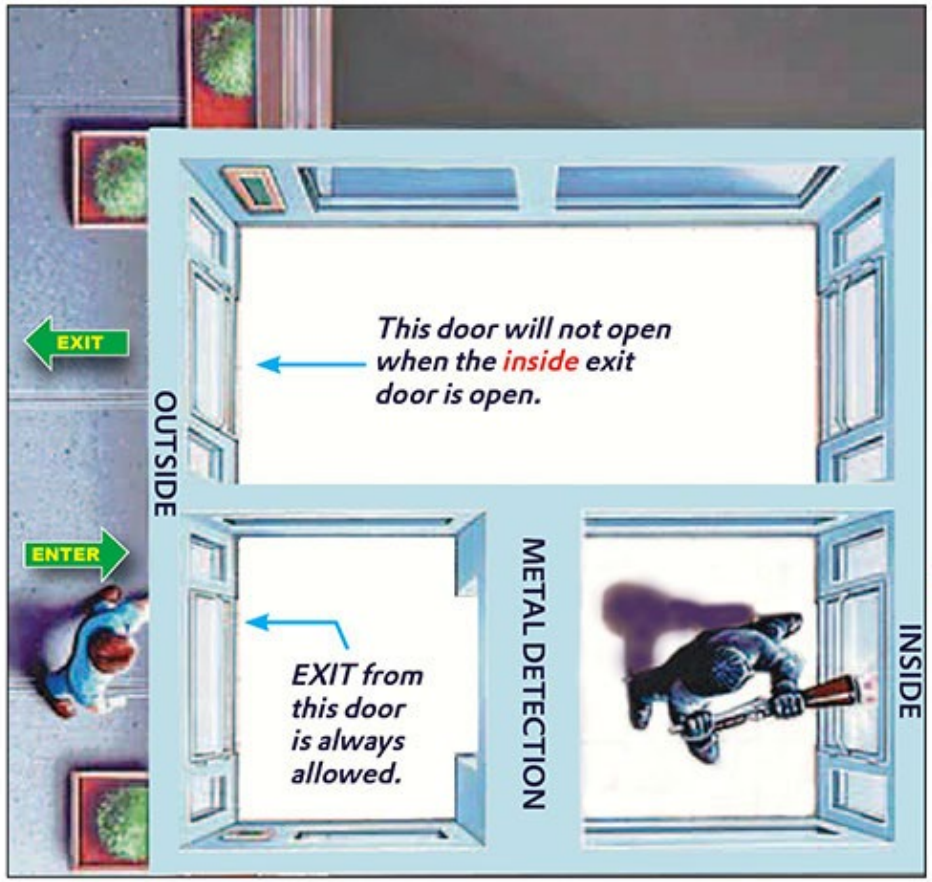
Input and Output



Crouzet Controller Input Details	
I1	Push bar door 1 allows exit - overrides manual lock
I2	Door contact door 1 - verifies open or closed
I3	Bond sensor door 1 maglock - verifies locked or unlocked
I4	Door contact door 2 - verifies open or closed
I5	Bond sensor door 2 maglock - verifies locked or unlocked
I6	Door contact door 3 - verifies open or closed
I7	Bond sensor door 3 maglock - verifies locked or unlocked
I8	Push bar door 4 allows exit - overrides manual lock
I9	Door contact door 4 - verifies open or closed
IA	Bond sensor door 3 maglock - verifies locked or unlocked
IB	IR door 1 - detects person between door 1 and weapon detector
IC	IR door 2 - detects person between weapons detector and door 2
ID	IR door 3 and 4 - detects person on exit side
IE	Weapon detector alarm - reset via admit switch
IF	Wireless admit button
IG	Capture on exit
IP	Call button activation (Tablet only)
IQ	Not used
IR	Not used
IS	Not used
IT	Not used
IU	Not used
Crouzet Controller Output Details	
O1	Voice announcement on alarm
O2	Green light - OK to exit door 4
O3	Green light - OK to exit door 1
O4	Green light - OK to exit door 2
O5	Red light - Do not enter door 2
O6	Maglock power door 1
O7	Maglock power door 2
COMMON	For outputs O8, O9, and OA
O8	Maglock power door 3
O9	Maglock power door 4
OA	Red light - Do not enter door 4
OF	Call output to lane module (tablet only)
OG	Not used
OH	Not used
OJ	Not used
IP Addressed Crouzet Controller and Consoles	
Master Console	IP Address is 192.168.0.10
Slave Console	IP Address is 192.168.0.11
Crouzet Controller	IP Address is 192.168.0.210
Subnet Mask All	Subnet Mask is 255.255.255.0

ECS Exit





This door will not open when the outside exit door is open.

A person can NOT enter this door if:

1. *A person is carrying a large mass of metal, or a firearm, that sets off the weapons detector.*
2. *The outside door is open.*