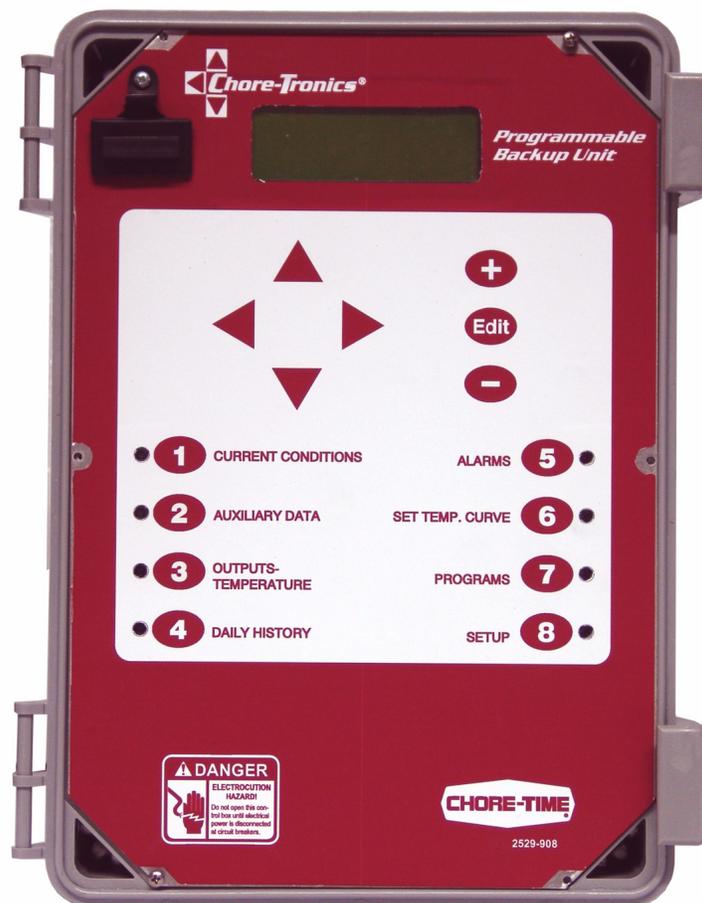# Chore-Tronics®
Programmable Backup Unit

CTB Inc. Warranty

CTB Inc. warrants each new product manufactured by it to be free from defects in material or workmanship for one year from and after the date of initial installation by or for the original purchaser. If such a defect is found by the Manufacturer to exist within the one-year period, the Manufacturer will, at its option, (a) repair or replace such product free of charge, F.O.B. the factory of manufacture, or (b) refund to the original purchaser the original purchase price, in lieu of such repair or replacement. Labor costs associated with the replacement or repair of the product are not covered by the Manufacturer.

Conditions and Limitations

1. The product must be installed by and operated in accordance with the instructions published by the **Manufacturer or Warranty will be void**.

2. Warranty is void if **all components** of the system are not original equipment supplied by the **Manufacturer**.

3. This product must be purchased from and installed by an authorized distributor or certified representative thereof or the Warranty will be void.

4. Malfunctions or failure resulting from misuse, abuse, negligence, alteration, accident, or lack of proper maintenance shall not be considered defects under the Warranty.

5. This Warranty applies only to systems for the care of poultry and livestock. Other applications in industry or commerce are not covered by this Warranty.

The **Manufacturer** shall not be liable for any **Consequential or Special Damage** which any purchaser may suffer or claim to suffer as a result of any defect in the product. **"Consequential"** or **"Special Damages"** *as used herein include, but are not limited to, lost or damaged products or goods, costs of transportation, lost sales, lost orders, lost income, increased overhead, labor and incidental costs and operational inefficiencies.*

THIS WARRANTY CONSTITUTES THE MANUFACTURER'S ENTIRE AND SOLE WARRANTY AND THIS MANUFACTURER EXPRESSLY DISCLAIMS ANY AND ALL OTHER WARRANTIES, INCLUDING, BUT NOT LIMITED TO, EXPRESS AND IMPLIED WARRANTIES AS TO MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSES SOLD AND DESCRIPTION OR QUALITY OF THE PRODUCT FURNISHED HEREUNDER.

CTB Inc. product Distributors are not authorized to modify or extend the terms and conditions of this Warranty in any manner or to offer or grant any other warranties for CTB Inc. products in addition to those terms expressly stated above. An officer of CTB, Inc. must authorize any exceptions to this Warranty in writing. The Manufacturer reserves the right to change models and specifications at any time without notice or obligation to improve previous models.

Effective: **March 2008**

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Thank You

The employees of CTB Inc. would like to thank your for your recent purchase. If a problem should arise, your CTB distributor can supply the necessary information to help you.

Overview

The Chore-Time Programmable Backup Unit (PBU) is used along with either the Backup Control or the Expanded Backup Control to provide a backup system for an electronically controlled livestock or poultry facility. Using this equipment for any other purpose or in a way not within the operating recommendations specified in this manual will void the warranty and may cause personal injury.

Introduction to the Control

Description of Control Front Panel
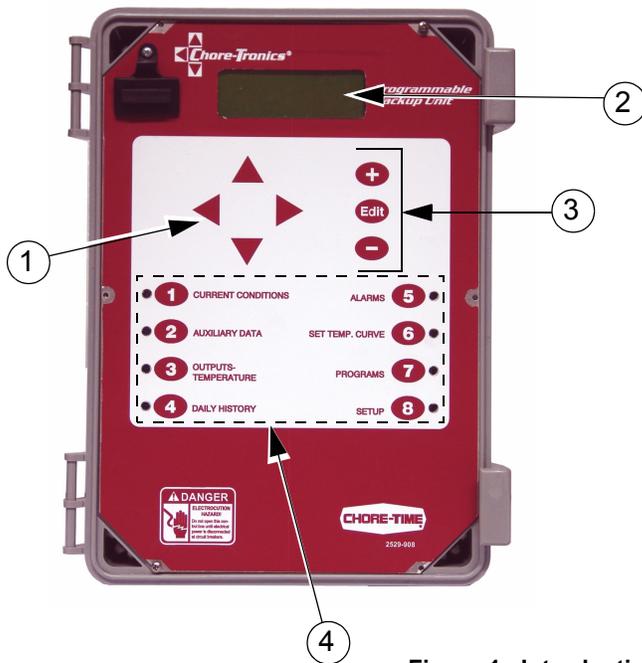
Item	Description
1	Navigation Buttons
2	Viewing Screen
3	Edit Buttons
4	Subject Buttons

Figure 1. Introduction to Control

Viewing Screen

The viewing screen has a display which has 4 lines, each containing 20 characters. This is the area that will display the requested information when a subject button is pressed. The viewing screen always remains lit. Normally the *Current Conditions screen* shows **(Figure 2)**.
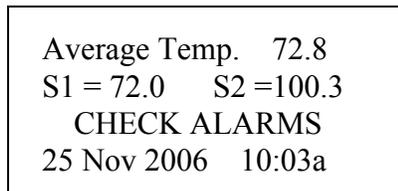
```
Average Temp.    72.8
S1 = 72.0     S2 =100.3
    CHECK ALARMS
25 Nov 2006    10:03a
```

Figure 2. Current Conditions Screen.

Navigation Buttons

These buttons allow you to scroll up and down in the screens that have more than 4 lines. Continuously pressing the up or down arrow button increases the scrolling speed. When you are in the *Edit Mode* the left and right arrow keys move the cursor to editable (changeable) positions. The cursor highlights the areas that can be changed.
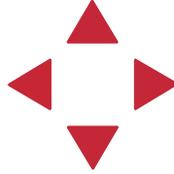
Edit Buttons

When the button labeled **EDIT** is pressed and you are looking at a screen that has editable fields, the cursor appears. With the *Navigation Buttons*, you can move the cursor to the parameter on the screen that you want to edit. By pressing the "+" or "–" buttons, the numerical values are changed. If you are changing text (i.e. "yes" or "no"), the "+" and "–" keys scroll through the possible text choices. Pressing the **EDIT** button a second time exits the edit mode.

Fast Edit

While editing a number on the screen, you will notice that the digit you are changing is underlined. For example: (72.0). If you wish you can move to different digits of the number in order to change the number more rapidly. To do this **See Figure 3 below.** Fast Edit is very useful when making large changes to numbers.

Action	Result
Press the Edit button	72.0
Press "+" followed by "-"	72.0
Within 3 seconds, Press the Left arrow twice	72.0
Press "+" twice arrow	92.0

Mt1701-065 1/02

Figure 3. Fast Edit.

Submenus for Screens 6,8,and 9

If screen 6,8, or 9 is selected a submenu listing of choices will appear **(see example figure below)**. Use the Up Arrow or the Down Arrow to highlight the desired submenu choice. Then press the Right Arrow key to enter the desired submenu screen. To return back to the submenu list, make sure the control is out of the edit mode, then press the Left Arrow to return to the submenu list.

(use ▶ to open choice, ◀ to return)
Mortality
Management
Reset data

MT2317A

Security

To provide for security in setting your Controls, there is a security feature that appears when you press the *Edit* button. The Control automatically asks for an access code at that time, The access code is a four digit number that you have selected while setting up the Control and is explained under the "**Changing the Access Code***"* section of this manual. Once you have inserted the correct code, the Control allows you to make changes. If five minutes pass since your last change, the access code has to be re-entered.

Subject Buttons

On the front of the Control are 8 subject keys. As each subject button is pressed, the light beside that button turns on and the subject that is described beside the button appears on the screen. If no other buttons are pressed for 5 minutes, the Control automatically returns to the *Current Conditions screen.*

How to Maneuver in the Viewing Screen

•The procedures below give a brief overview on the use of the *Navigation Buttons* and the *Edit Buttons.*

•Screen 8, "Setup" is used for this example.

Using the Navigation Buttons

1. Press BUTTON 8. **Figure 4** appears in the display.

```
Control Number        1
Temp Unit            C/F
Clock Type        12 HR
Time              11:01p
Date           25 Aug 06
```

Figure 4. Navigation Buttons.

2. Press the **DOWN ARROW** once.
    The view shown on the screen will scroll down one line as shown in **Figure 5.** If you push the **UP ARROW** once, the text scrolls back to where it was.

```
Temp Unit            C/F
Clock Type        12 HR
Time              11:01p
Date           25 Aug 06
```

Figure 5. Press Down Arrow.

3. The left and right arrow keys are used during the Edit Mode.

Glossary of Terms

Bend Point (BP)

The Bend Points (BPs) are simply the points on the curve that define the curve. For the Set Temperature and Minimum Ventilation Timer curves, the curve values are gradually changed between bend points. The bend point values are the exact values at midnight beginning the day # of each bend point. The curve takes over when you turn the curve "on" and the day number is equal to or greater than the day number assigned to BP #1.

Curve

A "curve" is a listing of up to 10 points in time (bend points) that defines how you want a parameter to automatically vary as the animals age.

Curve Value

The Control will list what the current value(s) the curve would be, if the current day number is greater than the day # of bend point #1, and the curve is "on", and there is no "offset" to the curve.

Day Number

The intention is that the day # is the age of the animals whose environment is being controlled. Day # 0 does not exist. Negative days (down to – 7) are allowed. Changing the day # in any screen that shows the day number, will change the day # in all the other screens that show the day #.

Heating Levels

Heating Levels are outputs that are intended to turn on heating outputs in the back up box. Each heating level that is used has a defined On and Off temperatures that are set in Screen 3. There can be a maximum of 2 heating levels

Main Control

This is the control that is normally operating the ventilation in the house. This would normally be the control that is being backed up by the PBU and the Backup Control.

Mode Sensor(s)

The concept of Mode Sensor(s) is essential to the understanding what makes the Control change from one mode to another. The Mode Sensor(s), of a currently operating mode, determines when the Control will leave that mode. As an example, while in the Power Mode, the Power Mode Sensor(s) determines when it's too hot to stay in the Power Mode (i.e. above the tunnel "on" temperature). Because of this, it converts to the Tunnel Mode (assuming there is no Natural Mode) at the tunnel "on" temperature. It comes back to the Power Mode from the Tunnel Mode, when the Tunnel Mode Sensor(s) say it's too cold to stay in the Tunnel Mode (i.e. below the tunnel "off" temperature).

Noticing an Alarm

"Noticing" an alarm is a very important part of using the alarm system. With button presses, you can tell the Control that you have "seen" the alarm message. The simplest way to do this is to first press the alarm button to read the alarm message(s) at the top of the alarm screen. Each additional press of the alarm button (while you're still looking at the alarm screen) "notices" the alarm(s), one at a time.

Natural Mode

Natural Mode requires the house to be equipped with Curtains in the side walls that are powered by Drive Units (Curtain Machines). The Control converts to this mode of operation when the temperature(s) inside the house raise to a level that the Fans of the Power Mode can't keep the temperature(s) under control. While in the Natural Mode of operation, the Curtains are opened or closed, as required, to control the temperature(s). This mode of operation generally happens during moderate weather.


Mt1701-Naturalmode 11/01
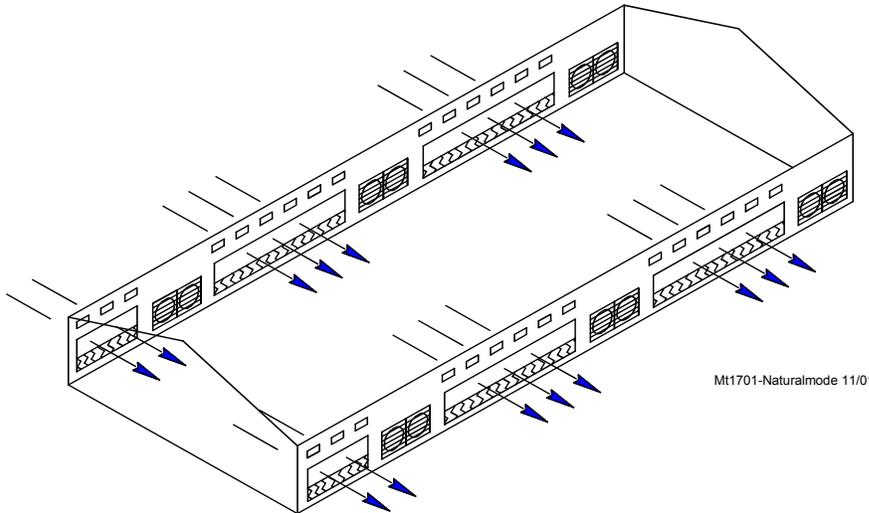
Offset

The term "offset" applies to the Set Temperature curve only. If you manually adjust either the Set Temperature or the Minimum Ventilation Timer settings, while the curve is on, you create an "offset" to that curve relative to it's "curve value". The "curve value" is not changed. (see the "curve value" definition above.) The curve value is shown as a convenience so that you know what you have to change it back to in order to get back on the actual curve's table listing. While an "offset" is in effect, the parameter of the curve is still modified versus time. However, the actual parameter value is the "curve value" modified by the "offset".

Power Mode

The building is closed up except for Inlets (usually Baffle Doors) which are powered open and close in order to control the static pressure level. In some cases Gravity Inlets are used where the static pressure is not controlled directly. The only ventilation provided is due to Fans mounted in the end or side walls. This mode of operation generally happens when the outside temperatures are somewhat lower than the set temperature.


Mt1701-Powermode 11/01
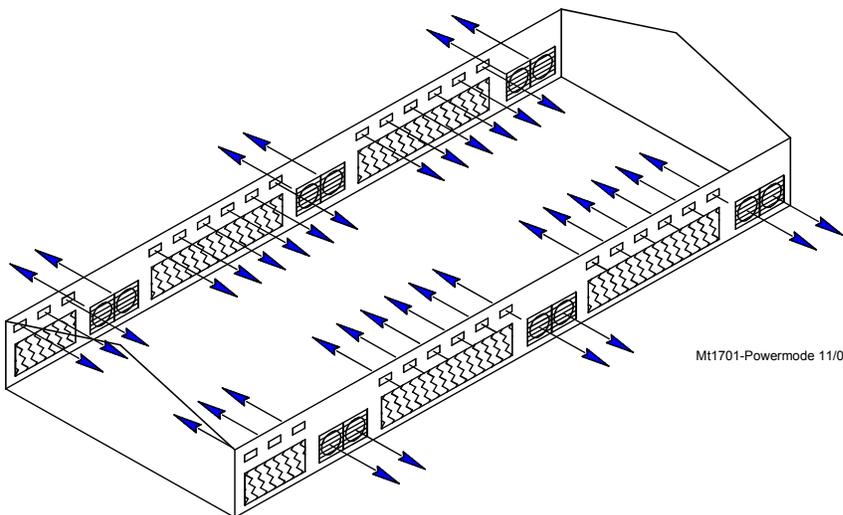
Program

A "program" is a complete set up of all the screens of a Control. In screen 7, six different "programs" can be saved and later activated. This can be very convenient when it is desired to change the set up at different points during the grow out or barn cycle, or times of the year.

Set Temperature

The set temperature is another very important, basic, concept. All temperatures are referenced to the set temperature. When the set temperature is adjusted either manually, or because the set temperature curve is on, all other temperature settings move up or down by the same amount. For instance, even though you program an actual temperature for each Fan to come on and off, when you change the set temperature, those Fan's on and off temperatures are adjusted by the same amount you changed the set temperature.

Tunnel Mode

This mode of operation requires a group of large (usually 48 inch or larger) Fans at one end of the house with a large air Inlet area at the opposite end of the house. The Control converts to this mode of operation from the Power or Natural Mode (if used), when the temperature(s) while in those modes get too high. The typical 5 or 6 mph. breeze, which can be created by the Tunnel Fans running, produces a wind chill effect that is significant. This mode of operation happens during warm to hot weather.

Mt1701-Tunnelmode 11/01
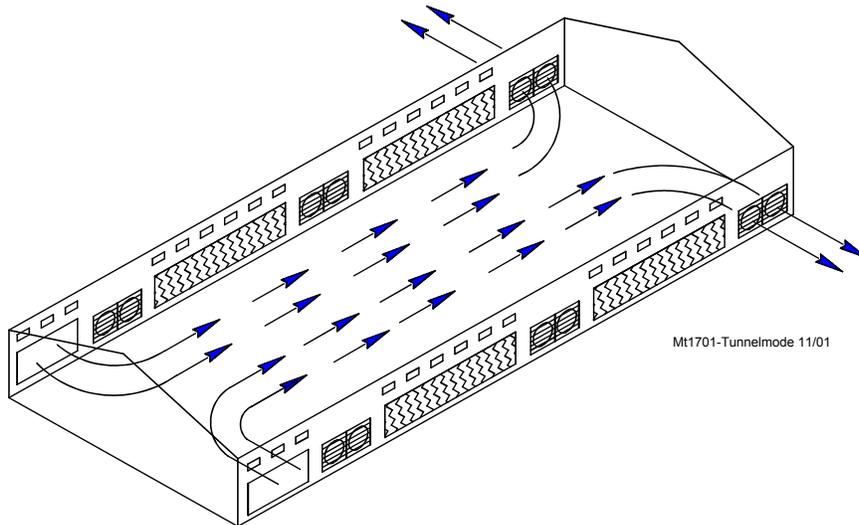
Ventilation Levels

Ventilation levels are outputs that are intended to turn on fans or other cooling outputs in the backup box. Each ventilation level that is used has a defined On and Off temperatures that are set in Screen 3. There can be a maximum of 5 ventilation levels.

Overview of Screens

Screen 1: Current Conditions

Screen 1 **(Figure 6)** shows a brief summary of the current conditions of the house. There are no editable values in this screen; it is for viewing only.
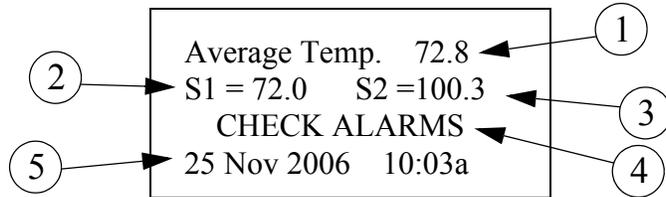

Figure 6. Current Conditions Screen

1. **Average Temp-** This is the average temperature of Sensors 1 and 2 of the PBU.
2. **S1-** Sensor #1's current temperature.
3. **S2-** Sensor #2's current temperature
4. **Check Alarms-** This will appear (flashing) if the PBU detects an alarm condition. This will continue to appear until the condition is corrected and noticed.
5. **Date and Time-** Current date and time.

Screen 2: Auxiliary Data Screen

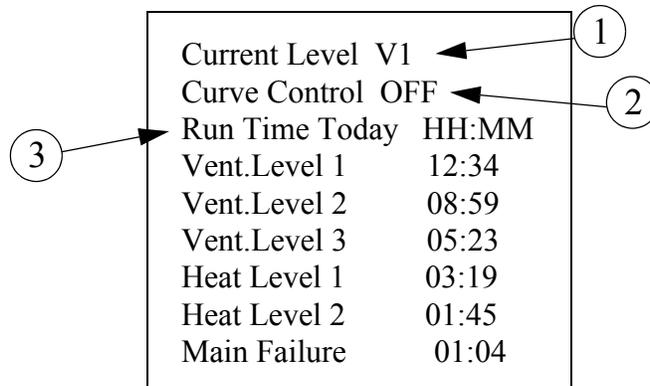Screen 2 **(Figure 7)** shows a brief summary of the ....

Figure 7. Auxiliary Data Screen

1. **Current Level-** The current ventilation (or heating) level the PBU is running.
2. **Curve Control-** Indicates whether the PBU's set temperature is running off of the Set Temperature Curve.
3. **Run Time Today-** Indicates how much time (in hours and minutes) each of the ventilation and heating levels have ran since midnight today. If the Main Control failure input is used it will also record how much time there was a main failure (loss of 24Vdc detected).

Screen 3: Outputs-Temperatures

Screen 3 (Figure 8) is a very important screen. It is the screen that determines at what temperatures Ventilation and/or heating levels operate.

ON	OFF	LEVEL
95.0	90.0	Vent 3
89.5	87.0	Vent 2
86.5	84.0	Vent 1
83.5		Set Temp
72.5	74.0	Heat 1
70.5	72.0	Heat 2

Figure 8. Auxiliary Data Screen

1. **On temperatures-** This column lists the On temperatures of each ventilation and heating level in the PBU.
2. **Off temperatures-** This column lists the Off temperatures of each ventilation and heating level in the PBU.
3. **Set Temp-** The current set temperature of the PBU. All other temperatures are keyed to the set temperature value. When set temperature is changed all of the ventilation and heating level temperatures are changed as well to maintain the same temperature difference from set temperature.

Screen 4: Daily History

Screen 4 (Figure 9) shows the amount of runtime (in hours and minutes) for each ventilation and heating level. The amount of time the PBU recorded a main control failure (if used) is also shown. The maximum number of history days is 100.

History	Daynumber 02
V1= 04:13	V2= 03:15
V3= 00:56	H1= 00:15
H2= 00:00	MF= 02:15

Figure 9. Daily History Screen

1./ **DayNumber-** The current day number whose data is being displayed in the history screen. This number is editable.
2. **Runtimes-** The amount of runtime in hours and minutes of each of the ventilation and heating levels.

Screen 5: Alarms

At the top of Screen 5, all current alarm conditions will be listed. If there are no alarm conditions, the status of the alarm will show at the top of the screen. The three possible statuses are ENABLED, DISABLED, and TEST. The status field is editable. See the "Alarms" section of this manual for more alarm information.
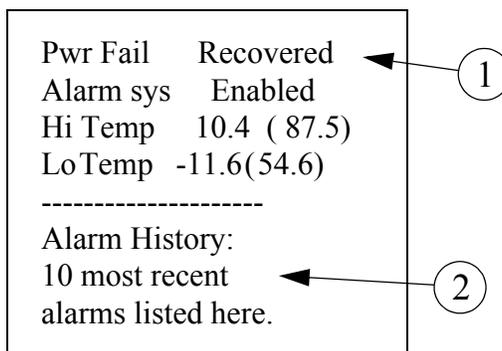


```
Pwr Fail      Recovered         (1)
Alarm sys     Enabled
Hi Temp     10.4  ( 87.5)
Lo Temp  -11.6(54.6)
----------------------
Alarm History:
10 most recent                    (2)
alarms listed here.
```

Figure 10. Alarms Screen

1. For this example, a power failure has occurred and recovered; this information is at the top of the screen and will remain there until the alarm is NOTICED.
2. The time, date and type of alarm of the most recent 10 alarms are listed in the lower part of the screen. The amount of time required for the alarm to recover and the amount of time needed to notice the alarm is listed in the history as well.
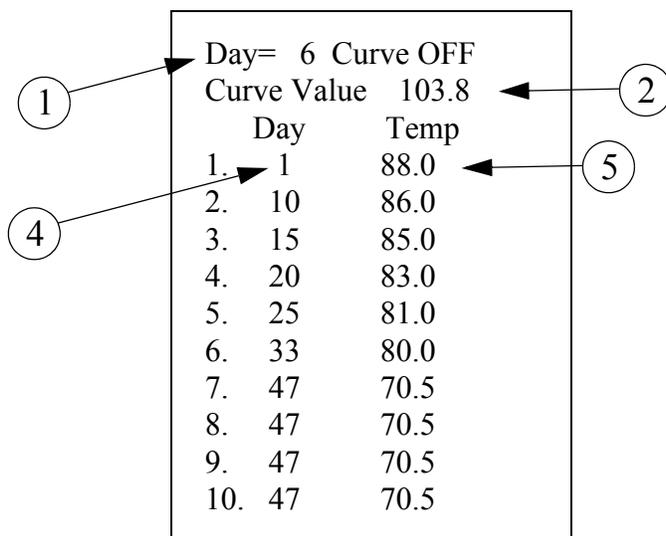
Screen 6: Set Temperature Curve


```
          Day=  6  Curve OFF        (1)
(1)       Curve Value    103.8      (2)
              Day        Temp
          1.    1        88.0        (5)
(4)       2.    10       86.0
          3.    15       85.0
          4.    20       83.0
          5.    25       81.0
          6.    33       80.0
          7.    47       70.5
          8.    47       70.5
          9.    47       70.5
          10.   47       70.5
```

Figure 11. Set Temperature Curve

1. **Today's Day-** The current day. This is also usually representative of the bird or animal age.
2. **Curve Value-** The current value of the set temperature curve.
3. **Bend Point (BP)-** Bend Points are the definition points of the curve. For the set temperature curve, the curve value is adjusted between bend points. The bend point values are the exact values at midnight on the day number of each bend point. The curve takes over when it is turned on and the day number is greater than or equal to the day number assigned in BP #1.
4. **Bendpoint Day-** Defines the day number of the bend point. This value can be negative and day #0 is not allowed.
5. **Bendpoint Temp-** Defines the set temperature value of the bend point.

Screen 7: Programs

The programs screen allows the user to save several different setups in the Control and activate those setups at a desired time.
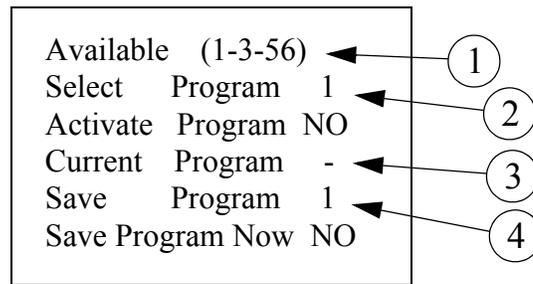
```
┌────────────────────────────────┐
│ Available    (1-3-56) ◄─────────── ( 1 )
│ Select      Program    1 ◄──────┐
│ Activate   Program  NO          └── ( 2 )
│ Current    Program     -  ◄─────── ( 3 )
│ Save        Program    1 ◄──────┐
│ Save Program Now  NO            └── ( 4 )
└────────────────────────────────┘
```

Figure 12. Programs

1. **Programs available-** Lists what programs have been saved are available to be activated the maximum number of programs is 6.

2. **Select Program x-** Select which program is to be activated. After selecting which program to activate, change the Activate Program line from NO to YES.

3. **Current Program-** Lists the current active program. This line will change to a "-" as soon as any parameter is changed that affects the operation of the PBU. This lets the user know that modifications have been made to the program.

4. **Save Program x-** Allows the user to select which program the current settings are to be saved. Once the desired program number has been selected, change the Save Program Now line from NO to YES.

Screen 8: Setup

When first pressing the setup key, 2 submenu choices will appear. One is the setup screen for setting up the PBU and the other is for accessing the Setup Key screen. See **page 5** for information on using submenu choices.
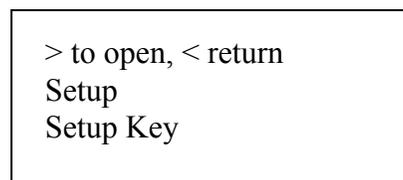
```
┌────────────────────────────────┐
│ > to open, < return            │
│ Setup                          │
│ Setup Key                      │
│                                │
└────────────────────────────────┘
```

Figure 13. Setup

Setup Screen

1. **Control Number-** Set the PBU's Control number here.
2. **Temp Unit-** Choose the desired temperature unit here (Celsius or Fahrenheit).
3. **Clock Type-** Choose the desired clock type to use (12 hour or 24 hour)
4. **Time and Date-** Set the current time and date.
5. **Tunnel Inlet assist-** Choose whether tunnel inlet assist will be used on the backup control. This feature is only available when the PBU is connected to an Expanded Backup control that has been equipped with the ability to do tunnel inlet assist.
6. **# of Vent Levels-** Set the desired number of ventilation levels (max 5).
7. **# of Heating Levels-** Set the desired number of heat levels (max. 2). A total of 5 levels are available. For example, if 4 vent. levels are chosen then only 1 heat level is available.
8. **Tunnel inlet assist-** Set which level the tunnel inlet assist relay will turn on (see #5 above).
9. **Relay-** Indicates which relay a particular vent level is assigned. These fields are not editable.
10. **Status-** Indicates the current status of the indicated ventilation or heating level (on or off).
11. **Main Control-** Indicates whether the PBU detects a main control failure. This feature is only available when the PBU is connected to an Expanded Backup Control that is equipped with a Main Control Fail output.
12. **Temp Sensor Cal-** Re-calibrate the temperature sensor here if desired. For more information see the "Calibrations" section of this manual.
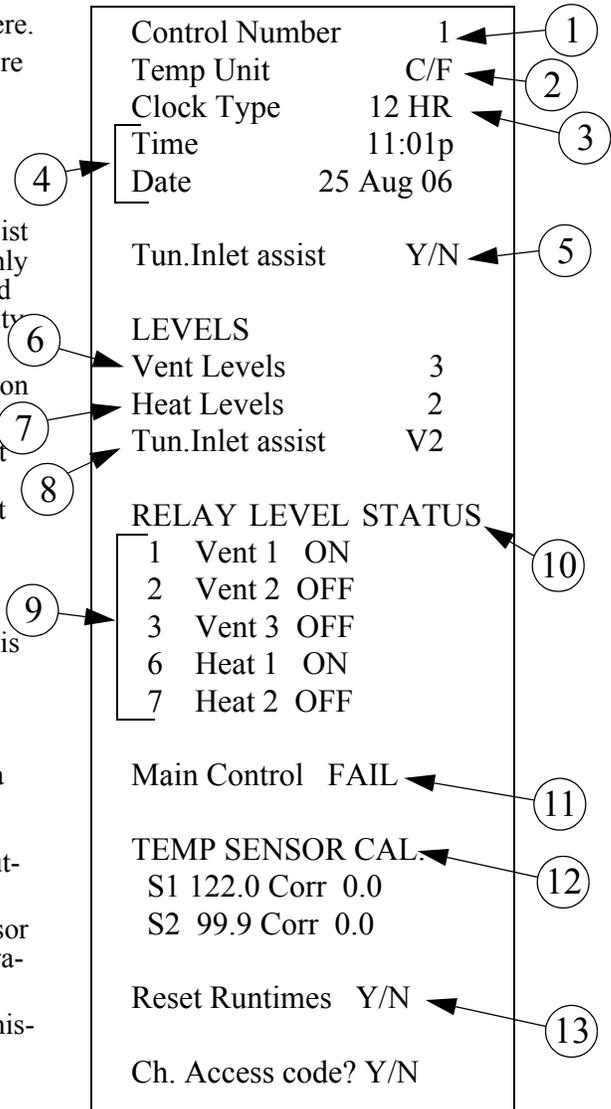13. **Reset runtimes:** If it is desired to reset the runtime history, answer YES here.

Figure 14. Setup Screen

Setup Key Screen

Before entering the setup key screen, make sure a setup key has been placed in the setup key port located in the upper left corner of the PBU.

1. **Control-** Shows the current software level of the PBU.
2. **Setup Key-** Shows the current software level of the settings saved on the setup key. If the setup key is blank nothing will be displayed here.
3. **To Setup Key-** Answer Yes here to save the current setting on the PBU to the Setup Key.
4. **To Control-** Answer Yes here to save the current settings that are on the setup key to the PBU. In order to save the settings the control and software version on both the control and the setup key must match.
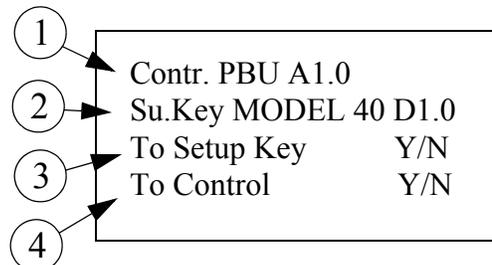
Figure 15. Programs

Initial Setup Procedure

Once the PBU (along with the appropriate backup control) has been properly installed, the PBU is ready to be setup. Refer to the standard or expanded backup control manual for proper installation of the backup controls.

CAUTION! Before turning power on to the PBU make sure all outputs connected to the backup box have their breakers in the OFF position. This will help to prevent an output from accidentally turning on during the setup process.

Go to the setup screen **(screen 8)**. Setup the PBU control number, temp unit, time and date. Then tell the control whether or not tunnel assist will be used (in the PBU and back up only). Finally enter how many ventilation and heating levels will be used and change the password if desired. When setting up a new control calibrating sensors should not be necessary.

Note: The relays inside the PBU are pre-assigned to certain ventilation levels. The relay assignment is as follows:

Relay 1- Vent Level 1   Relay 5- Vent Level 5

Relay 2- Vent Level 2   Relay 6- Heating Level 1

Relay 3- Vent Level 3   Relay 7- Heating Level 2

Relay 4- Vent Level 4   Relay 8- Tunnel Inlet Assist Relay

Once screen 8 is setup, it is not possible to go to screens 3-7 and complete setup. Please see the "Overview of screens" section of the manual as a reference to set up the other screens.

Control Operation Overview

The PBU Control must be connected to either a standard Backup Control or an Expanded Backup Control. It is not to be used as a stand alone device.

PBU connected to the standard Backup Control.

Normal operation
The PBU will monitor the average temperature of sensors 1 and 2. When the temperature rises to the On temperature of Ventilation Level 1, Relay number 1 in the PBU will close its contacts. This will cause the first level of ventilation to turn on inside the backup box and the backup will send an unconditional open signal to the tunnel inlet machine while blocking the close signal coming from the control. As the temperature continues to rise, the PBU will continue to turn on ventilation levels as their on temperatures are reached until all ventilation levels are on. As the temperature falls, the PBU will turn off ventilation levels as it reaches each ventilation level's off temperature. If the temperature falls, the PBU will turn on the heating level(s) when the temperature reaches each heating levels on temperature.

Power Loss of PBU
If power is loss to the PBU, this will automatically turn on ventilation level 1 providing there is still input power to the back up box.

Power Loss of main control or main control failure:
If the backup box (not the PBU) loses the presence of 24 Vdc coming from the control, then the backup box (not the PBU) will turn on ventilation level 1 providing there is still input power to the back up box.

PBU connected to Expanded Backup Control.

Normal operation

The PBU will monitor the average temperature of sensors 1 and 2. When the temperature rises to the On temperature of Ventilation Level 1, Relay number 1 in the PBU will close its contacts. This will cause the first level of ventilation to turn on inside the expanded backup box and the backup will send an unconditional open signal to either the tunnel inlet machine or the inlet door machine (depending on how the toggle switch is set) while blocking the close signal coming from the control. As the temperature continues to rise, the PBU will continue to turn on ventilation levels as their on temperatures are reached until all ventilation levels are on. As the temperature falls, the PBU will turn off ventilation levels as it reaches each ventilation level's off temperature. If the temperature falls, the PBU will turn on the heating level(s) when the temperature reaches each heating levels on temperature.

Tunnel Inlet Assist

If the Expanded Backup Control has been equipped with the ability to do Tunnel Inlet Assist and the backup is wired properly to the Tunnel inlet assist relay in the PBU, then at certain ventilation level the PBU can tell the expanded backup control to open the tunnel inlet after the inlet doors have already been opened by the backup box.

Important! The toggle switch on the backup box must be set to "Open Inlet Doors" in order for tunnel inlet assist to work. If the toggle switch is set to "Open Tunnel Inlet" then tunnel inlet assist will not work!

Power Loss of PBU

If power is loss to the PBU, this will automatically turn on ventilation level 1 providing there is still input power to the back up box.

Power Loss of main control or main control failure

If the backup box (not the PBU) loses the presence of 24 Vdc coming from the main control, then the backup box (not the PBU) will turn on ventilation level 1 providing there is still input power to the back up box.

If the expanded backup box is equipped with a main control failure output and it is connected to the PBU, then when the expanded backup control loses the presence of 24Vdc coming from the main control, the PBU will register a Main Control Failure alarm and also track the amount of time that the back up box was in the main control failure state.

Alarms

At the top of screen 5 a current alarm condition(s) will be listed. If there are no alarm conditions, the status of the alarm system will show at the top of the screen. The three possible statuses are ENABLED, DISABLED, and TEST. The status field can be changed.

Enabled

If the alarm system is ENABLED and one or more alarms arise, there will be alarm message(s) at the top of the screen. After pressing the screen 5 button the first time, the alarm Relay will be changed to the non alarm state for one minute and the alarm-screen will be shown. By pressing the screen 5 button a second time the alarm message will change from ALARM to the status NOTICED. This second button press is the manner that you tell the Control that you are aware of the alarm condition. If there is more than one alarm condition, you NOTICE each additional alarm condition with an additional button press for each additional alarm condition. If you fail to NOTICE an alarm with the additional button press(es), the alarm Relay will return to the alarm state one minute after the initial screen 5 button press. If the alarm condition is still present when you NOTICE the alarm, the word ALARM to the right of the condition will (for most alarm conditions) change to OFF FOR 24:00. The time setting is editable. It gives you time to deal with the problem. If you do not fix the problem, the alarm Relay will once again trigger your alarm system at the end of the time period. If the alarm condition has RECOVERED by the time you NOTICE the condition, the alarm message disappears when you NOTICE it and it is added to the alarm history at the bottom of the alarm screen.

Disabled

It is possible, but not recommended, to DISABLE the alarm system of the Control. One reason for this could be that the house is empty. The light beside the screen 5 button will flash slowly to remind you that the alarm system is disabled, but the alarm Relay will not change to the alarm state. The alarm history shown at the bottom of screen 5 does list that the alarm system was disabled, when, and for how long.

Test

If the user chooses TEST, the alarm Relay will immediately change to the alarm state. This allows testing the alarm system that is external to the Control (telephone dialer, for instance.) NOTICING the ALARM TEST, as you would a normal alarm, erases the alarm message and returns the alarm Relay to the non alarm state. Also, an ALARM TEST notification will be listed in the alarm history.

Warning

There also is an alarm message status called WARNING. This does not change the state of the alarm Relay, but alerts you that something isn't right. It needs to be NOTICED in the same way as a "hard" alarm in order to turn off the flashing lights, etc. An example is a failed Sensor.

Alarm History

At the bottom of the alarm screen is a listing of the most recent 10 alarms. The date and time of each alarm is shown. The amount of time elapsed (hh:mm) from the time the alarm occurs until the alarm is noticed and recovers is also show.

Alarm Messages:

Main Control Failure

This alarm will occur when the D1 input of the PBU IO board is open. This will indicate that an Expanded Backup control lost the presence of 24 Vdc from the main control. Alarm will recover once the Expanded Backup detects the presence of 24 Vdc and the D1 input on the PBU IO board is closed again.

Min/Max Act Sensor

The Minimum and Maximum Actual Temperature Alarm limits are the temperatures at which the alarm relay will change state if one of the sensors goes above or below the alarm limits for more than 1 minute. These numbers will change with set temperature and are referenced from set temperature. The number in parentheses indicates the temperature where the alarm will be triggered.

Sensor Failure

If one of the temperature sensors goes below 0°F or above 120°F for 1 minute, a silent alarm (warning) will be given. When this happens the failed sensor is ignored and all functions are based on the reading of the other sensor.

No Sensor Available

If both sensors fail at the same time, a Sensor Failure alarm is generated. This is a loud alarm and all outputs of the PBU will turn off until there is at least one sensor functional again and the No Sensor Available alarm is noticed.

Program # Activated

This is a message that will appear in the alarm screen after one of the 6 stored programs is activated. The alarm relay will not change state. The program activation history will be recorded in the alarm history.

Setup Key Restored

This message will appear after settings are transferred from the setup key to the PBU. The alarm relay will not change state.

Service alarms:

Listed below are additional alarm codes that relate to the internal operation of the PBU. Contact the nearest Chore-Time Distributor or CTB service personnel if one of these alarms occur.

Listed below are additional alarm codes that relate to the internal operation of the Control. Contact CTB service personnel, if any of these alarms occur.

SYSTEM FAILURE 100	ERROR 20
SYSTEM FAILURE 111	ERROR 21
ERROR 1	ERROR 22
ERROR 2	ERROR 23
ERROR 3	ERROR 27
ERROR 4	ERROR 29
ERROR 5	ERROR 30
ERROR 6	ERROR 33
ERROR 7	ERROR 34
ERROR 8	ERROR 35
	ERR 103

Programs

The following parameters are not saved when you save a program setup in screen 5

Day number
Time of day
Date
History
Alarm history
Control number
Calibrations
Access code

It would be inappropriate to reset these parameters to what they were when you saved the various program numbers.

Limp Modes

A limp mode is an abnormal type of operation that takes place whenever certain conditions occur. The object is to take action to minimize the effect of a Sensor failure.

Failed Temperature Sensor

A temperature sensor is considered to be failed if the reading of the sensor is less than 0°F or greater than 120°F.

The limp mode is

The other sensor connected to the PBU will take over full control with no alteration in function. A silent alarm is given (the alarm relay does not change states, but the light in **screen 5** will flash). If both sensors fail than all outputs will be turned off and loud (alarm relay does change states) No Sensor Available alarm is given. There will likely be either high or low temperature alarms as well.

Control Installation

Mounting the Control

The PBU Control requires a minimum mounting area of approximately 10" x 14" [55.9 cm x 55.9 cm]. This dimension is allowing extra room for the Control Door to open. **(See Figure 16)**. The box should be mounted level on a solid backing using the mounting holes provided.

Note: Mount the PBU Control as close to the Backup Control as possible. This will make it easier to connect and coordinate the two devices. **The PBU can not be used without a Standard or Expanded Backup Control.**
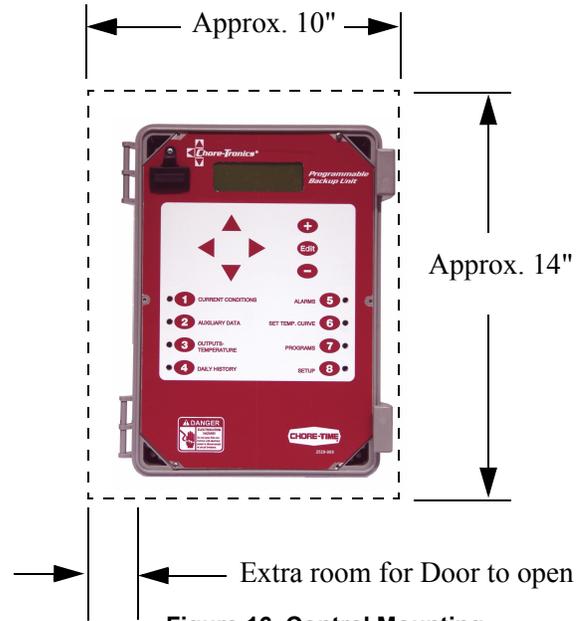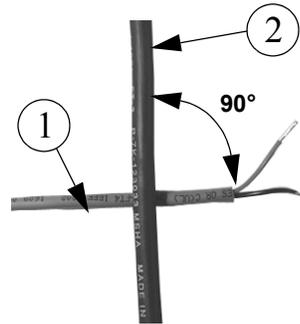

Figure 16. Control Mounting
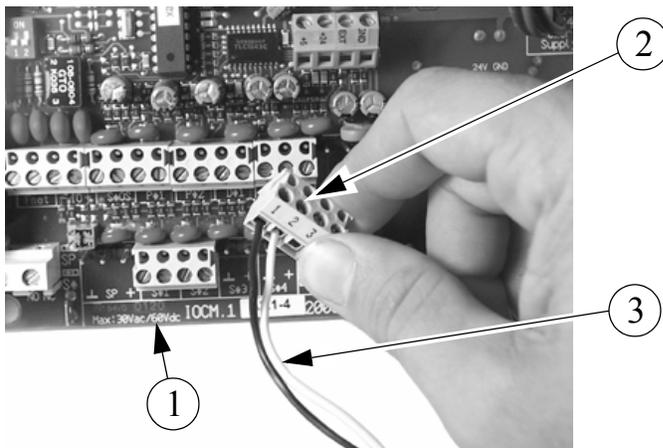
Teperature Sensor Installation

The Temperature Sensors require Non-Shielded 20 Guage Twisted Pair Wire **(See Figure 17)**. This wire is available from Chore-Time. When routing this wire in the house be sure to keep the wire a minimum of 12"(305mm) away from line voltage wiring. If there is a need for the Sensor wire to cross line voltage wires cross them at a 90° angle to each other as shown.**.**

The Temperature Sensor wires are connected to the PBU Control at the I/O Board. **(See Figure 18, Item 3)** Please note that the Terminal Connectors on the I/O Board can be detached for easy connection **(See Figure 18)**. There are no polarity restrictions for the Temperature Sensors.

Item	Description
1	Non-Shielded Twisted Pair Wire
2	Line Voltage Wiring

Figure 17. 90° Cross-over

Item	Description
1	I/O Board
2	Terminal Connectors
3	Non Shielded Temp. Sensor Wires

Figure 18. Temperature Sensor Installations

Calibrations

The calibration section of the setup screen allows the user to re-calibrate inputs if necessary. If it is felt that one of the inputs needs to be re-calibrated **Perform the Following Steps...**

Temperature Sensor Calibrations

To re-calibrate the Temperature Sensors, first obtain a digital thermometer that has a readout of at least .1°. **Do not use a temperature gun**. A temperature gun takes object temperatures, not air temperatures. Place the digital thermometer next to the Temperature Sensor that is being re-calibrated. Take the reading from the digital thermometer and enter that number under the temperature
column, **(Item 1, Figure 19),** of the Sensor being calibrated. The Correction column, **(Item 2)** is used only for service information and to return the Control to the factory settings. The settings should be reset to factory whenever a re-calibrated Temperature Sensor is replaced. To return to factory settings change the number under the correction column by one digit. This will cause the correction to automatically zero out and return to factory setting.

TEMPERATURE SENSOR CALIBRATION:

	Temperature	Correction
Sensor 1	XX.X	(0.0)
Sensor 2	XX.X	(0.0)
Sensor 3	XX.X	(0.0)
Sensor 4	XX.X	(0.0)
Sensor 5	XX.X	(0.0)
Sensor 6	XX.X	(0.0)

Mt1701-045 11/01

Figure 19. Temperature Sensors

Changing the Access Code

There is always an access code. From the factory the value is set at "1111". The 1111 is a special code that tells the control not to ask for an access code when the edit button is pressed. If it is desired, the access code can be changed to a 4 digit number. To change the access code answer YES to change access code at the bottom of screen 8. Then enter the desired 4 numbers buy pressing the subject buttons on the front of the control. If an access code can not be recalled please contact your Chore-Time distributor or service representative.

Wiring Diagrams

Control to Expanded Backup Control (Chore-Time part # 48119) Wiring

The diagram assumes that there will be 3 ventilation (fan) backup stages and 2 heating stage.
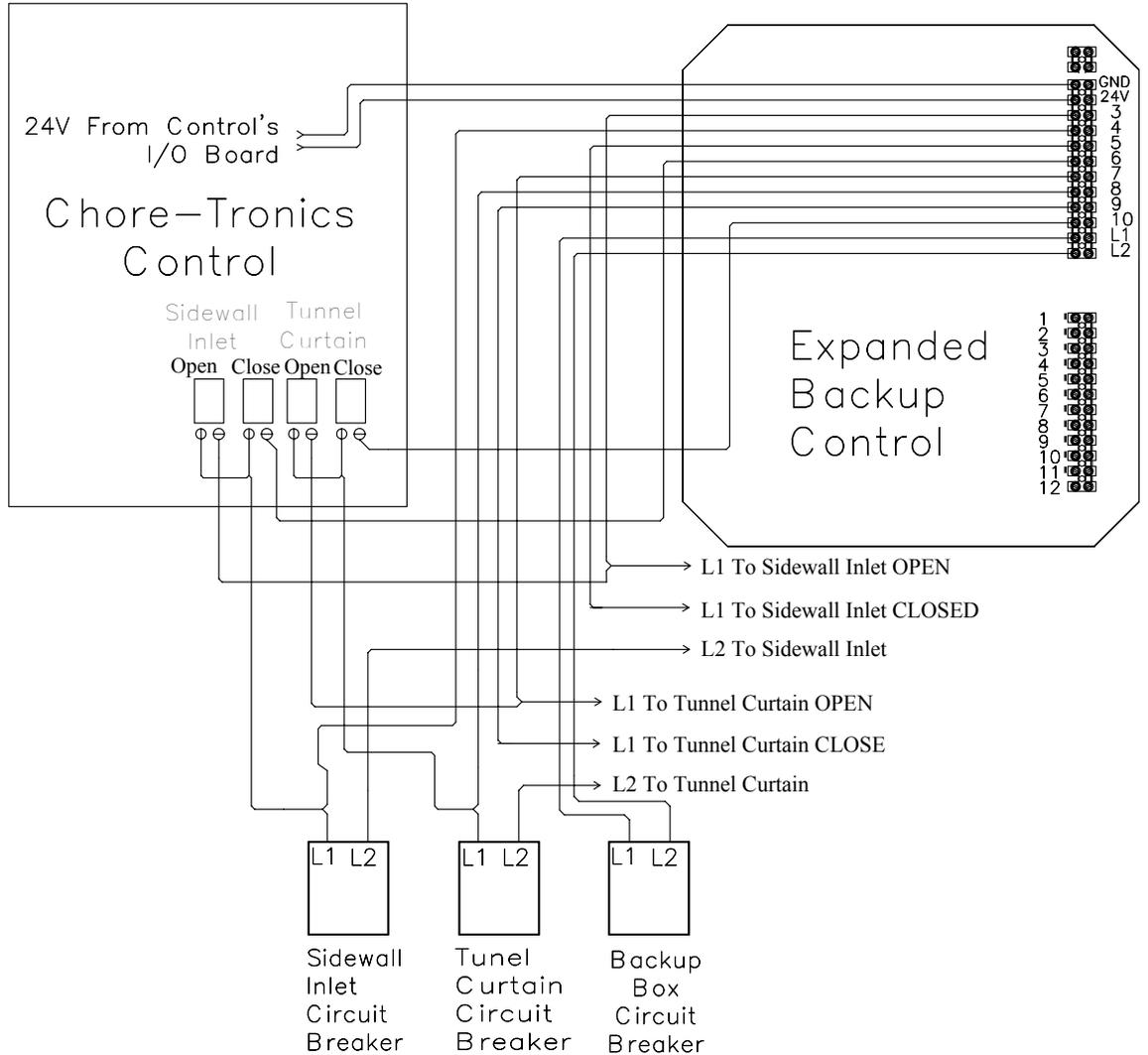
Expanded Backup Control to PBU Control Wiring (Continued)

Note: The wires going to relay #1 in the PBU should be wired to the common and normally CLOSED contacts. All other relays should be wired to the common and normally OPEN contacts.
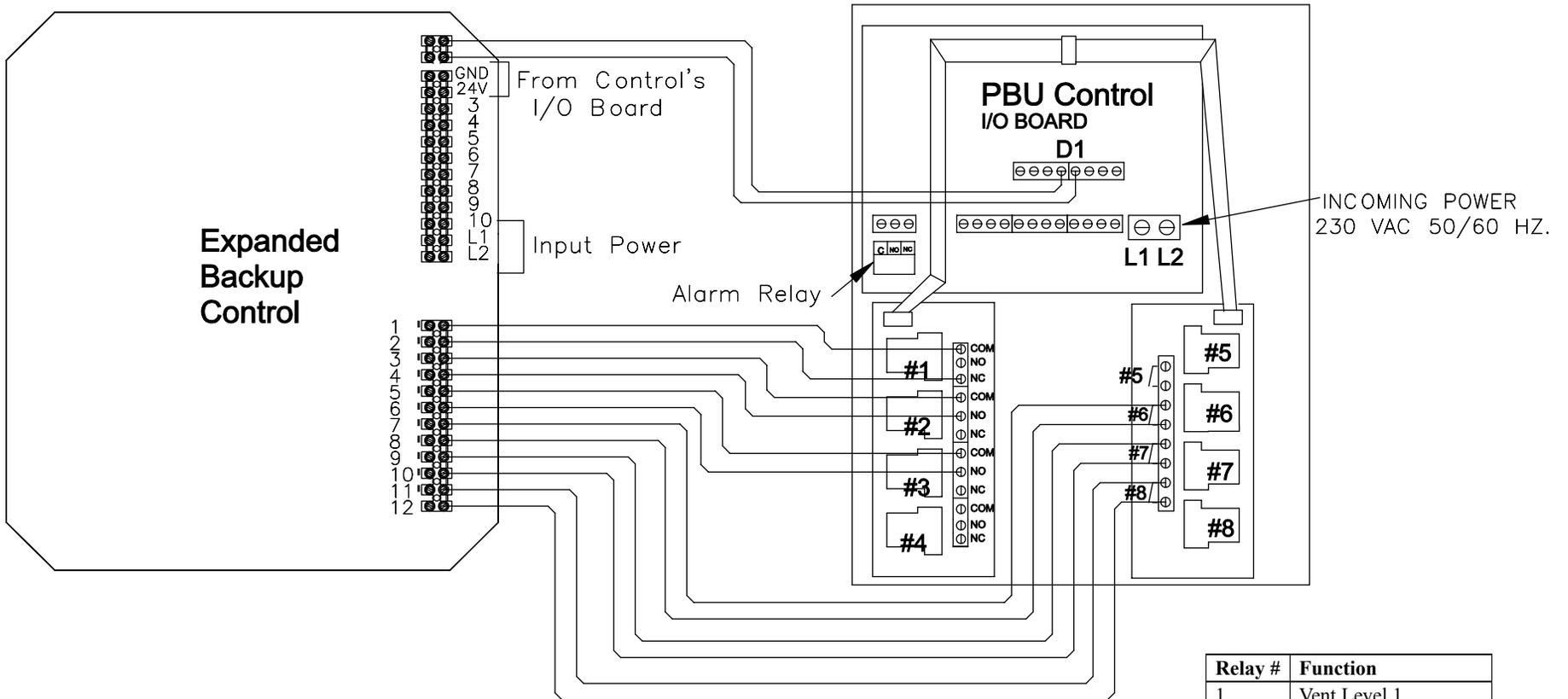

**Note:** For additional Expanded Backup Wiring information see Manual MT1805

Relay #	Function
1	Vent Level 1
2	Vent Level 2
3	Vent Level 3
4	Vent Level 4
5	Vent Level 5
6	Heat Level 1
7	Heat Level 2
8	Tunnel Inlet Assist (Exp. Backup Only)

## PBU to Standard Backup Control (Chore-Time part # 40727) Wiring

The diagram assumes that there will be 2 ventilation (fan) backup stages, 1 heating stage and the tunnel inlet assist and main control failure detection feature will be used. **Note: The wires going to relay #1 in the PBU should be wired to the common and normally CLOSED contacts. All other relays should be wired to the common and normally OPEN contacts.**
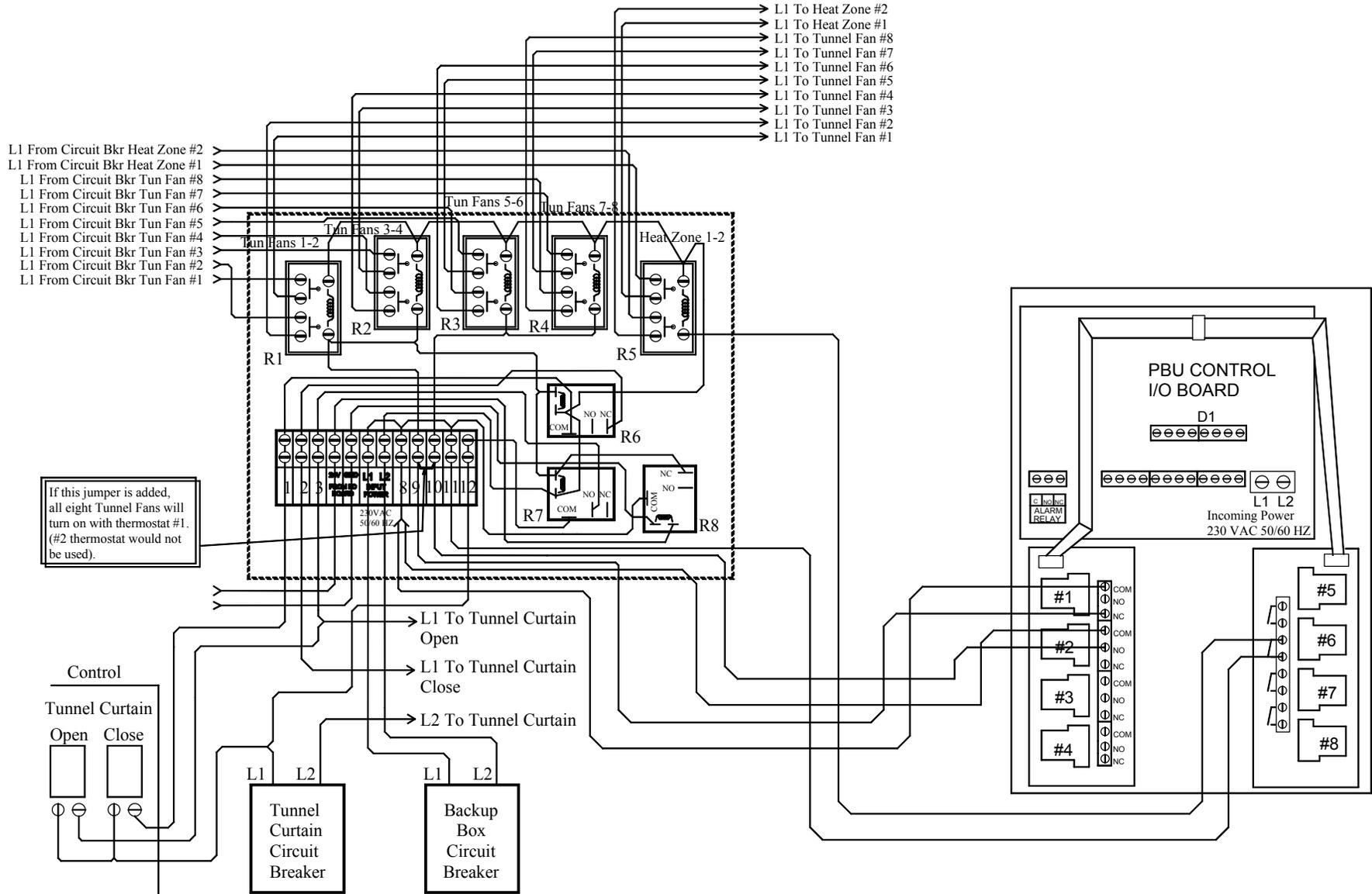
Part Numbers
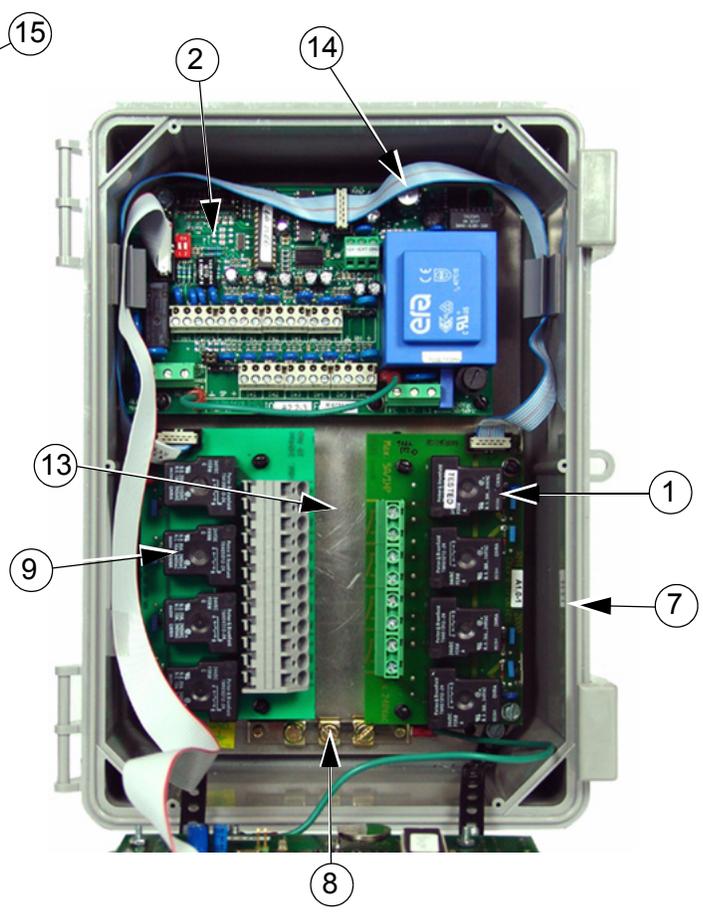
Item	Description	Part No.
1	Relay Module (RM4)	41305
2	I/0 Board	41312
3	Key Board Display (KD.2)	41316
4	4 x 20 Display	41318
5	PBU Front Decal	2529-908
6	Control Box Lid	30859-1*
7	Control Box	30860-3
8	Grounding Rail	43384-2
9	(RM.4DT) Board	51449
10	Setup Key Board (SKB)	51450
11	Cable 16P-590mm	51451
12	PBU Front Plate	51452
13	PBU Bottom Plate	51453
14	Cable, 10P-480mm Flat	41981
15	Control Box Latch	30862
16	Box Latch Pivot	30863
17	Cable, KSP 16P-210mm	43431
18	Setup Key Plug	49724
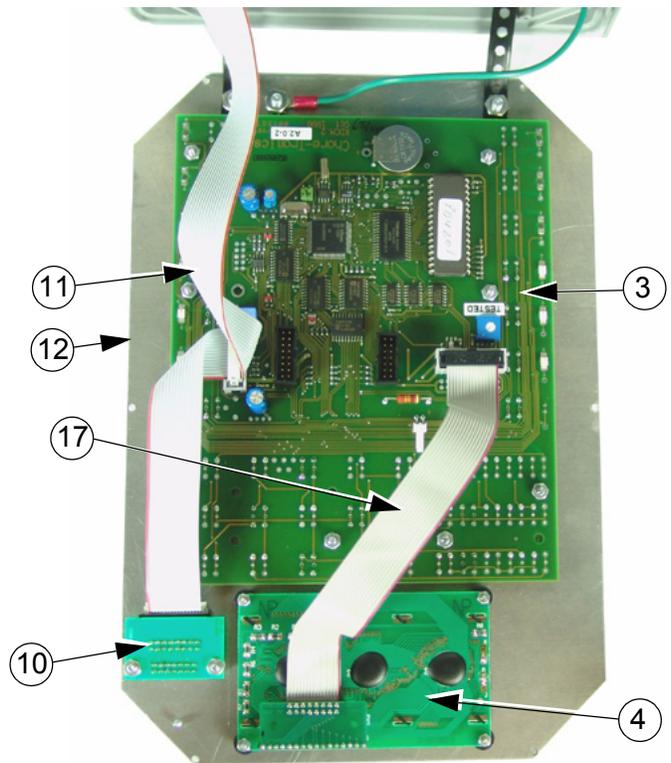
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Revisions to this Manual

Page No.   **Description of Change**

                      New Manual

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